March 13, 2013

TO: Academic Senate Members

FROM: Office of Academic Governance
Chris McGowan, Academic Governance Secretary

RE: Academic Senate Meeting

The Academic Senate will meet on Wednesday, March 20, 2013 at 2:00 p.m. in the TI Auditorium, ECS South 2.102.

Please bring the agenda packet with you to this meeting. If you cannot attend, please notify me at x4791.

xc: David Daniel  John Wiorowski  Darrelene Rachavong  Rochelle Peña
Hobson Wildenthal  Calvin Jamison  Abby Kratz  Raj Dwivendi SG President
Andrew Blanchard  Inga Musselman  Chief Larry Zacharias
Serenity King  Larry Redlinger  Deans

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*Speaker  **Secretary
AGENDA
ACADEMIC SENATE MEETING
March 20th, 2013

1. CALL TO ORDER, ANNOUNCEMENTS & QUESTIONS  DR. DANIEL

2. APPROVAL OF THE AGENDA  DR. LEAF

3. APPROVAL OF MINUTES
   February 20, 2013 Meeting  DR. LEAF

4. SPEAKER’S REPORT  DR. LEAF

5. FAC REPORT  DR. LEAF

6. ELECTION COMMITTEE REPORT  DR. CORDELL

7. STUDENT GOVERNMENT LIAISON REPORT

8. PRESENTATION ON DEVELOPMENT OF ‘COLLEGE TOWN’ AREA  DR. JAMISON

9. CEP PROPOSALS
   A. UNDERGRADUATE CATALOG  DR. CANTRELL
   B. GRADUATE CATALOG
   C. POSTHUMOUS DEGREE POLICY
   D. ACADEMIC CERTIFICATE PROGRAMS

10. PROPOSAL FROM THE COMMITTEE ON EFFECTIVE TEACHING  DR. MICHAELSON

11. FAC RESOLUTIONS  DR. LEAF

12. ADJOURNMENT  DR. DANIEL
UNAPPROVED AND UNCORRECTED MINUTES

These minutes are disseminated to provide timely information to the Academic Senate. They have not been approved by the body in question, and, therefore, they are not the official minutes.

ACADEMIC SENATE MEETING
FEBRUARY 20, 2013

PRESENT:  David Daniel, Hobson Wildenthal, Robert Ackerman, Shawn Alborz, Poras Balsara, John Barden, Kurt Beron, Dinesh Bhatia, Gail Breen, John Burr, Cy Cantrell, R. Chandrasekaran, David Cordell, Gregg Dieckmann, John Ferguson, John Geissman, Lev Gelb, Tobias Hagge, D. T. Huynh, Joe Izen, Murray Leaf, Dennis Miller, Jessica Murphy, Ramachandran Natarajan, Simeon Ntafos, Ravi Prakash, Monica Rankin, Michael Rebello, Liz Salter, Richard Scotch, Tres Thompson,

ABSENT:  Peter Assmann, Warren Goux, Umit Gurun, Jennifer Holmes, Mustapha Ishak-Boushaki, Kamran Kiasaleh, Nicole Leeper Piquero, Syam Menon, B.P.S. Murthi, Tim Redman, Robert Taylor, Zhenyu Xuan, Kang Zhang

VISITORS:  Andrew Blanchard, Serenity King, Abby Kratz, Emily Tobey, Raj Dwivedi, Inga Musselman, Karen Huxtable-Jester, Darrelene Rachavong, Gene Fitch, Robert Serfling

1. CALL TO ORDER, ANNOUNCEMENTS AND QUESTIONS
President Daniel called the meeting to order. He had just finished meeting with the Vice President of Budget and Finance. The University started the budget hearing process earlier this year. This will allow the information to feed into the process better than it was last year. Last year two to three faculty representatives sat in on the process. The president was pleased to have their input. President Daniel invited Senate members to attend. The hearings will take place the last two weeks of March.

The board of regents approved an $18 million building expansion immediately adjacent to the Callier Center of Richardson. This expansion is dependent upon the University’s ability to raise five million dollars in private money. The University has a $95 million request for a new engineering building before the state in tuition revenue bonds (TRB). The request ranked sixth in the state out of seventy-seven applications. Currently there is nothing in the State budget for any buildings at universities. However, there seems to be a lot of good will towards the investment.

The Legislature is much calmer than it was in 2011. There is positive money, instead of negative money. On the whole, the legislature is happier. The current budget from the house and senate favors our university. State funding is based upon weighted semester credit hours from the previous two years. The legislature will look at the last two years starting at September 2011. The university’s attendance is up over the last two years. This will raise the universities state funding by approximately $7 million in the base budget.
Speaker Leaf noted that in the past when faculty had a choice, they placed courses likely to get larger enrollments in base budget years and left courses that attracted lower enrollments in off-base years. This practice was a great help. President Daniel responded by noting that formula funding on the whole has become steadily less important in our overall operating budget. The first year UTD accepted freshmen, 1990; the University collected $4.20 of state support to fund the operation of the University for every dollar paid in tuition by the students. This fiscal year the university collected only thirty-seven cents of state support for every dollar paid of tuition by the students. President Daniel is hopeful that the state will continue to fund capital projects. There were no questions.

2. **APPROVAL OF THE AGENDA**

   Calvin Brown requested a very brief item on emergency preparedness be added to the agenda. Jessica Murphy moved that the presentation by the Committee on Teaching Effectiveness before the presentation from BAIT. Cy Cantrell seconded. Motion carried.

3. **APPROVAL OF MINUTES**

   Speaker Leaf presented the previous minutes. Cy Cantrell moved to approve the minutes as circulated. Richard Scotch seconded. The motion carried. The minutes were approved as circulated.

4. **PRESENTATION BY THE COMMITTEE ON TEACHING EFFECTIVENESS**

   Theresa Towner the chair of the committee on Teaching Effectiveness, presented a recommendation to set up a learning center at the university similar to the other Tier 1 schools. The recommendation had a unanimous approval vote from the teaching effectiveness committee. The committee would like the Senate’s support on this idea.

   Pat Michaelson presented a report called “Scholarship reconsidered – Priorities of the Professoriate” by Ernest L. Boyer. It was Boyer’s belief that faculty should treat their teaching with as much scholarly attention as they treat their research. He calls this the scholarship of teaching. What other universities have done to facilitate this climate is to create centers for teaching and learning.

   It is the CET’s opinion that our university is behind the times by not having a center for teaching and learning. A handout listing the benchmarked tier one universities with teaching and learning centers was circulated, as well as a copy of the flyer for the UT Austin teaching and learning center. Most of the centers were headed by PhDs that were tasked with staying ahead of the literature on Education and translating it into a way that can implemented by their faculty. At the University level there must be a balance due to the specialized needs of each discipline. The Education people can assist faculty with learning but the faculty will need to develop ways of communicating the specialized needs of individual disciplines.

   The flyer from UT Austin illustrates that it has a large center. In their center, they combine a number of items that are in various places across our campus. They have assessment within their center, as well as teaching technology. Their section on instructional development has a staff of ten. The flyer describes what the center does for the university. One of the items they highlight is their consulting services. A faculty member can have a one on one confidential
discussion with a consultant regarding problems they are having in their teaching. An example would be that a faculty member gave a mid-term exam and felt that the students were prepared for it, but all of the students flunked it. The consultant would review their exam, what the faculty member did to prepare the students, and then give recommendations on how to help them with their problem. Their center provides seminars, workshops, and presents speakers. In addition, they have a bi-weekly lunchtime series over a semester on a specific educational topic. The center also provides training for graduate students on how to give instruction as TA’s and later as first time lecturers.

Dr. Michaelson turned the floor over to Karen Huxtable-Jester to describe what BBS had been providing for their school. Dr. Huxtable-Jester circulated a hand-out that listed the ways that BBS is already providing services for their professors, and graduate students. Their group has been ‘filling the gap’ for their faculty and students due to the lack of a center for teaching and learning.

BBS is doing a wraparound approach to this topic. BBS has a very active teaching effectiveness committee that evaluates faculty’s effectiveness any time they are up for tenure or promotion. Last year they created a role, teaching support coordinator, which fills in the gaps that the university does not have from a teaching excellence center. Dr. Huxtable-Jester, as the teaching support coordinator for BBS, is available for one on one consultation to talk about teaching issues, or specific problems. These discussions are not evaluative, so the faculty/students are not judged in any way. The coordinator has no powers of evaluation, and does not tell anyone the topics of discussion. The BBS group does lunch seminars for its faculty several times a semester. They would like to bring in outside speakers for the seminars, but that has not been possible yet. She opened the floor to questions.

Cy Cantrell questioned how they teach the teaching assistants to teach. Dr. Huxtable-Jester responded that BBS teaching assistants have a teaching orientation. This allows them to know what is expected of them. This includes presentation by different faculty members, and panel discussions with previous graduate students. Last summer Dr. Underwood taught a seminar for Ph.D. students who are about to teach on their own for the first time. It is a course to help them develop their teaching persona; understand classroom dynamics, and other items related to developing their own courses.

Speaker Leaf requested asked what the Senate could do. What kind of operation did the committee recommend? Could the CET create a definite proposal to present to the Senate? Theresa Towner suggested that the Senate recommend that a staffed centralized office be created that is dedicate to creating the Teaching and Learning Center. Their goal is to centralize the resources the university already have at the school level. The CET would like formal endorsement from the university not just symbolically in this endeavor.

The Office of Graduate studies does a two-day orientation with the new teaching assistants that includes what the responsibilities and duties are of a university teacher. This past year they have been going to individual school orientations where they get further instruction. Unfortunately, these very ad hoc arrangements are subject to change. Dr. Tobey added that at new faculty orientation, which is required for new assistant professors who have never taught a
course before, are given three afternoon sessions to orient them. This was done in Fall 2012, and seven of those individuals are teaching their first class this semester. On average, she is spending 4 to 5 hours a week with them because they are unclear on what they are expected to do. This center would facilitate these types of trainings for new faculty and adjunct faculty.

Speaker Leaf noted that in order to proceed further there were two options. The first, the CET submits a proposal to the council. The second option, Senate sets up someone to work with the CET to create the proposal and submit it to the council. Dr. Towner said the CET would prefer option two.

Dr. Michaelson stated that the CET wants an expert on education to head the office. They would want someone who is educated in education, not just a great teacher. Richard Scotch recommended that the committee create a proposal, and a job description detailing the responsibilities of this new position. The proposal could then be presented to the Academic Council on March 6. Dr. Huxtable-Jester agreed to have a proposal from the committee to the Academic Council by the March 6 meeting.

President Daniel asked if the Provost office had been involved in the proposal. Dr. Huxtable-Jester said that only Dr. Tobey had been involved to date. President Daniel is in support of it, and is willing to back this proposal. The Provost office is the appropriate area to put forth a budget request for this program. Dr. Towner noted that the budget process has been started already. Currently there is a discrepancy between the schools regarding how they are addressing this problem. The President feels the program should be at the school level with the dean’s support, and not just at the university level. Jessica Murphy felt the more central the office was the more functionality it would have.

The senate asked the committee to make a specific recommendation for a central office to be brought back to the council on March 6.

5. **Presentation by Calvin Brown**

On April 2 of 2012 the university had a tornado scare. The Emergency management team created a program to educate the campus on emergency awareness. There were three main points they wanted to highlight. The first is the procedure of what to do when the different alerts are sounded. If an alarm sounds on the outside of buildings, everyone, is to go inside the nearest building immediately until an all clear is given. When an evacuation alarm is given, such as a fire alarm, everyone is to proceed to his or her evacuation area. The third type of alarm is a lock down alarm. All faculty are to lock, barricade the doors of their classrooms, and stay away from all windows and doors until the all clear is given. From the central desk, the emergency management team can broadcast to all buildings and via text messaging or email on phones when an alert occurs, as well as give all clears.

The second point is the responsibilities of faculty during these emergencies. During the April 2 2012 severe weather evacuation, a teacher did not take care of a student with disabilities. When even a student is in a faculty’s classroom, they are the faculty member’s responsibility. If there is not an evacuation information sheet in a classroom, faculty can call the Emergency Services group, and a new one will be posted for them. When the building alarm sounds and says to
evacuate, everyone is to evacuate immediately. If the faculty member cannot move the student with disabilities, they are to be brought to a safe area. The faculty are then to advise first responders where the person is located. The first responders will assist them.

The third point is that if a lock down message is given something bad has happened on campus. A faculty member is to secure themselves, students, and the room they are located in. They are to stay away from the windows and doors. This means that doors are to be locked, if there is no lock, the door is to be blocked with anything available to prevent unwanted entry. Everyone is to stay that way until an all clear is given. On January 8 2013, a drill for active shooter was performed. Emergency management feel between themselves and the police department, they can take care of the situation. In the meantime, they need everyone to take care of himself or herself until the emergency services can get to you.

This year is the first year that they will be doing severe weather shelter drills in all the buildings. They have trained people in each of the buildings what to do should an emergency arise. They will direct everyone to severe weather shelters. These are interior rooms, typically restrooms, where everyone will be safe from the effects of the storm. Do not be surprised when there is a notice that this drill will be happening. It will only take ten to fifteen minutes before the all clear is sounded.

Speaker Leaf asked if the deans had been alerted to these drills. This would allow them to alert their faculty and could be prepared for the disruption. Mr. Brown had not done that yet, but he would do it shortly. Dr. Izen noted that many classrooms do not have door locks. What are faculty to do in rooms that do not have locks should a lock down order be given? Mr. Brown suggests putting a chair behind it; barricade it with any furniture available. The Emergency management team is working on making it possible that from the central dispatch office they can auto lock all of the exterior doors of all the buildings. Currently not all buildings are set up to allow this, but most are. Dr. Izen asked that all classroom doors have locks, and that faculty have keys. Faculty members are strongly in favor of being in control of locking their classrooms when there is a threat and unlocking it when the all clear is given. Mr. Brown could not address that, but would pass along the recommendation. This may pose a problem as the University is attempting to go keyless. President Daniel asked that the question be taken under advisement. Calvin Brown with follow up with the Campus Police Chief on the question, and will get back with the Senate.

Emily Tobey asked that additional inspections of handicap doors on campus be performed. Many of the doors that she has dealt with recently have not been performing adequately. Mr. Brown responded by saying that they are inspected frequently but if a malfunction with the doors occur it should be reported to his office. They will see to its repair as soon as possible. President Daniel noted that if multiple requests are filed for a health and safety issue, but no action has been taken he would like to be notified. Typically, when he must deal with a problem personally the problem is addressed promptly. He would like the faculty to help him help everyone by alerting him when problems are not being addressed properly.
Ravi Prakash asked they should do if a lock down is in effect and a faculty member finds himself or herself outside of a building. Mr. Brown responded by saying that they should go to a secure location as quickly and safely as possible.

David Cordell asked if there was a posted phone number, like there are in restrooms, if there is an issue someone may call that number and it will be addressed. Mr. Brown responded that currently there is not, but it is a viable solution. It would allow the Health and Safety department to be alerted quicker if there is a malfunction.

A suggestion was made that wherever there is a shelter area, the wireless signal should be stronger. Most people will be getting the all clear via text message or email. Soon as students, staff and faculty are in a sheltered area, they are going to begin using their cell phones to find out what is going on. President Daniel suggested that Andrew Blanchard reviewed the Wi-Fi service strength in the sheltered areas.

6. **Presentation From BAIT**

While the BAIT set up for their presentation Speaker Leaf summarized what has happened in the past to bring them to the Senate. Over the break, there was a problem with a student who was not dangerous but who clearly did need help. Following this up, Speaker Leaf spoke with Darrelene Rachavong, the Vice President of Student Affairs, about the BAIT operations and visited one of their meetings. Two questions arose from this situation: Is the BAIT concerned with students beyond just those deemed “dangerous”? The answer was that they were. The second question was “How can there be better feedback to faculty?” These are the topics for today.

In the agenda packet is the current charge to the BAIT. The charge shows they have a broad scope. The next question addressed is how can the Senate help the BAIT?

Dr. Rachavong began by giving the Senate an overview. BAIT stands for Behavioral Assessment and Intervention Team. When students’ names are sent to the team, via residential life, police department, other students or faculty/ staff themselves, the team gathers all the information they can on the student from a variety of sources. They then make a decision on how they may intervene, and support them here at the university. This involves calling faculty, inviting faculty to BAIT meetings, or possibly getting family involvement. It does not just involve expelling the students if they are a problem. It is providing the help and support the student needs to be successful at the University. The members of the BAIT are James Cannici, Director of the Counseling Center; Gene Fitch, Dean of Students; the Director of Resident Life; the Chief of Police and his Lieutenant; Sheila Amin Gutierrez de Pineres, and the associate Dean of Students, Kimberly Winkler. They have added Cristen Casey, the Director for International Students, as many of their cases involve international students. Kerry Tate, Director of Student Access Ability, is not on the team but she is consulted as needed. They meet every Monday at 8:15 AM for one to two hours. The meetings are typically case management type meetings. If an incident occurs between meetings, they will address it quickly. All of the members are located on the same floor so they are able to talk about cases daily. The types of intervention they do may include bringing in family or sending students to the counseling center for mandated assessment. The assessment may require that a student continue counseling, helping the students get a medical withdrawal, or even hospitalization.
Many times, it may only require parental involvement to provide a support system for them. On the other hand, sometimes there is no way to keep the student active at the university. That only occurs when the behavior is so serious that the university cannot provide the kind of support that the student requires. They will work with the parents to get the student the help they need.

At the Council meeting, the BAIT walked the council through a recent case the BAIT has worked on. The team felt this would be the best way to illustrate what the team does. At this point Darrelene Rachavong turned the floor over to Gene Fitch.

He began by stating that the first priority of the team is the welfare of the university’s students, faculty and staff. If the BAIT is aware of a student that is dangerous or threatening, they are NOT in any of the classrooms. They have been addressed, and removed. They do not know about all of them, but the ones the team is aware of have been/ are being addressed. Dean Fitch then walked the Senate through the same case study described for the council. The details of the case study are omitted to protect the individuals involved.

Over the course of a year, the team will see sixty to seventy students whose cases they discuss at their regular meetings. To date, the team has had forty-five cases from fall until February 20, 2013. Thirty of those are undergraduate students, while roughly ten to fifteen are graduate students. They come from all segments of the student population.

Dr. Rachavong has discovered in the past couple weeks that it is not easy for the staff/faculty to navigate the web pages to find out where to go if they have a concern. There has never been a BAIT website, but there will be one now. It will have all the numbers and contact information of the committee members on it, as well as alternative numbers to contact someone should a student, faculty, or staff has a concern 24/7. Dean Fitch has added a letter to the process that will go to faculty and staff who have sent a student to the team. A formal letter will be sent to the faculty/staff who sent the student to them to let them know that the team is acting on their concern. The notification email that the team is required to send out at the beginning of each semester is being updated. They are creating a more involved email that they hope will explain what the team does, and how to contact them should they have a problem student.

Speak Leaf asked what faculty should do outside of working times, and the committee’s meeting time. There were provisions for that before, but they will now be more accessible to staff/faculty. Dr. Rachavong reiterated that the BAIT is adding more substance to their communications. She also brought up another question that had been addressed to them outside of Senate. What should faculty do if a student needs the counseling center on a weekend? The BAIT team knows that faculty are supposed to call the police department, and they have someone on staff 24/7 to deal with these situations. There has always been support staff available but it has never been properly communicated to the campus population.

Dr. Rachavong noted that faculty are ‘on the front line’ with students. If a faculty member sees a student having difficulties, please advise the BAIT. They can assist getting the help they need. The Dean of Students has the authority to contact the student and bring them into the counseling center. They will not hesitate if they feel a student needs to see the counseling center, in fact they can require it. That is the reason that the team is BEHAVIOR assessment team, and not a THREAT assessment team. The BAIT covers everything.

Tres Thomson asked how long the BAIT follows up with students to make sure they are compliant with their behavior modifications, medications, or counseling guidelines. Dean Fitch
responded that once a student is in the BAIT system they are never completely ‘off their radar’. The student may be at a higher or lower level but the BAIT will continue to follow a student’s case. The student may have completed their treatment plan but that does not mean that the BAIT will not continue to meet with them every week or bi-weekly to make sure they are doing all right.

7. **PRESENTATION BY ON SALARY COMPRESSION AND INVERSION**

Richard Scotch, the chair of the Budget Advisory committee, began by stating that at the caucus of 2011 and 2012 the issue of salary compression came up as a major concern. Since then the Budget committee has been investigating this issue. In 2012 they had discussion with administrators, and with the president’s support the committee was able to get a data base from the strategic planning office of faculty salaries for the current year. Robert Serfling, a member of the Budget Advisory committee, did an extensive statistical analysis on this data. A copy of his report is in the packet. He turned the floor over to Dr. Serfling to give a brief overview on the report, and take questions. The committee also has recommendations.

The base salary across all ranks for beginning faculty is increasing due to market changes. Currently there is not an adjustment internally being made for market changes. According to the report, if there were no compression or inversion, one would be expected to see the salary increase with years at UTD. On average salaries do not increase with years of service. Ideally, an Associate professor should be paid on average higher than the highest paid Assistant Professors. The same can be said about full professors. They should be paid, on average, higher than the highest paid Associate professors. It is true that across the university that Assistant and Associate professors are balanced properly; unfortunately, in the range of the Associate to Full Professor that is not the case. When looking at each school individually there are different levels of compression/inversion in each one. For example, in A&H there is increasing levels of overlapping between ranks, whereas in NS&M they do not overlap very much. These plots demonstrate that there is compression and inversion at UTD. This is most evident in BBS, especially the associate professor rank. One would expect that the assistant professors in the four to nine years bracket would have salaries somewhat above those with one to three years if there were no compression present. The report shows that there was a discrepancy between years of service and salary even with in the same rank across the university.

In summary, the report shows that there is substantial salary compression and inversion at UTD with in each of the schools. This appears as different patterns (i.e. cross ranks, with in ranks, or both). The report does not suggest why this happened, or give solutions to the problem. It simply states that there is a problem, and the committee suggests that the Senate investigate a solution.

Dr. Scotch presented the recommendations of the Budget Advisory Committee. They recommend that a committee be appointed to specifically address the salary compression and inversion. It should consist of members of faculty, and administrators consisting of one or two deans. There was a feeling among the committee that this is a problem that could be addressed by setting up a special fund. The committee is open to discuss this topic with administration and the Senate regarding weather it merits action or not. The committee feels that given Dr. Serfling’s report there is significant evidence that a problem exists. Dr. Scotch drafted a
resolution that was approved by the committee, but during the Academic Council meeting, President Daniel recommended some revisions. President Daniel recommended that gender equity be added to the research, especially in the science and engineering fields. He feels that these types of studies can help identify systemic problems. Dr. Scotch noted that he has already shared with Dr. Tobey due to her work with the Diversity committee that he is already adding further research on that line of thinking. Provost Wildenthal noted that in his thirty years dealing with the problem there is one universal fact. The longer you are at a particular institution, relative to everything else, the lower your salary compared is to those who move. Speaker Leaf suggested that should the resolution pass, the Provost would appoint one or two deans to work with the budget advisory committee. Richard Scotch moved to approve the resolution as amended. Cy Cantrell seconded. The motion passed.

8. **Speaker’s Report – Murray Leaf**

1. The deans have responded to our draft proposal for school guidelines with a memo to Dr. Daniel indicating definite interest in being involved, and noting the proposed hiring process as an area of concern. I have responded to President Daniel, copy to the deans, saying that we certainly will involve them. At its meeting on February 6th, the Academic Council agreed that the best way to involve the deans was by forming a 3+3 committee, with three (or so) deans to work with the Council working group. At that time, however, we did not stop to consider exactly who to appoint. I have therefore asked Dr. Wildenthal to make the appointments at his discretion.

2. President Daniel has been required by the Chancellor to implement a new UT System policy on conflict of interest, conflict of commitment, and outside employment. The most general part of the policy is that these three policies are now to be combined into one. There will be one web-page for making a declaration of possible conflict, there is one template for a campus policy, and there is one system policy. President Daniel received the letter on 16 January 2013. The Chancellor spoke to the FAC Executive Committee about the policy by conference call the next day. The instructions were to have the implementation in our Handbook of Operating Procedures by February 1. The Regents are imposing a sense of urgency. Nevertheless, the deadline is inconsistent with Regents Rule 20201 Section 4.9 (a)(b). This requires presidents to seek formal review from faculty governance on matters affecting faculty within “a reasonable timeframe (60 days or less).” I have asked President Daniel how he wants to proceed and he has said he will respond. An article by Reeve Hamilton in yesterday’s Texas Tribune points out that the disclosure requirements are a good deal more detailed than what the Regents are subject to, or the legislature. The policy and form are not inherently problematic, but they could be if they are not applied reasonably. We need discussion.

9. **FAC Report – Murray Leaf**

The FAC met January 24 and 25. The meeting was very busy and seems to have been regarded as quite constructive. The highlights were:

1. Regent Stillwell was the first speaker. He gave a very frank and constructive assessment of the general orientation of the Board at present and over the next few years. He emphasized two things. First, there is always a diversity of views and they manage to work
out the differences. Second, the process of appointment, and also much of what the board
decides to do, is “political.” He did not paraphrase what he meant by this, but my
understanding was that this does not mean that the regents work from fixed political
agendas or ideologies, but rather that they decide with a view toward what is being
discussed in the political arenas of the state and with a view toward political consequences.
Regent Stillwell expressed high regard for the faculty, emphasized the importance of
deferring to faculty judgment in professionalacademic matters, and generally conveyed the
sense that in the end the Regents would continue to act accordingly.
In connection with the idea of university concerns being also “political” several members of
the FAC brought up (once again) the prohibition on lobbying. Regent Stillwell noted that
legislators want to be informed and that they appreciate information and expressions of
concern from the faculty. Faculty also have rights as citizens.
2. Chancellor Cigarroa spoke in considerable detail about legislative issues. A priority will
be to emphasize the importance of formula funding.
He also spent considerable time on the Conflict of InterestConflict of Commitment Policy
and the political logic of the merger of UT Pan-American and UT Brownsville.
3. Pedro Reyes and Dan Sharphorn discussed a number of issues as well. Main points
were:
Outcomes based funding is likely to pass in the legislature, but would not be more than
10% of the formula appropriation. Guns on campus also seems likely to pass.
The UT System has initiated organizational analyses of the campuses in the system. Four
have been chosen to start. UTD was or is one of them. This is connected to the general
concern with lack of clarity and transparency by basic level administrative units—
departments on most campuses, school for us.
There was more discussion of Conflict of InterestCommitment. Dr. Reyes and Mr.
Sharphorn recognized that the Feb 1 deadline for finalizing policies was not likely to be
workable. FAC members should advise their campuses to do what they can. FAC also
discussed several issues. One was the meaning of “permission.” Mr. Sharphorn indicated
that from the system point of view, “approval” meant the same thing.
4. The next speaker was Senator Kel Seliger, the new chair of the Senate Higher Education
Committee. He is from OdessaMidland. The FAC felt that Senator Seliger would continue
with the supportive and knowledgeable leadership that had been exercised recently by
Senator Zafirini and would continue to work with Senator Zafirini on matters she has been
focusing on, including more support for research universities. Senator Seliger emphasized
the importance of formula funding.
5. James Cox, the OGC attorney on copyright, spoke to the FAC on Friday. Mr. Cox did not
disagree with my analysis of faculty rights under copyright law, but argued that there were
other kinds of “ownership” beside copyright. When the regents claimed to own our
research data, it is in one of these latter senses. The discussion was contentious but
interesting. The ideas clearly need further development.
6. Stephanie Huie spoke as the person who is replacing Sandra Woodley for system data on productivity. She mainly talked about Academic Analytics. This is available in Beta version but not to the public. We agreed to make it available for faculty to test—looking up themselves and seeing how complete the results are. It does include books; it does not include works or art or performances. There were resolutions on benefits for domestic partners, contingent faculty in governance, language for the campus Conflict of Interest policies, and measures to increase pay rates for work-study students in order to enhance retention. Other resolutions were deemed to need more work. I think it fair to say that the overall sense of meeting was that all who participated as guests shared the FAC members’ sense of what higher education required, why it was necessary, and what it promised.

10. **ELECTION COMMITTEE REPORT**

David Cordell announced that Tenure/ Tenure system has thirty-two nominees for forty-six positions. Thirteen people have one petition. Even if the one petition people got a second petition, we would still not reach the allowed forty-nine. He encourages that if any one wished to be a member of the Senate in 2013 to submit your petitions. For the Senior Lecturer group there are five positions, and four nominations. There are five with one petition. That will most likely fill up without a problem. He is concerned that the tenure slots will be filled.

There are 489 voting faculty. The bylaws allow as many as 10% of the tenure-system faculty to serve on the Senate. The maximum number of tenure-system faculty to on the Senate is 51 members plus five non-tenure system faculty. It is a milestone that the Senate has reached its maximum capacity, and membership is now capped.

11. **STUDENT GOVERNMENT LIAISON REPORT**

Raj Dwivedi had to leave early due to an exam at 4 pm. Emily Tobey read his report. Student Government convinced the Pub to remain open on Saturdays, and until 1 AM on weekends. Student Government is planning a Health fair/ 5 k event called ‘I heart UT Dallas’. The Student Fee Committee convened on Friday February 15, and will do so for the following three Fridays. He will continue to keep the Senate posted. If there were any questions members may contact him.

There being no further business, Provost Wildenthal adjourned the meeting.

**APPROVED:** ___________________________  **DATE:** _____________

Murray J. Leaf
Speaker of the Academic Senate
Core Curriculum

The University of Texas at Dallas requires that all students complete a general education Core Curriculum of 42 semester credit hours that serves as a broad foundation for the undergraduate degree. These requirements must be met by every student pursuing a baccalaureate degree at The University of Texas at Dallas, regardless of their major. Specific approved courses must be used to satisfy each Core requirement (see the Schedule of Classes). In accordance with the Texas Education Code, Chapter 61, Subchapter S, a student who successfully completes the entirety of a Core Curriculum at another Texas public institution of higher education before matriculating at UT Dallas may transfer that block of courses to UT Dallas where it will be substituted for the UT Dallas Core Curriculum. If a student does not complete all of the Core Curriculum at another Texas public institution of higher education before matriculating at UT Dallas, the student will receive credit for the portion completed and then may be required to complete additional courses from the UT Dallas Core Curriculum.

Change of Major

Students wishing to change majors should complete an "Undergraduate Change of Major Request Form" (located at http://www.utdallas.edu/student/registrar/forms) in their academic advisor's office before registration and no later than the first day of classes of a semester/term. Students with 54 or more hours must seek approval of the Associate Dean for Undergraduate Education in the school of the intended major.
Students with a cumulative GPA below 2.000 may only change their major with permission from the Associate Dean of their current major and the Associate Dean of their intended major. Both Associate Deans' signatures are required on the "Undergraduate Change of Major Request Form" prior to its submission to the Office of the Registrar in the Student Services Building, first floor customer service area. If the change of major is approved, the student will then be responsible for meeting all program requirements and course prerequisites of the catalog in effect at the time of the change. The Core Curriculum requirements, however, remain those of the catalog in force at the time of matriculation unless the student specifically chooses those of a more recent catalog. In the first semester of change to a new major, the student must meet with an academic advisor to prepare a degree plan.

**Deadlines and Fees**

The Office of the Registrar will accept "Undergraduate Change of Major" forms for processing up to the close of business on the first day of classes of each semester. Forms received after the first day of classes will be processed effective for the following semester.

All students are allowed to modify their major twice during their academic career at no charge. A modification is defined as a change, addition, or deletion of a major to a student’s academic plan. A student’s academic career begins the first class day of the first semester of enrollment at UT Dallas. If a student elects to modify his/her major more than two times during an academic career, the third modification requires a $50.00 fee. EXCEPTION: There is no charge to move from the "undeclared major" category.

**Declaring a Major**

Undergraduate students must declare an academic course of study or major by the time they have earned 54 semester credit hours in order to continue enrollment. These hours include UT Dallas credits, credit transferred from other institutions, and hours awarded through credit by examination (AP, CLEP, IB, SAT, and so on). Transfer students who have earned 54 hours at the time they apply for admission to UT Dallas may be undeclared for one semester. These students will be advised in their first semester by the Student Outreach and Academic Retention (SOAR) advising office. After the initial semester these students must then declare a major to be allowed to register for a subsequent semester.

Continuing students on academic probation who pass the 54-hour benchmark without declaring a major have a maximum of two long semesters to regain good academic standing. During this period students will remain undeclared. A student who fails to regain good standing within two long-semesters will be suspended from the University.

[http://catalog.utdallas.edu/2012/undergraduate/curriculum/other-degree-requirements](http://catalog.utdallas.edu/2012/undergraduate/curriculum/other-degree-requirements)

**Double Degree**

To qualify for double degrees at UT Dallas, students must complete all of the following requirements:

- 51 hours of upper division
- 45 hours must be taken at UT Dallas
- meet all degree requirements for both degrees
- meet all graduation requirements

**Double Major**

Students may earn a baccalaureate degree with two majors (double major) when the baccalaureate degree is the same. For example, a student may earn Bachelors of Science in Biology and Business Administration when the degrees are Bachelor of Science in Biology and Bachelor of Science in Business Administration.
With the approval of the relevant Associate Dean, students may complete a double major by satisfying all the following requirements:

- 51 hours of upper division
- 45 hours must be taken at UT Dallas
- meet all degree requirements
- meet all graduation requirements

Students pursuing a double major must identify one of their two majors as a primary major to establish an academic home of record.

The University of Texas at Dallas offers the following prescribed double majors:

- Biology (BA) and Criminology (BA)
- Business Administration (BS) and Biology (BS)
- Economics (BS) and Finance (BS)
- Molecular Biology (BS) and Business Administration (BS)

Double majors in Interdisciplinary Studies are not available. A student is limited to two majors per undergraduate degree.

Second Baccalaureate Degree

Incoming students who already hold a baccalaureate degree from another institution and have been admitted to UT Dallas to obtain a second baccalaureate degree at UT Dallas must complete all of the following requirements:

- 30 hours of upper division at UTD
- 51 total upper division hours (can be combined from UTD and transferred hours)
- 45 hours must be taken at UTD
- meet all degree requirements
- meet all graduation requirements

A student may earn a double major or a second baccalaureate degree but not both.

STUDENT TRAVEL POLICY (NEW, need new URL)

The University of Texas at Dallas promotes safe travel by students to and from activities or events within the scope of the University’s mission. Before traveling, it is beneficial to review the travel policy about domestic and foreign travel, emergency procedures, insurance, and liability; and to obtain authorization by completing travel authorization forms and other related forms at least 5 working days prior to travel. Procedures also apply to faculty, staff, and students who transport students off campus on any university-organized and university-sponsored travel business or related travel activities for student organizations.

Detailed information regarding this policy, in accordance to Texas Education Code, Section 51.950, can be accessed at the UT Dallas Policy Navigator, http://policy.utdallas.edu/utdbp3023, and at http://www.utdallas.edu/administration/insurance/travel/.
Academic Policies and Procedures

FERPA

The Family Educational Rights and Privacy Act (FERPA) is a federal law enacted in 1974 to protect the privacy of student education records. The law applies to those institutions that regularly receive federal funding from the Department of Education and is enforced by the Family Policy Compliance Office of the U.S. Department of Education.

FERPA forms for students can be found at http://www.utdallas.edu/student/registrar/forms (click on "FERPA packet").

Complaints of alleged violations may be addressed to
Family Policy Compliance Office U.S. Department of Education 400 Maryland Avenue SW Washington, D.C. 20202-5920

The UT Dallas FERPA violation link is located at http://www.utdallas.edu/legal/ferpa.

FERPA defines an eligible student as a student who has reached 18 years of age or is attending an institution of postsecondary education.

Students have four primary rights under FERPA:

• To inspect and review their education records
• To seek to amend those education records they believe to be inaccurate or misleading
• To have some control over the disclosure of information from those education records
• To file a complaint concerning alleged failures by an institution to comply with FERPA regulations within 180 days

More information regarding education records and the procedure for amending records can be found at http://www.utdallas.edu/student/registrar/faq.html#FERPA.

Directory or public information is information that is not generally considered harmful or an invasion of privacy if released. Directory information includes student’s full name, local and permanent address, email address, phone numbers, date and place of birth, major field of study, dates of attendance, degrees/awards/honors received, most recent previous educational agency or institution attended, enrollment status (classification, under/grad, part/full-time), participation in officially
recognized activities and sports, weight/height of members of athletic team, expected date of graduation and photographs.

Non-directory information is information that is not considered to be directory information, such as enrollment records, grades, schedules.

Student may choose to withhold release of directory information. A student may do so by completing the "Request for Confidentiality of Directory Information" form at http://www.utdallas.edu/student/registrar/forms (click on "FERPA packet").

More information regarding FERPA can be found at http://www2.ed.gov/policy/gen/guid/fpco/ferpa.

http://catalog.utdallas.edu/2012/undergraduate/policies/disciplinary-actions

Academic Policies and Procedures

Disciplinary Actions

Academic Good Standing

Students at UT Dallas are expected to maintain a grade point average ("GPA") of at least 2.000 on a 4.000 scale, which equates to a C average. Additionally, students are expected to maintain a GPA of 2.000 in their major-related courses to remain in Academic Good Standing.

Disciplinary Status Overview

UT Dallas maintains academic disciplinary policies to encourage students to make the necessary academic and life changes to succeed. Students (including those who seek second baccalaureate degrees or post-baccalaureate non-degrees) who fail to meet the minimum expectations of Academic Good Standing must meet more stringent standards and regularly consult with academic advisors.

a. Disciplinary Policy for First-Degree Seeking Students

The disciplinary policy provides a student with several opportunities to make the necessary adjustments prior to a final dismissal from UT Dallas.

UT Dallas Disciplinary Status:
• Academic Probation
• Academic Warning
• First Academic Suspension (One Semester)
• Second Academic Suspension (One Year)
• Final Dismissal

b. Disciplinary Policy for Second Baccalaureate Degrees or Post-Baccalaureate Non-Degree Seeking Students

Students who earned an undergraduate degree at UT Dallas or another regionally accredited college or university and are enrolled at UT Dallas are subject to the provisions of this policy, except that they may only be placed on the following disciplinary statuses:

• Academic Probation
• Academic Warning
• Final Dismissal

Each Disciplinary Status will be indicated on the student's academic record.

Academic Probation

If a student's cumulative GPA falls below a 2.000, the student will be placed on Academic Probation. Academic Probation will be indicated on the student's academic record.

Academic Probation is designed to help students make the required adjustments to achieve success and a degree at UT Dallas. These adjustments will vary based upon the individual circumstances of each student, but should be taken seriously.

If a student is placed on Academic Probation, the student will be required to follow certain protocols and meet higher academic standards. These protocols and standards are designed to bring the student back to Academic Good Standing and allow the student to meet graduation requirements.

A student on Academic Probation is required to meet the following Academic Probation Requirements for the semester:

Academic Probation Requirements:
• Earn a minimum semester GPA of 2.200.
• May not withdraw or request an incomplete from a class.
• Meet with your School academic advisor prior to registration.
• Retake all required Major and University Core Courses failed the previous semester.¹
• Register for a maximum of 15 semester credit hours.²
• Maintain satisfactory progress towards graduation.
• For students with less than 60 UT Dallas earned credit hours:
  a) Meet with a Student Outreach and Academic Retention (SOAR) office advisor.
  b) Follow the SOAR advising plan developed with the advisor.

If a student on Academic Probation meets the Academic Probation Requirements but fails to achieve a cumulative GPA of 2.000, the student will remain on Academic Probation and must continue to comply with all Academic Probation Requirements.

If at any time, a student's cumulative GPA meets the minimum requirements of 2.000 overall the student will regain Academic Good Standing. A student's cumulative GPA is only affected by UT Dallas coursework. Coursework at another institution cannot be used to return a student to Academic Good Standing.

1. The Associate Dean of the student's school reserves the right to alter this requirement on a case-by-case basis.

2. The Associate Dean of the student's school reserves the right to alter this requirement on a case-by-case basis. If a student has registered for more than 15 semester credit hours prior to his or her placement on Academic Probation, the student's schedule must be reduced to a maximum of 15 hours. The student is required to meet with his or her School academic advisor to find an appropriate adjustment to the student's academic schedule.

Academic Warning

A student will be placed on Academic Warning for failure to meet the Academic Probation Requirements. A student on Academic Warning is also required to meet the Academic Probation Requirements as listed below:

Academic Warning Requirements:
• Earn a minimum semester GPA of 2.200.
• May not withdraw or request an incomplete from a class.
• Meet with your School academic advisor prior to registration.
• Retake all required Major and University Core Courses failed the previous semester.¹
• Register for a maximum of 15 semester credit hours.²
• Maintain satisfactory progress towards graduation.
• For students with less than 60 UT Dallas earned credit hours:
  a) Meet with a Student Outreach and Academic Retention (SOAR) office advisor.
  b) Follow the SOAR advising plan developed with the advisor.

Academic Warning should be a wake-up call for students who have not been able to make the adjustments required of students on Academic Probation. If a student is placed on Academic Warning, the student should consider dramatic alterations in all of the circumstances that affect his or her academic progress. The student should increase the volume of work with the SOAR advisor and meet with his or her Faculty Mentors or Associate Dean to determine an academic path to success.

If the student meets the Academic Warning Requirements, the student will return to Academic Probation. If the student again fails to meet the Academic Probation Requirements while on Academic Warning, the student will be suspended.

When placed on suspension, it is the student’s responsibility to submit required documents to meet the readmission requirements for re-entry. Readmission is not guaranteed.

If at any time, a student's cumulative GPA meets the minimum requirements of 2.000 overall the student will regain Academic Good Standing. A student's cumulative GPA is only affected by UT Dallas coursework. Coursework at another institution cannot be used to return a student to Academic Good Standing.

³. The Associate Dean of the student's school reserves the right to alter this requirement on a case-by-case basis.

⁴. The Associate Dean of the student's school reserves the right to alter this requirement on a case-by-case basis. If a student has registered for more than 15 semester credit hours prior to his or her placement on Academic Probation, the student's schedule must be reduced to a maximum of 15 hours. The student is required to meet with his or her School academic advisor to find an appropriate adjustment to the student's academic schedule.
Academic Departure

First-degree seeking students who leave the University on Academic Probation or Academic Warning may be readmitted with the same status, even if they have attended another institution in the interim. Performance at another institution will be a factor in the readmission decision.

Academic Suspension

First-degree seeking students are automatically placed on Academic Suspension for failure to meet the Academic Probation Requirements while on Academic Warning. Second baccalaureate degree-seeking or post-baccalaureate non-degree seeking students shall be subject to final dismissal for failure to meet the Academic Probation Requirements while on Academic Warning.

First-degree seeking students on Academic Suspension may not enroll in, audit, or visit a class unless readmitted as described below. Students who have already pre-registered for classes will automatically be dropped from all classes. Notice of Academic Suspension will show on the student's academic record.

Length of Academic Suspension

- A student's First Academic Suspension will be for a period of one long semester.
- A student's Second Academic Suspension will be for a period of one year (12 months).
- A student's third Academic Suspension is Final Dismissal from UT Dallas without a possible readmission.

Readmission

A student, who has been placed on suspension, must complete the Undergraduate Academic Suspension Readmission Petition Form for readmission. It is the student’s responsibility to submit required documents to meet the readmission requirements for re-entry. Readmission is not guaranteed.

A student placed on One Long Semester Academic Suspension must petition to his or her Associate Dean for readmission. If the student has not declared a major or is a non-degree-seeking student, the student must petition the Dean of Undergraduate Education.
A student placed on One Year Academic Suspension must petition to his or her Associate Dean for readmission. The Dean of Undergraduate Education must approve the readmission of all students placed on One Year Academic Suspension.

A student that is readmitted may be subject to additional probationary conditions placed upon them by the Associate Dean or Dean of Undergraduate Education. Such additional probationary conditions may be individual to the student and his or her academic circumstances, but will be designed to encourage the student to reach Academic Good Standing and be eligible for Graduation.

A student who reenters the University after Academic Suspension will reenter on Academic Warning.
Appendix I

Rules, Regulations, and Statutory Requirements

A. Student Conduct and Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UT Dallas publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Series 50101 and in Title V, Rules on Student Services and Activities, Chapter 49 of the university’s Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students where staff are available to assist students in interpreting the rules and regulations (SSB 4.400, 972-883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating its standards of conduct whether such conduct takes place on or off campus or whether civil or criminal penalties are also imposed for such conduct.

1. Academic Dishonesty. The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work.
Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one’s own work of material that is not one’s own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

2. Campus and Residence Hall Solicitations. "Solicitations," as defined by the Rules and Regulations of the Board of Regents of The University of Texas System, means the sale, lease, rental of any property product, merchandise, publication, or service, whether for immediate or future delivery; an oral statement or the distribution or display of printed material, merchandise or product that is designed to encourage the purchase, use or rental of any property, product, merchandise, publication, or service; the oral or written appeal or request to join an organization other than a registered student, faculty or staff organization; the receipt of or request for any gift or contribution; and/or the request to support or oppose or to vote for or against a candidate, issue, or proposition appearing on the ballot at any election pursuant to state or federal law or local ordinances. All solicitations on the UT Dallas campus must conform to the Regents' Rules, copies of which are available in the offices of the President, Executive Vice President and Provost, Vice Presidents, and Deans and in numerous other administrative offices and the library.

3. Hazing. Hazing, submission to hazing, or failure to report first-hand knowledge of the planning or occurrence of specific hazing incidents is prohibited by state law and, in addition to disciplinary actions, is punishable by fines up to $10,000 and confinement in county jail for up to two years. Moreover, any hazing offense that causes the death of another person is a state jail felony. Hazing is defined by state law as, "... any intentional, knowing, or reckless act, occurring on or off the campus of an educational institution, by one person alone or acting with others, directed against a student, that endangers the mental or physical health or safety of a student for the purpose of pledging, being initiated into, affiliating with, holding office in, or maintaining membership in an organization." Any person who reports a specific hazing incident involving a student to the Dean of Students is immune from civil or criminal liability that he/she might otherwise incur as a result of the report. Any persons who have further questions about hazing or activities that may be considered hazing should call the Dean of Students' office at (972) 883-6391.

4. Copyrighted Material. Unauthorized distribution of copyrighted material may subject students to civil and criminal penalties. All UT Dallas syllabi
are required to include, whether in text or a hyperlink, student conduct policies including a copyright notice. This notice directs students to UT Dallas' Policy Regarding Photocopying Copyrighted Materials (UTD PP 1043) and UT System's copyright website. Further, the Director of Information Security is identified as the University's contact for copyright questions or concerns. See www.utdallas.edu/copyright.

5. Other Disciplinary Situations. Any student organization as a group is subject to disciplinary action or revocation of registration as a student organization for violation of a rule or regulation of The University of Texas System or The University of Texas at Dallas.

B. Grievance Procedures

The University of Texas at Dallas is committed to a policy of non-discrimination on the basis of age, color, disability, gender, race, religion, sexual orientation, national origin, or veteran status in its provision of services, activities, and programs, and in its treatment of students. Students seeking further information about this policy or related complaint procedures for alleged discrimination or sexual harassment should contact the Dean of Students. The dean will follow the procedures for student grievances that are found in Title V, Rules on Student Services and Activities, Chapter 51, summarized below.

Sexual harassment is a form of sex discrimination. Such harassment is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature. Suggestions that academic or employment reprisals or rewards will follow the refusal or granting of sexual favors also constitute sexual harassment. The full text of the University's "Sexual Harassment Policy and Procedure" may be found in the Administrative Policies and Procedures Manual, Section D, D11-115.0.

Any student who perceives that he or she has been subject to any form of discrimination as defined above may file a written complaint with the Dean of Students using the following procedures:

1. The complaint must contain the nature of the alleged discrimination, the date on which the alleged discrimination occurred, and other appropriate information as required by the dean.

2. The dean will refer all complaints that name an employee of the university (including graduate assistants and other student employees) as the offender to the Office of Human Resources for
investigation and resolution. When the nature of the complaint is discrimination on the basis of disability, the dean will refer the grievance or complaint to the ADA Coordinator who will investigate the complaint under the procedures given in the *Administrative Policies and Procedures Manual*, Vol. IIA, Section D, page D11-195. 0, Americans with Disabilities Act Grievance Policy.

3. With the exceptions noted in subsection (2) above, the student discipline procedure outlined in Title V, Chapter 49 Student Discipline and Conduct will be utilized for complaints that name a student as an alleged offender. Such complaints will be investigated by the dean.

4. As a result of the investigation, the dean will, on the basis of the information presented, determine: a) that the charges of discrimination are without basis, b) that further investigation is required, c) that campus action shall be initiated to alleviate a discriminatory situation, or d) that a hearing will be held.

C. Academic Grievances

Procedures for student grievances are found in university policy UTDSP5005. In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originated (hereafter called "the respondent."). Individual faculty members retain primary responsibility for assigning grades and evaluations.

**PROCEDURES TO APPEAL ACADEMIC DECISIONS**

(a) The appeal procedures defined in this section apply to an unresolved grievance concerning some aspect of the student's academic standing at UT Dallas. The intent is to address the grievance of the student in a prompt and orderly fashion. A grievance means a dispute concerning some aspect of the student's academic standing arising from an administrative or faculty decision that the student regards as incorrect or unjust. Grievances include, but are not limited to, disputes over grades, application of degree plan, graduation/degree program requirements, and thesis and dissertation committee and/or adviser actions or decisions. Grievances, as defined in this section, do not include the right to appeal
the termination of employment of a teaching assistant or research assistant during the term of the student's appointment. That appeal process is defined and described in UT Dallas Policy PP1075 University Policies Related to Graduate Student Teaching Assistants and Graduate Student Research Assistants.

(b) A grievance regarding academic concerns will be considered in the following manner:

(1) Initial Consideration of Grievance
In attempting to resolve any student grievance falling within the scope of this policy, it is the obligation of the student first to make a serious and prompt effort to resolve the matter through discussion with the instructor, supervisor, administrator, or committee chair with whom the grievance originated (hereafter called "the respondent") within sixty (60) calendar days after the date on which the decision was first rendered.

(2) Appeal to the Department/Program Head
If the matter cannot be resolved in discussions between the student and the respondent, the student grievant can submit a written appeal to the respondent's department/program head with a copy to the respondent clearly specifying the basis of the appeal and stating the remedies the student is seeking. This written appeal MUST be submitted no later than the sixty-fifth day after the date on which the decision in dispute was first rendered. Within ten business days while classes are in session, the respondent will provide both the student and the department/program head with a written response. The department/program head will have 10 business days to review all submissions and provide a written response to the student and respondent (an extension to this timeline may be granted by the school dean for good cause). In determining the validity of the grievance, the department head should be guided by the principle that the burden is on the grievant to show that the decision is arbitrary and capricious. If the department/program head decides that the grievance be granted, he/she will also provide a decision on how to resolve the dispute.

(3) Academic Appeals Panel
If the student is dissatisfied with the decision of the department/program head, the student may submit a written appeal via email or hard copy, within ten business days of the date the decision was sent, to the dean of the school hosting the course, comprehensive or oral examination with a copy to the department/program head (an extension to this timeline may be granted by the dean for good cause). The written appeal by the student
to the school dean must clearly state the reasons for the appeal and
remedy sought. The dean will appoint an appeals panel. The appeals
panel composition will consist of an associate dean of the school in which
the grievance originated, acting as chair, two faculty members from the
school in which the grievance originated, an associate dean from another
school, and a student. The student selected to serve on the panel will be
an undergraduate when the grievance is from an undergraduate student
and will be a graduate student when the grievance is from a graduate
student. The academic panel will review all submissions, obtain additional
information and opinions if desired, and provide the student with a written
response within twenty business days while classes are in session of the
receipt of the student's appeal to the school dean. The appropriate dean of
graduate or undergraduate studies will receive a copy of the panel's
response. The findings and recommendation of the appeals panel are final.

(c) All parties involved in an academic appeal will be informed about the
final disposition of the appeal. Copies of these rules and regulations are
available to students in the Office of the Dean of Students where staff are
available to assist students in interpreting the rules and regulations.

D. Privacy Act: Student Records

1. The student's university record is established and maintained to provide
both the student and the university with information regarding the student's
progress while enrolled at the university. Any student enrolled in the
university has access to and may inspect those records relating to his or
her academic progress, to the extent allowed by the Family Educational
Rights and Privacy Act and the Texas Public Information Act. The record is
considered to be confidential and may be released only within the
limitations clearly defined by university regulations and state and federal
statutes or with the student's written permission.

2. The university may release directory information which is defined as
public information and includes the student's name, local and permanent
address, telephone number, E-mail address, date and place of birth, major
field of study, participation in officially recognized activities and sports,
photographs, weight and height of members of athletic teams, dates of
attendance, degrees, awards and honors received, and the most recent
educational agency or institution attended by the student, classification,
and expected date of graduation. This information may be printed in
various publications of the university such as the student directory, honors
list, athletic programs, list of graduating students, or similar documents.
Additionally, this information may be released upon request. A student may
request that the university not release directory information by completing the appropriate forms during registration. The student must complete the forms each semester.

3. Student records which the university maintains include official university academic and personal records relating to scholastic, disciplinary and fiscal matters as well as records maintained by university agencies and agencies providing services sought voluntarily by students. Students may challenge the contents of educational records and request corrections to inaccurate or misleading information. Any request for correction or explanation of record contents should be presented in writing to the person in charge of the office where the record is maintained.

4. Detailed information pertaining to the content of and handling of student records is contained in Title V, Rules on Student Services and Activities of the university’s Handbook of Operating Procedures. Students wishing more information about their rights established under the Family Educational Rights and Privacy Act should contact the Office of the Registrar, Student Services Building, (972) 883-2342.

5. The Family Educational Rights and Privacy Act does not extend to research papers and theses authored by students; these documents are available to interested members of the public.

E. Clery Act

In compliance with the Student-Right-to-Know and Campus Security Act, The University of Texas at Dallas collects specified information on campus crime statistics, campus security policies, and institutional completion or graduation rates. The university publishes an annual report of campus security policies and crime statistics and distributes copies during registration.

F. Emergency Response, Fire Safety, and Security

Emergency Response: In the event of an emergency or natural disaster the campus community will be notified as prominently as possible through several means of communication. This includes Campus Alert E-mail, the University’s website, campus and local media, text-messaging, Fire Alarm Systems, Indoor Warning System and Outdoor Warning System. For policies and procedures, and reporting requirements please visit www.utdallas.edu/ehs/emergency.

Fire Safety: The entire UT Dallas campus fire alarm system is monitored 24-7 through a SimplexGrinnell Information management system. This IMS
operates on a fiber optic loop connected to every building fire panel on the Richardson campus. All 30 of UT Dallas' buildings have primary reporting to the University Police and secondary reporting to EHS and EMS. For policies and procedures please visit www.utdallas.edu/ehs/firelifesafety.

**Gang-free Zones:** Premises owned, rented or leaded by The University of Texas at Dallas, and areas within 1,000 feet of the premises are "gang-free" zones. Certain criminal offenses, including those involving gang-related crimes, will be enhanced to the next highest category of offense if committed in a gang-free zone by an individual 17 years or older. See Texas Penal Code, Section 71.028.

**Missing Student Notification:** The purpose of the UT Dallas Missing Persons Policy is to establish procedures for the University's response to reports of missing students as required by the Higher Education Opportunity Act of 2008. This policy applies to students who reside in on-campus housing. For purposes of this policy, a student may be considered a "missing person" when he or she is absent from the University for more than 24 hours without any known reason. A student may also be deemed missing when his/her absence is contrary to his/her usual pattern of behavior and/or unusual circumstances may have caused the absence. Such circumstances could include, but not be limited to, a report or suspicion that the missing person may be the victim of foul play, has expressed suicidal thoughts, is drug dependent, or has been with persons who may endanger the student's welfare.

All residential students will have the opportunity to designate a confidential contact to be notified by the University no more than 24 hours after the student is determined missing. Instructions will be provided on how to register that person's contact information. Residential students' contact information will be registered confidentially, will be accessible only to authorized UT Dallas officials, and may not be disclosed except to law enforcement personnel in furtherance of a missing person investigation.

All reports of missing students must be directed to the UT Dallas Police Department, which shall investigate each report and make a determination about whether the student is missing. In addition, no later than 24 hours after a student is determined missing, UT Dallas will notify the Richardson Police Department, unless the Richardson Police Department was the entity that determined the student to be missing. At that time, if the missing student is under the age of 18 and not emancipated, UT Dallas will also notify the student's custodial parent or guardian.

G. Use of Facilities
Pursuant to the general authority of *Texas Education Code* Chapter 65, and the specific authority of *Texas Education Code* Chapter 51, the Board of Regents of The University of Texas System, in Series 80101-80110 of the *Rules and Regulations*, promulgates rules relating to the use of buildings, grounds, and facilities for purposes other than programs and activities related to the role and mission of the UT System and the component institutions.

The property, buildings, or facilities owned or controlled by the UT System or UT Dallas are not open for assembly, speech, or other activities as are the public streets, sidewalks, and parks. The responsibility of the Board of Regents to operate and maintain an effective and efficient system of institutions of higher education requires that the time, place, and manner of assembly, speech, and other activities on the grounds and in the buildings and facilities of the UT System or UT Dallas be regulated.

Complete copies of the regental and institutional rules and regulations are available to students in the Office of the Dean of Students where staff members are available to assist students in interpreting the rules.
Appendix II

Transfer of Lower-Division Course Credit

The following procedures are established in the *Texas Administrative Code*, Title 19, Chapter 4, Subchapter B, Section 4.27 of the Texas Higher Education Coordinating Board rule pertaining to transfer of lower-division course credit. The designated official at The University of Texas at Dallas to be contacted regarding a transfer dispute for a lower-division course is the Dean of Undergraduate Education.

4.27. Resolution of Transfer Disputes for Lower-Division Courses

a. The following procedures shall be followed by public institutions of higher education in the resolution of credit transfer disputes involving lower-division courses:

1. If an institution of higher education does not accept course credit earned by a student at another institution of higher education, the receiving institution shall give written notice to the student and to the sending institution that transfer of the course credit is denied, and shall include in that notice the reasons for denying the credit.

2. A student who receives notice as specified in paragraph (1) of this subsection may dispute the denial of credit by contacting a designated official at either the sending or the receiving institution.

3. The two institutions and the student shall attempt to resolve the transfer of the course credit in accordance with Board rules and guidelines.

4. If the transfer dispute is not resolved to the satisfaction of the student or the sending institution within 45 days after the date the student received written notice of denial, the sending institution may notify the Commissioner in writing of the request for transfer dispute resolution, and the institution that denies the course credit for transfer shall notify the Commissioner in writing of its denial and the reasons for the
denial.

b. The Commissioner or the Commissioner's designee shall make the final determination about a dispute concerning the transfer of course credit and give written notice of the determination to the involved student and institutions.

c. Each institution of higher education shall publish in its course catalogs the procedures specified in subsections (a), (b), (d), and (e) of this section.

d. The Board shall collect data on the types of transfer disputes that are reported and the disposition of each case that is considered by the commissioner or the Commissioner's designee.

e. If a receiving institution has cause to believe that a course being presented by a student for transfer from another school is not of an acceptable level of quality, it should first contact the sending institution and attempt to resolve the problem. In the event that the two institutions are unable to come to a satisfactory resolution, the receiving institution may notify the Commissioner, who may investigate the course. If its quality is found to be unacceptable, the Board may discontinue funding for the course.
Appendix III

Comment [4]: Appendix III – Residency and charts will be deleted as agreed by Jen McDowell & Serenity King. McDowell added a residency classification text to the tuition section on page 97 in 1st 40 policies document. MJV researched other UT institutions’ catalogs; their catalogs have a brief text on residency regulations under the auspices of tuition fees, and have detailed charts on their Office of Registrar or Office of Admissions websites. UTD’s Registrar will do the same.

Deleted: For the state regulations that govern UT Dallas’ residency determinations, please see the 19 Texas Administrative Code, Chapter 21 Subchapter B, which may be found at http://go.utdallas.edu/texas-admin-code-ch21-b.
Appendix III

Travel and Risk-Related Activities

Appendix V

Religious Holy Days
# 010 Communications Component

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<td>BCOM 3311 Business Communications Communication (3 semester hours) Introduction to various types of professional communication, both written and oral, with an emphasis on business writing. Students practice skills in communication styles such as memos, will gain experience writing and revising business email, research reports, letters, proposals, presentations, and interviews. job search documents. Students may receive credit will work both individually and in teams and will exit the course with a clear understanding of the centrality of communication in business. Not eligible for either BCOM 3311 or ACCT 3311 to fulfill degree requirements. Prerequisite: audit. Prerequisites: RHET 4302.- (Same as ACCT 3311) 1302 and (ACCT 3100 or BA 3100 or FIN 3100 or IMS 3100 or MKT 3100 or MIS 3100 or OPRE 3100). (3-0) S</td>
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<td>BIOL 4337 Seminal Papers in Biology (3 semester hours) Theoretical and experimental papers in selected areas of biology will be discussed in a senior seminar format. The historical and biographical context of the papers and their authors will also be explored. The areas to be covered in any semester will vary with the instructor. Each student is expected to make an oral presentation and to prepare a written paper. Satisfies the Advanced Writing Requirement for Biology majors. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, BIOL/CHM 3361, 3302) and (BIOL 3361 or CHEM 3361) and (BIOL/CHM 3362, (BIOL 3362 or CHEM 3362). (3-0) S</td>
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<td>EPPS 3405 Introduction to Social Statistics with Lab (4 semester hours) This course introduces students to the basic tools of statistics and shows how they are used in the analysis of social science data. A fundamental understanding of these tools is a critical foundation for social science research in many fields. The course covers descriptive statistics, inference from samples, hypothesis testing, and the basics of regression analysis. NOTE: This course is required of all social science majors and is a prerequisite for a required course in social science research methods within each discipline (for example, ECON 3304 and GEOG 3304). Prerequisite: MATH 1306 or MATH 1314 (preferred). (preferred) or higher. (3-1) S</td>
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## 030/031 Natural Sciences Component

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<td>GEOG 1304 (GEOL 1304) History of Earth and Life (3 semester hours) Introduction to the history of the Earth. The history of life and an introduction to the principles of paleontology, stratigraphy and global change will be discussed. All topics will be discussed in the context of the tectonic evolution of North America. Field trip. Prerequisites: GEOS 1303 and GEOS 1103. (Same as GEOG 1304) (3-0) Y</td>
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<td>ENVS 2302 (GEOL 1305) The Global Environment (3 semester hours) An introduction to the physical aspects of the world’s geography emphasizing the interrelationships between the earth and its climate, vegetations, soils, and landforms. Provides a global perspective on the physical environment and the interactions between global systems to produce regional differences. (Same as GEOG 2302 and GEOS 2302) (3-0) T</td>
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University of Texas at Dallas

Undergraduate Catalog Degree Plans
2013-2014
School of Arts and Humanities

The School of Arts and Humanities offers baccalaureate degrees in Art and Performance, Historical Studies, Literary Studies, Arts and Technology, and Emerging Media and Communication. The first three majors integrate traditional courses of study in the studio arts and theater; history and philosophy; and American, English, Spanish, and other literatures. The fourth and fifth integrate elements of the other three majors.

The Arts and Technology (ATEC) degree emphasizes the mutually productive interaction of technology with the arts, with specific emphasis on the interplay of visual art, music, and narrative with the new modes of expression and communication that have emerged from the convergence of computing and media technologies. The program stresses not only the creation but also the potential applications and cultural implications of interactive media.

Emerging Media and Communication (EMAC) focuses on the uses, impact, and implications of digital networked technology on media and culture in the twenty-first century. EMAC majors learn to combine technological expertise with effective communication skills across a wide range of media, developing “new media literacy” in response to the digital revolution that has radically changed all aspects of human communication. EMAC prepares students not only for existing technologically sophisticated delivery systems but also prepares them to be future developers, entrepreneurs and content providers of emerging media.

While most conventional degree programs in media emphasize established message content strategies and delivery systems, EMAC integrates this traditional approach with the creation, applications and implications of emerging media. The program mixes classes that focus on the theory and history of media with ones focused on practical application where students become versed in a wide range of technical skills.

Students in the School of Arts and Humanities are encouraged to explore the boundaries and the interrelationships of the major fields of study within the school. Consistent with this focus on the integration of the arts and humanities and a commitment to interdisciplinary education, the School has no conventional departments. Rather, its curriculum is designed to allow study that crosses and transforms traditional disciplinary lines.

Each student in the School consults regularly with an advisor, who helps the student design an integrated program of coursework. At least 42 semester hours of upper-division course work of the total of 51 upper-division hours required to complete the BA are completed within the major and related fields. All students complete a 3-hour core course (HUMA 3300) that introduces the methods, strategies, and theories of inquiry and interpretation that are elaborated in subsequent arts and humanities courses. In addition to HUMA 3300, students complete either 3, 6, or 12 hours of core course work (depending on the major selected), a series of major requirements and
electives, and the remaining hours in related course work from within the School of Arts and Humanities. Students may use Interdisciplinary Studies courses and electives to complement and enrich their programs of study.

1. The Arts and Technology Major requires only 39 semester hours in required upper division course work and prescribed electives.

2. HUMA 3300 is not required of Arts and Technology Majors and Emerging Media and Communication majors.

**Teacher Certification**

Students interested in teaching in secondary schools can achieve Texas Teacher Certification in English and/or History and/or Composite Social Studies as part of their majors in either Literary Studies or Historical Studies. Immediately after being admitted to the University, interested students should meet with an advisor in the Teacher Development Center to receive a certification plan and with an Arts and Humanities adviser in Literary Studies or Historical Studies to receive a degree plan. Further details may be found in the Teacher Education section of the catalog.

**Fast Track Baccalaureate/Master's Degrees**

The Fast Track program is designed to permit exceptional undergraduate students in Arts and Humanities majors to begin work on the master's degree before graduation.

Qualified seniors at UT Dallas, who have completed at least 30 hours of upper-division work and the core courses in their major, may take up to 12 credit hours of approved graduate courses in Arts and Humanities during their senior year and apply these hours to their undergraduate degree plans as either major and related courses or electives. After admission to the graduate program, up to 12 graduate hours may be used to complete the bachelor's degree and also to satisfy requirements for the Master's degree.

For further information on the Fast Track program, see the Associate Dean for Undergraduate Education of the School of Arts and Humanities.

**Minors**

To minor in the Arts and Humanities, students must take a minimum of 18 hours for the minor, 12 of which must be upper-division hours. Core courses offered by the school may count as lower-division hours toward the minor. Students may choose to minor in any of the following fields of study:

- Art History
- Asian Studies
- Creative Writing
- Drama/Dance
Students may contact their academic advisor for a list of the courses that satisfy each minor.

Related Minor Areas:

Minor in Gender Studies (18 hours)

The Gender Studies minor is 18 semester hours. The courses consist of GST 2300, two other Gender Studies core courses, and nine hours of approved Gender Studies electives.

Arts and Humanities Core Course

HUMA 3300 Reading and Writing Texts (3 semester hours) focuses on a significant topic or issue through which students are offered an opportunity to gain experience in various analytic and interpretive approaches. Explores connections among artistic and intellectual endeavors appropriate to a range of courses in the Arts and Humanities. This course is a requirement for all AHST, AP, HIST, and LIT majors and should be taken prior to completing the first 12 hours of upper-division course work. Prerequisite: HUMA 1301 or equivalent. (3-0) S

Faculty


Associate Professors: Susan Briante, Sean J. Cotter, Frank Dufour, J. Michael Farmer, Midori Kitagawa, Shelley D. Lane (Associate Dean for Undergraduate Education), Patricia H. Michaelson, Lucy Petrovic, Venus O. Reese, Natalie Ring, Dean Terry, Daniel B. Wickberg, Michael L. Wilson (Associate Dean for Graduate Education)

Assistant Professors: Matt Bondurant, Matt Brown, Monica Evans, Eric Farrar, Todd Fechter, Shari Goldberg, John Gooch, Charles Hatfield, Kim Knight, Jessica Murphy, Cihan Muslu, Peter Park, David Parry, Monica Rankin, Mark Rosen, Eric Schlereth, Chihua Shen, Charissa Terranova, Katherine Turk, Shilyh Warren, Marjorie Zielke
Senior Lecturers: Zafar Anjum, Elizabeth Bell, Diane Durant, Kelly P. Durbin, Kathryn C. Evans, Scot Gresham-Lancaster, Dianne Goode, Michele Hanlon, George Henson, Melissa Hernandez-Katz, Carie Lambert, Tom M. Lambert, Wenqi Li, Kathy Lingo, Mary Medrick, Greg L. Metz, Chris Ryan, Monica M. Saba, Jeffrey Schulze, Yuki Watanabe, Betty H. Wiesepape

Clinical Associate Professors: Arkady Fomin, Betsy Schlobohm, Winston Stone, Jeff Stover, Dennis Walsh, Chip (Harold) Wood

Clinical Assistant Professors: Jay Ingrao, Janet Johnson, Michael McVay, Cassini Nazir, Lorraine Tady

Distinguished Research Scholar: Bonnie Pitman

Research Assistant Professors: Adam Brackin, Phillip Johnson, Sean McComber

Visiting Assistant Professors: Tim Christopher, Andrew Famiglietti, Kyle Kondas, Sabrina Starnaman, Jodi White

Emeritus Professors: Gerald L. Soliday, Deborah Stott
School of Arts and Humanities

Art and Performance (BA)

Students who complete the major in Art and Performance (AP) pursue an interdisciplinary study of the arts by selecting among courses in historical context, studio practice, performance ensemble, creative writing, and ideas and interpretation of the arts. In the AP core course, students will experience the theory and practice of the arts in a workshop setting and, in studio or ensemble courses, will gain practical experience in at least one area of the visual or performing arts or creative writing. Courses in the historical context and interpretation of the arts will enable students to understand how style, subject matter, and materials may respond to different motivations and purposes. In their selection of required and elective courses, students are encouraged to focus their coursework around one of the following areas: art history (early or modern period), two-dimensional or three-dimensional studio art, creative writing, art and technology (computer imaging, photography, video art), or music/theatre/performance.

Since the following catalog course descriptions are very general, students are urged to consult the detailed course descriptions available on the web site for the School of Arts and Humanities.

Unless otherwise noted, courses in Art and Performance are open to all students in the University.

Bachelor of Arts in Art and Performance

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (HUMA 3300)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)
3 hours Fine Arts

3 hours Humanities

Mathematics and Quantitative Reasoning (6 hours)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements, Lower Division: 6 hours

| ARTS 2380 2D Design Foundations | (Students who do not take upper-level Visual Arts courses are exempt from this requirement.) |

One of the following:

AHST 1303 Survey of Western Art History: Ancient to Medieval

AHST 1304 Survey of Western Art History: Renaissance to Modern

AHST 2331 Understanding Art

DANC 1310 Understanding Dance

DRAM 1310 Understanding Theater

FILM 2332 Understanding Film

MUSI 1306 Understanding Music

III. Major Requirements, Upper Division: 42 hours

Major Core Courses (6 hours)

AP 3300 Elements of Art and Performance

HUMA 3300 Reading and Writing Texts

Major Distribution and Elective Courses (24 hours)

3 hours upper-division Historical Context courses

6 hours of upper-division courses from Studio and Ensemble courses

15 hours of upper-division Art and Performance electives

Major-Related Courses (12 hours)
Students may select any combination of upper-division courses in Humanities, Historical Studies, Philosophy, Literature and Language, and/or Emerging Media & Communication.

IV. Elective Requirements: 30 hours

**Free Electives (30 hours)**

Both upper- and lower-division courses may be used as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a communication Core Curriculum requirement.
School of Arts and Humanities

Arts and Technology (BA)

Students who complete the major in Arts and Technology receive a thorough grounding in the mutually productive interaction of technology with the arts, with specific emphasis on the interplay of visual art, music, and narrative with the new modes of expression and communication that have emerged from the convergence of computing and media technologies. The program stresses not only the creation but also the potential applications and cultural implications of interactive media. A student majoring in Arts and Technology will be required to channel selected coursework according to individual needs and specialties. Particular attention should be given to the Prescribed Electives for the major, and close consultation with academic advisors is recommended. By selecting courses from a variety of the remaining elective headings, students are able to combine courses in technology and fine arts with course work in literary criticism and interpretation, creative writing and translation, and linguistics and languages.

Unless otherwise noted, courses in Arts and Technology are open to all students in the university. However, students majoring in Arts and Technology may be given preference in certain course enrollments.

Bachelor of Arts in Arts and Technology

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (ATEC 3320 or ATEC 3325)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (FILM 2332)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours College Math (MATH 1314)
3 hours Quantitative Mathematics (STAT 1342)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements, Lower Division: 21 hours

  ARTS 1316 Drawing Foundations
  ARTS 2380 2D Design Foundations
  ATEC 2320 Introductory Topics in Arts and Technology
  or ATEC 2326 Computer Animation Processes
  ATEC 2382 Computer Imaging
  ATEC 2384 Basic Design Principles and Practices
  CS 1335 Computer Science I for Non-majors
  CS 2335 Computer Science II for Non-Majors

III. Major Requirements, Upper Division: 21 hours

  ARTS 3371 Black and White Photography
  or ARTS 3372 Color Photography
  or ARTS 3377 Digital Photography
  or ARTS 3379 Photography and New Media
  ATEC 3317 Modeling and Texturing I
  or ATEC 3351 Game Development
  or ATEC 3310 Audio Technologies
  ATEC 4340 Project Management for Arts and Technology
  ATEC 4V80 Capstone Project
  CS 3360 Computer Graphics for Artists and Designers
HIST 3337 Technology and Western Civilization

or HIST 3374 American Technological Development

or HIST 3332 History of the Electronic Age

LIT 3334 Literature of Science

or LIT 3311 The Literature of Science Fiction and Fantasy

or HIST 3328 History and Philosophy of Science and Medicine

IV. Elective Requirements: 36 hours

Prescribed Electives (15 hours)

Any five of the following:

AHST 3318 Contemporary Art
ATEC 3315 Motion Graphics
ATEC 3318 Concept Development
ATEC 3319 Voice Over
ATEC 3326 Emerging Media Production
ATEC 3327 Lighting and Composition I
ATEC 3328 Rigging I
ATEC 3330 Digital Video Production I
ATEC 3331 Sound Design for Film
ATEC 3351 Game Development
ATEC 3352 Game Design
ATEC 3353 Game Studies
ATEC 3354 Sound Design for Games
ATEC 3361 Internet Studio I
ATEC 3363 Basic Interaction Design
ATEC 3365 Virtual Environments
ATEC 4310 Digital Audio Processing
ATEC 4326 Advanced Emerging Media Production
ATEC 4328 Rigging II
ATEC 4330 Digital Video Production II
ATEC 4337 Computer Animation
ATEC 4339 Special Effects
ATEC 4341 Digital Marketing Design
ATEC 4345 Motion Capture Animation
ATEC 4346 Story-Telling for New Media
ATEC 4347 Advanced Design
ATEC 4348 Modeling and Texturing II
ATEC 4349 Lighting and Composition II
ATEC 4350 Game Production Lab
ATEC 4351 Animation Studio I
ATEC 4352 Animation Studio II
ATEC 4357 Advanced Digital Arts
ATEC 4361 Internet Studio II
ATEC 4365 Level Design and Scripting
ATEC 4367 Advanced Game Development
ATEC 4368 Advanced Game Design
ATEC 4370 Topics in Arts and Technology
ATEC 4371 Topics in Animation
ATEC 4373 Topics in Game Development
ATEC 4374 Topics in Digital Design
ATEC 4375 Topics in Sound Design
MUSI 3389 Digital Music II

Free Electives (21 hours)

Both upper-and lower-division courses may be used as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Students who are ATEC/CS double majors or who plan to minor in CS must enroll in CS 1337 Computer Science I
3. Students who are ATEC/CS double majors or who plan to minor in CS must enroll in CS 2336 Computer Science II
School of Arts and Humanities

Emerging Media and Communication (BA)

The undergraduate major in Emerging Media and Communication (EMAC) is designed to educate "communicators of the twenty-first century" who can contribute to evolving fields such as journalism, advertising, public relations, corporate and civic communications, and the entertainment industry. The changing nature of communication in a technologically sophisticated, message-saturated and global economy has created a major and fast-growing need for graduates with the ability to communicate effectively in a wide range and mix of media. These new communicators will combine technological expertise with effective communication skills across multiple media platforms, developing "new media literacy" in response to the digital revolution that has radically changed all aspects of human communication.

Students will receive substantive educational training in the rhetorical, cultural, and cognitive aspects of communication, with an emphasis on new and emerging media. The EMAC program reflects a commitment to the concept of "applied humanities," as the curriculum balances theoretical understanding with opportunities for practical application. Some courses are predominantly academic, focusing on matters such as theory and history. Others blend academic analysis with practical application.

Today's technologically sophisticated and media rich environment requires a comprehensive approach to communication that includes but is not restricted to traditional notions of writing and rhetoric. Students who complete the prescribed curriculum will be able to identify appropriate media and effective rhetorical approaches for a wide range of purposes, audiences and situations. The curriculum integrates courses from three areas: communication/psychology, humanities, and media studies. Courses in Communication and Psychology focus both on the cognitive and social processes of communication to help students understand how people create, use and interpret messages. The humanities courses provide students with aesthetic, cultural and philosophic contexts for studying and employing emerging forms of technologically mediated communication. The media studies courses allow students to gain the expertise to communicate effectively using advanced forms of digital technology while honing collaborative skills. The curriculum culminates with a collaborative capstone project that requires students to integrate the three components with the creation, dissemination and contextual analysis of a multi-media text.

Educational Objectives

Students who complete a BA in EMAC will become effective producers and consumers of technologically mediated communication who can combine technological expertise with strategic communication skills. Graduates will be able to demonstrate this integrated expertise as they:

http://catalog.utdallas.edu/2012/undergraduate/programs/ah/emerging-media-and-communication
• Analyze communication opportunities to employ the most appropriate complex of media and rhetorical strategies to create and disseminate informative, entertaining and persuasive messages
• Create and/or apply digital content for existing and/or emerging forms of media
• Adapt their messages to audiences and technological constraints while retaining (and amplifying) the benefits provided by existing and emerging media
• Anticipate the ethical implications of emerging media and their power to shape public opinion.

Facilities

EMAC students have access to sophisticated facilities that include computer laboratories, a sound design laboratory, a Motion Capture laboratory and other facilities designed to encourage collaborative learning experiences.

Bachelor of Arts in Emerging Media and Communication

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
  3 hours Communication (RHET 1302)
  3 hours Communication Elective (COMM 3300)

Social and Behavioral Sciences (15 hours)
  6 hours Government (GOVT 2301 and GOVT 2302)
  6 hours American History
  3 hours Social and Behavioral Science Elective (PSY 2301)

Humanities and Fine Arts (6 hours)
  3 hours Fine Arts (FILM 2332)
  3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
  3 hours College Math (MATH 1314)
  3 hours Quantitative Mathematics (PSY 2317)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements, Lower Division: 15 hours
II. Major Requirements:
  40 hours

  ATEC 2382 Computer Imaging
  ATEC 2384 Basic Design Principles and Practices
  ATEC 2385 Sound Design
  ATEC 2321 Writing and Research for Emerging Media
  ATEC 2322 Theories of Emerging Media and Communications

III. Major Requirements, Upper Division: 27 hours

  1. COMM 3342 Advanced Topics in Communication
  2. COMM 4314 Persuasion
  3. ATEC 3326 Emerging Media Production
  4. ATEC 3361 Internet Studio I
  5. EMAC 4325 Digital Writing
  6. ATEC 4326 Advanced Emerging Media Production
  7. EMAC 4V80 Capstone Project

  or COMM 3311 Interpersonal Communication

  or PSY 3351 Mass Communication and Behavior

IV. Elective Requirements: 36 hours

  Prescribed Electives (15 hours)

  Any five of the following:

  1. ARTS 4308 Image/Text
  2. ATEC 3330 Digital Video Production I
  3. ATEC 3363 Basic Interaction Design
  4. ATEC 4330 Digital Video Production II
  5. ATEC 4346 Story-Telling for New Media
  6. ATEC 4347 Advanced Design

  Additional Electives (21 hours)

  Any 21 additional hours of Electives from 200-499 level courses.
CGS 4352 Human Computer Interactions I
CGS 4353 Human Computer Interactions II
COMM 3301 Public and Professional Speaking for Business
COMM 3311 Interpersonal Communication
COMM 3342 Advanced Topics in Communication
COMM 4340 Small Group Communication
COMM 4350 Intercultural Communication
COMM 4351 U.S. Culture & Communication
CRWT 3308 Creating Nonfictions
EMAC 3328 The Digital Society
EMAC 3343 Social Networks
EMAC 4372 Topics in Emerging Media and Communication
PSY 3355 Psychology of Creativity

Free Electives (21 hours)

Both upper- and lower-division courses may be used as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Repeatable for credit up to 6 hours.
School of Arts and Humanities

Historical Studies (BA)

Students who complete the major in Historical Studies may design distinctive degree programs by selecting among courses in historical and philosophical methods and approaches, traditional historical surveys, and specific historical and philosophical topics. Students are encouraged to focus their work in Historical Studies on a particular time or place, a significant theme, topic, or problem, or an approach to learning such as literature, the arts, ideas, science and technology, or the social sciences. Students may also be certified to teach history and/or social studies and/or English.

Since the following catalog course descriptions are very general, students are urged to consult the detailed course descriptions available on the web site for the School of Arts and Humanities.

Courses in Historical Studies are open to all students in the university.

Bachelor of Arts in Historical Studies

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^1\) 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (HUMA 3300)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts

3 hours Humanities

Mathematics and Quantitative Reasoning (6 hours)
Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements, Lower Division: 3 hours

**PHIL 1301** Introduction to Philosophy or equivalent

III. Major Requirements, Upper Division: 42 hours

**Major Core Courses (6 hours)**

- **HIST 3301** Historical Inquiry
- **HUMA 3300** Reading and Writing Texts

**Major Distribution and Elective Courses (24 hours)**

3 hours of upper-division elective courses from each of the following groups:

- European Historical Studies
- Asian, African, and Latin American Historical Studies
- Studies in Philosophy and Intellectual History
- Historical Studies with content before 1800

12 hours of upper-division Historical Studies electives

**Major-Related Courses (12 hours)**

Students may select any combination of upper-division courses in Art and Performance, Art History, Visual Arts, Arts & Technology, Communications, Creative Writing, Dance, Drama, Emerging Media & Communication, Film Studies, Humanities, Literature and Language, and/or Music.

IV. Elective Requirements: 33 hours

**Free Electives (24 hours)**

Both upper- and lower-division courses may be used as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement.
School of Arts and Humanities

Literary Studies (BA)

Students who complete the major in Literary Studies receive a thorough grounding in literary ideas and methods as well as a broad acquaintance with literatures of different periods and cultures, including literature in translation. Courses in this major are divided into the following groups: Literary Genres, English and American Literature, General Literature Courses, and Foreign Languages and Literatures. By selecting courses from a variety of these headings, students are able to combine courses in criticism and interpretation, in writing and translation, and in linguistics and languages. Students may also be certified to teach English and/or history and/or social studies.

Since the following catalog course descriptions are very general, students are urged to consult the detailed course descriptions available on the web site for the School of Arts and Humanities.

Unless otherwise noted, courses in Literary Studies are open to all students in the university.

Bachelor of Arts in Literary Studies

Degree Requirements (120 hours)
I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
3 hours Communication (RHET 1302)
3 hours Communication Elective (HUMA 3300)

Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)
3 hours Fine Arts
3 hours Humanities
Mathematics and Quantitative Reasoning (6 hours)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements, Lower Division: 3 hours
   
   LIT 2341 Literary Analysis

III. Major Requirements, Upper Division: 42 hours

Major Core Courses (6 hours)
   
   HUMA 3300 Reading and Writing Texts
   
   LIT 3300 Western Literary Tradition

Major Distribution and Elective Courses (24 hours)
   
   3 hours of upper-division courses from each of the following groups:
   
   Literary genres

   Literature before 1850

   18 hours of upper-division Literary Studies electives

Major-Related Courses (12 hours)
   
   Students may select any combination of upper-division courses from Art and Performance, Art History, Visual Arts, Arts & Technology, Communications, Creative Writing, Dance, Drama, Emerging Media & Communication, Film Studies, Historical Studies, Humanities, Music and/or Philosophy.

IV. Elective Requirements: 33 hours

Free Electives (33 hours)
   
   Both upper-division and lower-division courses may be used as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

   1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
   
   2. A required Major course that also fulfills a Core Curriculum requirement.
School of Behavioral and Brain Sciences

The School of Behavioral and Brain Sciences at The University of Texas at Dallas offers degrees in Child Learning and Development; Cognitive Science; Neuroscience; Psychology; and Speech-Language Pathology and Audiology. The Child Learning and Development program provides students a research-based approach to understanding child development as a preparation for careers as teachers, researchers, service providers, and policy makers. The Cognitive Science program provides a multidisciplinary approach to the study of the mind and behavior that incorporates methodology from the fields of philosophy, psychology, neuroscience, and computer science. The Neuroscience program provides students the opportunity to study the nervous system from a multidisciplinary approach that combines the study of brain structure, biochemistry, and physiology, and their links to behavior. The Psychology program provides basic training in the study of mind and behavior as preparation for graduate training in psychology, counseling and related fields, as well as providing courses that may be relevant to employment in human resources or research support positions. The Speech-Language Pathology and Audiology program offers study in the processes and disorders of speech, language and hearing. The program provides the foundation for graduate work leading to careers as a speech-language pathologist or audiologist. Students meeting BS degree and clinical practicum requirements are eligible for Texas state licensure as a speech-language pathology assistant.

The School of Behavioral and Brain Sciences (BBS) offers a number of services and programs for students. Academic Advising by a staff of professional advisors is available for all students, and students are encouraged to meet with their advisors on a regular basis. BBS sponsors events and workshops designed to inform students of research opportunities, career paths, and how to prepare for application to graduate and professional schools. BBS works closely with the UTD Career Center to assist students with exploring careers, opportunities for co-op experiences, resume-writing workshops and practice in interview skills. BBS also offers PSY 3100 Careers in Psychology, a course that explores career and graduate school paths for students in the School of Behavioral and Brain Sciences. This course is offered in the spring and fall semesters and has limited enrollment. It is recommended that students take this course during the sophomore year or early in the junior year.

The school's Internship Placement Program is open to all students who have achieved junior or senior standing (more than 53 hours) and a minimum 2.500 GPA. Students earn course credit for working 8 hours per week at an approved community agency of their choice. The program has over 70 established placement sites. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences.

The Honors Program of the School of Behavioral and Brain Sciences (BBS) provides enriching research and writing experiences in a mentoring environment with individual members of the faculty. These opportunities attempt to promote greater success in admission to top-ranked graduate schools and/or employment in chosen careers. The Program consists of the Honors
Thesis Core, completed by all students in the Honors Program, and a Dean's Scholars' Tier that is completed in addition to the Thesis Core by a subset of students who wish to pursue doctorate-level professional careers and to serve the School of BBS. Students are eligible for admission to the Program after completing at least 12 graded hours at UT Dallas including 2 core courses in the student's major and achieving the GPA(s) required. Separate emails are sent notifying students when/how to apply during the fall semester for the Honors Program (Thesis Core) and during the spring semester for the Dean's Scholars' Tier, approximately 2-3 weeks before the application period begins.

To earn BBS School Honors, students must meet the following criteria: (1) at least 30 graded hours at UT Dallas, (2) at least 12 hours in BBS major core courses, (3) an overall UT Dallas GPA of at least 3.500 (Honors Thesis Core) and of at least 3.600 (Dean's Scholars' Tier), (4) successful completion of the Honors Seminar (offered in the spring semester) or approved substitute activities, and (5) completion of an Honors Thesis with a grade of at least B+. Students in the Dean's Scholars' Tier must meet these additional criteria: successful completion of (6) the Dean's Scholars' Seminar (offered in the fall semester) and (7) multiple service activities to the School. School Honors with Distinction may be achieved by students whose Theses are judged by a faculty committee to be of exemplary quality.

Faculty


Professor and Dean Emeritus: J. Michael Coleman

Associate Professors: Marco Atzori, Shayla Holub, Daniel Krawczyk, Mandy Maguire, Candice Mills, Robert L. Rennaker, Pamela Rollins, Bart Rypma, Lucien T. Thompson

Assistant Professors: Robert Ackerman, Chandramalli Basak, Francesca Filbey, Cindy de Frias, Kristen Kennedy, Sven Kröener, Christa McIntyre, Jackie Nelson, Jonathan Ploski, Karen Rodrigue, Raul Rojas, Noah Sasson, Andrea Warner-Czyz, Gagan Wig

Distinguished Scholar in Residence: James Jerger

Senior Lecturers: Matthew Housson, Karen Huxtable-Jester, Nancy Juhn, Van Miller, Toosje Vanbeveren

Clinical Professors: John Stilwell

Clinical Associate Professors: Jackie Clark, Carol Cokely, Kenneth C. Pugh, Lee Wilson
Clinical Assistant Professor: Joanna Gentsch, Jeffrey Martin

Clinical Lecturers: Michelle Aldridge, Cheryl L. Bryant, Lucinda Dean, Diane Garst, Karen Kaplan, Helen Kenedi, Janice Lougeay, Felicity Sale
School of Behavioral and Brain Sciences

Child Learning and Development (BS)

Providing better ways to foster the intellectual and emotional development of all of our children is a national priority. As such, well-educated university graduates are needed to go on to become expert child development practitioners and researchers. Over the last 60 years, the academic disciplines of developmental psychology and child development have accumulated a vast body of research-based knowledge about the factors that promote optimal child learning, development and well-being, as well as those that contribute to disadvantaged child development. The Child Learning and Development major provides undergraduate students a rigorous science-based curriculum that immerses them in the theories, findings, research methods, and best practices that the scientific study of child development has to offer.

The Child Learning and Development major focuses on the fundamental processes of child and adolescent development within the contexts of families, schools, peer groups, and larger cultural milieu. Its three objectives are to provide students with a strong foundation in 1) cognitive, language, and socio-emotional development, 2) research skills for conducting scientific studies and evaluating applied programs, and 3) translating scientific findings into practical applications for understanding and improving children's lives. Opportunities for supervised and independent research, as well as field placements that involve working with children, families, schools, and social services, are provided in addition to formal work.

The Child Learning and Development major prepares students for a wide range of careers in education, psychology, social work, family medicine, public health, family law, and public policy. The major is especially well suited for students seeking elementary teacher certification (early childhood - 6th grade) through UT Dallas's Teacher Development Center. By combining a major in Child Learning and Development with elementary teacher certification, students will develop a strong foundation in child development and teaching. Elementary Teacher Certification requires a minimum of 45 additional hours of course work that can be completed within the free elective hours of the Child Learning and Development major. If you are interested in this combined child development/education program (called CLD/EC6), see an advisor to develop a degree plan.

Bachelor of Science in Child Learning and Development

Degree Requirements (120 hours)

I. Core Curriculum Requirements 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (CLDP 3494)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective (PSY 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours College Math (MATH 1306, MATH 1314 or MATH 2417)
3 hours Quantitative Methods or Math (PSY 2317)

Science (9 hours)

3 hours Science

6 hours Science Electives (including at least one course with a substantial laboratory component)

II. Major Requirements: 40 hours

Major Preparatory Courses (6 hours)

PSY 2301 Introduction to Psychology
PSY 2317 Statistics for Psychology
or STAT 1342 Statistical Decision Making

Major Core Courses (19 hours)

CLDP 3303 Normal Language Development
or CLDP 3305 Language and Literacy Development
CLDP 3310 Child Development
or CLDP 3339 Educational Psychology
or CLDP 4334 Lifespan Development
Major Related Courses (15 upper-division hours)

Guided Electives; 3 hours of one of the following:

- **CLDP 4394** Internship
- or **CLDP 4395** Co-op Fieldwork
- or **CLDP 4397** Honors Thesis
- or **CLDP 4V98** Directed Research
- or **CLDP 4V99** Individual Study

Plus 12 hours of courses with CLDP prefix or any of the following courses: **CGS 2301, CGS 3342, CGS 4312, CGS 4313, CGS 4314, CGS 4315, CGS 4352, CGS 4353, ED 4352, ED 4363, ED 4357, NSC 3345, NSC 4352, NSC 4353, NSC 4354, NSC 4367, PSY 3331, PSY 3333, PSY 3361, PSY 4331, PSY 4343, PSY 4359, PSY 4362, PSY 4364, PSY 4373, SPAU 3301, SPAU 3304, SPAU 3340, SPAU 3343, SPAU 3344, SPAU 3345** or **SPAU 4308**.

III. Elective Requirements: 38 hours

Free Electives (38 hours)

Students are encouraged to explore areas of concentration in Child Learning and Development as well as explore interests outside the field. Be aware that at least 51 hours of upper division credit hours are required for graduation.

**Minor in Child Learning and Development**

This minor is well suited for students pursuing Elementary Teacher certification and for those generally interested in the psychological development of children. Students must complete 18 credit hours including 9 required hours of foundation coursework and 9 credit hours of guided electives. At least 12 hours must be upper-division courses, of which at least 9 hours must have been completed at UT Dallas. Students majoring in Psychology or Speech-Language Pathology
and Audiology may minor in Child Learning and Development provided that no course is used to satisfy both major and minor requirements.

**Foundation Courses (9 hours required)**

- **PSY 3310** Child Development
- or **PSY 3339** Educational Psychology 4
- or **PSY 4334** Lifespan Development 5
- **PSY 3332** Social and Personality Development
- **PSY 3362** Cognitive Development

**Guided Electives Courses (select 9 hours)**

- **PSY 3342** Exceptional Children 4
- **PSY 4344** Child Psychopathology
- **PSY 4373** Psychological Assessment
- **PSY 4394** Internship in Psychology
- or **ED 4693** Student Teaching - Elementary (approval of Associate Dean required)

- **SPAU 3303** Normal Language Development 4
- **SPAU 3305** Language and Literacy Development
- **SPAU 4308** Language Disorders in Children

Other courses as approved by the Associate Dean.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. A required Major course that also fulfills a Core Curriculum requirement. Nine (9) hours are counted in Core Curriculum.
4. Required for EC-6 Teacher Certification.
5. PSY majors take an additional 3 hours of guided electives to replace PSY 3310 or PSY 4334.
School of Behavioral and Brain Sciences

Cognitive Science (BS)

Cognitive Science is the study of complex information processing in humans and machines and includes the multidisciplinary study of biological and artificial systems. Important components of cognitive science include areas of research such as: cognitive-neuroscience, brain-imaging studies of perceptual and cognitive processing, situated cognition, Human-Computer-Interactions (HCI), computational modeling, and Artificial Intelligence (AI). The field of cognitive science draws from diverse approaches to understanding complex information processing, including research from experimental psychology, neuroscience, linguistics, philosophy, computer science, mathematics, and engineering.

The Cognitive Science program in the School of Behavioral and Brain Sciences at UT Dallas consists of three concentration areas: (1) Psychology/HCI, (2) Cognitive-Neuroscience, and (3) AI/Computational Modeling. Cognitive Science Majors select the majority of their upper-division coursework from 2 of these 3 concentration areas in order to generate multidisciplinary areas of focus. In addition to providing a sound preparation for graduate work in Cognitive Science and related areas, the Cognitive Science major is an ideal choice for students pursuing careers that combine interests in neuroscience, cognition, mathematics, and computer science. There are exciting career prospects in both industry and academics for the Cognitive Science major.

Cognitive-Neuroscience Careers. Students whose focus area is cognitive-neuroscience will be well prepared for the pursuit of graduate degrees and careers associated with: medicine, clinical neuropsychology, brain-imaging technology, intraoperative neurophysiological monitoring, and evaluation of bionic/prosthetic technology (e.g., cochlear implants and artificial limbs). Students interested in Cognitive-Neuroscience career opportunities typically choose their core coursework from both the specialization areas of Psychology/HCI and Neuroscience.

Human-Computer-Interaction Careers. Students whose focus area is Human-Computer-Interactions (HCI), are prepared for the pursuit of careers in the areas of usability engineering and user-experience (UX) design and development that involve the evaluation and design of human-computer interfaces such as website and software graphical user interfaces (GUIs), smartphone interfaces and voice-user interfaces (VUIs). Students interested in HCI career opportunities should choose their core coursework from the Psychology/HCI specialization area and include one or more HCI courses.

AI/Computational Modeling Careers. Students whose focus area is AI/computational modeling are prepared for the pursuit of careers associated with the development and evaluation of Artificial Intelligence (AI) technology (e.g., web search engines, speech recognition, robotics, computer vision, and computer games), bionic and prosthetic technology development and evaluation (such as cochlear implant technology), computer-based natural language
understanding, data mining, and machine learning as well as the development of computational models to support theory development in the behavioral and brain sciences. Students interested in career opportunities in this area should choose their core coursework from the AI/Computational Modeling specialization area.

Bachelor of Science in Cognitive Science

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (CGS 3340 or PSY 3393)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective (PSY 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2417 and MATH 2419)

Science (9 hours)

6 hours Science (NSC 3361 and CGS 2301)

3 hours Science Electives (including at least one course with a substantial laboratory component)

II. Major Requirements: 60 hours (15 hours beyond Core Curriculum)

Major Preparatory Courses

The following are required for all concentration areas: (24 hours)

CGS 2301 Cognitive Science
**CS 1337** Computer Science I

**MATH 2417** Calculus I

**MATH 2419** Calculus II (prerequisite: **MATH 2417**)

**MATH 2418** Linear Algebra (prerequisite: **MATH 2419**)

**PSY 2301** Introduction to Psychology

**PSY 2317** Statistics for Psychology

or **CS 3341** or **SE 3341** or **STAT 3341** Probability and Statistics in Computer Science and Software Engineering (prerequisite: **MATH 2419** and **CS 2305**)

or **STAT 4351** Probability (prerequisite: **MATH 2451**)

**Additional Preparatory Courses for AI/Computational Modeling Area (10 hours)**

**CS 2305** Discrete Mathematics for Computing I (prerequisite: **MATH 2417**)

**CS 2336** Computer Science II (prerequisite: **CS 1337**)

**MATH 2451** Multivariable Calculus with Applications (prerequisite: **MATH 2419**)

**Major Core Courses required for all concentration areas (12 hours)**

**CGS 3361** Cognitive Psychology

**NSC 3361** Behavioral Neuroscience

**PSY 3392** Research Design and Analysis

**CGS 3340** Experimental Projects in Cognitive Science

or **PSY 3393** Experimental Projects in Psychology

**Major Related Courses (24 hours)**

Select 4 courses each from 2 of the following 3 Concentration Areas

**Core Courses for Psychology/HCI Concentration Area (select 12 hours from list of courses below)**

**CGS 3325** Historical Perspectives on Psychology: Mind and Machines since 1600

**CGS 4359** Cognitive Neuroscience (prerequisite: **PSY 2301**)

**CGS 4362** Perception (prerequisite: **CGS 2301** or **PSY 2301**)

**CGS 4352** Human Computer Interactions
CGS 4353 Human Computer Interactions II *(prerequisite: CGS 4342)*

CGS 4355 Human Computer Interactions Lab *(prerequisite: CGS 4352 or CGS 4353)*

PSY 4374 Judgment and Decision Making

PSY 3331 Social Psychology

PSY 4343 Abnormal Psychology

PSY 4334 Lifespan Development

PSY 3310 Child Development

PSY 3362 Cognitive Development *(prerequisite: PSY 4334 or PSY 3310)*

Core Courses required for Cognitive-Neuroscience Concentration Area (select 12 hours from list of courses below)

- NSC 4352 Cellular Neuroscience *(prerequisite: NSC 3361)*
- NSC 4354 Integrative Neuroscience *(prerequisite or corequisite: NSC 3361)*
- NSC 4356 Neurophysiology *(prerequisite: NSC 4352)*
- NSC 4366 Neuroanatomy *(prerequisite: NSC 3361 or BIOL 2311)*
- NSC 4363 Neuropharmacology *(prerequisite: NSC 4352 or NSC 4354)*
- NSC 4367 Developmental Neurobiology *(prerequisite: NSC 4352 or NSC 4354)*
- NSC 4359 Cognitive Neuroscience *(prerequisite PSY 2301)*
- NSC 4353 Neuroscience Laboratory Methods *(prerequisites: NSC 3361 and either NSC 4352 or NSC 4354)*

Core Courses required for AI/Computational Modeling Concentration Area (select 12 hours from list of courses below)

- CGS 3342 Cognitive and Neural Modeling Laboratory *(prerequisite: MATH 2418)*
- CGS 4312 Computational Modeling Methods for Language Understanding
- CGS 4313 Neural Net Mathematics *(prerequisites: MATH 2451 and MATH 2418; or instructor consent required)*
- CGS 4314 Intelligent Systems Analysis *(prerequisite: CGS 4313 or instructor consent required)*
- CGS 4315 Intelligent Systems Design *(prerequisite: CGS 4314 or instructor consent required)
CS 3305 Discrete Mathematics for Computing II (prerequisite: CS 2305 and (MATH 2414 or MATH 2419))

CS 3345 Data Structures and Introduction to Algorithmic Analysis (prerequisites: CS 2336 and CS 2305)

CS 4365 Artificial Intelligence (prerequisite: CS 3345)

CS 4375 Introduction to Machine Learning (prerequisites: CS 3345 and CS 3341)

CS 4391 Introduction to Computer Vision (prerequisite: CS 3345)

III. Elective Requirements: 19 hours

Free Electives (3-19 hours)

Students are encouraged to explore areas of concentration in Cognitive Science, Psychology, and Neuroscience as well as explore interests outside the field. Be aware that at least 51 hours of upper division credit hours are required for graduation. In addition, advanced CGS students in good academic standing may request permission from the Cognitive Science Program Head to take graduate Applied Cognition and Neuroscience coursework (ACN prefix) to fulfill some of the elective course requirements.

**Minor in Cognitive Science**

Students who are not majoring in Cognitive Science may minor in Cognitive Science by completing 18 semester credit hours. At least 12 of the 18 semester credit hours required by the minor in Cognitive Science must be upper-division courses from either the Psychology/HCI, Neuroscience, or Computational Modeling/Al specialization areas. In addition, 9 of the 18 semester credit hours required for the minor in Cognitive Science must have a Cognitive Science (CGS), Psychology (PSY), or Neuroscience (NSC) prefix and be upper-division courses. No credit hours may be used to satisfy both major and minor requirements; however, free elective hours or major preparatory classes may be used to satisfy the minor. At least one-third of the hours for a minor must be taken at UT Dallas.

**Fast Track Baccalaureate/Master's Degrees**

UT Dallas undergraduate students with strong academic records who intend to pursue a master's degree in Applied Cognition and Neuroscience at UT Dallas may consider an accelerated undergraduate-graduate plan of study. When accepted into the program, students may take up to 15 hours of graduate courses that may be used to complete the bachelor's degree and also to satisfy requirements for the Master's degree. Students must maintain a 3.00 grade point average and earn grades of B or better in the graduate courses taken. The Fast Track makes it possible for students to complete upper-division undergraduate education and graduate training in three years. Students must have completed at least 90 semester credit hours toward a baccalaureate...
degree before beginning Fast Track course work. Students should apply to admissions one semester before they reach 90 hours. To qualify for application, undergraduate students must have completed at least 18-semester credit hours in major core courses at UT Dallas. Apply to the Fast Track program through the Cognitive Science Program Office. Students should consult with a graduate advisor regarding admissions criteria and plans of study at the beginning of their junior year.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. Six hours of Calculus are counted to fulfill the Mathematics Core Requirement. MATH 2413, MATH 2414, and MATH 2415. Can substitute MATH 2417, and MATH 2419.
4. This course is a Major requirement that also fulfills a Core Curriculum requirement. Fifteen hours (15) are counted in Core Curriculum.
School of Behavioral and Brain Sciences

Neuroscience (BS)

Neuroscience is the multidisciplinary study of brain function that draws on recent advances in cell and molecular biology, biochemistry, biophysics, and computer and behavioral and cognitive sciences. It examines the brain's global and nanoscale biochemistry, its complex and extensively networked anatomical structure, and its remarkably adaptive physiology. The field considers neuronal development from early embryology through advanced senescence, and examines the brain's plasticity from the level of single proteins, of individual neurons, up through the level of networks or systems of cells, on up to complete behaving organisms. It studies the regulation and expression of behavior, the impact of that behavior on the brain, and the complex interactions of multiple neuronal systems that underlie the emergence of cognitive function. The Neuroscience program at UT Dallas provides students with the opportunity to focus on the brain from a systems-level perspective, drawing on behavioral and cognitive expertise combined with cellular and molecular analyses. It allows undergraduates extensive interactions with working neuroscientists who use the latest experimental techniques.

The Neuroscience program is designed to prepare students for admission to graduate, medical, or dental school, or for careers in related biomedical research, industry, and allied health science fields. Required courses and guided electives can include the approved pre-medical curriculum and offer an alternative to other traditional pre-health majors. Students who wish to continue their education in the fields of medicine, dentistry or allied professional areas should register with the Health Professions Advising Center during their first semester. Students are encouraged to design a personalized degree plan of guided electives with their advisor that combines courses from the neurosciences and related disciplines of mathematics, physics, chemistry, biology, engineering, computer science, psychology, and speech pathology and audiology in a way that will suit their individual interests and goals. Students are also strongly encouraged to gain research experience as part of their undergraduate training in Neuroscience.

Students can complete Core Curriculum and Neuroscience major requirements in a minimum of 85 semester credit hours, leaving 35 elective hours. Students can complete Core Curriculum, Neuroscience major, and pre-health Professions requirements in a minimum of 111 semester credit hours, leaving 9 remaining elective hours.

Bachelor of Science in Neuroscience

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
3 hours Communication (RHET 1302)
3 hours Communication Elective (NSC 4353)$^2$

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective (PSY 2301)$^2$

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours College Math (MATH 2414 or MATH 2417)$^2$
3 hours Quantitative Methods (PSY 2317 or STAT 1342)$^2$

Science (9 hours)

9 hours Science (CHEM 1311 and CHEM 1111, BIOL 2311 and BIOL 2281)$^2$

II. Major Requirements: 45 hours$^1$

Major Preparatory Courses (24 hours)$^1$

All of the following:

- BIOL 2281 Introductory Biology Laboratory$^1$
- BIOL 2311 and BIOL 2111 Introduction to Modern Biology$^1$ with Workshop
- CHEM 1311 and CHEM 1111 General Chemistry I with Laboratory$^1$
- CHEM 1312 and CHEM 1112 General Chemistry II with Laboratory
- MATH 2414 Integral Calculus
  
  or MATH 2417 Calculus$^1$
- PSY 2301 Introduction to Psychology$^1$
- PSY 2317 Statistics for Psychology$^1$
or STAT 1342 Statistical Decision Making

Major Core Courses (25 hours)

All of the following:

- NSC 3361 Behavioral Neuroscience
- NSC 4352 Cellular Neuroscience
- NSC 4353 Neuroscience Laboratory Methods
- NSC 4354 Integrative Neuroscience
- NSC 4356 Neurophysiology
- NSC 4363 Neuropharmacology
- NSC 4366 Neuroanatomy

And one emphasis course from the following six:

- NSC 4357 Neurobiology of Learning and Memory
- or NSC 4367 Developmental Neurobiology
- or NSC 4371 Neural Plasticity
- or NSC 4373 Sensory Neuroscience
- or NSC 4362 Molecular Neuroscience
- or NSC 4385 Neuropsychology

Major Related Courses (15 hours beyond the Core Curriculum)

Guided Electives, 15 semester hours from the following list (the Emphasis Course selected above will not count twice as an Guided Elective). Consultation with an advisor is required.

- BIOL 3301 and BIOL 3101 Classical and Molecular Genetics with workshop
- BIOL 3302 and BIOL 3102 Eukaryotic Molecular and Cell Biology with workshop
- BIOL 3361 and BIOL 3161 Biochemistry I with workshop
- BIOL 3362 and BIOL 3162 Biochemistry II with workshop
- BIOL 3455 Human Anatomy and Physiology with Lab I
**BIOL 3456** Human Anatomy and Physiology with Lab II

**NSC 3344** Anatomy and Physiology of Speech and Hearing

**NSC 3345** Neural Basis of Communication

**NSC 4188** Dean's Scholars' Seminar

**NSC 4351** Medical Neuroscience

**NSC 4355** Advanced Neuroscience Laboratory

**NSC 4357** Neurobiology of Learning and Memory

**NSC 4358** Neurobiology of Pain

**NSC 4359** Cognitive Neuroscience

**NSC 4362** Molecular Neuroscience

**NSC 4367** Developmental Neurobiology

**NSC 4370** Neuroendocrinology

**NSC 4371** Neural Plasticity

**NSC 4373** Sensory Neuroscience

**NSC 4374** Neuropasticity in Disorders of the Nervous System

**NSC 4375** Honors Seminar

**NSC 4376** Neurobiology of Stress

**NSC 4378** Neurotoxicology

**NSC 4385** Neuropsychology

**NSC 4386** Adult Development and Aging

**NSC 4394** Internship in Neuroscience

**NSC 4V95** Externship in Neuroscience

**NSC 4397** Thesis Research

**NSC 4V90** Special Topics in Neuroscience

**NSC 4V96** Teaching Internship
NSC 4V98 Directed Research
NSC 4V99 Independent Study
PSY 4362 Perception
SPAU 3304 Communication Sciences

III. Elective Requirements: 33 hours

Free Electives (33 hours)

At least 33 hours of lower- or upper-division courses of the student's choice. Students are encouraged to explore areas of concentration in Neuroscience as well as explore interests outside the field. Be aware that at least 51 hours of upper-division credit hours are required for graduation.

Premedical and/or other pre-health professions students (29 hours)

Students seeking to complete Pre-health Professions requirements should take the following as free electives:

Required pre-medical courses (12 hours)

- BIOL 2112 Introduction to Modern Biology II Workshop
- BIOL 2312 Introduction to Modern Biology II
- CHEM 2123 Introductory Organic Chemistry Laboratory I
- CHEM 2125 Introductory Organic Chemistry Laboratory II
- CHEM 2323 Introductory Organic Chemistry I
- CHEM 2325 Introductory Organic Chemistry II

Pre-med Advanced Biology requirement (8 hours, select 2 courses)

- BIOL 3301 and BIOL 3101 Classic and Molecular Genetics with workshop
- BIOL 3302 and BIOL 3102 Eukaryotic Molecular and Cell Biology with workshop
- BIOL 3361 and BIOL 3161 Biochemistry I with workshop
- BIOL 3362 and BIOL 3162 Biochemistry II with workshop

Pre-med Physics requirement (8 hours, select 2 courses)

- PHYS 1101 College Physics Laboratory I
Minor in Neuroscience

Students who are not majoring in Neuroscience may minor in Neuroscience by taking 18 semester credit hours selected from the lists of major core courses, major related courses and major preparatory courses. At least 12 hours must be upper-division Neuroscience core courses. No credit hours may be used to satisfy both major and minor requirements; however, free elective hours or major preparatory courses may be used to satisfy the minor. At least one-third of the hours for a minor must be taken at UT Dallas.

Fast Track Baccalaureate/Master's Degrees

UT Dallas undergraduate students with strong academic records who intend to pursue a master's degree in Applied Cognition and Neuroscience at UT Dallas may consider an accelerated undergraduate-graduate plan of study. When accepted into the program, students may take up to 15 hours of graduate courses that may be used to complete the baccalaureate degree and also satisfy requirements for the master's degree. Students must maintain a 3.000 grade point average and earn grades of B or better in graduate courses taken. Students must have completed at least 90 semester credit hours toward a baccalaureate degree before beginning Fast Track course work. Students should apply to admissions one semester before they reach 90 hours. To qualify for application, undergraduate students must have completed at least 18-semester credit hours in major core courses at UT Dallas. Apply to the Fast Track program through the Applied Cognition and Neuroscience Program Office. Students should consult with a graduate advisor regarding admissions criteria and plans of study.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. A required Major course that also fulfills a Core Curriculum requirement. Twenty-one (21) hours are counted in Core Curriculum.
4. May be repeated for credit, up to 9 hours.
5. May be repeated for credit, up to 6 hours.
6. Algebra-based Physics courses
7. Calculus-based Physics courses
School of Behavioral and Brain Sciences

Psychology (BS)

William James characterized psychology as "the study of mental life." Psychology is both a domain of scientific inquiry and a field of applied practice. The science of psychology is concerned with the study of how people perceive, learn, feel, think, develop, and interact with others. The practice of psychology helps people improve mental health, learning, and performance.

Undergraduate degrees in psychology provide students a number of career options. Further study in graduate school leads to professional careers as clinical, counseling, industrial, academic and other kinds of psychologists. Psychology is also a useful major for students planning careers in law, management, medicine, or social work. A psychology major provides students with the knowledge about human behavior and methods of research and data analysis that is valuable in business, helping fields, and many other occupations.

The Psychology program at UT Dallas approaches the field from a scientific perspective, applying behavioral science research methods to the study of the human mind and behavior. Thus, students will have laboratory experiences in addition to lectures, reading, and demonstrations. Psychology students learn to evaluate evidence relating to theories of social behavior, personality development, perception, memory, brain processes, and other facets of human experience. Students also gain hands-on experience through internship placements, directed research experiences in professors’ labs, and individualized study with faculty in specialized topics.

The undergraduate degree awarded through the Psychology program is a bachelor of science. Students may choose electives to obtain a broader grounding in psychology or a general education in the liberal arts. Students should note that it is possible to select clusters of electives that lead to particular concentrations in careers and graduate study. Students can complete Core Curriculum and Psychology major requirements in a minimum of 72 semester credit hours, leaving 48 elective hours.

Bachelor of Science in Psychology

Degree Requirements (120 hours)

I. Core Curriculum Requirements‡: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (PSY 3393)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective (PSY 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours College Math (MATH 1306, MATH 1314 or MATH 2417)
3 hours Quantitative Methods or Math (PSY 2317)

Science (9 hours with at least one lab course)

3 hours Science (NSC 3361)
6 hours Science Elective (see PSY Advisor for options)

II. Major Requirements: 30 upper-division hours

Major Preparatory Courses (6 hours)

PSY 2301 Introduction to Psychology
PSY 2317 Statistics for Psychology
or STAT 1342 Statistical Decision Making

Major Core Courses (24 upper-division hours)

NSC 3361 Behavioral Neuroscience
PSY 3360 Historical Perspectives on Psychology: Mind and Machines since 1600
PSY 3361 Cognitive Psychology
or CGS 2301 Cognitive Science
or PSY 4359 Cognitive Neuroscience
**Major Related Courses** (12 upper-division hours)

**Guided Electives; 3 hours of one of the following:**

- **PSY 4394** Internship in Psychology
- **PSY 4395** Co-op Fieldwork
- **PSY 4V96** Teaching Internship
- **PSY 4397** Thesis Research
- **PSY 4V98** Directed Research
- **PSY 4V99** Independent Study

Plus any 9 hours of courses with PSY or CGS or CLDP or NSC prefixes or the following courses: SPAU 3301, SPAU 3303, SPAU 3304, SPAU 3340, SPAU 3343, SPAU 3344, SPAU 3345 or SPAU 4308.

**III. Elective Requirements: 48 hours**

**Free Electives (48 hours)**

Electives are selected by students to explore areas of concentration in Psychology as well as explore interests outside the field. Both lower- and upper-division courses may count as electives but students must be sure to complete at least 51 hours of upper-division courses to qualify for graduation.

**Minor in Psychology**

Students who are not majoring in Psychology may minor in Psychology by taking 18 semester credit hours of Psychology courses (i.e., those with a PSY prefix, excluding those listed under Independent Study in the Catalog). At least 12 hours must be upper-division courses, of which at
least 9 hours must be Psychology major core courses taken at UT Dallas (see list below). No credit hours may be used to satisfy both major and minor requirements; however, free elective hours or major preparatory classes may be used to satisfy the minor.

Psychology Major Core Courses: PSY 3310, PSY 3331, PSY 3360, PSY 3361, PSY 3392, PSY 3393, PSY 4331, PSY 4334, PSY 4343, PSY 4359, CGS 2301, and NSC 3361 (students cannot take both PSY 3310 and PSY 4334).

Because Psychology is concerned with a wide range of social behaviors, it provides a strong foundation for all careers that deal with people. Students considering careers in business, education, law, medicine, clinical psychology, counseling or social work can benefit from minoring (or majoring) in psychology. The following courses are suggested preparation for each of these career paths.

**Business Careers**

Graduate schools of business look for students with a strong liberal arts background that focuses on both writing and quantitative skills. Suggested courses are Cognitive Psychology, Personality Psychology, Social Psychology, Psychology in the Workplace, Industrial and Organizational Psychology, Human Relations, and Research Design and Analysis.

**Education Careers**

Psychology courses are especially relevant for students pursuing careers in child development, educational psychology, education counseling, and school psychology. Suggested courses are Child or Lifespan Development, Cognitive Psychology, Educational Psychology, Cognitive Development, Exceptional Children, Social and Personality Development, Adolescent Psychology, Psychological Assessment, Statistics for Psychology, and Research Design and Analysis.

**Law and Crime and Justice Careers**

A background in psychology can be enormously useful for the study and practice of law and law enforcement. Suggested courses are Forensic Psychology, Lifespan Development, Cognitive Psychology, Judgment and Decision-Making, Personality Psychology, Social Psychology, Abnormal Psychology, Psychological Assessment, Statistics for Psychology, and Research Design and Analysis.

**Medical Careers**

Psychology is highly recommended as a major or minor for premedical students interested in psychiatry or neurology, or any student who wishes to practice medicine. The intended area of medical specialization should influence choice of courses; for example, a future pediatrician would benefit from courses in developmental psychology. In general, suggested courses are Lifespan or Child Development, Behavioral Neuroscience, Health Psychology, Abnormal

**Careers in Clinical Psychology, Counseling, or Social Work**

All courses in psychology are good preparation for these careers. It is especially important that students take Lifespan Development, Behavioral Neuroscience, Cognitive Psychology, Personality Psychology, Abnormal Psychology, Statistics for Psychology, and Research Design and Analysis. Other courses of interest include Approaches to Clinical Psychology, Social Communication, Human Relations, Health Psychology, Psychological Assessment, Child Psychopathology, and Violence in the Family.

**Fast Track Baccalaureate/Master's Degrees**

UT Dallas undergraduate students with strong academic records who intend to pursue a master's degree in Human Development and Early Childhood Disorders or in Applied Cognition and Neuroscience at UT Dallas may consider an accelerated undergraduate-graduate plan of study. When accepted into the program, students may take up to 15 hours of graduate courses that may be used to complete the baccalaureate degree and also to satisfy requirements for the master's degree. Students must maintain a 3.000 grade point average and earn grades of B or better in graduate courses taken. Students must have completed at least 90 semester credit hours toward a baccalaureate degree before beginning Fast Track course work. Students should apply to admissions one semester before they reach 90 hours. To qualify for application, undergraduate students must have completed at least 18-semester credit hours in major core courses at UT Dallas. Apply to the Fast Track program through the Program Offices of the master's programs. Students should consult with a graduate advisor regarding admissions criteria and plans of study.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. A required Major course that also fulfills a Core Curriculum requirement. Twelve (12) hours are counted in Core Curriculum.
School of Behavioral and Brain Sciences

Speech-Language Pathology and Audiology (BS)

The Speech-Language Pathology and Audiology program offers study in the processes and disorders of speech, language, and hearing. The program provides the foundation for graduate study leading to career opportunities and clinical certification as a speech-language pathologist or audiologist. Students completing the BS degree and required clock hours of clinical practicum are also eligible for Texas state licensure as a speech-language pathology assistant. The curriculum in Speech-Language Pathology and Audiology focuses on the development of communicative abilities; the anatomical and physiological mechanisms underlying speech, language, and hearing; the causes of communication disorders in children and adults; and theories and techniques of assessment and treatment of communication disorders. Supervised clinical practicum provides students experience in clinical assessment and intervention with persons having communication impairments.

Students majoring in Speech-Language Pathology and Audiology are strongly encouraged to select electives in Psychology to complement course work in their major field. PSY 3361 Cognitive Psychology, PSY 4334 Lifespan Development, and NSC 3361 Behavioral Neuroscience are especially relevant for Speech-Language Pathology and Audiology majors. Suggested electives in the major include SPAU 3390 Clinical Practicum in Speech-Language Pathology (may be taken twice for credit), SPAU 4325/PSY 3342 Exceptional Children, SPAU 4342 Assessment Procedures in Speech-Language Pathology, and SPAU 4395 Issues in the Management of Persons with Hearing Impairment.

Students who plan to attend graduate school in speech-language pathology or audiology should be aware that clinical certification by the American Speech-Language-Hearing Association requires that students complete at least one course in each of the following subject areas: Biological Sciences (e.g. biology, neuroscience), Physical Sciences (e.g. chemistry, physics), Behavioral Sciences (e.g. psychology, sociology), and Mathematics (statistics preferred.) Completion of this coursework prior to application to graduate school is strongly advised.

Students who wish to combine Speech-Language Pathology and Audiology with Psychology or Neuroscience should be able to meet requirements in both majors, and, with the approval of the Associate Dean, complete a double major. Students considering a double major should consult with their advisor regarding specific requirements. Students can complete Core Curriculum and Speech-Language Pathology and Audiology major requirements in a minimum of 78 semester credit hours, leaving 42 elective hours.

Bachelor of Science in Speech-Language Pathology and Audiology
Degree Requirements (120 hours)

I. Core Curriculum Requirements

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (SPAU 3390)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective (PSY 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours College Math (see Advisor for recommended courses)
3 hours Quantitative Methods (PSY 2317 or STAT 1342)

Science (9 hours with at least one lab course)

3 hours Science (SPAU 3344)
6 hours Science Elective (Students planning to attend graduate school in speech-language pathology or audiology should take a minimum of one course in the biological sciences and one course in chemistry or physics)

II. Major Requirements: 33 hours

Major Preparatory Courses (3 hours)

PSY 2301 Introduction to Psychology

Major Core Courses (39 hours)

SPAU 3301 Communication Disorders

SPAU 3303 Normal Language Development
III. Elective Requirements: 45 hours

**Free Electives (45 hours)**

At least 45 hours of lower- or upper-division courses of the student's choice. Students are encouraged to explore areas of concentration in Speech-Language Pathology and Audiology as well as explore interests outside the field. At least 51 hours of upper-division credit hours are required for graduation.

**Minor in Speech-Language Pathology and Audiology**

Students interested in communication sciences and disorders may elect to minor in Speech-Language Pathology and Audiology. Students complete 18 credit hours including 12 required hours of foundation coursework and 6 elective hours. Foundation coursework in conjunction with elective hours permits students to choose to emphasize hearing science/audiology, language development and disorders, or speech production and perception. Students majoring in Psychology, Neuroscience, or Cognitive Science, or students with interests in the health sciences may find that a minor in Speech-Language Pathology and Audiology adds a valuable interdisciplinary dimension to their overall plan of study and may enhance their opportunities for graduate study. No credit hours may be used to satisfy both major and minor requirements; however, free elective hours or major preparatory classes may be used to satisfy the minor. At least one-third of the hours for a minor must be taken at UT Dallas.
Foundation Courses (12 hours required)

- SPAU 3301 Communication Disorders
- SPAU 3303 Normal Language Development
- SPAU 3304 Communication Sciences
- SPAU 3343 Phonetics

Elective Courses (select 6 hours)

- SPAU 3340 Articulation Disorders
- SPAU 3341 Audiology
- SPAU 3344 Anatomy and Physiology of Speech and Hearing
- SPAU 3388 Clinical Observation in Speech-Language Pathology
- SPAU 3390 Clinical Practicum in Speech-Language Pathology
- SPAU 4308 Language Disorders in Children
- SPAU 4393 Language in Culture and Society
- SPAU 4395 Issues in the Management of Persons with Hearing Impairment

Fast Track Baccalaureate/Master's Degrees

UT Dallas undergraduate students with strong academic records who intend to pursue a master's degree in Communication Disorders at the University may consider an accelerated undergraduate-graduate plan of study. If accepted into the program, students may take up to 15 hours of graduate courses that may be used to complete the baccalaureate degree and also to satisfy requirements for the master's degree. Students must earn grades of B or better in graduate courses taken. Students must have completed at least 90 semester credit hours toward a baccalaureate degree before beginning Fast Track course work. Students may apply for Fast Track admission up to one semester before they reach 90 hours. To qualify for admission, students must have completed at least 18 semester credit hours in major field core courses at UT Dallas. Application for admission to the Fast Track is through the graduate Communication Disorders program, not through Enrollment Services. GRE scores are required. For applications and instructions, please contact the Associate Dean's office.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. A required Major course that also fulfills a Core Curriculum requirement. Nine (9) hours are counted in Core Curriculum.
School of Economic, Political and Policy Sciences

As a collective of several disciplines, social science is the study of institutions, organizations and behavior. Social scientists ask such questions as: What roles do government, law and politics play in our society? How can public and nonprofit organizations be effectively managed? How are groups formed? How do people produce and distribute goods? Why do cities grow, and why do some cities decay? What are the causes of war, racial discrimination, and revolutions? How can we improve organizational capability in leadership and ethical decision making? Social science uses rigorous methodologies to apply ideas and theories to the real world. Degrees in the social sciences provide students with the tools of critical thinking that allow them to work and succeed in business, government and not-for-profit organizations.

The School of Economic, Politics and Policy Sciences offers undergraduate degrees in Criminology, Economics, Geospatial Information Sciences, International Political Economy, Political Science, Public Affairs, and Sociology. Each degree offers a large number of elective hours that allow students to direct their educational focus. Careers building on social science degrees include law, public service, nonprofit management, finance, banking, criminal justice, human resource management, teaching, market research and analysis, urban planning and counseling to name a few.

Faculty

**Professors:** Sheila Amin Gutiérrez de Piñeres (Dean, Undergraduate Education), Daniel Arce, Kurt Beron, Brian J. L. Berry, Thomas Brunell, Anthony M. Champagne, Harold Clarke, Denis J. Dean (Dean), Lloyd J. Dumas, Euel Elliott, Daniel Griffith, Edward J. Harpham, Donald A. Hicks, Bruce Jacobs, L. Douglas Kiel, Murray J. Leaf, Robert Lowry, James Marquart, James C. Murdoch, Alex Piquero, Nicole Leeper Piquero, Lawrence J. Redlinger, Todd Sandler, Richard K. Scotch, Marianne C. Stewart, Donggyu Sul, Robert Taylor, John Worrall

**Associate Professors:** Bobby C. Alexander, Paul Battaglio, Nathan Berg, Denise Paquette Boots, Patrick Brandt, Simon Fass, Doug Goodman, Jennifer S. Holmes, Linda Camp Keith, Dohyeong Kim, Tomislav Kovandzic, Sarah Maxwell, Susan Williams McElroy, Fang Qiu, Kevin Siqueira, Sheryl Skaggs, Gregory S. Thielemann, Michael Tiefelsdorf, Lynne Vieraitis

**Assistant Professors:** Rodney Andrews, James C. Barnes, Jonas Bunte, Yongwan Chun, Nadine Connell, Monica Deza, Evgenia Gorina, James Harrington, Brandon Kinne, Xin (Sherry) Li, Young-Joo Lee, Asli Leblebicioglu, Banks Miller, Robert Morris, Clint Peinhardt, Meghna Sabharwal, Nicholas Vargas

**Professors Emeritus:** Ronald Briggs, Alexander L. Clark, Irving J. Hoch
Clinical Professors: Donald Arbuckle, Brian Beary, Timothy Bray, Douglas Dow, Rodolfo Hernandez Guerrero, Elmer Polk

Senior Lecturers: Teodoro Benevides, Karl Ho, Luba Ketsler, Carol Cirulli Lanham, Irina Vakulenko, Yuki Watanabe (joint appointment with A&H)

Programs and General Courses

The School of Economic, Political and Policy Sciences has eight degree granting programs: Criminology, Economics, Geospatial Information Sciences, International Political Economy, Political Science, Public Affairs, and Sociology. Within each of these programs, students may specialize in areas that complement their interests and career plans, such as, political economy, law and society, and comparative studies. Students should also note that many courses listed under Interdisciplinary Studies (ISSS) and Social Sciences (SOCS) apply within their major.

Minor Areas of Study

The School of Economic, Political and Policy Sciences offers minors in Criminology, Economics, International Political Economy, Political Science, Public Affairs, and Sociology. Minors are described following each major. The School of Economic, Political and Policy Sciences requires that a minimum of 12 of the 18 hours for a minor be taken at UT Dallas.

Related Minor Areas

Please refer to the Undergraduate Minors Guide for specific course requirements.

Social Studies Teacher Certification

Teacher certification is offered in Composite Social Studies, Economics, Geography, Government, and History. Specific course requirements are available in the Teacher Development Center.

Economic, Political, and Policy Sciences Core Requirements

All undergraduates receiving degrees in the School of Economic, Political and Policy Sciences must have taken and passed a core of courses designed to provide breadth and an interdisciplinary perspective beyond any individual social science discipline. These courses include:

Three semester hours in economics (normally ECON 2301 or ECON 2302)

Three semester hours in sociology (normally SOC 1301 or SOC 2319)
Four semester hours in statistics (normally EPPS 3405)

Three semester hours in an approved ISSS or other Social Science course.

Three semester hours in an approved Social Science course satisfying the advanced writing requirement; see courses under Major Core Courses for each Major.

Internship and Independent Study Policy

The total number of independent study and internship hours are limited to nine total hours with the exception of extenuating circumstances to be approved by the Associate Dean for Undergraduate Education.

Fast Track Baccalaureate/Master's Degrees

Undergraduate EPPS majors with a strong academic record (3.250 or above overall UT Dallas GPA) are encouraged to enter the Fast Track program, which allows qualified seniors to take up to 15 credit hours of graduate courses during their senior year. The number of hours required to complete the graduate degree is reduced by the number of Fast-Track graduate hours completed with grades of B or better. So, for example if the degree requirements were 36 hours, a Fast-Track undergraduate who passed 12 hours of well-chosen graduate coursework with grades of A or B, would have only 36-12=24 hours of graduate coursework left in order to complete the graduate degree. When a successful Fast-Track student graduates with the BS/BA degree, he or she still needs to complete an application for admission to the graduate school at UT Dallas.

Degree requirements and hours vary by programs. Students enrolled in the Fast Track must maintain a 3.000 grade point average in graduate courses taken and earn grades of B or better in graduate courses taken. Students who are interested in the Fast Track should speak with the relevant Graduate Program Advisor and complete an application form with their undergraduate academic advisor prior to the final 30 credit hours of work for the BA or BS degree.

To be eligible for the Fast Track program in EPPS that allows a student to apply Graduate-level courses taken as an Undergraduate student towards the relevant Master's degrees offered by EPPS, the student must meet the following criteria:

1. Have an overall Undergraduate UT Dallas GPA of 3.250.
2. Be within 30 hours of graduating with the Bachelor's degree.
3. Have permission from the Associate Dean and the respective Graduate Program Advisor or Program Head to enter the Fast Track program.
4. Must obtain a B or better in all graduate level classes to continue in the Fast Track program.
5. Meet other requirements for the relevant Master's Degree that the student is interested in.
6. If a student loses his or her fast track status, the student will be required to fulfill the admissions requirements, if the student decides to apply to the master's program at UT Dallas in the future.

**Economics, Political, and Policy Sciences Honors Program**

The School Honors Program in the School of EPPS provides eligible students with the opportunity for recognition at the Program level for scholarly performance in degree programs within the School. In order to earn EPPS honors a student must:

- graduate with an overall GPA of 3.40 or higher
- graduate with a GPA of 3.400 or higher in their major program of study
- complete any two of the following requirements:

1. Complete 9 hours of honors designated courses as determined by the program, with no less than a "B" in each course. Honors designated courses are often graduate courses taken in one of the School's fast track programs. Exceptions may be made by the Associate Dean upon recommendation of the Program Head.

2. Complete an internship by completing three hours of 4V98 internship. The internship must be approved by the Program Head, and have a significant research component.

3. Register for 4V99 Senior Honors and complete an Honors paper.

School Honors with Distinction will be awarded to those students who complete a Senior Honors thesis, and whose paper is judged by a faculty committee to be of exemplary quality and provided the students meet the other requirements stated above.

Students must apply for admission to the Program Head and Undergraduate Program advisor of the academic program in which they expect to receive their degree. Students must apply no later than 30 semester hours prior to graduation and no earlier than 60 hours prior to graduation.
School of Economic, Political and Policy Sciences

Criminology (BA)

The Criminology Program is an interdisciplinary academic program, based primarily in criminology and sociology that studies the interrelationships among law, policy, and societal conditions. The relationships among these factors are dynamic and complex, therefore Criminology integrates a variety of perspectives, approaches, and social science disciplines in order to analyze and understand the origins of crime and injustice and society's response to these issues.

Mission Statement

The mission of the Criminology Program is to examine the causes and consequences of crime and crime control politics by providing a program of study involving a variety of perspectives, approaches, and social science disciplines to undergraduate students. Our faculty members are dedicated teachers and scholars who have published their work in the most prestigious journals in the field. They are committed to expanding the knowledge of the discipline and preparing students to be leaders in influencing our society's response to crime.

Majors in the Criminology Program at UT Dallas will be provided an educational experience, which will allow them to put their academic training, background and experience to use in a wide variety of post-graduate educational and occupational positions, including:

- Employment in Criminal Justice agencies at the federal, state, and local government level;
- Graduate School in Criminology or Criminal Justice (or a related social science discipline);
- Law School; or
- Social Work, Counseling, or other Human Service program.

Bachelor of Arts in Criminology

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (CRIM 3300)²

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History (HIST 1301 and HIST 1302)

3 hours Social and Behavioral Sciences Elective (ECON 2301 or ECON 2302 or SOC 1301 or SOC 2319)²

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours Mathematics (at or above College Algebra, MATH 1306 or MATH 1314 [recommended])
4 hours Quantitative Reasoning (EPPS 3405)²

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 43 hours

Major Preparatory Courses (22 hours beyond Core Curriculum)

CRIM 1301 Introduction to Criminal Justice
CRIM 1307 Introduction to Crime and Criminology
CRIM 2306 Criminal Law
CRIM 2308 Juvenile Law
CRIM 2313 Police & Society
CRIM 2316 Corrections
CRIM 2317 Criminal Prosecution and Court Process
EPPS 3405 Introduction to Social Statistics with Lab²

Major Core Courses (21 hours)

CRIM 3302 Advanced Criminology
CRIM 3303 Advanced Criminal Justice
Distributive Justice Focus

Choose one of the following (3 hours):

- CRIM 3301 Theories of Justice
- SOC 4361 Law and Society
- SOC 4302 Class, Status and Power
- ECON 4330 Law and Economics

International or Comparative Focus

Choose one of the following (3 hours):

- CRIM 3319 Comparative Justice Systems
- SOC 3336 Culture Regions
- ECON 4360 International Trade
- PSCI 3350 Comparative Politics

III. Elective Requirements: 35 hours

Major Related Upper Level Elective Courses (15 hours)

15 hours CRIM upper-division courses or related to CRIM

Electives (9 hours)

All students are required to take at least nine hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (11 hours)

This requirement may be satisfied with lower- and upper-division courses from any field of study. Note: Students must complete at least 51 hours of upper-division credit to qualify for graduation.

Minor in Criminology (18 hours)
For a minor in Criminology, students must take the following: CRIM 1301 and CRIM 1307, and twelve hours of upper-division CRIM classes, excluding CRIM 4V97, CRIM 4V98, and CRIM 4V99.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. This course is a Major requirement that also fulfills a Core Curriculum requirement. Credits will count toward the Core Curriculum requirements.
3. Three hours are counted under Quantitative Reasoning core, and one hour is counted as Major Preparatory Courses.
4. To be taken upon completion of core courses
5. Preferred courses for Criminology Majors
School of Economic, Political and Policy Sciences

Bachelor of Arts in Criminology and Biology (Double Major)

Degree Requirements (128-130 hours)

I. Core Curriculum Requirements\(^{1}\): 42 hours

Communication (6 hours)

- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (CRIM 3300, BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, PSCI 3325, or NATS 4310)\(^{2}\)

Social and Behavioral Sciences (15 hours)

- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History (HIST 1301 and HIST 1302)
- 3 hours Social and Behavior Sciences Elective (ECON 2301 or ECON 2302 or SOC 1301 or SOC 2319)\(^{3}\)

Humanities and Fine Arts (6 hours)

- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)\(^{2,4}\)

- 6 hours Calculus (MATH 2413 and MATH 2414)
  - or Applied Calculus (MATH 1325) and either Statistics for Life Sciences (STAT 3332) or Introduction to Social Statistics with Laboratory (EPPS 3405)

Science (9 hours)

- 9 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112 and CHEM 2123)
II. Major Requirements: 71-73 hours

Criminology Major Preparatory Course (No hours beyond Core Curriculum)

ECON 2301 Principles of Macroeconomics
or ECON 2302 Principles of Microeconomics

Criminology Core Courses (24 hours)

CRIM 3300 Crime and Civil Liberties
CRIM 3301 Theories of Justice
CRIM 3302 Advanced Criminology
CRIM 3303 Advanced Criminal Justice
CRIM 3304 Research Methods in Crime and Justice Studies
CRIM 3319 Comparative Justice Systems
CRIM 4311 Crime and Justice Policy
CRIM 4322 Senior Research Seminar

Biology Major Preparatory Courses (15-17 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory I
CHEM 1112 General Chemistry Laboratory II
CHEM 1311 General Chemistry I
CHEM 1312 General Chemistry II
CHEM 2123 Introductory Organic Chemistry Laboratory I
CHEM 2125 Introductory Organic Chemistry Laboratory II
CHEM 2323 Introductory Organic Chemistry I
CHEM 2325 Introductory Organic Chemistry II
MATH 2413 Differential Calculus and MATH 2414 Integral Calculus
or MATH 1325 Applied Calculus I and either STAT 3332 Statistics for Life Sciences
or EPPS 3405 Introduction to Social Statistics with Lab
**PHYS 2325** Mechanics and **PHYS 2125** Physics Laboratory I

or **PHYS 1301** College Physics I and **PHYS 2125** Physics Laboratory II

**PHYS 2326** Electromagnetism and Waves and **PHYS 2126** Physics Laboratory II

or **PHYS 1302** College Physics II and **PHYS 2126** Physics Laboratory II

### Biology Major Core Courses (32 hours)

**BIOL 2111** Introduction to Modern Biology Workshop I

**BIOL 2112** Introduction to Modern Biology Workshop II

**BIOL 2281** Introductory Biology Laboratory

**BIOL 2311** Introduction to Modern Biology I

**BIOL 2312** Introduction to Modern Biology II

**BIOL 3101** Classical and Molecular Genetics Workshop

**BIOL 3102** Eukaryotic Molecular and Cell Biology Workshop

**BIOL 3161** Biochemistry Workshop I

**BIOL 3162** Biochemistry Workshop II

or **BIOL 3335** Microbial Physiology

**BIOL 3301** Classical and Molecular Genetics

**BIOL 3302** Eukaryotic Molecular and Cell Biology

**BIOL 3315** Forensic Biology

**BIOL 3361** Biochemistry I

**BIOL 3362** Biochemistry II

**BIOL 3380** Biochemistry Laboratory

### III. Elective Requirements: 15 hours

**Guided Electives (15 hours)**

Biology (6 hours): **BIOL 4380** Cell and Molecular Biology Laboratory

Criminology Related Electives (9 hours)
All students must complete at least 51 hours of upper-division credit to graduate.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.
2. Double majors may choose CRIM 3300, BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, PSCI 3325, NATS 4310 or another approved Biology elective to fulfill the Core Curriculum Communication Elective.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
School of Economic, Political and Policy Sciences

Economics (BA, BS)

Economists study how people make choices in life when scarcity limits what is available and provides incentives to induce efficient behavior. They look at a society's financial, industrial, and labor organizations; its distribution of income and ownership rights; its governmental activities; and its political and economic philosophies, and analyze how these and other factors influence the goods an economy produces, the resources it uses in production, and the distribution of its output. They also look at how incentives affect decisions relating to human behavior, such as whether to obey the law, get married, or have children.

Economic analysis leads to explanations, predictions, and policy suggestions. How are wages and prices set? Why do some cities boom while others decline? Why do we have an energy crisis? How should we use our exhaustible resources? How will consumers and corporations react to a tax cut? How can the crime rate be reduced? If we are to use our resources efficiently, what antitrust and government regulations should be enforced? What can be done to reduce inflation and unemployment? To prevent excess pollution? To achieve economic growth? To distribute income more equitably? In examining these sorts of questions, economics helps us to understand more clearly the choices available to us and the consequences of our decisions.

There is an abundance of career opportunities for an economics major.

Careers in business include consulting, banking and other financial institutions, insurance, corporate strategic planning, real estate, journalism, management, marketing, and public utilities.

Careers in government include consulting, publicly owned utilities, planning and forecasting, regulatory agencies, management, needs assessment, legislative staffs, judicial agencies, and executive support.

Careers in the interface of business and government include labor arbitration, regulation, environmental planning, urban and regional planning, and interest representation.

Economics is an excellent preparation for a career in law.

Bachelor of Arts in Economics

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours
Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (ECON 3330, ECON 4332, or ECON 4382)\(^2\)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History (HIST 1301 and HIST 1302)

3 hours Social and Behavioral Sciences Elective (SOC 1301, SOC 2319, CRIM 1301, or CRIM 1307)\(^2\)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)\(^3\)

3 hours Mathematics (at or above the level of College Algebra)

3 hours Quantitative Reasoning (STAT 1342 or EPPS 3405 [recommended])\(^3\)\(^4\)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 46 hours

Major Preparatory Courses (7 hours beyond Core Curriculum)

- ECON 2301 Principles of Macroeconomics\(^5\)
- ECON 2302 Principles of Microeconomics\(^5\)
- STAT 1342 Statistical Decision Making\(^2\)

or EPPS 3405 Introduction to Social Statistics with Lab\(^5\)\(^4\)

Major Core Courses (12 hours)

- ECON 3304 Basic Techniques for Economic Research\(^5\)
- ECON 3310 Intermediate Microeconomic Theory
- ECON 3311 Intermediate Macroeconomic Theory
- ECON 4320 Public Sector Economics
One of the following:

- **ECON 3330** Economics of Health
- **ECON 4332** Energy and Natural Resource Economics
- **ECON 4382** International Finance

**Major Related Courses (27 hours)**

- 27 hours upper-division ECON courses

**III. Elective Requirements: 32 hours**

<table>
<thead>
<tr>
<th>Electives (6 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.</td>
</tr>
</tbody>
</table>

**Free Electives (26 hours)**

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Minors in Economics (18 hours)**

For a minor in Economics, students must take **ECON 2301**, **ECON 2302**, either **ECON 3310** or **ECON 3311**, and nine hours of ECON electives. Electives may be any upper-division course with the ECON prefix with the exception of **ECON 4V97**, **ECON 4V98**, and **ECON 4V99**.

**Bachelor of Science in Economics**

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

<table>
<thead>
<tr>
<th>Communication (6 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 hours Communication (<strong>RHET 1302</strong>)</td>
</tr>
<tr>
<td>3 hours Communication Elective (<strong>ECON 3330</strong>, <strong>ECON 4332</strong>, or <strong>ECON 4382</strong>)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social and Behavioral Sciences (15 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours Government (<strong>GOVT 2301</strong> and <strong>GOVT 2302</strong>)</td>
</tr>
<tr>
<td>6 hours American History (<strong>HIST 1301</strong> and <strong>HIST 1302</strong>)</td>
</tr>
</tbody>
</table>
3 hours Social and Behavioral Sciences Elective (SOC 1301, SOC 2319, CRIM 1301, or CRIM 1307)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)\(^1\)

3-4 hours Mathematics (MATH 1325 or MATH 2413 or MATH 2417)\(^1\)

3-4 hours Quantitative Reasoning (STAT 1342 or EPPS 3405 [recommended])\(^1\)^2

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 54 hours

Major Preparatory Courses (12 hours beyond Core Curriculum)

- **ECON 2301** Principles of Macroeconomics\(^1\)
- **ECON 2302** Principles of Microeconomics\(^2\)
- **MATH 2417** Calculus I\(^1\)\(^2\)
  or **MATH 1325** Applied Calculus I\(^1\)\(^2\)
- **MATH 2419** Calculus II
  or **MATH 1326** Applied Calculus II\(^2\)
  or **MATH 2414** Integral Calculus
- **STAT 1342** Statistical Decision Making\(^6\)
  or **EPPS 3405** Introduction to Social Statistics with Lab [recommended]\(^5\)\(^2\)

Major Core Courses (15 hours)

- **ECON 3310** Intermediate Microeconomic Theory
- **ECON 3311** Intermediate Macroeconomic Theory
- **ECON 4320** Public Sector Economics
- **ECON 4351** Mathematical Economics
- **ECON 4355** Econometrics
One of the following:

- ECON 3330 Economics of Health
- ECON 4332 Energy and Natural Resource Economics
- ECON 4382 International Finance

**Major Related Courses (27 hours)**

- 27 hours Economics upper-division ECON courses

**Optional Major Core Concentrations (9 hours)**

**Green Economics**

One course from:

- ECON 4333 Environmental Economics
- ECON 4336 Environmental Economic Theory and Policy

Two additional courses from:

- ECON 4320 Public Sector Economics
- ECON 4332 Energy and Natural Resource Economics
- ECON 4333 Environmental Economics
- ECON 4336 Environmental Economic Theory and Policy

**International Economics**

Both of the following:

- ECON 4360 International Trade
- ECON 4382 International Finance

Select one course from:

- ECON 3369 Political Economy of Terrorism
- ECON 4362 Development Economics
- GEOG 3370 Global Economy
GEOG 3372 Population and Development

Business Economics

Three courses from:

- ECON 3312 Money and Banking
- ECON 4301 Game Theory
- ECON 4310 Managerial Economics
- ECON 4340 Labor Economics and Human Resources
- ECON 4345 Industrial Organization
- ECON 4355 Econometrics
- ECON 4385 Business and Economic Forecasting

III. Elective Requirements: 24 hours

Electives (6 hours)

All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (18 hours)

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation. Note: students may need more than 18 hours, depending on the mathematics sequence selected.

Minor in Economics (18 hours)

For a minor in Economics, students must take ECON 2301, ECON 2302, either ECON 3310 or ECON 3311, and nine hours of ECON electives. Electives may be any upper-division course with the ECON prefix with the exception of ECON 4V97, ECON 4V98, and ECON 4V99.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum above.
3. Students wishing to pursue Master’s or PhD degrees in economics should consult their advisor about appropriate mathematics and quantitative methods courses.
4. Three hours are counted under Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes in Economics and Finance.
6. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
7. Three hours are counted under Mathematics and Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
8. Hours to be counted as part of major related courses.
School of Economic, Political and Policy Sciences

Bachelor of Science in Economics and Finance (Double Major)

Degree Requirements (130 hours)¹

I. Core Curriculum Requirements ²: 42 hours

Communication (6 hours)
3 hours Communication (RHET 1302)
3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History (HIST 1301 and HIST 1302)
3 hours Social and Behavioral Sciences Elective (ECON 2301)²

Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)³
6 hours Mathematics (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 70 hours

Major Preparatory Courses (18 hours)

ACCT 2301 Introductory Financial Accounting ⁴
ACCT 2302 Introductory Management Accounting ⁵
BLAW 2301 Business and Public Law ⁵

Mary Jo Venetis 12/9/12 10:50 AM
Deleted: with an emphasis in CFA®

Mary Jo Venetis 12/9/12 10:53 AM
Comment [3]: Received email from Vy Tran confirming Dr. Murdoch ok’d the change of hours to match JSOM’s reduced hours. (Major requirements and electives). Now 130 hours.

Mary Jo Venetis 12/9/12 10:50 AM
Deleted: 132

Mary Jo Venetis 11/24/12 4:55 PM

Mary Jo Venetis 12/9/12 10:52 AM

Mary Jo Venetis 10/25/12 4:16 PM
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Mary Jo Venetis 12/9/12 10:52 AM

Mary Jo Venetis 12/9/12 10:52 AM

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vtd017000 10/25/12 4:16 PM
Deleted: 3 hours Quantitative Reasoning (STAT 3360 or OPRE 3360).
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 2301</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2302</td>
<td>Principles of Microeconomics</td>
<td>5</td>
</tr>
<tr>
<td>MATH 1325</td>
<td>Applied Calculus I</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>MATH 1326</td>
<td>Applied Calculus II</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>MATH 2333</td>
<td>Matrices, Vectors and Their Application</td>
<td>5, 6</td>
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**Major Core Courses (48 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BCOM 3311</td>
<td>Business Communication</td>
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<tr>
<td>BCOM 4350</td>
<td>Advanced Business Communication</td>
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<td>FIN 3320</td>
<td>Business Finance</td>
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<td>FIN 3330</td>
<td>Personal Financial Planning</td>
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<td>MIS 3300</td>
<td>Introduction to Management Information Systems</td>
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<td>OPRE 3310</td>
<td>Operations Management</td>
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<td>OBHR 3310</td>
<td>Organizational Behavior</td>
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<td>MKT 3300</td>
<td>Principles of Marketing</td>
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<td>FIN 3390</td>
<td>Introduction to Financial Modeling</td>
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<td>BPS 4305</td>
<td>Strategic Management</td>
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<td>FIN 4310</td>
<td>Intermediate Business Finance</td>
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<td>FIN 4310</td>
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<td>IMS 3310</td>
<td>International Business</td>
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<tr>
<td>ECON 3310</td>
<td>Intermediate Microeconomic Theory</td>
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<tr>
<td>ECON 3311</td>
<td>Intermediate Macroeconomic Theory</td>
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<tr>
<td>ECON 4351</td>
<td>Mathematical Economics</td>
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<tr>
<td>ECON 4355</td>
<td>Econometrics</td>
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<tr>
<td>OPRE 3360</td>
<td>Managerial Methods in Decision Making Under Uncertainty</td>
</tr>
<tr>
<td>or STAT 3360</td>
<td>Probability and Statistics for Management and Economics</td>
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</table>

*Comment [4]: This course was dropped from JSOM Economics/Finance degree plan. JSOM added FIN 4310 Intermediate Business Finance.*
ACCT 3320  Financial Information Management

III. Elective Requirements: **18** hours

Guided Electives

Select **9** hours from: FIN 3305, FIN 3340, FIN 3350, FIN 3365, FIN 3380, FIN 4310, FIN 4320, FIN 4340, FIN 4380, FIN 4V90, or ACCT 4336.

Select **9** hours from: ECON 3312, ECON 3335, ECON 4301, ECON 4310, ECON 4320, ECON 4345, ECON 4360, ECON 4382, ECON 4385, FIN 4390, ECON 4396, or ECON 4V99.

1. Degree is **131** hours if student is required to take EPPS 1110.
2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
3. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. These hours are counted under Mathematics Core; students may substitute MATH 2313 and MATH 2414 or MATH 2417 and MATH 2419.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes in Economics and Finance.
6. Students may substitute MATH 2418, OPRE 3333 or CS 2305.
School of Economic, Political and Policy Sciences

Geospatial Information Sciences (B.S.)

Geospatial Information Science (or GIScience) is the study of relationships between phenomena in space and time. In recent years, powerful new technologies and techniques have emerged that greatly improve our ability to acquire, archive, analyze and communicate information regarding people, places and other things on or near the Earth’s surface. These same technologies and techniques allow us to combine this information into multi-tiered databases describing the physical, social and other aspects of all or portions of the Earth. Such databases can then be analyzed in novel ways that take the data’s explicit spatial (or locational) nature into account. The insights produced by analyzing these types of databases are revolutionizing many fields of science, government and business, Currently, commonplace consumer products such as web-based mapping systems and GPS units that incorporate locational information are directly impacting the everyday lives of ordinary individuals.

Graduates of the Bachelors of Science in Geospatial Information Science program will understand the logical, mathematical and technological foundations for compiling and analyzing spatial data. They will be skilled in solving geospatial problems, enabling them to move into professional roles handling the geospatial needs of typical corporate, government, and nonprofit organizations. The graduates will not only be skilled in the use of common GIScience software systems, but also will understand the underlying principles upon which software systems are based. This will allow them to transfer their knowledge from one software system to another, to expand the capabilities of these systems and most importantly, to view geospatial problems as issues that can be solved by applying basic theories, techniques and methodologies.

Mission and Objectives

The mission of the Bachelor of Science in Geospatial Information Sciences program is to provide students with a rigorous understanding of the fundamental theories and concepts underlying GIScience, as well as to provide them with extensive hands-on experience with contemporary GIScience hardware and software. The goal of the program is to give students a firm grasp of the theories, ideas and techniques that underlay software and hardware systems for the compilation and analysis of spatially referenced data, and thus provide them with a foundation of knowledge and skill that transcends any individual piece of software or hardware. Graduates of this program will be able to successfully compete for professional positions within GIScience and related fields, and be admitted into the best graduate schools globally.

Students within the program will:
• Demonstrate their understanding of the underlying theories, ideas, concepts and techniques of GIScience.
• Master contemporary computer hardware and software systems commonly employed in GIScience.
• Demonstrate problem solving skills that employ their understanding of theories, ideas and concepts as well as their mastery of GIScience software and hardware.

Bachelor of Science in Geospatial Information Sciences

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (GEOG 3377)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History (HIST 1301 and HIST 1302)
3 hours Social and Behavioral Sciences Elective (SOC 1301, SOC 2319, CRIM 1301, or CRIM 1307)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours Mathematics (MATH 1325, MATH 2413 or MATH 2417)\footnote{\textsuperscript{2}}
3-4 hours Quantitative Reasoning (EPPS 3405)\footnote{\textsuperscript{2}}

Science (9 hours)

\textbf{GEOS 1103} Physical Geology Laboratory

\textbf{GEOS 1303} Physical Geology

5 credit hours Science elective(s)

II. Major Requirements: 44 hours
Major Preparatory Courses (11 hours beyond Core Curriculum)

- **EPPS 3405** Introduction to Social Statistics with Lab[^1]
- **MATH 1325** Applied Calculus[^1]
  or **MATH 2413** Differential Calculus[^1]
  or **MATH 2417** Calculus[^1]
- **ENVR 2302** or **GEOG 2302** or **GEOS 2302** The Global Environment
- **GEOG 2303** People and Place: An Introduction to World Geographic Regions
- **GEOG 3370** The Global Economy

Major Core Courses (18 hours)

- **GEOG 3304** or **GISC 3304** or **GEOS 3304** Tools for Spatial Analysis
- **GEOG 4380** Spatial Concepts and Organization
- **GISC 2301** or **GEO 2301** Introduction to Geospatial Information Science
- **GISC 2302** Geodesy and Geospatial Analysis
- **GISC 4325** or **GEO 4325** Introduction to Remote Sensing
- **GISC 4382** Applied Geographic Information Systems

Concentrations (15 hours in ONE of the following concentration areas)

**Geography**

- **GEOG 3331** Urban Growth and Structure
- **GEOG 3357** Spatial Dimensions of Health and Disease[^4]
- **GEOG 3359** Human Migration and Mobility[^4]
- **GEOG 3372** Population and Development
- **GEOG 3382** Russia: Yesterday, Today and Tomorrow[^4]

**GeoComputation and GeoVisualization**

- **MIS 3300** Introduction to Management Information Systems
- **GISC 4317** GeoComputation
III. Elective Requirements: 34 hours

**Prescribed Electives (15 hours)**

All students are required to take at least fifteen hours of prescribed upper-division elective courses.

**Free Electives (19 hours)**

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

### Minor in Geography

This minor will provide students from all majors with a better understanding of distribution issues and the skills to analyze current and evolving spatial problems at various scale levels from local to global. Students are encouraged to learn to view spatial issues from scientific, environmental, political, and social standpoints. The 18-hour Geography Minor enables UT Dallas students to develop expertise in this important area.

Students are expected to take the following classes to meet the requirements:

- **ENVR 2302** or **GEOG 2302** or **GEOS 2302** The Global Environment
- **GEOG 2303** People and Place: An Introduction to World Geographic Regions
- **GEOG 3370** The Global Economy

The remaining 9 credit hours must all be upper division **GEOG** or **GISC** courses.

Student may also contact their academic advisor for a list of the courses that satisfy the minor requirements.

Because Geography is concerned with a distribution and interrelationships analysis, it provides a strong foundation for all careers that deal with spatial data. All social sciences study relationships on some level: prices and quantities, political parties and campaign contributions, musical genres and cultural diversity, etc. Students considering careers in business, education, law, public health, urban development, environmental studies, or government work can benefit from minoring in Geography.

Upon completion of the Minor Program, students will:
• Have a comprehensive general education background
• Have a working knowledge of spatial principles and tools
• Understand the societal and environmental issues that may impede the adoption of geographic information systems across various fields of application
• Have the ability to communicate effectively and work collaboratively
• Be able to become successful professionals and, if they desire, be able to pursue graduate study

1. Curriculum Requirements can be fulfilled by other approved courses, including courses from accredited institutions of higher education. The courses listed in parentheses are the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Three hours are counted under Mathematics and/or Quantitative Reasoning core, and **one hour** is counted under Major Preparatory Courses.

3. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum above.

4. **Alternative courses**, as approved by the department head, may be used to satisfy this requirement.
School of Economic, Political and Policy Sciences

International Political Economy (BA, BS)

The International Political Economy program is an interdisciplinary academic program to help students function successfully in today's increasingly complex international environment. Graduates will develop skill sets that include critical thinking, knowledge of multiple cultures, and effective communication skills. Students will be prepared for entry-level analytical and administrative positions in the public, nonprofit, and for profit private sectors. The School of Economic, Political, and Policy Sciences offers both the BA and BS degree in International Political Economy. The BA degree places a somewhat greater emphasis on culture, literature, and history. The BS degree places a somewhat greater emphasis on economics and international finance.

Employment options include, but are not limited to:

- Careers in the diplomatic corps;
- Positions with international organizations including The United Nations, World Trade Organization, World Bank, and others;
- Positions with multinational corporations as analysts and managers.

Bachelor of Arts in International Political Economy

Degree Requirements (120 hours)

I. Core Curriculum Requirements*: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (PSCI 3325 or PSCI 4360 or PSCI 4307)²

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History (HIST 1301 and HIST 1302)

3 hours Economics Elective (ECON 2301)²

Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
3 hours Mathematics (at or above College Algebra MATH 1314)
4 hours Quantitative Reasoning (EPPS 3405)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 22 hours

Major Preparatory Courses (1 hour beyond Core Curriculum)
EPPS 3405 Introduction to Social Statistics with Lab

Major Core Courses (Select 7 courses from the following)
ECON 2302 Principles of Microeconomics
GEOG 3370 Global Economy
GEOG 2303 People and Place: An Introduction to World Geographic Regions
GEOG 3304 Tools for Spatial Analysis
PSCI 4329 Global Politics
PSCI 4356 International Political Economy
ISSS 3349 World Resources and Development
LIT 3304 Advanced Composition

III. Elective Requirements: 36 hours

International Political Economy (15 hours)
All students are required to take at least eighteen hours of electives from approved courses.
Area Electives (9 hours)

This requirement may be satisfied with upper-division courses from any given area within IPEC and related fields of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

Foreign Language Requirement (12 hours)
Four consecutive semesters (spring and fall semesters) in one language of choice or if the language credit is obtained without requiring to take classes, 12 hours of Free Electives (upper-division or lower-division) can be taken by student.

IV. Free Electives Requirements: 20 hours

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Bachelor of Science in International Political Economy**

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^1\): 42 hours

**Communication (6 hours)**
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (ECON 4382 or PSCI 4360 or PSCI 4307)\(^2\)

**Social and Behavioral Sciences (15 hours)**
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History (HIST 1301 and HIST 1302)
- 3 hours Economics Elective (ECON 2301)\(^2\)

**Humanities and Fine Arts (6 hours)**
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

**Mathematics and Quantitative Reasoning (6 hours)\(^3\)**
- 3 hours Mathematics (MATH 1325)
- 4 hours Quantitative Reasoning (EPPS 3405)\(^2,4\)

**Science (9 hours including at least one course with a substantial laboratory component)**

II. Major Requirements: 28 hours

**Major Preparatory Courses (1 hour beyond Core Curriculum)**
- EPPS 3405 Introduction to Social Statistics with Lab\(^2,4\)
Major Core Courses (select 9 courses from the following)

- **ECON 2302** Principles of Microeconomics
- **ECON 3310** Intermediate Microeconomic Theory
- **ECON 3311** Intermediate Macroeconomic Theory
- **ECON 4360** International Trade
- **GEOG 2303** People and Place: An Introduction to World Geographic Regions
- **GEOG 3304** Tools for Spatial Analysis
- **ISSS 3349** World Resources and Development
- **LIT 3304** Advanced Composition
- **PSCI 4329** Global Politics
- **PSCI 4356** International Political Economy

III. Elective Requirements: 33 hours

**International Political Economy (15 hours)**

All students are required to take at least fifteen hours of electives from approved courses.

**Area Electives (6 hours)**

This requirement may be satisfied with upper-division courses from any given area within IPEC and related fields of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Foreign Language Requirement (12 hours)**

Four consecutive long semesters (spring and fall semesters) in one language of choice or if the language credit is obtained without requiring to take classes, 12 hours of Free Electives (upper-division or lower-division) can be taken by student.

IV. Free Elective Requirements: 17 hours

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Minor in International Political Economy (18 hours)**

Please see your advisor for the latest requirements for this minor.
1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. Students wishing to pursue Master’s or PhD degrees in economics should consult their advisor about appropriate mathematics and quantitative methods courses.
4. Three hours are counted under Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
School of Economic, Political and Policy Sciences

Political Science (BA)

Political Science involves the study of interesting and important topics about citizenship, government and politics. These topics include the influence of citizens on what government does, the scope, responsibilities and effectiveness of government itself, and the activities of both elected and appointed public officials. These topics are important parts of what political scientists know about American government and politics, comparative government and politics, international relations, political behavior, political economy, political institutions, and political theory. Political scientists and public administrators pay particular attention to the design, implementation, and evaluation of laws and public policies that may affect people's well-being.

The Political Science Program at The University of Texas at Dallas provides:

- the foundations for more advanced, graduate study of citizenship, government and politics in Political Science;
- the special core knowledge needed for subsequent professional education in law and public policy analysis;
- the opportunity to acquire useful skills for careers in federal, state, and local government, community service, educational and other nonprofit organizations, and business firms.

Bachelor of Arts in Political Science

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (PSCI 3325 or PSCI 4307 or PSCI 4360)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History (HIST 1301 and HIST 1302)

3 hours Social and Behavioral Sciences Elective (CRIM 1301 or ECON 2301 or ECON 2302 or SOC 1301 or SOC 2319)
Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours Mathematics (at or above level of College Algebra, recommended: MATH 1306 or MATH 1314)
4 hours Quantitative Reasoning (EPPS 3405)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 55 hours

Major Preparatory Courses (1 hours beyond Core Curriculum)

GOVT 2301 Constitutional Foundations and Political Behavior in the U.S. and Texas
GOVT 2302 Political Institutions in the U.S. and Texas
PSCI 3325 American Public Policy
or PSCI 4307 Predicting Politics
or PSCI 4360 The Political Economy of Multinational Corporations
EPPS 3405 Introduction to Social Statistics with Lab

One of the following:

CRIM 1301 Introduction to Criminal Justice
ECON 2301 Principles of Macroeconomics
ECON 2302 Principles of Microeconomics
SOC 1301 Introduction to Sociology

Major Core Courses (18 hours)

PSCI 3301 Political Theory
PSCI 3322 Constitutional Law
PSCI 3333 Political Behavior
PSCI 3362 The American Political Institutions
One of the following:

- CRIM 3301 Theories of Justice
- PSCI 3303 Civil Liberties
- PSCI 3326 Politics and Business
- PSCI 3364 Campaigns and Elections
- PSCI 4364 Civil Rights Law and Society

**Major Related Courses (36 hours)**

36 hours Major and Related electives

**III. Elective Requirements: 23 hours**

**Electives (6 hours)**

All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

**Free Electives (17 hours)**

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Minor in Political Science (18 hours)**

For a minor in Political Science, students must take GOVT 2301 and GOVT 2302. In addition students must take four upper-division courses with a PSCI prefix with the exception of PSCI 4V76, PSCI 4V97, PSCI 4V98, and PSCI 4V99.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are **recommended as** the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Core Curriculum Requirement that also fulfills a Major Requirement. Hours are counted in the Core Curriculum.
3. Three hours are counted under Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
4. Most students take upper-division PSCI courses. However, subject to advisor approval, courses from other disciplines may be used to satisfy this requirement.
School of Economic, Political and Policy Sciences

Public Affairs (BS)

The Bachelor of Science in Public Affairs is intended for individuals called upon to manage in the arenas of government, nonprofits, or business. These generalist managers must synthesize many forms of knowledge derived from government, economics, sociology, and other fields, and must apply that knowledge creatively to meet the varied and multiple challenges of public administration. The ability to understand the substance of policy and program issues; the ability to grasp the administrative, political, and ethical implications embedded in them; and the ability then to act upon the issues with effect, together define the worth of contemporary managers.

The Public Affairs program promotes acquisition of knowledge and skills essential to the tasks of identification, analysis, design implementation, supervision, evaluation, communication, and other key functions that are integral components of management careers in federal, state, and local governments; criminal justice; in social service, education, community development, arts and other nonprofit organizations; and in business firms.

Bachelor of Science in Public Affairs

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (PA 3377)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History (HIST 1301 and HIST 1302)

3 hours Social and Behavioral Sciences Elective (SOC 1301, SOC 2319, CRIM 1301, or CRIM 1307)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

3 hours Mathematics (at or above level of College Algebra, recommended: MATH 1306 or MATH 1314)

4 hours Quantitative Reasoning (EPPS 3405)\(^2\)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 49 hours

Major Preparatory Courses (4 hours beyond Core Curriculum)

ECON 2301 Principles of Macroeconomics
or ECON 2302 Principles of Microeconomics

EPPS 3405 Introduction to Social Statistics with Lab\(^2\)

Major Core Courses (18 hours)

PA 3304 Research Methods in Public Administration
PA 3310 Public Administration
PA 3333 Human Resources Management
PA 3380 Organizations and Management in the Public Sector
PA 4360 Ethics in Public Administration
PA 4340 Creating High Performance Organizations

Major Related Courses (27 hours)

27 hours Major and Related electives\(^4\)

III. Elective Requirements: 29 hours

Electives (6 hours)

All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (23 hours)
This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Minor in Public Affairs (18 hours)**

For a minor in Public Affairs, students must take PA 3310 or PSCI 3310, PA 3333, and any nine semester hours of upper-division classes with a PA prefix with the exception of PA 4V97, PA 4V98, and PA 4V99 or from the following list of courses: ECON 4320, ECON 4330, GEOG 3370, PSCI 3326.

**Minor in Public Health (18 hours)**

For a minor in Public Health, students must take the following: SOC 4369, SOC 4384, SOC 4385, and nine hours of the following upper-division electives, ECON 3330, GEOG 3357, GEOG 3372, HIST 3328, HTLH 1322, HTLH 3301, HTLH 3305, HTLH 3310, HTLH 4380, HMGT 4301, ISIS 3315, PSCI 4365, PSY 4328, PSY 4346, SOC 4357, SOC 4371, SOC 4372, SOC 4377, or SPAN 3341.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. Three hours are counted under Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
4. Most students take upper-division PA courses. However, subject to advisor approval, courses from other disciplines may be used to satisfy this requirement.
School of Economic, Political and Policy Sciences

Sociology (BA)

Sociology offers a scientific approach to examining social groups, human interactions and social change. Sociologists are interested in a wide range of topics and issues related to social life. Some examples of sociological questions include: Why do some groups have more resources and power than others in society and what explains these inequalities? What factors influence marriage and divorce rates? How do families, schools, churches, and corporations affect social control? What are the functions of welfare programs? How do cities grow and transform to reflect changing technologies and population trends? How does law interact with society and social institutions? What are the causes and consequences of crime and deviant behavior?

The mission of the BA in Sociology is to provide undergraduate students (both majors and non-majors) with broad knowledge of the theoretical concepts, empirical research findings, and methodological approaches of the discipline of sociology, with an emphasis on theory and research related to social inequality. As part of this program, sociology majors should gain mastery of these concepts, findings, and approaches central to sociology, as well as develop basic skills in empirical analysis and professional communication.

At UT Dallas, sociology majors are encouraged to go beyond scholarly study to explore ways that sociology can be utilized in corporations, government agencies, or voluntary organizations. Sociology graduates of the university have pursued careers or graduate study in a variety of areas including policy research, social services, business, law, education, law enforcement, and other social sciences.

Bachelor of Arts in Sociology

Degree Requirements (120 hours)

I. Core Curriculum Requirements‡: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (SOC 3306)‡

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History (HIST 1301 and HIST 1302)
3 hours Social and Behavioral Sciences Elective (SOC 1301)\textsuperscript{1}

**Humanities and Fine Arts (6 hours)**
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

**Mathematics and Quantitative Reasoning (6 hours)**
3 hours Mathematics (at or above level of College Algebra, recommended: MATH 1306 or MATH 1314)
4 hours Quantitative Reasoning (EPPS 3405)\textsuperscript{2,3}

**Science (9 hours including at least one course with a substantial laboratory component)**

II. Major Requirements: 46 hours

**Major Preparatory Courses (4 hours beyond Core Curriculum)**
ECON 2301 Principles of Macroeconomics
or ECON 2302 Principles of Microeconomics
EPPS 3405 Introduction to Social Statistics with Lab\textsuperscript{2,3}

**Major Core Courses (15 hours)**
SOC 2319 Race, Gender, and Class
SOC 3303 Classical Social Theory
SOC 3325 Race, Ethnicity, and Community
or SOC 4369 Public Health and Society
SOC 3306 Research and Writing for Sociological Practice\textsuperscript{4}
SOC 4302 Class, Status, and Power

One of the following:
SOC 3333 Religion in Society
SOC 3336 Culture Regions
SOC 4361 Law and Society
Major Related Courses (27 hours)

18 hours upper-division Sociology courses
9 hours Major and Related electives

III. Elective Requirements: 32 hours

Electives (6 hours)

All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (26 hours)

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division credit to qualify for graduation.

Minor in Sociology (18 hours)

For a minor in Sociology, students must take SOC 1301, SOC 3303, SOC 4302, and nine semester hours of upper-division classes with a SOC prefix, with the exception of SOC 4V97, SOC 4V98, and SOC 4V99.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
3. Three hours are counted under Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.
4. Most students take upper-division SOC courses. However, subject to advisor approval, courses from other disciplines may be used to satisfy this requirement.
Erik Jonsson School of Engineering and Computer Science

Named in honor of one of the three founders of Texas Instruments, Inc. and of The University of Texas at Dallas, the Erik Jonsson School of Engineering and Computer Science provides undergraduate degree preparation for professional practice as an engineer or computer scientist. Particular emphasis is placed on developing strong analytical and problem solving abilities as a foundation for graduate study in these fields.

The school's curricula emphasize electronic information processing devices and technologies that are involved with the acquisition, interpretation, transmission, and utilization of information. The school offers seven degree programs: Biomedical Engineering, Computer Engineering, Computer Science, Electrical Engineering, Mechanical Engineering, Software Engineering and Telecommunications Engineering; a minor in Nanoscience and Nanotechnology is offered by the Department of Materials Science and Engineering. The Biomedical Engineering program offers students the opportunity to combine engineering with biology and physiology. The Computer Science program emphasizes the design and analysis of efficient parallel and sequential algorithms with applications in VLSI layout and routing, distributed networks and operating systems, image processing, computational geometry, automation and robotics. The Software Engineering program concentrates on all aspects of software development including requirements engineering, software architecture and design, program testing, validation, and quality assurance. The Electrical Engineering program offers students an opportunity to acquire a solid foundation in the broad areas of electrical engineering and emphasizes advanced study in digital systems, telecommunications, and microelectronics. The Mechanical Engineering program focuses on the analysis, design, manufacturing of mechanical and thermal systems with particular emphasis on energy conversion, harvesting, and utilization, micro- and nano-technology devices and processes, and robotics. The Computer Engineering and Telecommunications Engineering programs are interdisciplinary, as they require a blend of knowledge from the areas of Electrical Engineering and Computer Science.

All programs are based on a solid foundation of science and mathematics coursework. Students in these programs are given an opportunity to learn to extend their abilities to analyze and solve complex problems and to design new uses of technology to serve today's society. The Engineering programs provide an integrated educational experience directed toward the development of the ability to apply pertinent knowledge to the identification and solution of practical problems in engineering. These programs ensure that the design experience is developed and integrated throughout the curriculum in a sequential development leading to advanced work and includes both analytical and experimental studies. Established cooperative education programs with area industry serve to further supplement design experiences.
The University of Texas at Dallas is located at the heart of a high concentration of companies that specialize in the areas of microelectronics, telecommunications, signal processing and optics. The Erik Jonsson School of Engineering and Computer Science maintains close relationships with these companies and has established cooperative programs through which students can obtain industrial experience to complement their classroom instruction. Details of specific cooperative programs between Computer Science and Engineering students and local companies are available in the respective program offices.

**Industrial Practice Programs**

The Industrial Practice Programs (IP Programs or IPP) of the Erik Jonsson School of Engineering and Computer Science include the school's Cooperative Education, Internship, and Curricular Practical Training Programs. These programs combine classroom learning with paid work experience. Qualified students are referred to participating employers seeking candidates for career-related, pre-professional work assignments. The programs enhance a student's education and career preparation by integrating classroom theory with on-the-job performance, providing an understanding of work environments and professional requirements, testing career and professional goals, developing confidence, maturity and skills in human relations, and establishing contacts and interests.

Students are expected to register with and follow the rules of the IP Programs when working in any position titled by the employer as an Internship or a Cooperative Education assignment. Also, the Jonsson School offers one credit hour ECSC courses (may be used towards free elective requirements), and a three-hour course (may be used towards advanced free elective requirements) that provide students the opportunity to evaluate their work experience.

For more information about the IP programs, call (972) 883-4363. The IP Programs Office is located in the Student Services suite (ECS South 2.502).

**Department of Materials Science and Engineering**

**Faculty**

**Professors:** Orlando Audicello, Yves Chabal, Ke Yongjae (KJ) Cho, Massimo V. Fischetti, Bruce E. Gnade, Julia W. Hsu, Moon J. Kim, Don Shaw (Emeritus), Robert M. Wallace

**Associate Professors:** Lev D. Gelb, Jiyoung Kim, Manuel Quevedo-Lopez, Amy V. Walker

**Assistant Professors:** Christopher Hinkle, Walter E. Voit, Chadwin D. Young

**Research Professors:** Padmakumar Nair

**Minor in Nanoscience and Technology**
Goals for the Minor in Nanoscience and Technology

As the field of nanotechnology develops further, particularly in the north Texas region, The University of Texas at Dallas has an important role to play in the education of knowledge workers for the industry. The Minor in Nanoscience and Technology offered by the Department of Materials Science and Technology provides a means for undergraduate students to familiarize themselves with the concepts and principles of nanotechnology.

This minor has been designed around three core NANO designated courses, the content of which is exclusively related to Nanoscience and Nanotechnology. The remaining nine hours of courses may be chosen from the list of courses below.

The contents of the courses BIOL 4461, CHEM 3322, and PHYS 4301 are similar enough that only one of these three courses may count toward the minor. In addition, several lower-level electives have been included to provide streamlined access to the available upper-level electives.

Since the three core courses are all upper-level electives, only one of the remaining nine hours must be an upper-level course, although students may choose to challenge themselves by pursuing all nine hours as upper-level electives.

In concordance with the creation of this minor, the Nanoscience (NANO) course designation would be added to the course catalog for use in designating future Nanoscience-specific courses as they are created.

Educational Objectives for the Minor in Nanoscience and Technology

On completion of the Minor program, students will:

- Have a comprehensive general education background
- Have a working knowledge of nanotechnology and nanoscience principles and industry applications
- Be able to apply key concepts in materials science, chemistry, physics, biology, and engineering to the field of nanotechnology
- Understand the societal and technology issues that may impede the adoption of nanotechnology
- Have the ability to communicate effectively and work collaboratively
- Be able to become successful professionals and, if they desire, be able to pursue graduate study
- Be able to identify career paths and requisite knowledge and skills for career change towards nanotechnology

Requirements for the Minor in Nanoscience and Technology

A total of 18 hours are required, consisting of three core classes (9 hours) and 9 additional hours of electives.

1. Core Requirements: 9 hours
NANO 3301 Introduction to Nanoscience and Nanotechnology

NANO 3302 Microscopy, Spectroscopy, and Nanotech Instrumentation

NANO 4V95 Undergraduate Research in Nanotechnology

II. Elective Requirements: 9 hours

Students must complete at least nine hours chosen from the following courses. At least one of the courses must be upper-level (3000 or 4000):

**Nano-designated courses:**

- NANO 3310 Introduction to Materials Science
- NANO 4391 or EE 4391 Technology of Plasma
- NANO 4V95 Undergraduate Research in Nanotechnology

Any other upper-level NANO-designated course

**Lower-level courses:**

- CHEM 2323 Introductory Organic Chemistry I
- CHEM 2325 Introductory Organic Chemistry II
- MATH 2451 Multivariable Calculus with Applications
- PHYS 2303 Contemporary Physics
- MECH 2320 Strength of Materials

**Upper-level courses:**

- PHYS 4352 Concepts of Modern Physics
- PHYS 4383 Plasma Physics
- MECH 4360 Introduction to Nanostructured Materials
- MECH 4370 Introduction to MEMS
- MECH 3301 Mechanics of Materials
- EE 4392 Introduction to Optical Systems
- EE 3310 Electronic Devices
- EE 3311 Electronic Circuits
CHEM 4335 Polymer Chemistry
CHEM 3472 Instrumental Analysis
CHEM 4473 Physical Measurements Laboratory
CHEM 3321 Physical Chemistry I
CHEM 4355 Computational Modeling

Only one of the following courses may be used to count toward the Minor:

BIOL 4461 Biophysical Chemistry
CHEM 3322 Physical Chemistry II
PHYS 4301 Quantum Mechanics I
Erik Jonsson School of Engineering and Computer Science

Department of Bioengineering

Biomedical Engineering (BS)

Faculty

Professors: Steven D. Levene, Mathukumalli Vidyasagar

Associate Professor: Shalini Prasad

Assistant Professors: Leonidas Bleris, Lan Ma, Hyun-Joo Nam, Danieli BC Rodrigues, Hyuntae Yoo

Affiliated Faculty: Dinesh Bhatia (Electrical Engineering), Jinming Gao (UT Southwestern), Michael Kilgard (Brain and Behavioral Science), Raimund Ober (Electrical Engineering), Issa Panahi (Electrical Engineering), Balakrishnan Prabhakaran (Computer Science), Robert Rennaker (Brain and Behavioral Science), A. Dean Sherry (Chemistry), Zhenyu Xuan (Molecular and Cell Biology), Michael Q. Zhang (Molecular and Cell Biology)

Mission of the Department of Bioengineering

The mission of the Bioengineering Department is to provide a state-of-the-art, highly interdisciplinary, teaching and research environment for undergraduate and graduate students. Whether at undergraduate or post-graduate levels, our students will be able to reach across traditional disciplinary boundaries, and work effectively with experts in engineering, life sciences, and medicine. At the Bachelors level, our graduates will be ready to meet the rapidly growing demand for bioengineers, and tackle challenges in emerging areas, including but not limited to personalized medicine, biomedical devices, and targeted drug delivery. At the Masters and PhD levels, our graduates will undertake original cutting-edge research at the forefront of scientific and technological developments in bioengineering.

High School Preparation
Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year each in elementary algebra, intermediate and advanced algebra, plane geometry, chemistry, and physics, thus developing their competencies to the highest possible levels and preparing to move immediately into demanding college courses in calculus, calculus-based physics, and chemistry for science majors. It is also essential that pre-engineering students have the competence to read rapidly and with comprehension, and to write clearly and correctly.

**Lower-Division Study**

All lower-division students in Biomedical Engineering concentrate on mathematics, science and introductory engineering courses, building competence in these cornerstone areas for future application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

**Academic Progress in Biomedical Engineering**

In order to make satisfactory academic progress as a Biomedical Engineering major, a student must meet all University requirements for academic progress, and must earn a grade of C- or better in each of the major core courses. No "Major Requirement" course may be taken until the student has obtained a grade of C- or better in each of the prerequisites. If a higher grade requirement is stated for a specific class, the higher requirement applies.

**Bachelor of Science in Biomedical Engineering**

**Degree Requirements (126 hours)**

I. Core Curriculum Requirements: 42 hours

**Communication (6 hours)**

3 hours Rhetoric (RHET 1302)

3 hours Professional and Technical Communication (ECS 3390)

**Social and Behavioral Sciences (15 hours)**

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social Issues and Ethics in Computer Science and Engineering elective (ECS 3361)

**Humanities and Fine Arts (6 hours)**
3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2417 and MATH 2419)²

Science (9 hours)

8 hours Physics (PHYS 2325, PHYS 2125, PHYS 2326 and PHYS 2126)

4 hours Chemistry (CHEM 1311 and CHEM 1111)²

II. Major Requirements: 82 hours⁵

Major Preparatory Courses (26 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory I²,
CHEM 1311 General Chemistry I²,
CHEM 1312 General Chemistry II
CHEM 1112 General Chemistry II Laboratory
CS 1325 Introduction to Programming
BIOL 2311 Introduction to Modern Biology I
BIOL 2111 Introduction to Modern Biology Workshop I
BIOL 2312 Introduction to Modern Biology II
BIOL 2112 Introduction to Modern Biology Workshop II
BIOL 2281 Introductory Biology Laboratory
MATH 2417 Calculus I²
MATH 2419 Calculus II²

MATH 2420 Differential Equations with Applications

PHYS 2125 Physics Laboratory I

PHYS 2126 Physics Laboratory II

PHYS 2325 Mechanics
**PHYS 2326** Electromagnetism and Waves

**Major Core Courses (53 hours beyond Core Curriculum)**

- **ECS 1200** Introduction to Engineering and Computer Science
- **BMEN 1208** Introduction to Biomedical Engineering
- **ENGR 2300** Linear Algebra for Engineers
- **BMEN 2310** Static Equilibrium and Rigid Body Dynamics
- **ECS 3361** Social Issues and Ethics in Computer Science and Engineering
- **ECS 3390** Professional and Technical Communication
- **ENGR 3300** Advanced Engineering Mathematics
- **BMEN 3301** Introduction to Biomechanics
- **BMEN 3101** Biomechanics Laboratory
- **EE 3302** Signals and Systems
- **EE 3102** Signals and Systems Laboratory
- **BMEN 3310** Fluid Mechanics and Transport Processes in Biomedical Engineering
- **BMEN 3110** Biomedical Transport Processes Laboratory
- **BMEN 3320** Electrical and Electronic Circuits in Biomedical Engineering
- **BMEN 3120** Biomedical Circuits and Instrumentation Laboratory
- **BMEN 3315** Thermodynamics and Physical Chemistry in Biomedical Engineering
- **BMEN 3330** Engineering Physiology of the Human Body
- **BMEN 3130** Engineering Physiology Laboratory
- **ENGR 3341** Probability Theory and Statistics
- **BMEN 3350** Biomedical Component and System Design
- **BMEN 3150** Biomedical Engineering Laboratory
- **BMEN 4310** Feedback Systems in Biomedical Engineering

or **EE 4310** Systems and Controls
Prescribed Electives (3 hours)

Students pursuing the general program take 3 semester hours from the list below:

BMEN 4320 Intermediate Electrical Systems
BMEN 4330 Advanced Engineering Physiology of the Human Body
BMEN 4350 Applied Sensor Technology

III. Elective Requirements: 2 hours

Free Electives (2 hours)

Both lower-and upper division courses may count as free electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

Fast Track Baccalaureate/Master's Degrees

In response to the need for advanced education in Biomedical engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student's education so that both a BS and an MS degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate course work during the senior year. Details are available from the Associate Dean for Undergraduate Education.

Honors Program

The Department of Biomedical Engineering offers upper-division Honors for outstanding students in the BS Biomedical Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors (BMEN 4399) or Undergraduate Research in Biomedical Engineering (BMEN 4V98) and a Senior Honors Thesis must be completed within one of those two classes. While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project. The other 5 honors classes can come from a mixture of Graduate level (up
to a count of 4) classes and special honor sections of regular undergraduate ME classes (up to a count of 2).

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

Minors

The Department of Bioengineering does not offer minors at this time.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication elective of the Core Curriculum.
3. Six hours of Calculus are counted under Mathematics Core, and two hours of Calculus are counted as Major Preparatory Courses.
4. One hour of General Chemistry I and General Chemistry I Laboratory is counted under Science core, and three hours are counted as Major Preparatory Courses.
5. Students must pass each of the EE, CS, Math and Science courses listed in this degree plan and each of their prerequisites, with a grade of C- or better.
6. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
7. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
Erik Jonsson School of Engineering and Computer Science

Interdisciplinary Programs

The Erik Jonsson School of Engineering and Computer Science offers Bachelor of Science programs in Computer Engineering and in Telecommunications Engineering. These programs are delivered by faculty from the Department of Computer Science and Electrical Engineering.

Computer Engineering (BS)

Affiliated Faculty


Associate Professors: Jorge Cobb, Yiorgos Makris, Hlaing Minn, Neeraj Mittal, Ivor Page, Issa Panahi, Yuke Wang, Weili Wu

Assistant Professor: Roozbeh Jafari

Senior Lecturers: Nathan Dodge, Greg Ozbirn

The Computer Engineering program is interdisciplinary. It was designed by the combined faculties of the Computer Science Department and the Electrical Engineering Department. Computer Engineering requires a blend of knowledge from the areas of hardware (Electrical Engineering) and software (Computer Science). The focus of the Computer Engineering degree is to provide excellent education in modern computer systems and prepare its graduates for outstanding careers in the rapidly changing and growing profession and for further continuing education.

The Computer Engineering program is based on a solid foundation of science and mathematics coursework. Students in this program are given an opportunity to learn to extend their abilities to analyze and solve complex problems and to design new uses of technology to serve today's society. This program provides an integrated education experience directed toward the development of the ability to apply pertinent knowledge to the identification and solution of practical problems in computer engineering.
The Computer Engineering curriculum ensures that the design experience, which includes both analytical and experimental studies, is integrated throughout in a sequential development leading to advanced work. Design problems are frequently assigned in both lecture and laboratory courses. Each student is required to complete a major design project during the senior year. In addition, established cooperative education programs with area industries may further supplement a student’s design experiences.

Mission of the Computer Engineering (CE) Program

The mission of the Computer Engineering Program is to provide education in the theory and practice of modern computer engineering. We will prepare our graduates to have rewarding and successful careers in a diverse range of computer engineering fields, including materials, devices, circuits, digital systems, signal/speech processing, and communications.

Goals for the Computer Engineering Program

The focus of the Computer Engineering degree at UT Dallas is to provide excellent education in both computer science and electrical engineering. Our graduates shall be uniquely qualified to apply traditional engineering design and problem solving skills to modern computer systems comprising both hardware and software components.

Program Educational Objectives for Computer Engineering

Within a few years after graduation, graduates of the Computer Engineering program should:

- Have a successful, long-lived engineering based career path
- Meet the needs of industry
- Contribute to, and/or lead engineering based teams
- Actively pursue continuing (lifelong) learning

High School Preparation

Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year each in elementary algebra, intermediate and advanced algebra, plane geometry, chemistry and physics, thus developing their competencies to the highest possible levels and preparing them to move immediately into demanding college courses in calculus, calculus-based physics and chemistry for science majors. Pre-Computer Engineering students should have some experience with elementary programming in a high level language such as C, C++, or Java. It is also essential that pre-engineering students have the competence to read rapidly and with comprehension, and to write clearly and correctly.

Lower-Division Study

All lower-division students in Computer Engineering concentrate on mathematics, science, and introductory engineering courses, building competence in these cornerstone areas for future
application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

**ABET Accreditation**

The BS program in Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

**Academic Progress in Computer Engineering**

In order to make satisfactory academic progress as a Computer Engineering major, a student must meet all University requirements for academic progress, and must earn a grade of C- or better in each of the major core courses. No "Major Requirement" course (as listed under Section II of the BS degree requirement) may be taken until the student has obtained a grade of C- or better in each of the prerequisites (if a higher grade requirement is stated for a specific class, the higher requirement applies).

** Bachelor of Science in Computer Engineering**

**Degree Requirements (126 hours)**

I. Core Curriculum Requirements\(^1\): 42 hours

**Communication (6 hours)**

3 hours Communication *(RHET 1302)*

3 hours Professional and Technical Communication *(ECS 3390)*\(^2\)

**Social and Behavioral Sciences (15 hours)**

6 hours Government *(GOVT 2301 and GOVT 2302)*

6 hours American History

3 hours Social and Behavioral Science elective *(ECS 3361)*\(^2\)

**Humanities and Fine Arts (6 hours)**

3 hours Fine Arts *(ARTS 1301)*

3 hours Humanities *(HUMA 1301)*

**Mathematics and Quantitative Reasoning (6 hours)**

6 hours Calculus *(MATH 2417 and MATH 2419)*\(^2\)
Science (9 hours)

8 hours Physics (PHYS 2325, PHYS 2125, PHYS 2326 and PHYS 2126) or (PHYS 2421 and PHYS 2422)

1 hour Science (CE 1202)

II. Major Requirements: 77 hours

Major Preparatory Courses (24 hours including 3 listed above in Core Curriculum)

- CE 1337 Computer Science I
- ECS 1200 Introduction to Engineering and Computer Science\(^5\)
- CE 1202 Introduction to Electrical Engineering\(^5\) \(^6\)
- ENGR 2300 Linear Algebra for Engineers
- CE 2305 Discrete Mathematics for Computing I
- CE 2310 Introduction to Digital Systems
- CE 2336 Computer Science II
- MATH 2417 Calculus I\(^4\)
- MATH 2419 Calculus II\(^4\)
- MATH 2420 Differential Equations with Applications
- PHYS 2125 Physics Laboratory I
- PHYS 2126 Physics Laboratory II
- PHYS 2325 Mechanics
- PHYS 2326 Electromagnetism and Waves

Major Core Courses (53 hours beyond Core Curriculum)

- CE 3101 Electrical Network Analysis Laboratory
- CE 3102 Signals and Systems Laboratory
- CE 3110 Electronic Devices Laboratory
- CE 3111 Electronic Circuits Laboratory
- CE 3120 Digital Circuits Laboratory
### Social Issues and Ethics in Computer Science and Engineering

**ECS 3361** Social Issues and Ethics in Computer Science and Engineering

**ECS 3390** Professional and Technical Communication

**ENGR 3300** Advanced Engineering Mathematics

**CE 3301** Electrical Network Analysis

**CE 3302** Signals and Systems

**CE 3310** Electronic Devices

**CE 3311** Electronic Circuits

**CE 3320** Digital Circuits

**ENGR 3341** Probability Theory and Statistics

**CE 3345** Data Structures and Introduction to Algorithmic Analysis

**CE 3354** Software Engineering

**CE 4304** Computer Architecture

**CE 4337** Organization of Programming Languages

**CE 4348** Operating Systems Concepts

**CE 4370** Embedded Microprocessor Systems

**CE 4388** Senior Design Project I

**CE 4389** Senior Design Project II

**CE 4390** Computer Networks

### Elective Requirements: 7 hours

#### Free Electives (7 hours)

Both lower- and upper-division courses may count as free electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the University can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.
Fast Track Baccalaureate/Master's Degrees

In response to the need for advanced education in computer engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student's education so that both a BS and an MS degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate course work during the senior year. Details are available from the Associate Dean for Undergraduate Education.

Honors Program

The Computer Engineering Program offers upper-division Honors for outstanding students in the BS Computer Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors in Computer Engineering (CE 4399) or Undergraduate Research in Computer Engineering (CE 4V98) and a Senior Honors Thesis must be completed within one of those two classes. (While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project.) The other 5 honors classes can come from a mixture of Graduate level (up to a count of 4) classes and special honor sections of regular undergraduate CE classes (up to a count of 2). Current undergraduate honors courses include but are not limited to: CE 2310 (H), ENGR 4334, CE 4372, CE 4399, and CE 4V98. Course grades in the 6 honor classes used to determine Honors status must be B- or higher to qualify.

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

Minors

The School of Engineering and Computer Science does not offer a minor in Computer Engineering at this time.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication component of the Core Curriculum.
3. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
4. Six hours of Calculus are counted under the Mathematics Core above, and two hours of Calculus are counted as Major Preparatory Courses.
5. One hour of CE 1202 counted under Science core above, and one under Major Preparatory courses.
6. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
http://catalog.utdallas.edu/2012/undergraduate/programs/ecs/computer-science

Erik Jonsson School of Engineering and Computer Science

Department of Computer Science

Computer Science (BS) and Software Engineering (BS)

Faculty


Associate Professors: Sergey Bereg, Lawrence Chung, Jorge A. Cobb, Kendra M.L. Cooper, Xiaohu Guo, Kevin Hamlen, Sandra Harabagiu, Murat Kantarcioglu, Yang Liu, Neeraj Mittal, Vincent Ng, Ivor P. Page, Kamil Sarac, Haim Schweitzer, Yuke Wang, Rym Wenkstern, Weili Wu.

Assistant Professors: Alvaro Cardenas, Mark Gabel, Vibhav Gogate, Zhiqiang Lin, Ryan McMahan.

Senior Lecturers: Ebru Cankaya, John Cole, Tim Farage, Shyam Karrah, Pushpa Kumar, Linda Morales, Nhut Nguyen, Greg Ozbirn, Mark Paulk, Miquel Razo-Razo, Charles Shields Jr., Janell Straach, Laurie Thompson, Jay Veerasamy

The Computer Science Department offers the BS degree in Computer Science and the BS degree in Software Engineering. Both are based on a solid foundation of mathematics, including calculus, linear algebra, and discrete mathematics. These programs of study are designed to offer students opportunities to prepare for an industrial, business, or governmental career in a rapidly changing profession and to prepare for graduate study in a field in which further education is strongly recommended. The two programs have the same basis in core computer science, including the analysis of algorithms and data structures, modern programming methodologies, and the study of operating systems. The Computer Science program continues with courses in advanced data structures, programming languages, telecommunications networks, and automata theory, while the Software Engineering program include courses in requirements engineering, software validation and testing, and software architecture, culminating in a challenging project course in which students must demonstrate use of software engineering techniques. Both programs offer a rich choice of elective studies, including courses in artificial intelligence, computer graphics, databases, and compiler design.
The school offers a “fast track” BS/MS option; see Fast Track Baccalaureate/Master's Degree Program.

**Mission of the Department of Computer Science**

The mission of the Department of Computer Science is to prepare undergraduate and graduate students for productive careers in industry, academia, and government by providing an outstanding environment for teaching, learning, and research in the theory and applications of computing. The Department places high priority on establishing and maintaining innovative research programs to enhance its education quality and make it an important regional, national and international resource center for discovering, integrating and applying new knowledge and technologies.

**Bachelor of Science in Computer Science (BS)**

**Goals for the Computer Science Program**

The undergraduate Computer Science program is committed to provide students with a high-quality education and prepare them for long and successful careers in industry and government.

Our graduates, while eminently ready for immediate employment, will also be fully ready for focused training as required for specific positions in Computer Science and closely related areas. Graduates interested in highly technical careers, research, and/or academia will be fully prepared to further their education in graduate school.

**Program Educational Objectives for Computer Science**

Within a few years after graduation, graduates of the Computer Science program should:

- Have a successful, long-lived, computer science based career path
- Meet the needs of industry or academia
- Contribute to, and/or lead, computer science based teams
- Actively pursue continuing (lifelong) learning

**ABET Accreditation**

*The BS program in Computer Science is accredited by the Computing Accreditation Commission of ABET, [http://www.abet.org](http://www.abet.org).*

**Bachelor of Science in Computer Science**

**Degree Requirements (124 hours)**

I. Core Curriculum Requirements: 42 hours
Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Professional and Technical Communication (ECS 3390)\(^2\)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science (ECS 3361)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413, MATH 2414 or MATH 2417, MATH 2419)\(^2\)

Science (9 hours)

6 hours Lecture courses (PHYS 2325 and PHYS 2326)\(^2\)
2 hours Laboratory courses (PHYS 2125 and PHYS 2126)\(^2\)
4 hours Science Elective\(^4\)

II. Major Requirements: 68 hours

Major Preparatory Courses (20 hours beyond Core Curriculum)

ECS 1200 Introduction to Engineering and Computer Science\(^5\)
CS 1337 Computer Science I
CS 2305 Discrete Mathematics for Computing I
CS 2336 Computer Science II
MATH 2413 Differential Calculus
or MATH 2417 Calculus \(^1\)
MATH 2418 Linear Algebra
MATH 2414 Integral Calculus

or MATH 2419 Calculus II

PHYS 2125 Physics Laboratory I

PHYS 2126 Physics Laboratory II

PHYS 2325 Mechanics

PHYS 2326 Electromagnetism and Waves

4 hours Science Elective

Major Core Courses (39 hours beyond Core Curriculum)

CS 3162 Professional Responsibility in Computer Science and Software Engineering

CS 3305 Discrete Mathematics for Computing II

CS 3340 Computer Architecture

CS 3341 Probability and Statistics in Computer Science and Software Engineering

CS 3345 Data Structures and Introduction to Algorithmic Analysis

CS 3354 Software Engineering

CS 3376 C/C++ Programming in a UNIX Environment

ECS 3361 Social Issues and Ethics in Computer Science and Engineering

ECS 3390 Professional and Technical Communication

CS 4141 Digital Systems Laboratory

CS 4337 Organization of Programming Languages

CS 4341 Digital Logic and Computer Design

CS 4348 Operating Systems Concepts

CS 4349 Advanced Algorithm Design and Analysis

CS 4384 Automata Theory

CS 4485 Computer Science Project

Major Guided Electives (9 hours)
CS guided electives are 4000 level CS courses approved by the student's CS advisor. The following courses may be used as guided electives without the explicit approval of an advisor:

- **CS 4314** Intelligent Systems Analysis
- **CS 4315** Intelligent Systems Design
- **CS 4334** Numerical Analysis
- **CS 4336** Advanced Java
- **CS 4347** or **SE 4347** Database Systems
- **CS 4352** Human Computer Interactions I
- **CS 4353** Human Computer Interactions II
- **CS 4361** Computer Graphics
- **CS 4365** Artificial Intelligence
- **CS 4375** Introduction to Machine Learning
- **CS 4376** Object-Oriented Programming Systems
- **CS 4386** Compiler Design
- **CS 4389** Data and Applications Security
- **CS 4390** Computer Networks
- **CS 4391** Introduction to Computer Vision
- **CS 4392** Computer Animation
- **CS 4393** Computer and Network Security
- **CS 4394** Implementation of Modern Operating Systems
- **CS 4395** Human Language Technologies
- **CS 4396** Networking Laboratory
- **CS 4397** Embedded Computer Systems
- **CS 4398** Digital Forensics
- **CS 4399** Senior Honors in Computer Science
- **EE 4325** Introduction to VLSI Design
III. Elective Requirements: 14 hours

**Free Electives (14 hours)**

Both lower- and upper-division courses may count as free electives but students must complete at least 51 hours of upper-division credit to qualify for graduation.

**Fast Track Baccalaureate/Master’s Degrees**

In response to the need for post-baccalaureate education in the exciting field of computer science, a Fast Track program is available to well-qualified UT Dallas undergraduate students. At the end of five years of successful study, it is possible to earn both the BS and the MS in Computer Science (or MS in Computer Science with Major in Software Engineering). Qualified seniors may take up to 15 graduate hours that may be used to complete the baccalaureate degree and also to satisfy requirements for the master’s degree. Interested students should see the Associate Dean of Undergraduate Education (ADU) for specific requirements.

**Honors Programs**

The Department of Computer Science offers upper-division Honors for outstanding students in both the BS in Computer Science and BS in Software Engineering degree programs. These programs offer special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes, including a Senior Thesis or Senior Design Project class. For more details, contact the Office of Undergraduate Advising (ECS South 2.502; 972-883-2004).

Departmental Honors with Distinction may be awarded to students whose Senior Thesis or Senior Design Project is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses and PhD Dissertations in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

**Minors**
A minor in Computer Science requires 21 credit hours earned through the following courses:

- CS 1337 Computer Science I
- CS 2305 Discrete Mathematics for Computing I
- CS 2336 Computer Science II
- CS 3305 Discrete Mathematics for Computing II
- CS 3345 Data Structures and Introduction to Algorithmic Analysis
- CS 3354 Software Engineering
- CS 43XX Elective (any 4000-level organized CS class or CS 4390)

A minor in Information Assurance requires 30 credit hours earned through the following courses:

- CS 1337 Computer Science I
- CS 2305 Discrete Mathematics for Computing I
- CS 2336 Computer Science II
- CS 3305 Discrete Mathematics for Computing II
- CS 3345 Data Structures and Introduction to Algorithmic Analysis
- CS 4347 Database Systems
- CS 4348 Operating Systems Concepts
- CS 4389 Data and Applications Security
- CS 4393 Computer and Network Security
- CS 4398 Digital Forensics

Certificates

A Certificate in Information Assurance can be obtained by completing the following (as well as any required prerequisites):

- CS 4389 Data and Applications Security
- CS 4393 Computer and Network Security
- CS 4398 Digital Forensics
The certificate is intended for those individuals who are working in the industry and who already have background similar to a BS degree. CS and SE majors that complete the required classes, as well as students that complete the Minor in Information Assurance will be awarded certificates in Information Assurance.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication elective of the Core Curriculum.
3. Six hours of Calculus are counted under Mathematics Core, and two hours of Calculus are counted as Major Preparatory Courses.
4. Nine hours of Science are counted under Science Core. Three hours are counted under Major Preparatory Courses. Students should consult an advisor for specific classes that satisfy this requirement.
5. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
6. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
Erik Jonsson School of Engineering and Computer Science

Department of Electrical Engineering

Electrical Engineering (BSEE)

Faculty


Associate Professors: Gerald O. Burnham, Yun Chiu, Walter Hu, Hoi Lee, Dongsheng Ma, Yiorgos Makris, Hlaing Minn, Issa Panahi, Siavash Pourkamali, Robert Rennaker, Mohammad Saquib, Murat Torlak

Assistant Professors: Bilal Akin, Bhaskar Banerjee, Carlos Busso, Nickolas Gans, Rashauda Henderson, Roozbeh Jafari

Research Professors: Walter Duncan, Sam Schichijo

Research Assistant Professor: Woofil Kim

Senior Lecturers: Charles P. Bernardin, Peter A. Blakey, Nathan B. Dodge, Edward J. Esposito, Jung Lee, Randall E. Lehmann, P. K. Rajasekaran, Ricardo Saad, Marco Tacca

Affiliated Faculty: Larry P. Ammann (Math Sciences), Leonidas Bleris (Bioengineering), Yves J. Chabal (Materials Science and Engineering), Matthew Gocekner (Math Sciences), Bruce E. Gnade (Materials Science and Engineering), Jiyoung Kim (Materials Science and Engineering), Moon J. Kim (Materials Science and Engineering), Yang Liu (Computer Science), Mario A. Rotea (Mechanical Engineering), Madhukumali Vidyasagar (Bioengineering), Robert M. Wallace (Materials Science and Engineering), Chadwin Young (Materials Science and Engineering), Stephen Yurkovich (Systems Engineering)

The Electrical Engineering Department offers a bachelor's degree in Electrical Engineering. The Electrical Engineering program offers students an opportunity to acquire a solid foundation in
the broad areas of electrical engineering and emphasizes advanced study in digital systems, digital signal processing, communications, analog systems, RF/microwave, and microelectronics.

The Electrical Engineering program offers students a solid educational foundation in the areas of electrical networks, electronics, electromagnetics, computers, digital systems, and communications and is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Mastery of these areas provides students with the ability to adapt and maintain leadership roles in their post-baccalaureate pursuits through the application of fundamental principles to a rapidly changing and growing discipline.

Students in the Electrical Engineering program a broad general program in electrical engineering and can then take advanced courses in computer hardware and software; the analysis and design of analog and digital communication systems; analog and digital signal processing; the analysis, design, and fabrication of microelectronic components and systems; and guided and unguided wave propagation. A broad choice of electives (within and external to electrical engineering) allows students to broaden their education as well as develop expertise in areas of particular interest. In keeping with the role of a professional, students are expected to develop communication skills and an awareness of the relationship between technology and society.

The Electrical Engineering program is based on a solid foundation of science and mathematics coursework. Students in this program are given an opportunity to learn and extend their abilities to analyze and solve complex problems and to design new uses of technology to serve today's society. The engineering programs at UT Dallas provide an integrated educational experience directed toward the development of the ability to apply pertinent knowledge to the identification and solution of practical problems in Electrical and other related engineering fields. These programs ensure that the design experience, which includes both analytical and experimental studies, is integrated throughout the curriculum in a sequential development leading to advanced work. Design problems are frequently assigned in both lecture and laboratory courses. Each student is required to complete a major design project during the senior year. In addition, established cooperative education programs with area industry serve to further supplement design experiences.

Mission of the Electrical Engineering Program

The focus of the Electrical Engineering degree is to provide excellent education in modern electrical engineering practice. Our graduates are uniquely qualified for rewarding and successful careers in materials, devices, circuits, digital systems, signal processing, and communications. In the spring of 2005 the EE faculty adopted a new set of Program Educational Objectives that refined the prior objectives and established measurements and benchmarks to monitor progress. A feedback mechanism using Alumni Surveys (by the ECS Office of Assessment) and other tools are used to measure progress toward these objectives.

Program Educational Objectives for Electrical Engineering

One broad goal for the Erik Jonsson School is an excellent education for our students.
Within a few years of graduation, graduates of the Electrical Engineering program should:

- Have a successful, long-lived engineering based career path
- Meet the needs of industry
- Contribute to, and/or lead engineering based teams
- Actively pursue continuing (lifelong) learning

**High School Preparation**

Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year each in elementary algebra, intermediate and advanced algebra, plane geometry, chemistry, and physics, thus developing their competencies to the highest possible levels and preparing to move immediately into demanding college courses in calculus, calculus-based physics, and chemistry for science majors. It is also essential that pre-engineering students have the competence to read rapidly and with comprehension, and to write clearly and correctly.

**Lower-Division Study**

All lower-division students in Electrical Engineering concentrate on mathematics, science and introductory engineering courses, building competence in these cornerstone areas for future application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

<table>
<thead>
<tr>
<th>ABET Accreditation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The BS program in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET, <a href="http://www.abet.org">http://www.abet.org</a>.</td>
</tr>
</tbody>
</table>

**Academic Progress in Electrical Engineering**

In order to make satisfactory academic progress as an Electrical Engineering major, a student must meet all University requirements for academic progress, and must earn a grade of C- or better in each of the major core courses. No "Major Requirement" course (as listed under Section II of the BSEE degree requirement) may be taken until the student has obtained a grade of C- or better in each of the prerequisites (if a higher grade requirement is stated for a specific class, the higher requirement applies).

**Bachelor of Science in Electrical Engineering**

**Degree Requirements (128 hours)**

1. Core Curriculum Requirements‡: 42 hours
<table>
<thead>
<tr>
<th>Course Category</th>
<th>Credits</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>6</td>
<td>3 hours Communication (RHET 1302) &lt;br&gt;3 hours Professional and Technical Communication (ECS 3390)²</td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>15</td>
<td>6 hours Government (GOVT 2301 and GOVT 2302) &lt;br&gt;6 hours American History &lt;br&gt;3 hours Social and Behavioral Science elective (ECS 3361)</td>
</tr>
<tr>
<td>Humanities and Fine Arts</td>
<td>6</td>
<td>3 hours Fine Arts (ARTS 1301) &lt;br&gt;3 hours Humanities (HUMA 1301)</td>
</tr>
<tr>
<td>Mathematics and Quantitative Reasoning</td>
<td>6</td>
<td>6 hours Calculus (MATH 2417 and MATH 2419)²</td>
</tr>
<tr>
<td>Science</td>
<td>9</td>
<td>8 hours Physics (PHYS 2325, PHYS 2125, PHYS 2326 and PHYS 2126) &lt;br&gt;4 hours Chemistry (CHEM 1311 and CHEM 1111)²</td>
</tr>
</tbody>
</table>

II. Major Requirements: 76 hours

Major Preparatory Courses (22 hours beyond Core Curriculum)

- CHEM 1111 General Chemistry Laboratory II ² ³
- CHEM 1311 General Chemistry ² ³
- CS 1325 Introduction to Programming
- ECS 1200 Introduction to Engineering and Computer Science ³
- EE 1202 Introduction to Electrical Engineering ³
- ENGR 2300 Linear Algebra for Engineers
- EE 2310 Introduction to Digital Systems
- MATH 2417 Calculus II ³
MATH 2419  Calculus II

MATH 2420  Differential Equations with Applications

PHYS 2125  Physics Laboratory I

PHYS 2126  Physics Laboratory II

PHYS 2325  Mechanics

PHYS 2326  Electromagnetism and Waves

Major Core Courses (45 hours beyond Core Curriculum)

ECS 3361  Social Issues and Ethics in Computer Science and Engineering

ECS 3390  Professional and Technical Communication

EE 3101  Electrical Network Analysis Laboratory

EE 3102  Signals and Systems Laboratory

EE 3110  Electronic Devices Laboratory

EE 3111  Electronic Circuits Laboratory

EE 3120  Digital Circuits Laboratory

EE 3150  Communications Systems Laboratory

ENGR 3300  Advanced Engineering Mathematics

EE 3301  Electrical Network Analysis

EE 3302  Signals and Systems

EE 3310  Electronic Devices

EE 3311  Electronic Circuits

EE 3320  Digital Circuits

ENGR 3341  Probability Theory and Statistics

EE 3350  Communications Systems

EE 4301  Electromagnetic Engineering I

EE 4310  Systems and Controls
EE 4368 RF Circuit Design Principles
EE 4388 Senior Design Project I
EE 4389 Senior Design Project II

Major Guided Electives (9 hours)

Students pursuing the general program take 9 semester hours from any other 4000 level Electrical Engineering courses. Students pursuing a concentration in Microelectronics take 3 of the following courses:

EE 4302 Electromagnetic Engineering II
EE 4304 Computer Architecture
EE 4325 Introduction to VLSI Design
EE 4330 Integrated Circuit Technology
EE 4340 Analog Integrated Circuit Analysis and Design
EE 4341 Digital Integrated Circuit Analysis and Design
EE 4391 Technology of Plasma

Students pursuing a concentration in Telecommunications take 3 of the following courses:

EE 4360 Digital Communications
EE 4361 Introduction to Digital Signal Processing
EE 4365 Introduction to Wireless Communication
EE 4367 Telecommunications Networks
EE 4390 Computer Networks
EE 4392 Introduction to Optical Systems

III. Elective Requirements: 10 hours

Free Electives (10 hours)

Both lower- and upper-division courses may count as free electives but students must complete at least 51 hours of upper-division credit to qualify for graduation.
Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the University can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.

**Fast Track Baccalaureate/Master's Degrees**

In response to the need for advanced education in electrical engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student's education so that both a BS EE and an MS EE degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate course work during the senior year. Details are available from the Associate Dean for Undergraduate Education.

**Honors Program**

The Department of Electrical Engineering offers upper-division Honors for outstanding students in the BS Electrical Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors in Electrical Engineering (EE 4399) or Undergraduate Research in Electrical Engineering (EE 4V98) and a Senior Honors Thesis must be completed within one of those two classes. (While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project). The other 5 honors classes can come from a mixture of Graduate level (up to a count of 4) classes and special honor sections of regular undergraduate EE classes (up to a count of 2). Current undergraduate honors courses include but are not limited to EE 2310 (H), EE 3350 (H), EE 4302, EE 4399, and EE 4V98. Course grades in the 6 honors classes used to determine Honors status must be B- or higher to qualify.

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

**Minors**

The Department of Electrical Engineering does not offer minors at this time.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication component of the Core Curriculum.
3. Six hours of Calculus are counted under Mathematics Core, and two hours of Calculus are counted as Major Preparatory Courses.
4. One hour of Chemistry is counted under Science core, and three hours are counted as Major Preparatory Courses.
5. Students must pass each of the EE, CS, Math and Science courses listed in this degree plan and each of their prerequisites, with a grade of C- or better.
6. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
7. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
Erik Jonsson School of Engineering and Computer Science

Department of Mechanical Engineering

Faculty

**Professors:** Xin-Lin Gao, Hongbing Lu, Mario A. Rotea, Seung M. You

**Associate Professors:** Yaoyu Li, Dong Qian

**Assistant Professors:** Wonjae Choi, Robert Gregg, Fatemeh Hassanipour, Majid Minary, Wooram Park, Yonas Tadesse, Walter Voit

**Senior Lecturers:** Robert Hart, James Hilkert, Oziel Rios

**Affiliated Faculty:** Andrew J. Blanchard, Gerald O. Burnham, Cyrus D. Cantrell III, Yves J. Chabal, Kyeongjai Cho, Babak Fahimi, Bruce E. Gnade, Matthew J. Goeckner, Walter Hu, Louis R. Hunt (Emeritus), Jiyoung Kim, Moon J. Kim, Jeong-Bong Lee, Kaushik Rajashekara, Mark. W. Spong, Mathukumalli Vidyasagar, Robert M. Wallace, Steve Yurkovich

Objectives

The objective of the Bachelor of Science degree program in Mechanical Engineering is to produce Mechanical Engineering graduates who will be capable of undertaking challenging projects that require knowledge of the fundamentals of the design of mechanical and thermal systems. The program seeks to educate Mechanical Engineers to meet the analysis, design, and development needs of local and state industry as well as to educate them to be innovators and policy makers. The BS degree program will provide the necessary training and education for future engineers who can effectively identify new problems and develop innovative solutions, including new manufacturing and fabrication technologies.

Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for teaching and research. These include computer cluster, wind tunnels, heat exchangers, hydraulics, material test systems, split Hopkinson bars, ultra-high speed camera,
nanoindenter, AFM, DMA, XPS, FTIR, NMR, TGA, DSC, XRD, μ-Raman, Fluorescence Spectrometer, FIB/SEM, and HRTEM, motion and thermal control systems, 3-D printing. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research.

**Mechanical Engineering (BS)**

**Program Educational Objectives for Mechanical Engineering**

One broad goal for the Erik Jonsson School is an excellent education for our students. Within a few years after graduation, graduates of the Mechanical Engineering Program should:

- Have a successful, long-lived engineering-based career path.
- Meet the needs of industry.
- Contribute to, and lead, engineering-based teams.
- Actively pursue life-long learning.

**High School Preparation**

Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year in elementary algebra, intermediate and advanced algebra, geometry, pre-calculus, chemistry, and physics, thus developing their competencies to the highest possible levels and preparing to move immediately into demanding college courses in calculus, calculus-based physics, and chemistry for science majors. It is also essential that pre-engineering students have the competence of reading comprehension, and to write logically, clearly and correctly.

**Lower-Division Study**

All lower-division students in Mechanical Engineering concentrate on mathematics, science and introductory engineering courses, building competence in these cornerstone areas for future application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

Although the Mechanical Engineering curricula that follow have been designed to meet these criteria, students have the responsibility, in consultation with an
advisor, to monitor their own choice of courses carefully to be certain that all academic requirements for graduation are being satisfied. Students are encouraged to take courses in such subjects as industrial management, finance, personnel administration, and engineering economy.

**Academic Progress in Mechanical Engineering**

In order to make satisfactory academic progress as a Mechanical Engineering major, a student must meet all University requirements for academic progress, and must earn a grade of C- or better in each of the major core courses. No "Major Requirement" course may be taken until the student has obtained a grade of C- or better in each of the prerequisites. If a higher grade requirement is stated for a specific class, the higher requirement applies.

**Bachelor of Science in Mechanical Engineering**

Degree Requirements (127 hours)

I. Core Curriculum Requirements\(^1\): 42 hours

**Communication (6 hours)**
- 3 hours Communication (RHET 1302)
- 3 hours Professional and Technical Communication (ECS 3390)

**Social and Behavioral Sciences (15 hours)**
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science elective (ECS 3361)

**Humanities and Fine Arts (6 hours)**
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

**Mathematics and Quantitative Reasoning (6 hours)**
- 6 hours Calculus (MATH 2417 and MATH 2419)^2

**Science (9 hours)**
- 8 hours Physics (PHYS 2325, PHYS 2125, PHYS 2326 and PHYS 2126)
- 4 hours Chemistry (CHEM 1311 and CHEM 1111)^3

II. Major Requirements: 79 hours\(^4\)
**Major Preparatory Courses** (29 hours beyond Core Curriculum Requirements)

- **CHEM 1111** General Chemistry Laboratory I, 4  
- **CHEM 1311** General Chemistry II  
- **CS 1325** Introduction to Programming  
- *or* **CS 1337** Computer Science I  
- **ECS 1200** Introduction to Engineering and Computer Science  
- **MATH 2417** Calculus I  
- **MATH 2419** Calculus II  
- **MATH 2420** Differential Equations with Applications  
- **MECH 1208** Introduction to Mechanical Engineering  
- **ENGR 2300** Linear Algebra for Engineers  
- **MECH 2310** Statics  
- **MECH 2320** Strength of Materials  
- **MECH 2330** Dynamics  
- **PHYS 2125** Physics Laboratory I  
- **PHYS 2126** Physics Laboratory II  
- **PHYS 2325** Mechanics  
- **PHYS 2326** Electromagnetism and Waves

**Major Core Courses** (38 hours beyond Core Curriculum Requirements)

- **ECS 3361** Social Issues and Ethics in Computer Science and Engineering  
- **ECS 3390** Professional and Technical Communication  
- **MECH 3105** Computer Aided Design Laboratory  
- **MECH 3115** Fluid Mechanics Laboratory  
- **MECH 3120** Heat Transfer Laboratory  
- **MECH 3150** Mechanical Systems Laboratory  
- **ENGR 3300** Advanced Engineering Mathematics  
- **MECH 3305** Computer Aided Design  
- **MECH 3310** Thermodynamics  
- **MECH 3315** Fluid Mechanics  
- **MECH 3320** Heat Transfer  
- **ENGR 3341** Probability Theory and Statistics  
- **MECH 3350** Kinematics and Dynamics of Mechanical Systems  
- **MECH 3351** Design of Mechanical Systems  
- **MECH 4110** Systems and Controls Laboratory  
- **MECH 4310** Systems and Controls  
- **MECH 4381** Senior Design Project I  
- **MECH 4382** Senior Design Project II
Prescribed Electives (12 hours)

Students pursuing the general program take 12 semester hours from the list below:

- ECS 3310 Introduction to Material Science
- MECH 3301 Mechanics of Materials
- MECH 4330 Intermediate Fluid Mechanics
- MECH 4340 Mechanical Vibrations
- MECH 4350 Applied Heat Transfer
- MECH 4360 Introduction to Nanostructured Materials
- MECH 4370 Introduction to MEMS

III. Elective Requirements: 6 hours

Free Electives (6 hours)

Both lower- and upper-division courses may count as free electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the University can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.

Fast Track Baccalaureate/Master's Degrees

In response to the need for advanced education in Mechanical Engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student's education so that both a BS and an MS degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate course work during the senior year. Details of the requirements are available from the Associate Dean for Undergraduate Education.

Honors Program
The Department of Mechanical Engineering offers upper-division Honors for outstanding students in the BS Mechanical Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors (MECH 4399) or Undergraduate Research in Mechanical Engineering (MECH 4V98) and a Senior Honors Thesis must be completed within one of those two classes. While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project. The other 5 honors classes can come from a mixture of Graduate level (up to a count of 4) classes and special honor sections of regular undergraduate ME classes (up to a count of 2).

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

Minors

The Department of Mechanical Engineering does not offer minors at this time.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Six hours of Calculus are counted under Mathematics Core, and two hours of Calculus are counted as Major Preparatory Courses.
3. One hour of Chemistry is counted under Science core, and three hours are counted as Major Preparatory Courses.
4. Students must pass each of the EE, CS, Math and Science courses listed in this degree plan and each of their prerequisites, with a grade of C- or better.
5. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
6. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
7. Hours fulfill the communication component of the Core Curriculum.
Erik Jonsson School of Engineering and Computer Science

Department of Computer Science

Computer Science (B.S) and Software Engineering (B.S)

Faculty


Associate Professors: Sergey Bereg, Lawrence Chung, Jorge A. Cobb, Kendra M.L. Cooper, Xiaohu Guo, Kevin Hamlen, Sanda Harabagiu, Murat Kantarcioğlu, Yang Liu, Neeraj Mittal, Vincent Ng, Ivor P. Page, Kamil Sarac, Haim Schweitzer, Yuke Wang, Rym Wenkster, Weili Wu.

Assistant Professors: Alvaro Cardenas, Mark Gabel, Vibhav Gogate, Zhiqiang Lin, Ryan McMahan.


The Computer Science Department offers the B.S degree in Computer Science and the B.S degree in Software Engineering. Both are based on a solid foundation of mathematics, including calculus, linear algebra, and discrete mathematics. These programs of study are designed to offer students opportunities to prepare for an industrial, business, or governmental career in a rapidly changing profession and to prepare for graduate study in a field in which further education is strongly recommended. The two programs have the same basis in core computer science, including the analysis of algorithms and data structures, modern programming methodologies, and the study of operating systems. The Computer Science program continues with courses in advanced data structures, programming languages, telecommunications networks, and automata theory, while the Software Engineering program include courses in requirements engineering, software validation and testing, and software architecture, culminating in a challenging project course in which students must demonstrate use of software engineering techniques. Both programs offer a rich choice of elective studies, including courses in artificial intelligence, computer graphics, databases, and compiler design.
The school offers a “fast track” BS / MS option; see Fast Track Baccalaureate/Master's Degree Program.

**Mission of the Department of Computer Science**

The mission of the Department of Computer Science is to prepare undergraduate and graduate students for productive careers in industry, academia, and government by providing an outstanding environment for teaching, learning, and research in the theory and applications of computing. The Department places high priority on establishing and maintaining innovative research programs to enhance its education quality and make it an important regional, national and international resource center for discovering, integrating and applying new knowledge and technologies.

**Software Engineering (BS)**

**Goals of the Software Engineering Program**

The focus of the Software Engineering degree is to provide world class education in modern software engineering. The overall goals of the Bachelor of Science in Software Engineering Program are:

- To prepare students for software engineering positions in industry or government.
- To prepare students for graduate study in Software Engineering.
- To provide a solid foundation in Computer Science and Software Engineering principles that will allow graduates to adapt effectively in a quickly changing field.

**Program Educational Objectives for Software Engineering**

Within a few years after graduation, graduates of the Software Engineering Program should:

- Have a successful, long-lived, software engineering based career path
- Meet the needs of industry or academia
- Contribute to, and/or lead, software engineering based teams
- Actively pursue continuing (lifelong) learning

**ABET Accreditation**


**Bachelor of Science in Software Engineering**

Degree Requirements (123 hours)
I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Professional and Technical Communication (ECS 3390)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science (ECS 3361)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413, MATH 2414 or MATH 2417, MATH 2419)

Science (9 hours)

6 hours Lecture courses (PHYS 2325 and PHYS 2326)
2 hours Laboratory courses (PHYS 2125 and PHYS 2126)
4 hours Science Elective

II. Major Requirements: 70 hours

Major Preparatory Courses (20 hours beyond Core Curriculum)

ECS 1200 Introduction to Engineering and Computer Science
CS 1337 Computer Science I
CS 2305 Discrete Mathematics for Computing I
CS 2336 Computer Science II
MATH 2413 Differential Calculus
or MATH 2417 Calculus
MATH 2418 Linear Algebra
MATH 2414 Integral Calculus
or MATH 2419 Calculus II
PHYS 2125 Physics Laboratory I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
PHYS 2326 Electromagnetism and Waves
4 hours Science Elective

Major Core Courses (38 hours beyond Core Curriculum)
  SE 3162 Professional Responsibility in Computer Science and Software Engineering
  SE 3306 Mathematical Foundations of Software Engineering
  SE 3340 Computer Architecture
  SE 3341 Probability and Statistics in Computer Science and Software Engineering
  CS 3345 Data Structures and Introduction to Algorithmic Analysis
  CS 3354 Software Engineering
  ECS 3361 Social Issues and Ethics in Computer Science and Engineering
  SE 3376 C/C++ Programming in a UNIX Environment
  ECS 3390 Professional and Technical Communication
  CS 4348 Operating Systems Concepts
  SE 4351 Requirements Engineering
  SE 4352 Software Architecture and Design
  SE 4367 Software Testing, Verification, Validation and Quality Assurance
  SE 4381 Software Project Planning and Management
  SE 4485 Software Engineering Project

Major Guided Electives (12 hours)
SE guided electives are 4000 level CS/SE courses approved by the student's CS/SE advisor. The following courses may be used as guided electives without the explicit approval of an advisor:

- **CS 4141** Digital Systems Laboratory
- **CS 4314** Intelligent Systems Analysis
- **CS 4315** Intelligent Systems Design
- **CS 4334** Numerical Analysis
- **CS 4337** Organization of Programming Languages
- **CS 4341** Digital Logic and Computer Design
- **CS 4349** Advanced Algorithm Design and Analysis
- **CS 4352** Human Computer Interactions I
- **CS 4353** Human Computer Interactions II
- **CS 4361** Computer Graphics
- **CS 4365** Artificial Intelligence
- **CS 4375** Introduction to Machine Learning
- **CS 4384** Automata Theory
- **CS 4386** Compiler Design
- **CS 4389** Data and Applications Security
- **CS 4390** Computer Networks
- **CS 4391** Introduction to Computer Vision
- **CS 4392** Computer Animation
- **CS 4393** Computer and Network Security
- **CS 4394** Implementation of Modern Operating Systems
- **CS 4395** Human Language Technologies
- **CS 4396** Networking Laboratory
- **CS 4397** Embedded Computer Systems
- **CS 4398** Digital Forensics
An important aspect of Software Engineering education is the use of software engineering concepts in a particular application domain. Students should use two or three of their guided electives to complete one of the applications domains below. Additional application domains may become available. Completing an application domain may require careful scheduling since many of these classes will not be offered every semester. It is strongly encouraged that you consult with an advisor.

**Networks (9 hours)**

- **CS 4390** Computer Networks
- **CS 4393** Computer and Network Security
- **CS 4396** Networking Laboratory

**Information Assurance (9 hours)**

- **CS 4389** Data and Applications Security
- **CS 4393** Computer and Network Security
- **CS 4398** Digital Forensics

**Embedded Systems (9 hours)**

- **CS 4141** Digital Systems Laboratory
- **CS 4341** Digital Logic and Computer Design
- **CS 4397** Embedded Computer Systems
- **CS 4348** Operating Systems Concepts

**Computer Imaging (9 hours)**

- **CS 4361** Computer Graphics
CS 4391 Introduction to Computer Vision
CS 4392 Computer Animation

Artificial Intelligence and Cognitive Modeling (9 hours; take 3 of 5)
CS 4314 Intelligent Systems Analysis
CS 4315 Intelligent Systems Design
CS 4365 Artificial Intelligence
CS 4375 Introduction to Machine Learning
CS 4395 Human Language Technologies

Human-Computer Interaction (9 hours)
CS 4352 Human Computer Interactions I
CS 4353 Human Computer Interactions II
CS 4361 Computer Graphics

III. Elective Requirements: 11 hours

Free Electives (11 hours)

All students must accumulate at least 124 hours of university credit to graduate. Both lower- and upper-division courses may count as free electives but students must complete at least 51 hours of upper-division credit to qualify for graduation.

Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the University can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.

Fast Track Baccalaureate/Master's Degrees

In response to the need for post-baccalaureate education in the exciting field of software engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. At the end of five years of successful study, it is possible to earn both the BS degree in Software Engineering and the MS degree in Computer Science or the MS degree in Computer Science with Major in Software Engineering. Qualified seniors may take up to 15 graduate hours that may be used to complete the baccalaureate degree and also to satisfy the requirements for the master's degree. Interested students should see the Associate Dean of Undergraduate Education (ADU) for specific requirements.
Honors Programs

The Department of Computer Science offers upper-division Honors for outstanding students in both the BS in Computer Science and BS in Software Engineering degree programs. These programs offer special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes, including a Senior Thesis or Senior Design Project class. For more details, contact the Office of Undergraduate Advising (ECS South 2.502; 972-883-2004).

Departmental Honors with Distinction may be awarded to students whose Senior Thesis or Senior Design Project is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses and PhD Dissertations in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.

Minors

A minor in Software Engineering requires 21 credit hours earned through the following courses:

- **CS 1337** Computer Science I
- **CS 2305** Discrete Mathematics for Computing I
- **CS 2336** Computer Science II
- **SE 3306** Mathematical Foundations of Software Engineering
- **CS 3345** Data Structures and Introduction to Algorithmic Analysis
- **CS 3354** Software Engineering
- **SE 43XX** Elective (any 4000-level organized SE class)

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication elective of the Core Curriculum.
3. Six hours of Calculus are counted under Mathematics Core, and two hours of Calculus are counted as Major Preparatory Courses.
4. Nine hours of Science are counted under Science Core. Three hours are counted as Major Preparatory Courses. Students should consult an advisor for specific classes that satisfy this requirement.
5. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
6. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
Erik Jonsson School of Engineering and Computer Science

Interdisciplinary Programs

The Erik Jonsson School of Engineering and Computer Science offers Bachelor of Science programs in Computer Engineering and in Telecommunications Engineering. These programs are delivered by faculty from the Department of Computer Science and Electrical Engineering.

Telecommunications Engineering (BSTE)

Affiliated Faculty


**Associate Professors:** Jorge Cobb, Hlaing Minn, Neeraj Mittal, Mohammad Saquib, Kamil Sarac, Murat Torlak, Yuke Wang

**Senior Lecturers:** Charles Bernardin, Nathan Dodge, PK Rajasekaran, Marco Tacca

Goals for the Telecommunications Engineering Program

The focus of the UT Dallas' Telecommunications Engineering degree is to provide excellent education in modern communications networks and systems. Our graduates shall be uniquely qualified to apply traditional engineering design and problem solving skills in modern telecommunications.

Program Educational Objectives for Telecommunications Engineering

Within a few years after graduation, graduates of the Telecommunications Engineering Program should:

- Have a successful, long-lived, engineering based career path
- Meet the needs of industry
- Contribute to, and/or lead, engineering based teams
- Actively pursue continuing (lifelong) learning
High School Preparation

Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year each in elementary algebra, intermediate and advanced algebra, plane geometry, chemistry, and physics, thus developing their competencies to the highest possible levels and preparing to move immediately into demanding college courses in calculus, calculus-based physics, and chemistry for science majors. It is also essential that pre-engineering students have the competence to read rapidly and with comprehension, and to write clearly and correctly.

Lower-Division Study

All lower-division students in either Electrical Engineering or Telecommunications Engineering concentrate on mathematics, science and introductory engineering courses, building competence in these cornerstone areas for future application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

ABET Accreditation


Academic Progress in Telecommunications Engineering

In order to make satisfactory academic progress as a Telecommunications Engineering major, a student must meet all University requirements for academic progress, and must earn a grade of C- or better in each of the major core courses. No "Major Requirement" course (as listed under Section II of the BSTE degree requirement) may be taken until the student has obtained a grade of C- or better in each of the prerequisites (if a higher grade requirement is stated for a specific class, the higher requirement applies).

Bachelor of Science in Telecommunications Engineering

Degree Requirements (125 hours)

I. Core Curriculum Requirements\(^2\): 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Professional and Technical Communication (ECS 3390)\(^2\)

Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science elective (ECS 3361)

**Humanities and Fine Arts (6 hours)**
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

**Mathematics and Quantitative Reasoning (6 hours)**
6 hours Calculus (MATH 2417 and MATH 2419)

**Science (9 hours)**
8 hours Physics (PHYS 2325, PHYS 2125, PHYS 2326 and PHYS 2126)
4 hours Chemistry (CHEM 1311 and CHEM 1111)

II. Major Requirements: 74 hours

**Major Preparatory Courses (22 hours beyond Core Curriculum)**
- CHEM 1111 General Chemistry Laboratory
- CHEM 1311 General Chemistry
- ECS 1200 Introduction to Engineering and Computer Science
- CS 1337 Computer Science I
- CS 2336 Computer Science II
- TE 1202 Introduction to Electrical Engineering
- MATH 2417 Calculus I
- MATH 2419 Calculus II
- MATH 2420 Differential Equations with Applications
- PHYS 2125 Physics Laboratory I
- PHYS 2126 Physics Laboratory II
**PHYS 2325** Mechanics

**PHYS 2326** Electromagnetism and Waves

**Major Core Courses (52 hours beyond Core Curriculum)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CS 3340</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>CS 4141</td>
<td>Digital Systems Laboratory</td>
</tr>
<tr>
<td>CS 4341</td>
<td>Digital Logic and Computer Design</td>
</tr>
<tr>
<td>ECS 3361</td>
<td>Social Issues and Ethics in Computer Science and Engineering</td>
</tr>
<tr>
<td>ECS 3390</td>
<td>Professional and Technical Communication</td>
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<tr>
<td>EE 3150</td>
<td>Communications Systems Laboratory</td>
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<tr>
<td>ENGR 3300</td>
<td>Advanced Engineering Mathematics</td>
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<tr>
<td>EE 3350</td>
<td>Communications Systems</td>
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<tr>
<td>EE 4360</td>
<td>Digital Communications</td>
</tr>
<tr>
<td>EE 4361</td>
<td>Introduction to Digital Signal Processing</td>
</tr>
<tr>
<td>TE 3101</td>
<td>Electrical Network Analysis Laboratory</td>
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<tr>
<td>TE 3102</td>
<td>Signals and Systems Laboratory</td>
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<tr>
<td>TE 3301</td>
<td>Electrical Network Analysis</td>
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<tr>
<td>TE 3302</td>
<td>Signals and Systems</td>
</tr>
<tr>
<td>ENGR 3341</td>
<td>Probability Theory and Statistics</td>
</tr>
<tr>
<td>TE 3345</td>
<td>Data Structures and Introduction to Algorithmic Analysis</td>
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<tr>
<td>TE 4348</td>
<td>Operating Systems Concepts</td>
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<td>TE 4365</td>
<td>Introduction to Wireless Communication</td>
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<tr>
<td>TE 4367</td>
<td>Telecommunication Networks</td>
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<tr>
<td>TE 4388</td>
<td>Senior Design Project I</td>
</tr>
<tr>
<td>TE 4389</td>
<td>Senior Design Project II</td>
</tr>
<tr>
<td>TE 4390</td>
<td>Computer Networks</td>
</tr>
</tbody>
</table>
III. Elective Requirements: 9 hours

**Free Electives (9 hours)**

Both lower-and upper division courses may count as free electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation.

Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the University can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.

**Fast Track Baccalaureate/Master's Degrees**

In response to the need for advanced education in telecommunications engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student's education so that both a B.S. and an M.S. degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate course work during the senior year. Details are available from the Associate Dean for Undergraduate Education.

**Honors Program**

The Telecommunications Engineering Program offers upper-division Honors for outstanding students in the B.S. Telecommunications Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 GPA in at least 30 hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors (CE 4399) or Undergraduate Research in Telecommunications Engineering (TE 4V98) and a Senior Honors Thesis must be completed within one of those two classes. (While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project.) The other 5 honors classes can come from a mixture of Graduate level (up to a count of 4) classes and special honor sections of regular undergraduate TE classes (up to a count of 2). Current undergraduate honors courses include but are not limited to: CE 2310 or EE 2310 (H), EE 3350 or TE 3350 (H), CE 4399 and TE 4V98. Course grades in the 6 honor classes used to determine Honors status must be B- or higher to qualify.

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to M.S. Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.
Minors

The School of Engineering and Computer Science does not offer minors in Telecommunications Engineering at this time.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Hours fulfill the communication component requirement of the Core Curriculum.
3. Six hours of Calculus are counted under Mathematics Core above, and two hours of Calculus are counted as Major Preparatory Courses.
4. One hour of General Chemistry I and General Chemistry I Laboratory is counted under Science core, and three hours are counted as Major Preparatory Courses.
5. Students must pass each of the EE, CS, Math and Science courses listed in this degree plan and each of their prerequisites, with a grade of C- or better.
6. Transfer students with sufficient background may petition to substitute upper level hours in the major for this class.
7. Hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.
School of Interdisciplinary Studies

The School of Interdisciplinary Studies provides an environment that allows students to understand and integrate the liberal arts and sciences. The school administers interdisciplinary degree programs that afford students the opportunity to design their degree plans on an individualized basis. To assist the student in pursuing a course of study leading to successful completion of an undergraduate degree, the school provides a unique support structure. Included in this structure is the school's Internship Program that supports professional work experience in diverse career settings. The educational environment of Interdisciplinary Studies is especially congenial to students eager to pursue unconventional or innovative combinations of course work.

Faculty

All faculty in the university are eligible to participate.

Professors: George W. Fair, Karen J. Prager, Lawrence J. Redlinger

Associate Professor: Erin A. Smith

Senior Lecturers: Kathleen Byrnes, Candice T. Chandler, Susan P. Chizeck, Dachang Cong, Jillian Duquaine-Watson, Jonathan Frome, Patricia A. Leek, Angela McNulty, Rebekah Nix, Elizabeth M. Salter, Nancy C. Van, Tonya Wissinger

Programs

The School of Interdisciplinary Studies administers the programs for the Bachelor of Arts in American Studies, the Bachelor of Science in Healthcare Studies, the Bachelor of Arts in Interdisciplinary Studies, and the Bachelor of Science in Interdisciplinary Studies. The program in American Studies is designed for students who wish to learn more about United States’ institutions, arts, and society, both in the past and present. The Bachelor of Science in Healthcare Studies is designed for those planning to enter the healthcare professions and affiliated fields. The Bachelor of Arts and the Bachelor of Science in Interdisciplinary Studies Programs emphasize a broad learning experience and a wider perspective than that provided by traditional undergraduate majors. All programs are designed for students who wish to choose among conventional disciplines, both to explore a variety of topics and to integrate courses focusing on a particular area of interest. They are also appropriate for those students who seek a thorough grounding in the traditional arts and sciences from an interdisciplinary perspective. For students in other schools who wish to broaden their education by including a School of Interdisciplinary Studies program, the double degree is recommended. This option calls for a minimum of 30 semester credit hours at the upper division beyond those necessary for the major with the larger credit hour requirement. In addition, the student must satisfy all requirements for both majors. The School of Interdisciplinary Studies encourages double majors in American Studies, but a double major is not an option in Interdisciplinary Studies. Students seeking to double major in
American Studies must consult with the Associate Dean for Undergraduate Education in the School of Interdisciplinary Studies. The School of Interdisciplinary Studies is now working in collaboration with the Health Professions Advising Center to offer health courses under the prefix of HLTH. In order to graduate with a degree from the School of Interdisciplinary Studies, students must complete 51 hours of upper-division course work. They must complete a minimum of 45 hours at UT Dallas. In the final semester, all the course work should be taken at UT Dallas.

**Internship Program**

All undergraduates in the School of Interdisciplinary Studies are encouraged to take an internship with an organization in the community. Internships provide students with the opportunity to apply the knowledge and skills that they have mastered in their academic work. Students applying for internships must be in their junior or senior year and in good academic standing, have completed the appropriate course work, and receive approval of the Internship Director. Students normally enroll for 3 to 6 semester hours. Students interested in the program should see the Internship Director of the School of Interdisciplinary Studies or call 972/883-2354.

**Honors in the Major**

The School of Interdisciplinary Studies offers Honors Programs, which vary, by major, and provide an intellectually challenging opportunity for the brightest and best students in the School of Interdisciplinary Studies.

Junior and Senior students with a cumulative UT Dallas GPA of 3.900 are eligible to apply for the honors programs, which consist of a 30 hour defined curriculum, including an upper level writing course, and an internship component. Due to our high GPA entrance requirements, an honors thesis is not required for honors in the major. For Honors with distinction, however, an honors thesis is required. This thesis must be submitted at least one week before the end of classes, and must be nominated by the supervising professor as being of exceptional quality. The faculty of the school (or a subgroup thereof) will then determine if the thesis warrants this level of distinction. Students must apply for Departmental Honors through their academic advisor at the time they apply for graduation. For applications and more details, please consult your Interdisciplinary Studies academic advisor.

**Minors**

The School of Interdisciplinary Studies offers minors in American Studies, in Environmental Studies, in Exercise Sciences, in Gender Studies, and in Healthcare Studies. The latter is designed for students from any major who have an interest in pursuing a career in one of the healthcare fields. Students in the BA in American Studies program can pursue a minor as part of their degree plans. Students in the IS degree programs cannot have a minor. Nor is there a minor offered in Interdisciplinary Studies. The requirements for each minor are listed below the degree requirements.
Minor in American Studies

The American Studies minor is 18 semester hours. AMS 3302 and BIS 3320 are required in addition to four other approved American Studies courses chosen from AMS 3300, AMS 3321, AMS 3322, AMS 3326, AMS 3374, AMS 4360, AMS 4379, ISIS 3335, and ISIS 3336. Students pursuing a degree in American Studies can incorporate a minor from another discipline in their degree program.

Minor in Environmental Studies

This minor will provide students from all majors with a better understanding of environmental issues and the skills to analyze future environmental problems. The name "Environmental Studies" reflects the goal of this interdisciplinary minor to encourage students to learn to view environmental issues from scientific, political, and social standpoints. The 18-hour Environmental Sciences minor enables UT Dallas students to develop expertise in this important area. The framework provides all students with a policy and science perspective and allows students to tailor the minor, through choice of electives, to their individual goals. Students will be strongly encouraged to include an Environmental Studies Internship in their minor though it may not be possible for all students.

The Environmental Studies minor will be housed within the School of Interdisciplinary Studies with a Supervisory Committee consisting of Dr. Elizabeth Salter and the professors of the two required courses, Dr. Lloyd Dumas and Dr. Lynn Melton.

18 semester credit hours are required, all of which must be upper level hours.

Foundation Courses (required) (6 hours)

- ECON 4336: Environmental Economic Theory and Policy
- NATS 2333: Energy, Water, and the Environment

Electives (12 hours) (choose 4 from this list, or three from the list with one alternate course accompanied by written permission of the Supervisory Committee)

- BIOL 4324: Field Ecology
- BIS 3310: Environmental Studies Project (This course is strongly recommended.)
- ECON 4332: Energy & Natural Resources Economics
- ECON 4333: Environmental Economics
- GEOS 2302: The Global Environment
Minor in Exercise Sciences

This 18 hour minor in Exercise Sciences is ideal for students who are interested in broadening their experience and knowledge base in the study and analysis of principles related to human movement, exercise and athletics. Students will acquire new information on key domains of the field including exercise physiology, psychological approach to health, nutrition principles and injury prevention and treatment strategies. Specifically, the minor provides students with an introductory grounding in physiologic principles that help us understand not only how human systems respond to exercise stress, but also how the body changes with chronic exercise stress.

Required Courses (9 hours)

- **HLTH 1301**: Introduction to Kinesiology
- **HLTH 1322**: Human Nutrition
- **BIOL 3370**: Exercise Physiology

Upper-Level Requirements (at least 9 hours from the following courses) Note many of these courses have pre-requisites and you must have them to take the course.
Minor in Gender Studies

The minor in Gender Studies is designed to examine the ways in which gender as a complex social construction intersects with class, race, age, ethnicity, nationality, sexual orientation, and sexual identity; to examine the lives and experiences of groups that have been underrepresented in traditional academic work; and to acquaint students with the fundamental methodologies of women's and gender studies.

The Gender Studies minor is 18 semester hours. The courses consist of GST 2300/SOC 2300, two courses chosen from GST 3301/PSY 3324, GST 3302/HIST 3302, and GST 3303/SOC 3354, and nine hours chosen from: AMS 3300, BIS 3V04, CRIM 3324, GST 3301/PSY 3324, GST 3302/HIST 3302, GST 3303/SOC 3354, GST 4311, GST 4325, GST 4360/AMS 4360, GST 4380/SOC 3354, GST 3302/HIST 3302, HIST 3366, HIST 3384, HIST 4360, ISIS 3306, ISIS 3312, LIT 3327, LIT 3380, PSCI 3353, PSY 3338/CLDP 3338, PSY 4345/CLDP 4345, PSY 4346, SOC 3343, SOC 3352, or SOC 4375.

Minor in Healthcare Studies

The Healthcare Studies minor is designed for students from any major who have an interest in pursuing a career in one of the healthcare fields. Students will learn important aspects of the health profession including appropriate terminology and the foundational elements of professionalism in the healthcare setting. Students will also gain an understanding of basic biological and medical principles related to human health and disease, the fundamental aspects of the history or philosophy of healthcare, and psychological, social, or economic issues associated with healthcare or the healthcare system in America.

This minor is well suited for traditional pre-health students (medicine, dentistry, pharmacy, and optometry) as well as those interested in allied health fields (physical therapy, physician assistant studies, clinical nutrition, etc.), public health, clinical psychology, and counseling.

18 semester credit hours are required, 12 semester credit hours of which must be upper-level courses. No courses used to fulfill requirement of a major or another minor may be used.

Health Career Development Foundations
BIS 4V04 Internship or HLTH 4V04 Health Professions Internship (1-6 hours)

HLTH 1100 Career Explorations for the Health Professions

HLTH 3300 Pre-Health Professional Development

HLTH 3101 Medical Terminology

**Historical, Legal, and Philosophical Foundations**

At least one of the following courses:

- HIST 3328 History and Philosophy of Science and Medicine
- PHIL 4320 Medical Ethics or PHIL 4321 Philosophy of Medicine (both of these topics may be taken when offered)
- PSCI 4365 Law and Medicine

**Biological Foundations**

At least one of the following courses:

- BIOL 3370 Exercise Physiology
- BIOL 3455 Human Anatomy and Physiology with Lab I
- BIOL 3456 Human Anatomy and Physiology with Lab II
- HLTH 1322 Human Nutrition
- ISIS 3306 Human Female: Biology and Culture
- ISIS 3308 Bones, Bodies, and Disease
- NSC 3344 Anatomy and Physiology of Speech and Hearing
- NSC 4356 Neurophysiology
- NSC 4366 Neuroanatomy

**Psychological, Social and Economic Foundations**

At least one of the following courses:

- ECON 3330 Economics of Health
- HLTH 3301 Issues in Geriatric Healthcare
**PSY 4328** Health Psychology

**PSY 4346** Human Sexuality

**GEOG 3357** Spatial Dimensions of Health and Disease

**SOC 4372** Health and Illness

**SPAN 3341** Medical Spanish
School of Interdisciplinary Studies

American Studies (BA)

The program in American Studies focuses on the study of the cultures, institutions, legal system, political structure, and social processes of the United States. It emphasizes an interdisciplinary perspective. Students choose two broad areas or options to study.

American Studies graduates work in business, culture industries, government, legal fields, media, non-profit organizations, and sports industries. The B.A. in American Studies is also an excellent preparation for law school or graduate school. Each student designs his or her own program within specific guidelines and in consultation with an academic advisor. The courses a student takes as part of the American Studies program may be given in any school within the university but will include American Studies courses and appropriate Interdisciplinary Studies courses. A list of courses which apply to the American Studies degree may be obtained from the academic advisors in the School of Interdisciplinary Studies. Double majors including American Studies are encouraged.

Bachelor of Arts in American Studies

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BIS 3320)¹

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours History (HIST 1301 and HIST 2301)

3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (AMS 2341)²
Mathematics and Quantitative Reasoning (6 hours)

3 hours College Algebra (MATH 1306 or MATH 1314)$^2$

3 hours Statistics (STAT 1342 or PSY 2317)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 54 hours$^2$ (42 hours beyond the Core Curriculum)

Major Preparatory Courses (6 hours)

One of the following:

MATH 1306 College Algebra for the Non-Scientist$^2$

MATH 1314 College Algebra$^2$

MATH 1325 Applied Calculus$^1$

MATH 2417 Calculus I$^2$

One of the following:

PSY 2317 Statistics for Psychology$^2$

or STAT 1342 Statistical Decision Making$^2$

Major Core Courses (12 hours)

AMS 3302 American Cultures

or AMS 2341 American Studies for the Twenty-First Century$^2$ (at the lower division)

BIS 3320 The Nature of Intellectual Inquiry$^2$, 3

Two of the following courses:

HIST 3369 United States Foreign Relations

PSCI 3325 American Public Policy

PSCI 3327 American Foreign Policy

And other courses on American history or American government approved by the academic advisor

Major Related Courses (36 hours)
In addition to the core requirements, students will take 18 semester credit hours of course work in each of two of the following disciplinary options, for a total of 36 hours:

- African American Culture
- American Body Politic
- American Economic System
- American Legal System
- American Past and Present
- America and the World Community
- American Business and Technology
- American Literature and Arts
- Gender Studies
- Issues in Media and Communication
- Latino/Latina Culture
- Popular Culture

III. Elective Requirements: 36 hours

Guided Elective (1 hour)

BIS 1100 Interdisciplinary Studies Freshman Seminar

Free Electives (35 hours)

Students must complete 51 hours of upper-division course work to graduate. They must complete a minimum of 45 hours at UT Dallas. In the final semester, all the course work should be taken at UT Dallas.

Honors in American Studies

GPA: 3.900 cumulative GPA, 3.900 GPA in courses described below, and a total of 27 or 30 upper level UTD hours as described below. (The variation is determined by whether or not AMS 3302 or AMS 2341 is chosen). The total hours must be 30.

Required courses:

AMS 3302 American Cultures
or AMS 2341 American Studies for the Twenty-First Century (3 hours)

BIS 3320 The Nature of Intellectual Inquiry (3 hours)

Two of HIST 3369, PSCI 3325, PSCI 3327 or other courses on American history or American government approved by the academic advisor (6 hours)

Core Course of first chosen option area (3 hours)

Core Course of second chosen option area (3 hours)

One approved AMS course from option area 1 (3 hours)

One approved course from option area 2 (3 hours)

Options: (6 hours)

6 hours of Internship

3 hours of Internship and one approved three hour course from option area 1 or 2

Notation on Transcript: Honors in Major

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. A required major course that also fulfills a Core Curriculum requirement.

3. An additional IS course will be taken if BIS 3320 is used to satisfy the Core Curriculum Communication Elective requirement.

4. It will be 42 hours if MATH 1314, STAT 1342, BIS 3320 and AMS 2341 are taken as part of the students' core curriculum requirements.
School of Interdisciplinary Studies

Healthcare Studies (BS)

The BS in Healthcare Studies is designed to give students a multidisciplinary perspective on human health and healthcare. The curriculum consists of existing courses offered by various schools across campus that are repackaged into one multidisciplinary program. In addition to the expected combination of science courses with laboratories (32 semester credit hours or SCH), the proposed degree program also requires healthcare foundation courses offered by the School of Interdisciplinary Studies (14 SCH) as well as courses specifically related to the study of healthcare in a philosophical, historical, psychological, sociological and biological context (15 SCH). The program is designed to be a preparatory program for students continuing their education beyond the baccalaureate degree; for distinguished students in healthcare studies, the major provides excellent preparation for entry into professional schools of medicine, optometry or pharmacy. It can also be beneficial for students planning to enter graduate programs in such allied health areas as occupational therapy, physical therapy and physician assistant studies. In addition, students may choose the healthcare studies major as preparation for entry into graduate programs in areas such as healthcare management.

Bachelor of Sciences in Healthcare Studies

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BIS 3320)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours History (HIST 1301 and HIST 1302)

3 hours Social and Behavioral Sciences Elective (PSY 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)
Mathematics and Quantitative Reasoning (6 hours)

3 hours Calculus (MATH 1325 or MATH 2413 or MATH 2417)

3 hours Statistics (STAT 3332)

Science (9 hours including at least one course with a substantial laboratory component)

BIOL 2111 Modern Biology Workshop I

CHEM 1311 General Chemistry I

CHEM 1111 General Chemistry Laboratory I

PHYS 1301 College Physics I

PHYS 2125 Physics Laboratory I

II. Major Requirements: 52 hours

Foundation I: Healthcare Foundation Studies (14 hours)

HLTH 1100 Career Exploration for the Health Professions

HLTH 1322 Human Nutrition

HLTH 3101 Medical Terminology

HLTH 3300 Pre-Health Professional Development

HLTH 3305 The U.S. Healthcare System

HLTH 4304 Health Professions Internship

Foundation II: Scientific Foundation Studies (23 hours)

BIOL 2311 Introduction to Modern Biology I

BIOL 2111 Introduction to Modern Biology Workshop I

BIOL 2312 Introduction to Modern Biology II

BIOL 2112 Introduction to Modern Biology Workshop II

CHEM 1312 General Chemistry II

CHEM 1112 General Chemistry Laboratory II

PHYS 1302 College Physics II
**PHYS 2125** Physics Laboratory II

**CHEM 2323** Introductory Organic Chemistry I

**CHEM 2123** Introductory Organic Chemistry Laboratory I

**CHEM 2325** Introductory Organic Chemistry II

**CHEM 2125** Introductory Organic Chemistry Laboratory II

**Foundation III: Multidisciplinary Healthcare Studies (15 hours)**

Required (9 hours):

- HLTH 3301 Issues in Geriatric Healthcare
- HLTH 3315 Issues in Patient Education
- PSY 4328 Health Psychology or PSY 4334 Lifespan Development

And choose 6 hours from among the following:

- **HMG T 4301** Introduction to Healthcare Management
- HLTH 3310 Health Care Issues: Global Perspectives
- **ECON 3330** Economics of Health
- **GEOG 3357** Spatial Dimensions of Health & Disease
- **HIST 3328** History and Philosophy of Science and Medicine
- HLTH 4380 Special Topics in Healthcare
- **PHIL 4320** Medical Ethics
- **PHIL 4321** Philosophy of Medicine
- **PSCI 4365** Law and Medicine
- **SOC 4369** Public Health and Society
- **SOC 4371** Mental Health and Illness
- **SOC 4372** Health and Illness

**III. Elective Requirements: 26 hours**

**Prescribed Electives (1 hour)**
**UNIV 1010** Freshman Seminar

**Free Electives (25 hours)**

Students must complete a total of 51 hours of upper-level course work to graduate. A minimum of 45 hours must be taken at UT Dallas. All the course work in the final semester must be taken at UT Dallas.

Students interested in pursuing entrance into health professional schools (such as medical, dental, pharmacy or optometry schools) should seek advising on additional courses required for entrance into the particular professional school of their interest. A subset of the following courses should be considered essential and should be taken as part of their elective credits.

**BIOL 3301** Classical and Molecular Genetics
**BIOL 3101** Classical and Molecular Genetics Workshop
**BIOL 3361** Biochemistry I
**BIOL 3161** Biochemistry Workshop I
**BIOL 3455** Human Anatomy & Physiology with Lab I
**BIOL 3456** Human Anatomy & Physiology with Lab II
**BIOL 3370** Exercise Physiology
**BIOL 3V20** General Microbiology with Lab
**HLTH 4V01** Health Professions Independent Study
**ISIS 3308** Bones, Bodies & Disease
**ISIS 3309** Dental Anthropology
**NSC 3361** Behavioral Neuroscience
**NSC 4366** Neuroanatomy
**NSC 4351** Medical Neuroscience

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. A required major course that also fulfills a Core Curriculum requirement.
School of Interdisciplinary Studies

Interdisciplinary Studies (BA, BS)

The Bachelors' degrees in Interdisciplinary Studies emphasize a broad learning experience and a wider perspective than that provided by traditional undergraduate majors. They are designed to offer the student the opportunity to participate in an interdisciplinary, coherent, academically sound, and goal-oriented education directly relevant to the student's intellectual development and career aspirations. They are appropriate for those students who seek a thorough grounding in the traditional arts and sciences from an interdisciplinary perspective. Each student in the Interdisciplinary Studies program becomes an active partner in the formulation of his or her program of study, working in consultation with an academic advisor to devise an appropriate individual degree plan. Within the framework of two foundation areas, a university-wide Interdisciplinary Studies sequence, and a multidisciplinary concentration, a student may draw upon the resources of all schools of the university to create a degree program.

Common areas of concentration for the B.A.I.S. are business issues, environmental studies, human resources, international relations, law, public relations, urban studies and courses toward Teacher Certification (EC-6 and 4-8). Graduates have been accepted into graduate programs in divinity, environmental studies, the health professions, humanities, interdisciplinary studies, law, management, and social sciences. The B.S. in Interdisciplinary Studies is selected by students interested in environmental studies, the health professions, and other science-related fields. Students interested in pre-health are advised to contact Head of the Healthcare Studies during their first semester.

Minors and Double Majors are not allowed in these two Interdisciplinary Studies degrees. In order to make the Interdisciplinary Studies degrees reflect their name, no more than 21 hours of courses with the same prefix are allowed in the combined major requirements and the 6 hours of advanced electives. (All courses taught by the Naveen Jindal School of Management courses count as a single prefix.) In the major requirements and 6 hours of advanced electives, there must be a minimum of 51 hours of upper-division courses. In the concentration, a minimum of three (3) prefixes must be represented. Please consult an academic advisor for further elaboration.

Bachelor of Arts in Interdisciplinary Studies

Degree Requirements (120 hours)

I. Core Curriculum Requirements‡: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (BIS 3320)\(^1\)  

Social and Behavioral Sciences (15 hours)  
6 hours Government (GOVT 2301 and GOVT 2302)  
6 hours American History  
3 hours Social and Behavioral Sciences Elective  

Humanities and Fine Arts (6 hours)  
3 hours Fine Arts (ARTS 1301)  
3 hours Humanities (HUMA 1301)  

Mathematics and Quantitative Reasoning (6 hours)  
3 hours College Algebra (MATH 1306 or MATH 1314)\(^2\)  
3 hours Statistics (STAT 1342 or PSY 2317)\(^2\)  

Science (9 hours including at least one course with a substantial laboratory component)  

II. Major Requirements: 60 hours\(^2\) (51 hours beyond the Core Curriculum)  

Major Preparatory Courses (6 hours)  
MATH 1306 College Algebra for the Non-Scientist\(^2\)  
or MATH 1314 College Algebra  
STAT 1342 Statistical Decision Making\(^2\)  
or PSY 2317 Statistics for Psychology\(^2\)  

Major Core Courses (12 hours)  
One 3 hour ISIS course  
One 3 hour IS course offered by another school (ISAH, ISEC, ISNS, or ISSS)  
One 3 hour course chosen from AMS, GST or ISIS, or BIS 4 V04 (internship)  
BIS 3320 The Nature of Intellectual Inquiry\(^2\)\(^,\)\(^1\)  

Major Related Courses (42 hours) consisting of:  
Two Foundations: 12 hours each (24 credit hours)
The two foundations are drawn from the Schools of Arts and Humanities, Behavior and Brain Sciences, Computer Science, Economic, Political and Policy Sciences, Interdisciplinary Studies, Management, and Natural Sciences and Mathematics.

**One Concentration: 18 hours**

Each student devises, in consultation with his/her advisor, the topic for the Concentration and selects 18 semester credit hours of course work related to the topic, drawn from at least three academic disciplines.

Appropriate IS course work may be selected.

**III. Elective Requirements: 27 hours**

<table>
<thead>
<tr>
<th>Guided Elective (1 hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIS 1100</strong> Interdisciplinary Studies Freshman Seminar</td>
</tr>
</tbody>
</table>

| Free Electives (26 hours)² |

Students must complete 51 hours of upper-division course work to graduate. A minimum of 45 hours must be taken at UT Dallas. All the course work in the final semester must be taken at UT Dallas.

**Honors in Interdisciplinary Studies (BA)**

GPA: 3.900 cumulative GPA, 3.900 GPA in courses described below, and a total of 30 upper level UT Dallas hours as described below.

**Required courses:**

| **BIS 3320** The Nature of Intellectual Inquiry (3 hours) |

Foundation I (3 hours)

Foundation II (3 hours)

**Concentration (15 hours)**

**Options: (6 hours)**

- 6 hours of Practice Teaching
- 6 hours of Internship
- 3 hours of Internship and one three hour ISIS/AMS/GST course

**Notation on Transcript:** Honors in Major
Bachelor of Science in Interdisciplinary Studies

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BIS 3320)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 1325 and MATH 1326 or MATH 2417 and MATH 2419)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 60 hours (51 hours beyond the Core Curriculum)

Major Preparatory Courses (6-8 hours)
- Either MATH 1325 Applied Calculus I^1,2 and MATH 1326 Applied Calculus II^1,2
  or MATH 2417 Calculus I^1,2 and MATH 2419 Calculus II^1,2

Major Core Courses (12 hours)
- Three Science IS courses
  - BIS 3320 The Nature of Intellectual Inquiry^2,4

Major Related Courses (42 hours) consisting of:
- Two Foundations: 12 hours each (24 student credit hours)
Foundation I consists of courses taught by the School of Natural Sciences and Mathematics, Computer Science, or Science courses from the School of Behavior and Brain Sciences.

Foundation II is drawn from Arts and Humanities, Behavior and Brain Sciences (if not used for Foundation I), Computer Science (if not used in Foundation I), Economical, Political and Policy Sciences, Interdisciplinary Studies, and Management.

One Concentration: 18 hours

Each student devises, in consultation with his/her advisor, the topic for the Concentration and selects 18 semester credit hours of course work related to the topic, drawn from at least three academic disciplines. Appropriate IS course work may be selected. Three courses must be science courses and one must be a statistics course.

III. Elective Requirements: 27 hours

Guided Elective (1 hour)

BIS 1100 Interdisciplinary Studies Freshman Seminar

Free Electives (26 hours) ²

Honors in Interdisciplinary Studies (BS)

GPA: 3.900 cumulative GPA, 3.900 GPA in courses described below, and a total of 30 upper level UT Dallas hours as described below.

Required courses:

BIS 3320 The Nature of Intellectual Inquiry (3 hours)

Foundation I - Natural Science and Mathematics (6 hours)

Concentration (15 hours)

Options: (6 hours)

6 hours of Practice Teaching

6 hours of Internship

3 hours of Internship and one three hour ISIS/AMS/GST course

Notation on Transcript: Honors in Major

Highly Recommended
Internships, basic computer skills, foreign languages, international studies, and courses in literature and history, offered by the School of Interdisciplinary Studies are highly recommended in all Interdisciplinary Studies degree plans. Students should consult closely with their advisors on particular areas of interest they wish to include in their programs.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required major course that also fulfills a Core Curriculum requirement.
3. An additional ISIS course will be taken if BIS 3320 is used to satisfy the Core Curriculum Communication Elective requirement.
4. It will be 51 hours if MATH 1314, STAT 1342, and BIS 3320 are taken as part of the students' core curriculum requirements.
5. An additional (or fourth) ISIS course (science or non-science) will be taken if BIS 3320 is used to satisfy the Core Curriculum Communication Elective requirement.
6. An additional ISIS course will be taken if BIS 3320 is used to satisfy the Core Curriculum Communication Elective requirement.
7. Students may elect to substitute MATH 2417 and MATH 2419 for MATH 1325 and MATH 1326 and count two of the credit hours as Free Electives.
8. It will be 51 hours if MATH 1325, MATH 1326 and BIS 3320 are taken as part of the students' core curriculum requirements.
Naveen Jindal School of Management

The Naveen Jindal School of Management's mission is to meet the challenges of a rapidly changing, technology driven, global society by partnering with the business community to:

- Conduct research enhancing management knowledge;
- Deliver high quality management education to a diverse group of undergraduate and graduate students and practicing executives;
- Develop, innovate and continuously improve programs advancing management education and practice.

The Naveen Jindal School of Management is committed to providing our students with an outstanding educational experience that will expand and hone their skill sets, help them become leaders of business and leave them with strong career prospects. Focusing on the rapidly changing challenges of our technology-driven global society, many of the School's programs have been instituted in response to requests from business and designed to meet the needs of tomorrow's industry. Our programs stress innovations in the latest technologies while providing a foundation in the basics of business management.

The Bachelor of Science degree in Business Administration is designed to provide students with a broad preparation for a business career and to lay the foundation for further study in business administration. Emphasis is placed on problem solving techniques that are crucial in the modern business environment. The Bachelor of Science in Business Administration offers concentrations in Innovation and Entrepreneurship, Real Estate, Healthcare Management, and Organizational Behavior Human Resources Management in addition to the general degree. Double majors with Biology and Molecular Biology are offered in conjunction with the Biology Department.

The program leading to the degree of Bachelor of Science in Accounting provides students a broad-based education that balances conceptual with pragmatic knowledge and exposes accounting students to other related areas. The objective of the program is to develop professionals who understand the role of information in organizations and financial markets; have the necessary skills to integrate financial analysis and information technology; and possess analytical and management functional area skills. Completion of this program will enable students to seek careers in information-intensive organizations as information managers, consultants or financial analysts. Students who desire a comprehensive accounting education and are seeking to become Certified Public Accountants are advised to pursue the 150 credit-hour, B.S. and M.S. Fast-Track Program in Accounting. Students who successfully complete both degrees may choose to sit for the CPA examination upon completion of the 150 semester-hour educational requirement of the Texas State Board of Public Accountancy.

The Bachelor of Science degree in Finance provides students with both practical and theoretical training in financial decision making. Students who choose this degree will have the opportunity to develop the skills required to analyze financial information, to make sound personal or business financial decisions, as
The Bachelor of Science degree in Global Business provides students with the knowledge and skills required for succeeding as a global manager while developing an understanding of the cultural, political and regulatory environments that shape international business and trade. Students who enroll in this program will learn the skills necessary for understanding the international business environments and financial markets, cross-cultural communication and negotiation, international human resource management, formulating and implementing global strategy, as well as marketing on a global basis. Completion of this program will enable students to seek careers in multinational corporations, consultancy firms, or internationally oriented organizations that operate in today’s increasingly globalized economy.

The Bachelor of Science degree in Management Information Systems provides students with both practical and theoretical training in information technology which has become an integral part of every aspect of business. The objective of the program is to prepare professionals who understand business processes and the information required to support them, have the IT expertise to automate, improve, and re-engineer business processes; and develop an ability to keep up with the changing technology and information needs of business. Completion of the degree requirements will permit students to seek careers as business analysts, application developers, and IT consultants in many industries including corporations and government agencies. With the appropriate choice of courses, a student should be able to successfully get certified in areas such as SAP, SAS Business Intelligence, and Information Security.

The Bachelor of Science degree in Marketing provides students with the necessary knowledge to make good marketing decisions. Students will be exposed to the theoretical foundations of marketing in addition to obtaining practical training needed to make decisions with respect to sales management, customer service, pricing, promotions, market research, and marketing strategy. Students will have the opportunity to develop their analytical and quantitative skills required to analyze marketing and sales data, to formulate strategic responses to competitive moves, and to develop long term and short term marketing plans. Students who complete this degree can seek careers in sales, marketing research, brand management, and advertising and promotions.

The Bachelor of Science in Supply Chain Management prepares students to recognize the needs of consumers and how to serve them better by designing, producing, and managing superior products and services with a ‘bottom line’ perspective. Students will also learn how to think strategically while focusing on effective analysis. The proposed program places emphasis on three important elements: 1) supply chain management, 2) logistics and distribution, and 3) purchasing and sourcing. The secondary goal is to prepare students for a variety of roles in private, non-profit, and government sectors. Completion of degree requirements will prepare students for graduate study or entry-level management roles.
analyst positions in consultancy, operations, logistics and distribution, manufacturing, purchasing and sourcing, warehousing, information technology, and various other industrial sectors.

All degrees contain a central core of 25-28 hours. In the core courses, students have an opportunity to learn theories and analytical techniques that can be applied to the functional areas of business, such as finance and marketing. They are exposed to the international dimensions of business activities and to social and political factors that impinge on business behavior. A capstone course in strategic management provides an integrative experience where students are challenged to solve real world business problems. Fifty percent of the total business credit hours must be taken at UT Dallas. Students may use a maximum of 9 credit hours of online-only distance learning business courses toward their degree.

Students are also required to take courses outside the Naveen Jindal School of Management in order to broaden their educational experience in preparation for leadership roles as professionals and/or managers in the modern business organization.

Faculty


Associate Professors: Nina Baranchuk, Indranil Bardhan, Norris Bruce, Metin Cakanyildirim, Huseyin Cavusoglu, Daniel Cohen, Richard Harrison, Ernan Haruvy, Ganesh Janakiraman, Surya Janakiraman, Robert Kieschnick, Nanda Kumar, Seung-Hyun Lee, Livia Markoczy, Stan Markov, Syam Menon, Alp Muharremoglu, R. Natarajan, Ashutosh Prasad, Orlando Richard, Young Ryu, Jane Salk, David Springate, Ying Xie, Yexiao Xu, Yuan Zhang, Feng Zhao, Eric Zheng

Assistant Professors: Mehmet Ayvachi, Jianqing Chen, Zhonglan Dai, Rebecca Files, Bernhard Ganglmair, Xianjun Gong, Elisabeth Honka, Jun Li, Bin Li, Meng Li, Ningzhong Li, Elizabeth Lim, Arzu Ozoguz, Valery Polkovnichenko, Roberto Ragozzino, Alessio Saretto, Harpreet Singh, Gonca Soysal, Andrei Strijnev, Upender Subramanian, Yu Wang, Malcolm Wardlaw, Kelsey Wei, Han Xia, Yuanping Ying, Alejandro Zentner, Jun Zhang, Yibin Zhou

Visiting Professor: Usman Ghani, Harini Mittal, Ishwar Murthy

Visiting Assistant Professor: Emily Choi
Clinical Faculty: Hans-Joachim Adler, Larry Chasteen, David Cordell, Tsvitik Dalgic, Howard Dover, Michael Deegan, Forney Fleming, Pamela Foster Brady, Ayfer Gurun, Randall Guttery, Charlie Hazzard, Robert Hicks, Marilyn Kaplan, Peter Lewin, Vance Lewis, John F. McCracken, Dennis McCuistion, Mark McNabb, Radha Mookerjee, Kumar Nair, Joseph Picken, Divakar Rajamani, Carolyn Reichert, Robert Robb, Rajiv Shah, Mark Thouin, C. Justice Tillman, Joe Wells, Habte Woldu, Fang Wu, Laurie Ziegler

Senior Lecturers: Art Agulnek, Shawn Alborz, Frank Anderson, John Barden, Abhijit Biswas, Ron Blair, Daniel Bolscher, Tiffany Bortz, Richard Bowen, Judd Bradbury, Bobby Chang, George DeCourcy, Gene Deluke, Alexander Edsel, Amal El-Ashmawi, Judith Feld, Carol Flannery, Mary Beth Goodrich, Maria Hasenhuttl, Julie Haworth, Jennifer Johnson, Jackie Kimzey, Chris Linstead, Diane S. McNulty, Madison Pedigo, Jared Pickens, Nataliya Polkovnichenko, Matt Polze, Kannan Ramanathan, Jim Richards, Mark Salamasick, Awanti Sethi, Jeanne Sluder, Steven Solcher, Lou Thompson, Amy Troutman, McClain Watson

Davidson Management Honors Program

The Davidson Management Honors Program provides an intellectually challenging and stimulating academic experience in a unique learning environment for the best and brightest students. Incoming freshmen are considered for membership based on high school class rank, SAT/ACT scores and leadership activities in high school. Other students that have earned at least a 3.500 grade point average in a minimum of 15 hours at UT Dallas with no more than 60 hours of total college credit may also apply. To graduate with Management Honors students must have a minimum of a 3.500 GPA based on at least 30 graded hours at UT Dallas and complete an honors curriculum along with satisfying other program requirements. Management Honors with Distinction are awarded to students whose thesis is judged by the faculty to be of exemplary quality. Applications and detailed information are available in the Naveen Jindal School of Management Advising Office.

Professional Program in Accounting

The Professional Program in Accounting (PPA) is designed for students who wish to pursue a career in professional accounting. This program is a two-and-a-half year program beginning in the spring semester of the student's junior year. Qualified students will earn their Bachelor of Science in Accounting degree once all degree requirements for the bachelor's degree have been satisfied, additionally, the Master of Science in Accounting (MS-ACCT) degree will be awarded upon successful completion of requirements for that degree. The goals of the program are to place PPA students in professional accounting internships and full-time positions, increase networking opportunities among students with professionals, and prepare students to become Certified Public Accountants. Applications to the program are accepted in the fall semester of a student's junior year. Applications and detailed information are available in the Naveen Jindal School of Management Advising Office.

Fast Track Baccalaureate/Master's Degrees
Fast Track programs are designed to permit undergraduate students enrolled at UT Dallas to begin work on the MBA or M.S. degrees before graduation. Qualified seniors may take graduate courses in Management that will apply toward the Bachelor of Science degree and also satisfy requirements for the Master's degree. These courses are selected from a list determined by the School.

Fast Track courses taken during the undergraduate senior year must be well chosen so that they satisfy the requirements of the B.S. degree AND those of the intended MBA/M.S. degree. Students in one major may choose to Fast Track into another major. Students can take the Fast Track courses as substitutes for major related courses, as guided and/or Free Electives. Students from other Schools at UTD can Fast Track into JSOM degrees as long as they meet the Fast Track admission requirements. Students must earn a grade of at least B in Fast Track courses - otherwise the courses only count toward the undergraduate degree.

Admission to a Fast Track program does not guarantee admission to the graduate program. Students are required to meet the admission requirements of the MBA and M.S. programs to which they apply, including the GMAT. Students may delay for up to one year entering the graduate program and have their Fast Track courses count toward their graduate degree.

Students can also take graduate courses to apply toward either undergraduate or graduate credit. Students must submit an acceptable GMAT score and receive permission from the Associate Dean before taking more than 12 graduate hours for any use. Details of the programs are available from the Naveen Jindal School of Management Advising Office.

**Fast Track Options in the Naveen Jindal School of Management**

**Fast Track B.S. / MBA:** The MBA program is a 53 hour program. Qualified seniors may take up to 12 hours of graduate courses that will apply to the B.S. degree and the MBA degree.

**Fast Track B.S. / M.S. in Accounting:** The M.S. in Accounting is a 36 hour program. It is primarily designed to permit students to meet the educational requirements of the Texas State Board of Public Accountancy to become Certified Public Accountants. Qualified seniors may take up to 6 hours of graduate courses that will apply to the B.S. degree and the M.S. degree.

**Fast Track B.S. / M.S. in Finance:** Students choose from four tracks. The investment management track permits students interested in career paths that require Chartered Financial Analyst (CFA®) certification to take the graduate finance courses that are required to master the complex topics covered on the CFA® examination. The financial analyst track is designed for students interested in pursuing corporate finance related careers (e.g., investment banking, venture capital, private equity, corporate turnarounds, etc.) The financial engineering and risk management track is designed for students with the quantitative ability to pursue a career applying quantitative methods to investment and risk management problems. The financial management track allows students to tailor their course work for careers in a range of activities.

**Fast Track B.S. / M.S. in Management and Administrative Science:** Students may choose concentrations in Electronic Commerce, Strategy, and Innovation and Entrepreneurship. Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for an M.S. degree.
Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for an M.S. degree.

Fast Track B.S. / M.S. in Healthcare Management: Students in the Business-Biology double major can Fast Track into this M.S. degree by selecting their business electives appropriately. Students in other majors can Fast Track into this degree by using Free Electives for the Fast Track courses. Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for an M.S. degree.

Fast Track B.S. / M.S. in Information Technology and Management: Students may choose a concentration in Enterprise Systems, Healthcare Systems and Information Security. Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for an M.S. degree.

Fast Track B.S. / M.S. in International Management Studies: The program provides students the opportunity to learn in-depth the fundamentals of functional areas of management, international management, and cultural, sociopolitical and geographical constraints affecting international business decisions. Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for the M.S. degree.

Fast Track B.S. / M.S. in Management and Administrative Science: Students may choose concentrations in Electronic Commerce, Strategy, and Innovation and Entrepreneurship. Qualified seniors may take up to 9 hours of graduate courses that will apply to the Bachelor of Science degree and also satisfy the requirements for an M.S. degree.

Fast Track B.S./ M.S. in Supply Chain Management: Students explore the key issues associated with the design and management of industrial supply chains. Qualified seniors may take up to 9 hours of graduate courses that will apply to the B.S. degree and also satisfy the requirements for the M.S. degree.

Minors

Minors are available in Business Administration, Accounting, Business Intelligence and Analytics, Enterprise Systems, Finance, Innovation and Entrepreneurship, Marketing, and Organizational Behavior. Human Resource Management.

For a minor in Business Administration, students must take: OBHR 3310, MKT 3300, BCOM 3311, and MIS 3300 with an addition 6 hours of upper division JSOM coursework as approved by the program director (students may not double count courses for both their major and their minor; thus, additional electives may need to be added). All course prerequisites must be met.

For a minor in Accounting, students must take:

ACCT 2301 Introductory Financial Accounting
ACCT 2302 Introductory Management Accounting
ACCT 3331 Intermediate Financial Accounting I
ACCT 3350 Fundamentals of Taxation
ACCT 4342 Analysis and Design of Accounting Systems
ACCT One Elective must be upper level (ACCT 3XXX or 4XXX) Accounting course

All course prerequisites must be met.

For a minor in Business Intelligence and Analytics, students must take STAT 3360, MIS 4300 or CS 4347, MIS 4350, MIS 4351, MIS 4352, and one course from the following list of courses: MIS 3320, MKT 4330. Students pursuing this minor should be proficient in MS Excel and MS Access. The course prerequisite of MIS 3300 will be exempt. All other prerequisites should be met.

For a minor in Enterprise Systems, students must take ACCT 2301, MIS 4300 or CS 4347, and MIS 4340, with an additional 9 hours to be selected from the following list of courses: MIS 4330 or CS 4376, MIS 4351, OPRE 4320, ACCT 3322, MIS 4342. Students completing the enterprise systems minor will be eligible to participate in SAP Business One and/or TERP 10 certification programs. Students pursuing this minor should be proficient in MS Excel and MS Access. The course prerequisite of MIS 3300 will be exempt. All other prerequisites should be met.

For a minor in Finance, students must take: ACCT 2301, FIN 3320, FIN 3390, and an additional nine hours to be selected from upper-level finance courses listed as options under the finance degree. All course prerequisites must be met.

For a minor in Innovation and Entrepreneurship, students must take MKT 3300, ENTP 3301, and 9 hours selected from the following: ENTP 3360 or FIN 3360, ENTP 4311, ENTP 4320 or ENTP 4350, with an additional 3 hours to be selected from the following: the remaining ENTP course listed above not previously taken ENTP 3320 or ENTP 3321, ENTP 4340, ENTP 4360, or ENTP 4V90. All course prerequisites must be met.

For a minor in Marketing, students must take MKT 3300, MKT 3340, MKT 3320, and MKT 3330 with an additional six hours to be selected: MKT 4380 Capstone, MKT 4331 (CRM), MKT 4332 Advanced Personal Selling, 4V90 Internship, MKT 4350 Advertising, MKT 4340 Consumer Behavior or MKT 4V8 3 Individual Study in Marketing. All course prerequisites must be met.
For a minor in Organizational Behavior Human Resource Management, students must take: OBHR 3310, OBHR 3311, OBHR 3330, OBHR 4350 and OBHR 4360 with an addition 3 hours of upper division OBHR coursework as approved by the program director (students may not double count courses for both their major and their minor; thus, additional electives may need to be added). All course prerequisites must be met.
Naveen Jindal School of Management

Bachelor of Science in Accounting

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 72 hours

Major Preparatory Courses (18 hours)

ACCT 2301 Introductory Financial Accounting
ACCT 2302 Introductory Management Accounting
BLAW 2301 Business and Public Law
ECON 2301 Principles of Macroeconomics
**Major Core Courses (25 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 3100</td>
<td>Professional Development</td>
</tr>
<tr>
<td>BCOM 3311</td>
<td>Business Communication</td>
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<tr>
<td>BCOM 4350</td>
<td>Advanced Business Communication</td>
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<td>FIN 3320</td>
<td>Business Finance</td>
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<tr>
<td>MIS 3300</td>
<td>Introduction to Management Information Systems</td>
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<tr>
<td>OPRE 3310</td>
<td>Operations Management</td>
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<tr>
<td>OBHR 3310</td>
<td>Organizational Behavior</td>
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<tr>
<td>MKT 3300</td>
<td>Principles of Marketing</td>
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<tr>
<td>BPS 4305</td>
<td>Strategic Management</td>
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<tr>
<td>IMS 3210</td>
<td>International Business</td>
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**Major Related Courses (18 hours)**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ACCT 3331</td>
<td>Intermediate Financial Accounting I</td>
</tr>
<tr>
<td>ACCT 3332</td>
<td>Intermediate Financial Accounting II</td>
</tr>
<tr>
<td>ACCT 3341</td>
<td>Cost Management Systems</td>
</tr>
<tr>
<td>ACCT 3350</td>
<td>Fundamentals of Taxation</td>
</tr>
<tr>
<td>ACCT 4334</td>
<td>Auditing</td>
</tr>
<tr>
<td>ACCT 4342</td>
<td>Analysis and Design of Accounting Systems</td>
</tr>
</tbody>
</table>
Guided Electives (12 hours)

Electives may be any undergraduate chosen from a list of courses approved by the Director of Accounting Programs.

Students wishing to fast-track into the graduate program in accounting may take up to six hours of graduate ACCT electives.

III. Elective Requirements: 6 hours

Free Electives (5 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. These hours are counted under Mathematics Core above; students may substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.
5. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Business Administration

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)

- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

- 6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 52-58 hours

Major Preparatory Courses (18 hours)

- ACCT 2301\textsuperscript{1} Introductory Financial Accounting
- ACCT 2302\textsuperscript{2} Introductory Management Accounting
- BLAW 2301 Business and Public Law
- ECON 2301\textsuperscript{2} Principles of Macroeconomics\textsuperscript{2}
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ECON 2302</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>MATH 1325</td>
<td>Applied Calculus I</td>
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<td>MATH 1326</td>
<td>Applied Calculus II</td>
</tr>
<tr>
<td>OPRE 3333</td>
<td>Quantitative Business Analysis</td>
</tr>
<tr>
<td>or MATH 2333</td>
<td>Matrices, Vectors, and Their Application</td>
</tr>
<tr>
<td>STAT 3360</td>
<td>Probability and Statistics for Management and Economics</td>
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<tr>
<td>or OPRE 3360</td>
<td>Managerial Methods in Decision Making Under Uncertainty</td>
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**Major Core Courses (25 hours)**

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<td>BCOM 3311</td>
<td>Business Communication</td>
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<td>BCOM 4350</td>
<td>Advanced Business Communication</td>
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<td>FIN 3320</td>
<td>Business Finance</td>
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<td>MIS 3300</td>
<td>Introduction to Management Information Systems</td>
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<td>OPRE 3310</td>
<td>Operations Management</td>
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<td>OBHR 3310</td>
<td>Organizational Behavior</td>
</tr>
<tr>
<td>MKT 3300</td>
<td>Principles of Marketing</td>
</tr>
<tr>
<td>BPS 4305</td>
<td>Strategic Management</td>
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<tr>
<td>IMS 3310</td>
<td>International Business</td>
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**Major Related Courses (12-18 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</table>

**General Business (18 hours)**

Required for all students: ENTP 3301 Entrepreneurship

Breadth Core Courses for students not choosing a concentration. Select 15 hours from the following with at least 1 course from 3 of the 6 groups:

**Group 1: Management - OBHR prefix**

**Group 2: Marketing - MKT prefix**
Group 3: Finance and Accounting - ACCT or FIN prefix

Group 4: Information Systems - MIS prefix

Group 5: Business Environment - BPS, BLAW, HMGT, or IMS prefixes

Group 6: Operations Management - OPRE prefix

For Students Choosing a Concentration

**Core Courses for the Innovation and Entrepreneurship Concentration:** (12 hours)

- ENTP 3301 Entrepreneurship
- ENTP 3360 Entrepreneurial Finance
  or FIN 3360 Entrepreneurial Finance
- ENTP 4311 Entrepreneurial Strategy & Business Models
- ENTP 4320 Small Business Management
  or ENTP 4350 Corporate Entrepreneurship

**Core Courses for the Organizational Behavior Concentration:** (15 hours)

- ENTP 3301 Entrepreneurship
- OBHR 3311 Principles of Management
- OBHR 3330 Introduction to Human Resource Management
- OBHR 4350 Introduction to Leading and Managing
- OBHR 4360 Advanced Organizational Behavior and Leadership

**Core Courses for the Real Estate Concentration:** (15 hours)

- ENTP 3301 Entrepreneurship
- MIS 3320 Business Analytics using Excel
  or FIN 3390 Introduction to Financial Modeling
REAL 3305 Real Estate Principles
REAL 3365 Real Estate Finance and Advanced Principles
REAL 4321 Real Estate Law and Contracts

Core Courses for the Healthcare Management Concentration (12 hours)

ENTP 3301 Entrepreneurship
HMGT 4301 Introduction to Healthcare Management
HMGT 3311 Healthcare Accounting
HMGT 4321 Introduction to Healthcare Information Systems

Guided Electives for Concentrations:

Innovation and Entrepreneurship Concentration: (12 hours)

Guided Entrepreneurship Electives (9 hours selected from the following. At least 3 hours must have an ENTP prefix.)

The remaining Entrepreneurship Core Course not taken above (i.e., either ENTP 4320 Small Business Management or ENTP 4350 Corporate Entrepreneurship)

ENTP 3320 Start-up Launch I
ENTP 4321 Start-up Launch II
ENTP 4340 Social Entrepreneurship
ENTP 4360 Innovation & Creativity
ENTP 4V90 Innovation and Entrepreneurship Internship
IMS 4310 Export Market Development
or IMS 4320 International Marketing
MKT 3330 Introduction to Professional Selling
MKT 3340 Marketing Research
MKT 4330 Digital and Internet Marketing

Another upper level course may be substituted for the non-ENTP courses listed above with advance permission.

Organizational Behavior Concentration: (9 hours)

Nine hours to be selected from:
OBHR 3320 Groups and Teams

OBHR 4300 Management of Non-Profit Organization

OBHR 4310 Business Ethics

OBHR 4331 Compensation and Benefits Administration

OBHR 4333 Performance Management

OBHR 4334 Talent Acquisition and Management

OBHR 4352 Negotiation and Dispute Resolution

OBHR 4354 Leading Organizational Change

OBHR 4356 Power and Influence in Organizations

OBHR 4358 Transformational Leadership, Ethics, and Social Responsibility

Healthcare Management Concentration: (12 hours)

Twelve hours to be selected from:

HMGT 4331, HMGT 4341, OBHR 4350, OBHR 4310, MIS 4300, OBHR 4352, MKT 4321, OPRE 3320, OPRE 4310, PA 3333, ECGN 3330, or SPAN 3341.

Real Estate Concentration: (9 hours)

Nine hours to be selected from:

FIN 3360, FIN 4300, GEOG 3304, MIS 4300, MKT 3340, MKT 4321, OBHR 4352, OPRE 3330, PA 3377, REAL 4326, REAL 4365, REAL 4V80, or REAL 4V90.

III. Elective Requirements: 20-26 hours

Free Electives (7-16 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. These hours are counted under Mathematics Core above; students may substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.
5. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Business Administration and Biology (Double Major)

Degree Requirements (143 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Sciences Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 2413 and MATH 2414)

Science (9 hours)
- 9 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112 and CHEM 2123)

II. Major Requirements: 89 hours

Business Major Preparatory Courses (16 hours beyond Core Curriculum)
- ACCT 2301, Introductory Financial Accounting
- ACCT 2302, Introductory Management Accounting
- BA 3100, Professional Development
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<td>BLAW 2301</td>
<td>Business and Public Law</td>
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<td>ECON 2301</td>
<td>Principles of Macroeconomics</td>
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<td>OPRE 3333</td>
<td>Quantitative Business Analysis</td>
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<td>or MATH 2333</td>
<td>Matrices, Vectors, and Their Application</td>
<td>3.5</td>
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<tr>
<td>BCOM 3311</td>
<td>Business Communication</td>
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<td>BCOM 4350</td>
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<td>FIN 3320</td>
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<td>MIS 3300</td>
<td>Introduction to Management Information Systems</td>
<td></td>
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<td>OPRE 3310</td>
<td>Operations Management</td>
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<td>OBHR 3310</td>
<td>Organizational Behavior</td>
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<td>Probability and Statistics for Management and Economics</td>
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<td>or STAT 3332</td>
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<td>or OPRE 3360</td>
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**Business Core Courses (27 hours)**

**Biology Major Preparatory Courses (17 hours beyond Core Curriculum)**

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<tr>
<td>CHEM 1311</td>
<td>General Chemistry I</td>
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<tr>
<td>CHEM 1312</td>
<td>General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 2123</td>
<td>Introductory Organic Chemistry Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 2125</td>
<td>Introductory Organic Chemistry Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Credits</td>
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<tr>
<td>------------</td>
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<td>---------</td>
</tr>
<tr>
<td>CHEM 2323</td>
<td>Introductory Organic Chemistry I</td>
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<td>CHEM 2325</td>
<td>Introductory Organic Chemistry II</td>
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<td>MATH 2413</td>
<td>Differential Calculus and MATH 2414 Integral Calculus</td>
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<td>PHYS 2325</td>
<td>Mechanics and PHYS 2125, Physics Laboratory I</td>
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<tr>
<td>PHYS 2326</td>
<td>Electromagnetism and Waves and PHYS 2126 Physics Laboratory II</td>
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### Biology Core Courses (29 hours)

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<td>BIOL 2112</td>
<td>Introduction to Modern Biology Workshop II</td>
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</tr>
<tr>
<td>BIOL 2281</td>
<td>Introductory Biology Laboratory</td>
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</tr>
<tr>
<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
<td>5</td>
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<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
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</tr>
<tr>
<td>BIOL 3101</td>
<td>Classical and Molecular Genetics Workshop</td>
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<tr>
<td>BIOL 3102</td>
<td>Eukaryotic Molecular and Cell Biology Workshop</td>
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<tr>
<td>BIOL 3161</td>
<td>Biochemistry Workshop I</td>
<td></td>
</tr>
<tr>
<td>BIOL 3162</td>
<td>Biochemistry Workshop II</td>
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<td>BIOL 3301</td>
<td>Classical and Molecular Genetics</td>
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<td>BIOL 3302</td>
<td>Eukaryotic Molecular and Cell Biology</td>
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</tr>
<tr>
<td>BIOL 3361</td>
<td>Biochemistry I</td>
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<tr>
<td>BIOL 3362</td>
<td>Biochemistry II</td>
<td></td>
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<tr>
<td>or BIOL 3335</td>
<td>Microbial Physiology</td>
<td></td>
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<tr>
<td>BIOL 3380</td>
<td>Biochemistry Laboratory</td>
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### III. Elective Requirements: 12 hours

#### Guided Electives (12 hours)

Business: (9 hours) to be selected from any upper-level JSOM course. If qualified, the student may select from JSOM graduate courses.
Biology: (3 hours) **BIOL 4380** Cell and Molecular Biology Laboratory or approved upper-level biology course.

1. **Degree is 144 hours** if students are required to take BA 1100.

2. **Curriculum Requirements** can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Biology Major Preparatory Courses.

5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

6. Students may substitute MATH 2418 or CS 2305.

7. Students may substitute MATH 2413 and MATH 2414 by taking MATH 2417 and MATH 2419.
Naveen Jindal School of Management

Bachelor of Science in Business Administration and Molecular Biology (Double Major)

Degree Requirements (144 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Sciences Elective (ECON 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2417 and MATH 2419)

Science (9 hours)

9 hours (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112, and CHEM 2123)

II. Major Requirements: 93 hours

Business Major Preparatory Courses (16 hours beyond Core Curriculum)

ACCT 2301 Introductory Financial Accounting

ACCT 2302 Introductory Management Accounting
BA 3100 Professional Development
BLAW 2301 Business and Public Law
ECON 2301 Principles of Macroeconomics
ECON 2302 Principles of Microeconomics
OPRE 3333 Quantitative Business Analysis
or MATH 2333 Matrices, Vectors, and Their Application

Business Core Courses (27 hours)

BCOM 3311 Business Communication
BCOM 4350 Advanced Business Communication
FIN 3320 Business Finance
MIS 3300 Introduction to Management Information Systems
OPRE 3310 Operations Management
OBHR 3310 Organizational Behavior
MKT 3300 Principles of Marketing
BPS 4305 Strategic Management
IMS 3310 International Business
STAT 3360 Probability and Statistics for Management and Economics
or STAT 3332 Statistics for Life Sciences
or OPRE 3360 Managerial Methods in Decision Making Under Uncertainty

Biology Major Preparatory Courses (17 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory
CHEM 1112 General Chemistry Laboratory
CHEM 1311 General Chemistry
CHEM 1312 General Chemistry
CHEM 2123 Introductory Organic Chemistry Laboratory
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<td>Introductory Organic Chemistry Laboratory II</td>
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<td>CHEM 2323</td>
<td>Introductory Organic Chemistry I</td>
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<td>MATH 2417</td>
<td>Calculus I</td>
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<tr>
<td>MATH 2419</td>
<td>Calculus II</td>
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<tr>
<td>PHYS 2325</td>
<td>Mechanics and PHYS 2125 Physics Laboratory I</td>
</tr>
<tr>
<td>PHYS 2326</td>
<td>Electromagnetism and Waves and PHYS 2126 Physics Laboratory II</td>
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### Biology Core Courses (33 hours)

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<tr>
<td>BIOL 2111</td>
<td>Introduction to Modern Biology Workshop I</td>
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<td>BIOL 2112</td>
<td>Introduction to Modern Biology Workshop II</td>
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<tr>
<td>BIOL 2281</td>
<td>Introductory Biology Laboratory</td>
</tr>
<tr>
<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
</tr>
<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
</tr>
<tr>
<td>BIOL 3101</td>
<td>Classical and Molecular Genetics Workshop</td>
</tr>
<tr>
<td>BIOL 3102</td>
<td>Eukaryotic Molecular and Cell Biology Workshop</td>
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<td>BIOL 3362</td>
<td>Biochemistry II</td>
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<tr>
<td>or BIOL 3335</td>
<td>Microbial Physiology</td>
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<td>BIOL 3380</td>
<td>Biochemistry Laboratory</td>
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<tr>
<td>BIOL 4461</td>
<td>Biophysical Chemistry</td>
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</table>

III. Elective Requirements: 9 hours
Guided Electives (9 hours)

Business: (6 hours) to be selected from any upper level JSOM course. If qualified, the student may select from JSOM graduate courses.

Biology: (3 hours) BIOL 4380 Cell and Molecular Biology Laboratory or approved upper-level biology course.

1. Degree is 145 hours if students are required to take BA 1100.
2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Biology Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
6. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Finance

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning: (6 hours)
- 6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 73 hours

Major Preparatory Courses (18 hours)
- ACCT 2301 Introductory Financial Accounting
- ACCT 2302 Introductory Management Accounting
- BLAW 2301 Business and Public Law
- ECON 2301 Principles of Macroeconomics
- ECON 2302 Principles of Microeconomics
- MATH 1325 Applied Calculus I
- MATH 1326 Applied Calculus II
- OPRE 3333 Quantitative Business Analysis
- or MATH 2333 Matrices, Vectors, and Their Application
- STAT 3360 Probability and Statistics for Management and Economics
- or OPRE 3360 Managerial Methods in Decision Making Under Uncertainty

Major Core Courses (25 hours)
- FIN 3100 Professional Development
- BCOM 3311 Business Communication
- BCOM 4350 Advanced Business Communication
- FIN 3320 Business Finance
- MIS 3300 Introduction to Management Information Systems
- OPRE 3310 Operations Management
Major Related Courses (9 hours)

**FIN 3390** Introduction to Financial Modeling  
**FIN 3330** Personal Financial Planning  
**FIN 4310** Intermediate Business Finance

Elective Courses (21 hours)

Students must select no less than 12 hours of upper division course work from the following list of courses: FIN 3305, FIN 3340, FIN 3350, FIN 3360, FIN 3365, FIN 3370, FIN 3380, FIN 3390, FIN 4300, FIN 4320, FIN 4321, FIN 4328, FIN 4330, FIN 4335, FIN 4340, FIN 4345, FIN 4350, FIN 4360, FIN 4380, FIN 4390, FIN 4399, FIN 4V80, or FIN 4V90.

Students must select at least 3 hours of upper division course work from the following list of courses: ACCT 3331, ACCT 3332, ACCT 3341, ACCT 3350, or ACCT 4336.

Finance Tracks

Students pursuing a Bachelor of Science in Finance will be best prepared for certain career paths if they follow the below recommended course work for each of the below tracks, but they are not required to do so.

**Corporate Finance Track** – Students who choose this track will focus on the skills necessary to manage the financial problems of a firm. Students completing this track pursue careers as corporate financial officers, private equity capitalists, and investment bankers.

*Recommended coursework (21 Hours):* FIN 3350, FIN 3380, FIN 4340, FIN 4360, ACCT 3331, ACCT 3332, ACCT 3341

**Investment Track** – Students who choose to concentrate in the Investments track study to become investment analysts and investment advisors. Careers in this field include security analysts, portfolio managers, etc. Students who complete this track should be prepared to take the CFA® level 1 exam.

*Recommended coursework (21 hours):* FIN 3340, FIN 3350, FIN 4300, FIN 4340, FIN 4345 or 4380, ACCT 3331, ACCT 4336
Personal Financial Planning – Students who choose this track will learn how to become financial planners and help clients with their financial problems. Students that complete this track meet the educational requirements set forth for the CFP® Board of Standards, Inc.

Recommended Coursework (21 Hours): FIN 3305, FIN 3370*, FIN 4300*, FIN 4330*, FIN 4335*, FIN 4350*, ACCT 3350

* Notates classes required by the CFP® Board of Standards, Inc. to fulfill the educational requirement for the CERTIFIED FINANCIAL PLANNER™ Designation

Real Estate Track – Students who choose this track will learn both the qualitative and quantitative tools necessary to enter one of the many different areas within real estate including investment analysis, consulting, brokerage, appraisal, development and corporate asset management.

Recommended Coursework (21 Hours): FIN 3305, FIN 3365, FIN 4321, FIN 4328, FIN 3350 or FIN 3370, ACCT 4365

Financial Information Management Track – Students who choose to concentrate in the Financial Information Management track will learn how to use the tools of information technology to apply their knowledge of finance within either a corporate or investment setting demanding the ability to work with and manipulate digitally stored data. Careers in this field include trading, investment analysis, and business analysis.

Recommended Coursework (21 Hours): FIN 3350, FIN 4300, FIN 4340, FIN 4345, MIS 4300, MIS 4350, MIS 4351

III. Free Electives 5 hours

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Students may elect to substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.
5. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Finance and Economics (Double Major)

Degree Requirements (130 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History (HIST 1301 and HIST 1302)
- 3 hours Social and Behavioral Sciences Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 3 hours Mathematics (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 70 hours

Major Preparatory Courses (18 hours)
- ACCT 2301 Introductory Financial Accounting
- ACCT 2302 Introductory Management Accounting
- BLAW 2301 Business and Public Law
- ECON 2301 Principles of Macroeconomics
- ECON 2302 Principles of Microeconomics
- MATH 1325 Applied Calculus I
- MATH 1326 Applied Calculus II
- MATH 2333 Matrices, Vectors and Their Application

Major Core Courses (48 hours)
- FIN 3100 Professional Development
- BCOM 3311 Business Communication
- BCOM 4350 Advanced Business Communication
- FIN 3320 Business Finance
- FIN 3330 Personal Financial Planning
- MIS 3300 Introduction to Management Information Systems
- OPRE 3310 Operations Management
- OBHR 3310 Organizational Behavior
- MKT 3300 Principles of Marketing

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III. Elective Requirements: 18 hours

Guided Electives

Select 9 hours from: FIN 3305, FIN 3340, FIN 3350, FIN 3365, FIN 3380, FIN 4310, FIN 4320, FIN 4340, FIN 4380, FIN 4390, FIN 4V90, or ACCT 4336.

Select 9 hours from: ECON 3312, ECON 3335, ECON 4301, ECON 4310, ECON 4320, ECON 4345, ECON 4360, ECON 4382, ECON 4385, ECON 4396, or ECON 4V99.

1. Degree is 13 hours if student is required to take BA 1100.
2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
3. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. These hours are counted under Mathematics Core; students may substitute MATH 2313 and MATH 2414 or MATH 2417 and MATH 2419.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes in Economics and Finance.
6. Students may substitute MATH 2418, OPRE 3333 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Global Business

Degree Requirements (120 hours)

A minimum of 9 credit hours must be earned during a semester of study abroad. Any 9 credit hours from the degree plan may be chosen, however, students should be aware that study abroad courses are subject to a pre-approval process to ensure transferability.

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning: (6 hours)

6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 73 hours

Major Preparatory Courses (18 hours)

ACCT 2301 Introductory Financial Accounting

[...]

Mary Jo Venetis 12/6/12 4:14 PM
Comment [7]: Now footnote 2

Mary Jo Venetis 11/23/12 5:30 PM
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Mary Jo Venetis 12/6/12 4:14 PM
Comment [8]: All footnotes numbered 2 now renumbered to 3; new footnote 1 moved to last page.

Mary Jo Venetis 11/23/12 6:43 PM
Deleted: 1 Students with non-academic obligations (for example, full-time jobs) who cannot study abroad for an entire semester may request a waiver to substitute 6 credit hours of faculty-led study trips (IMS391, IMS3V92, IMS3V93, IMS3V94, IMS3V95, IMS3V96)...

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ACCT 2302^  Introductory Management Accounting
BLAW 2301^  Business and Public Law
ECON 2301^  Principles of Macroeconomics
ECON 2302^  Principles of Microeconomics
MATH 1325^  Applied Calculus 3,4
MATH 1326^  Applied Calculus II 3,4
OPRE 3333^  Quantitative Business Analysis
or  MATH 2333^  Matrices, Vectors, and Their Application
STAT 3360  Probability and Statistics for Management and Economics
or  OPRE 3360  Managerial Methods in Decision Making Under Uncertainty

Major Core Courses (25 hours)
IMS 3100  Professional Development
BCOM 3311  Business Communication
BCOM 4350  Advanced Business Communication
FIN 3320  Business Finance
MIS 3300  Introduction to Management Information Systems
OPRE 3310  Operations Management
OBHR 3310  Organizational Behavior
MKT 3300  Principles of Marketing
BPS 4305  Strategic Management
IMS 3310  International Business

Major Related Courses (18 hours)
IMS 4320  International Marketing
FIN 3380  International Financial Management
IMS 4330  Global Human Resource Management
IMS 4373 Global Strategy

Six credit hours of the same foreign language. May include 3 hours from BCOM 3320, BCOM 3321, BCOM 3322, BCOM 3323.

Guided Electives (12 hours)

Select 12 hours from one of the following tracks:

Global Business Track
- IMS 4310 Export Market Development
- ENTP 4311 Entrepreneurial Strategy & Business Models
- OBHR 4310 Business Ethics
- OBHR 4352 Negotiation & Dispute Resolution
- FIN 3350 Financial Markets and Institutions
- OPRE 3320 Supply Chain Management
- Faculty led foreign study trip
- GEOG 3370 The Global Economy
- ECON 4360 International Trade

Finance Track
- FIN 3330 Personal Financial Planning
- FIN 3380 International Financial Management
- FIN 3350 Financial Markets & Institutions
- FIN 3340 Regulation of Business and Financial Markets
- FIN 3305 Real Estate Principles

IT Track
- MIS 4300 Database Fundamentals
- MIS 4340 Enterprise Resource Planning
- MIS 4350 Introduction to Business Intelligence and Data Mining
- MIS 4352 Introduction to Web Analytics
- MIS 4360 Network and Information Security

Marketing Track
- MKT 3340 Marketing Research
- MKT 3320 Product and Brand Management
- MKT 3330 Introduction to Professional Selling
- MKT 4330 Digital and Internet Marketing
- MKT 4340 Consumer Behavior
Supply Chain Management Track

OPRE 3330 Project Management  
OPRE 4340 Purchasing and Sourcing Management  
OPRE 3320 Supply Chain Management  
OPRE 4350 Global Outsourcing Services  
OPRE 4330 Logistics and Inventory Management

Innovation & Entrepreneurship Track

ENTP 3301 Entrepreneurship  
Any 3 (9 credit hours of the following)

ENTP 3360 Entrepreneurial Finance  
or FIN 3360 Entrepreneurial Finance  
ENTP 4311 Entrepreneurial Strategy & Business Models  
ENTP 4320 Small Business Management  
ENTP 4350 Corporate Entrepreneurship  
ENTP 4340 Social Entrepreneurship

International Political Economy Track

ISSS 3349 World Resources and Development  
ISSS 4358 National and International Security  
GEOG 3372 Population and Development  
PSCI 4356 International Political Economy  
PSCI 4329 Global Politics  
PSCI 4347 The War on Drugs  
PSCI 4348 Terrorism  
GEOG 3359 Human Migration and Mobility: Global Patterns  
ISSS 4377 Alternative Approaches to National Security  
PSCI 4360 The Political Economy of Multinational Corporations  
PSCI 4359 Globalization and International Conflict  
PSCI 4332 Latin American Politics
SOC 3336 Culture Regions

GEOG 3382 Russia: Yesterday, Today, and Tomorrow

SOC 3338 Japanese Culture and Society

III. Elective Requirements: 5 hours

Free Electives (5 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Students with non-academic obligations (for example, full time jobs) who cannot study abroad for an entire semester may request a waiver to substitute 6 credit hours of faculty led study trips (IMS 3V91, IMS 3V92, IMS 3V93, IMS 3V94, IMS 3V95, IMS 3V96). An international internship may also be substituted for the semester of study abroad.

2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

3. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

4. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

5. Students may elect to substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.

6. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Management Information Systems

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning: (6 hours)
- 6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 70 hours

Major Preparatory Courses (18 hours)
- ACCT 2301 Introductory Financial Accounting
- ACCT 2302 Introductory Management Accounting
- BLAW 2301 Business and Public Law
- ECON 2301 Principles of Macroeconomics
- [Other courses listed...]

[Other details and course numbers provided for completeness...]

[Notes and remarks added by Mark Thouin...]

Mark Thouin 11/28/12 9:42 AM
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**ECON 2302** Principles of Microeconomics

**MATH 1325** Applied Calculus I

**MATH 1326** Applied Calculus II

**OPRE 3333** Quantitative Business Analysis

or **MATH 2333** Matrices, Vectors, and Their Application

**STAT 3360** Probability and Statistics for Management and Economics

or **OPRE 3360** Managerial Methods in Decision Making Under Uncertainty

### Major Core Courses (25 hours)

- **MIS 3100** Professional Development
- **BCOM 3311** Business Communication
- **BCOM 4350** Advanced Business Communication
- **FIN 3320** Business Finance
- **MIS 3300** Introduction to Management Information Systems
- **OPRE 3310** Operations Management
- **OBHR 3310** Organizational Behavior
- **MKT 3300** Principles of Marketing
- **BPS 4305** Strategic Management
- **IMS 3310** International Business

### Major Related Courses (9 hours)

- **MIS 4300** Database Fundamentals
- **MIS 4330** Systems Analysis and Design
- **MIS 4390** Information Systems Capstone

### Guided Electives (18 hours)

Three hours to be selected from

- **MIS 4310**, **MIS 4312**
Fifteen hours to be selected from

BA 4199, BA 4299, MIS 3320, MIS 4312, MIS 4340, MIS 4342, MIS 4350, MIS 4351, MIS 4352, MIS 4360, MIS 4361, MIS 4370, MIS 4V90.

III. Elective Requirements: 8 hours

Free Electives (8 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

4. Students may elect to substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.

5. Students may substitute MATH 2418 or CS 2305.
Naveen Jindal School of Management

Bachelor of Science in Marketing

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^1\): 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning: (6 hours)

6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 64 hours

Major Preparatory Courses (18 hours)

ACCT 2301\(^1\) Introductory Financial Accounting

ACCT 2302\(^2\) Introductory Management Accounting

BLAW 2301\(^2\) Business and Public Law

ECON 2301\(^2\) Principles of Macroeconomics\(^2\)
**ECON 2302** Principles of Microeconomics  
**MATH 1325** Applied Calculus I  
**MATH 1326** Applied Calculus II  
**OPRE 3333** Quantitative Business Analysis  
or **MATH 2333** Matrices, Vectors, and Their Application  
**STAT 3360** Probability and Statistics for Management and Economics  
or **OPRE 3360** Managerial Methods in Decision Making Under Uncertainty

**Major Core Courses (25 hours)**

- **MKT 3100** Professional Development  
- **BCOM 3311** Business Communication  
- **BCOM 4350** Advanced Business Communication  
- **FIN 3320** Business Finance  
- **MIS 3300** Introduction to Management Information Systems  
- **OPRE 3310** Operations Management  
- **OBHR 3310** Organizational Behavior  
- **MKT 3300** Principles of Marketing  
- **BPS 4305** Strategic Management  
- **IMS 3310** International Business

**Major Related Courses (12 hours)**

- **MKT 3340** Marketing Research  
- **MKT 3320** Product and Brand Management  
- **MKT 3330** Introduction to Professional Selling  
- **MKT 4380** Capstone Course in Marketing

**Guided Electives (9 hours)**

Three hours to be selected from:
MKT 4340, MKT 4321, MKT 4350, MKT 4360, MKT 4322, IMS 4320, or MKT 4V93.

Six hours to be selected from:

MKT 4340, MKT 4330, MKT 4321, MKT 4350, ENTP 3301, IMS 4325, MKT 4351, MKT 4360, MKT 4322, MKT 4333, BA 4199, BA 4299, MKT 4V90, MKT 4V93, ECON 3310, MIS 4352, IMS 4320, IMS 4373, IMS 4310, ENTP 3301.

III. Elective Requirements: 14 hours

Free Electives (14 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Students may elect to substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.
5. Students may substitute MATH 2418 or CS 2305.
Bachelor of Science in Supply Chain Management

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 1325 and MATH 1326)

Science (9 hours including at least one course with a substantial laboratory component)

II. Major Requirements: 67 hours

Major Preparatory Courses (18 hours)
- ACCT 2301\textsuperscript{1} Introductory Financial Accounting
- ACCT 2302\textsuperscript{2} Introductory Management Accounting
- BLAW 2301\textsuperscript{1} Business and Public Law
- ECON 2301\textsuperscript{1} Principles of Macroeconomics\textsuperscript{3}
ECON 2302 Principles of Microeconomics
MATH 1325 Applied Calculus I
MATH 1326 Applied Calculus II
OPRE 3333 Quantitative Business Analysis
or MATH 2333 Matrices, Vectors, and Their Application
STAT 3360 Probability and Statistics for Management and Economics
or OPRE 3360 Managerial Methods in Decision Making Under Uncertainty

Major Core Courses (25 hours)
OPRE 3100 Professional Development
BCOM 3311 Business Communication
BCOM 4350 Advanced Business Communication
FIN 3320 Business Finance
MIS 3300 Introduction to Management Information Systems
OPRE 3310 Operations Management
OBHR 3310 Organizational Behavior
MKT 3300 Principles of Marketing
BPS 4305 Strategic Management
IMS 3310 International Business

Major Related Courses (15 hours)
OPRE 3320 Supply Chain Management
OPRE 3330 Project Management
OPRE 4310 Lean and Six Sigma Processes
OPRE 4330 Logistics and Inventory Management
OPRE 4340 Purchasing and Sourcing Management
Guided Electives (9 hours)

- MKT 3330 Introduction to Professional Selling
- IMS 4310 Export Market Development
- OBHR 4352 Negotiation and Dispute Resolution
- OBHR 4310 Business Ethics
- MIS 4340 Enterprise Resource Planning
- MIS 4300 Database Fundamentals
- MIS 3320 Business Analytics Using Excel
- MIS 4353 Electronic Commerce
- OPRE 4320 Integrated SCM Information Systems
- OPRE 4360 Capstone Projects in Supply Chain Management
- OPRE 4350 Global Outsourcing Services

III. Elective Requirements: 6 hours

Free Electives (11 hours)

Both lower- and upper-division courses may count as electives but students must complete at least 51 hours of upper-division credit to qualify for graduation. JSOM freshman are required to take BA 1100 Business Basics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

4. These hours are counted under Mathematics Core above; students may substitute MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419.

5. Students may substitute MATH 2418 or CS 2305.
Program overview updates approved by DMiller 1-30-13

http://catalog.utdallas.edu/2012/undergraduate/programs/nsm

School of Natural Sciences and Mathematics

The School of Natural Sciences and Mathematics offers both graduate and undergraduate programs in Biology and Molecular Biology, Chemistry and Biochemistry, Geosciences, Mathematics, and Physics, and a graduate program in Science Education. Undergraduate and post-baccalaureate programs in teacher certification are administratively housed in the School of Natural Sciences and Mathematics but serve other schools as well.

The undergraduate programs in Biology and Molecular Biology provide a basic foundation in molecular and cell biology to prepare students for graduate studies in biological sciences (BS), for professional studies in a wide variety of health-related areas, for secondary school teaching, and for employment as research assistants in pharmaceutical, biotechnology, government, and environmental science laboratories (BS, BA).

The undergraduate program in Chemistry provides the fundamental knowledge required for professional participation in chemically oriented industries, for graduate study in chemistry, and for medical or dental studies (BS), or for secondary science teaching or ancillary positions (sales, legal, etc.) in the chemical industries (BA).

The undergraduate program in Geosciences provides a general scientific background suitable for some careers in business or law, for secondary school teaching (BA), or for employment as a professional geologist, or for graduate studies in Geosciences (BS).

The undergraduate programs in Mathematics (BS) encompass Mathematics, Statistics, and Applied Mathematics, and are designed so that students can have the opportunity to prepare for employment immediately upon graduation in a broad range of positions in business, industry, government and education - or for continuing with graduate studies in any of these areas.

The undergraduate Physics program offers a basic foundation in classical and modern physics for students interested in professional careers in physics, usually requiring graduate degrees, as well as in related fields, e.g., electrical engineering, medical physics, radiology, lasers, geophysics, computer science (BS), or a strong base in physics for students seeking to pursue careers in medicine, patent law, government or industrial laboratories, or secondary school teaching (BA).

The School of Natural Sciences and Mathematics also provides opportunities for students to complete Texas Teacher Certification requirements in Biology, Chemistry, Earth Science, Life/Earth Science, Mathematics, and Physics. Students who wish to be certified should consult the UT Teach Dallas for specific requirements as soon as possible after formal admission to the University. Further details may be found in the Teacher Education Certification Program section of the catalog.
UT-PACT BA/MD Program

The Partnership in Advancing Clinical Transition (UT-PACT) is a collaborative program between UT Dallas and UT Southwestern Medical School. Students enrolled in UT PACT will have joint admission to BA in Biology and MD training programs. The University of Texas System initiative is an effort to expedite the training for healthcare professions and to prepare students for careers in medicine through the coordination of undergraduate and medical school curricula.

Information about the UT-PACT partnership is available at http://www.utdallas.edu/pre-health/ut-pact

Major Honors

The Departments of the School of Natural Science and Mathematics offer the opportunity for outstanding students to graduate with Honors or Honors with Distinction in their major. The program provides for these students to work individually with faculty for an in-depth experience in research.

Eligibility requirements include:

- at least 30 graded hours of coursework at UTD with a cumulative grade point average of 3.750,
- at least 12 hours of upper division courses in the student's major with a grade point average of 3.750 over all the upper division courses in the major, and
- completion of an honors thesis evaluated by two faculty members with a grade of at least B+.

The thesis would satisfy the advanced writing requirement if completed as part of a three-hour research course, and submitted at least three weeks prior to the last day of classes of the term. It is then critiqued by the faculty mentor, returned to the student for revision and resubmission following the guidelines of the advanced writing requirement by the last day of classes of the term.

Honors with Distinction will be awarded to students whose theses are judged by a faculty committee of at least three members to be of exemplary quality, and if carried to fruition, would warrant publication in a journal in the field of work.
School of Natural Sciences and Mathematics

Actuarial Science (B.S.)

The Bachelor of Science Actuarial Science (AS) Program at the University of Texas at Dallas is administered through the Department of Mathematical Sciences.

Students receive a rigorous mathematical background including all the major courses taken by students majoring in mathematics or statistics. Further, ten courses devoted to finance, economics, applied statistics, insurance and actuarial science are required. Upon completion of this program, a student will have the knowledge and business background necessary to pursue a career as an actuary, as well as to undertake graduate study in actuarial science, statistics, mathematics, economics or finance.

Bachelor of Science in Actuarial Science Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

- Communication (6 hours)
  - 3 hours Communication (RHET 1302)
  - 3 hours Business Communication (BCOM 3311)
- Social and Behavioral Sciences (15 hours)
  - 6 hours Government (GOVT 2301 and GOVT 2302)
  - 6 hours American History
  - 3 hours Social and Behavioral Sciences Elective (ECON 2301)
- Humanities and Fine Arts (6 hours)
  - 3 hours Fine Arts (ARTS 1301)
  - 3 hours Humanities (HUMA 1301)
- Mathematics and Quantitative Reasoning (6 hours)
  - 6 hours Calculus (MATH 2417 and MATH 2419)
- Science with at least 1 hour of laboratory (9 hours)
  - PHYS 2325 and PHYS 2125 Mechanics with Laboratory
or PHYS 2421 and PHYS 2125 Honors Physics I - Mechanics and Heat with Laboratory
or CHEM 1311 and CHEM 1111 General Chemistry I with Laboratory
PHYS 2326 and PHYS 2126 Electromagnetism and Waves with Laboratory
or PHYS 2422 and PHYS 2126 Honors Physics II - Electromagnetism and Waves with Laboratory
or CHEM 1312 and CHEM 1112 General Chemistry II with Laboratory,

• And an additional acceptable science course

II. Major Requirements: 77 hours

Major Preparatory Courses (29 hours)

ACCT 2301 Introductory Financial Accounting
ACCT 2302 Introductory Management Accounting
ACCT 3320 Financial Information Management
CS 1337 Computer Science I
ECON 2302 Principles of Microeconomics
MATH 2417 Calculus I
MATH 2419 Calculus II
MATH 2418* Linear Algebra
MATH 2420* Differential Equations with Applications
MATH 2451* Multivariable Calculus with Applications

Major Core Courses (48 hours)

ACTS 4301 Principles of Actuarial Models: Life Contingencies I
ACTS 4302 Principles of Actuarial Models: Financial Economics
ACTS 4304 Construction and Evaluation of Actuarial Models
ACTS 4308 Actuarial Financial Mathematics
FIN 3320 Business Finance
MIS 3300 Introduction to Management Information Systems
FIN 4300 Investment Management
FIN 3390 Introduction to Financial Modeling
MATH 3310 Theoretical Concepts of Calculus
MATH 3311 Abstract Algebra I
MATH 3379 Complex Variables
MATH 4334 Numerical Analysis
III. Elective Requirements: 1 hour

Freshman students are required to take UNIV 1010 and NATS 1101.

Preparation for Actuarial Exams

- Exam 1/P: STAT 4351 or ACTS 4306
- Exam 2/FM: ACTS 4308, FIN 3320, and FIN 4300
- Exam 3/L/MLC: ACTS 4301
- Exam 3/F/MFE: ACTS 4302
- Exam 4/C: ACTS 4304

Validation by Educational Experience (VEE) Credits

- Applied Statistical Methods: STAT 3355 and STAT 4382
- Corporate Finance: FIN 3320
- Economics: ECON 2301 and ECON 2302

Minor in Actuarial Science

The Minor in Actuarial Science program at UT Dallas is administered through the Department of Mathematical Sciences. It is ideal for students who are interested in broadening their experience and knowledge base in the study and analysis of principles of Actuarial Science. The minor core courses prepare students for a number of actuarial exams required for a designation of Associate of the Society of Actuaries, Casualty Actuarial Society, or Canadian Institute of Actuaries. Specifically, the minor provides students with an intense background in principles of actuarial models. All of the courses in the minor serve as starting points for learning the concepts covered on the preliminary actuarial exams (P/1, FM/2, MLC/3L).
Students not majoring in Actuarial Science may obtain a minor in Actuarial Science by satisfying 24 semester credit hours (9 semester credit hours of minor core courses and 15 semester credit hours of minor preparatory courses).

**Minor Preparatory Courses (15 hours)**
- **MATH 2417** Calculus I (Differential Calculus)
- **MATH 2419** Calculus II (Integral Calculus)
- **MATH 2451** Multivariable Calculus with Applications
- **MIS 3300** Introduction to Management Information Systems

**Minor Core Courses (9 hours)**
- **STAT 4351** Probability
- **ACTS 4301** Principles of Actuarial Models: Life Contingencies I
- **ACTS 4308** Actuarial Financial Mathematics

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parenthesis are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Six hours of Calculus are counted to fulfill the Mathematics Core Requirement with the remaining 2 hours to be counted under Major Preparatory Courses.

3. Students may choose one of the following calculus sequences: (a) MATH 2413, MATH 2414, and MATH 2415; or (b) MATH 2417 and MATH 2419.

4. A required Major preparatory course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum (6 hours) and Major Preparatory Courses (2 hours).

5. NATS 1101 may be substituted for an appropriate elective for transfer students.

6. These classes prepare for the three preliminary actuarial examinations jointly administered by the Society of Actuaries (SOA), Casualty Actuarial Society (CAS) and the Canadian Institute of Actuaries (CIA).
7. Students whose major does not require MATH 2417 and MATH 2419 as part of their Mathematics and Quantitative Reasoning Core Curriculum Requirements, should take this sequence as their core curriculum courses to ensure efficiency toward the minor.
School of Natural Sciences and Mathematics

Biochemistry (BS)

The Biochemistry program at UT Dallas, administered through the Department of Chemistry, draws on faculty from the Departments of Chemistry, Molecular and Cell Biology, and researchers from UT Southwestern Medical School to provide courses and research opportunities to its majors. The Biochemistry major bridges the gap between modern Chemistry and Biology. The curriculum, designed to prepare students for either graduate work in the Biological Sciences, the Chemical Sciences, or for entry-level positions in the biotechnology industry, builds on a base of biology, chemistry, physics, and mathematics to provide the student the opportunity to develop essential theoretical and practical skills.

Faculty

Chemistry:

Robert A. Welch Chair in Chemistry; Professor of Chemistry: Ray H. Baughman, Dennis Smith Jr.

Cecil and Ida Green Distinguished Chair in Systems Biology; Professor of Chemistry: A. Dean Sherry

Distinguished Chair in Natural Sciences and Mathematics; Dean of the School of Natural Sciences and Mathematics: Bruce M. Novak

Professors: Kenneth J. Balkus, Jr., Rockford K. Draper (Biology), John P. Ferraris, Bruce E. Gnade (Electrical Engineering), Inga H. Musselman

Associate Professors: Jung-Mo Ahn, Michael C. Biewer, Gregg R. Dieckmann, Warren J. Goux, Steven O. Nielsen, Paul Pantano, John W. Sibert IV

Assistant Professors: Jiyong Lee, Mihaela C. Stefan, Ronald A. Smaldone, Jie Zheng

Affiliated Professors: Lee A. Bulla (Biology), Yves Chabal (Materials Science & Engineering), Lev Gelb (Materials Science & Engineering), Amy Walker (Materials Science & Engineering), Anvar A. Zakhidov (Physics)

Research Professors: Gary E. Kiefer, Duck Joo Yang

Emeritus Professor: Richard A. Caldwell
Senior Lecturers: Umut Bulut, Sergio Cortes, Sandhya R. Gavva, Yanping Qin, Amandeep Sra, Claudia Taenzler

Molecular and Cell Biology:

Professors: Lee A. Bulla, Santosh D'Mello, Rockford K. Draper, Juan E. Gonzalez, Donald M. Gray, Steven D. Levene, Betty S. Pace, Lawrence J. Reitzer, Li Zhang, Michael Q. Zhang

Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. Delong, Ernest M. Hannig, Dennis L. Miller, Stephen Spiro

Assistant Professor: Tianbing Xia, Zhenyu Xuan


UT Southwestern Medical School

UTD Biochemistry majors may perform their research in the laboratories of faculty members from the departments of Biochemistry, Internal Medicine, Pharmacology and Physiology at UT Southwestern, as available.

Bachelor of Science in Biochemistry

Degree Requirements (120 hours)

I. Core Curriculum Requirements (42 hours)

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (Satisfied by BIOL 4390 or CHEM 4390, BIOL 4399 or CHEM 4399, BIOL 4391 or equivalent)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)
Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419)

Science (9 hours)

Introductory Chemistry (CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112, and CHEM 2401)

II. Major Requirements: 66 hours

Major Preparatory Courses (29 hours beyond core curriculum)

BIOL 2111 Introduction to Modern Biology Workshop I

BIOL 2311 Introduction to Modern Biology I

CHEM 1111 General Chemistry Laboratory I

or CHEM 1115 Honors Freshman Chemistry Laboratory I

CHEM 1112 General Chemistry Laboratory II

or CHEM 1116 Honors Freshman Chemistry Laboratory II

CHEM 1311 General Chemistry I

or CHEM 1315 Honors Freshman Chemistry I

CHEM 1312 General Chemistry II

or CHEM 1316 Honors Freshman Chemistry II

CHEM 2123 Introductory Organic Chemistry Laboratory I

CHEM 2125 Introductory Organic Chemistry Laboratory II

CHEM 2323 Introductory Organic Chemistry I

CHEM 2325 Introductory Organic Chemistry II

CHEM 2401 Introductory Quantitative Methods in Chemistry

MATH Sequence - Students may choose one of the following sequences:

I. MATH 2413 Differential Calculus

and MATH 2414 Integral Calculus
and MATH 2415 Calculus of Several Variables

OR

II. MATH 2417 Calculus I
and MATH 2419 Calculus II
and MATH 2451 Multivariable Calculus with Applications

PHYS 2125 Physics Laboratory I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
or PHYS 2421 Honors Physics I - Mechanics and Heat
PHYS 2326 Electromagnetism and Waves
or PHYS 2422 Honors Physics II - Electromagnetism and Waves

Major Core Courses (37 hours beyond core curriculum)

BIOL 3101 Classical and Molecular Genetics Workshop
BIOL 3102 Eukaryotic Molecular and Cell Biology Workshop
BIOL 3161 Biochemistry Workshop I
BIOL 3162 Biochemistry Workshop II
BIOL 3301 Classical and Molecular Genetics
BIOL 3302 Eukaryotic Molecular and Cell Biology
BIOL 3380 Biochemistry Laboratory

BIOL 3361 or CHEM 3361 Biochemistry I
BIOL 3361 or CHEM 3362 Biochemistry II
CHEM 3321 Physical Chemistry I

CHEM 3322 Physical Chemistry II

CHEM 3472 Instrumental Analysis

Any two upper-division Chemistry or Biology electives (8 hours) not taken to fulfill above.
III. Elective Requirements: 12 hours

**Free Electives (12 hours)**

The plan must include sufficient upper-division credit to total 51 upper-division credit hours.

**STAT 3332** Statistics for Life Sciences is strongly recommended.

**Fast Track Baccalaureate/Master's Degrees**

Undergraduate students at UT Dallas with strong academic records who intend to pursue the M.S. in Chemistry at UT Dallas may apply for a Fast Track plan of study which involves taking selected graduate courses as an upper-level student. After admission to the graduate program, 15 hours of graduate courses with an earned grade of B or better can be used toward completion of the baccalaureate degree and to satisfy requirements for the master's degree. Interested students should contact the undergraduate advisor well in advance of the junior year to prepare a sequence permitting maximal advantage to be taken of the catalog's regulations (see [http://catalog.utdallas.edu/2012/undergraduate/policies/graduate-courses](http://catalog.utdallas.edu/2012/undergraduate/policies/graduate-courses)) regarding Undergraduate Registration for Graduate Courses.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills Core Curriculum requirements. If hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirement for graduation. Course selection assistance is available from the undergraduate advisor.
3. Hours above the Core Curriculum requirement are counted as part of the Major Preparatory Courses.
4. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
5. Students will take one of the two Physics sequences: PHYS 2325 and PHYS 2326 or PHYS 2421 and PHYS 2422 with accompanying labs.
School of Natural Sciences and Mathematics

Biology (BA, BSc)

The Biology Program at UT Dallas emphasizes the unifying molecular and cellular nature of organisms. At the center of the Biology undergraduate curriculum are the biochemical, genetic, and cell biology concepts and tools used to study the genes of prokaryotes and eukaryotes, to study the proteins and ribonucleic acids (RNA) encoded by these genes, and to study how the expression of these genes is regulated during the development and lifetimes of organisms. Molecular Biology represents a fusion of the four disciplines of biochemistry, biophysics, genetics, and cell biology. Modern biology requires a background in other disciplines such as chemistry, mathematics, physics, and computer sciences. Principles from these disciplines have to be merged to understand and apply new biotechnology and genetic engineering techniques. It is desirable for entering students to have a broad interest and background in the sciences.

Both B.S. and B.A. degrees are offered in Biology at UT Dallas; a B.S. degree is offered in Molecular Biology. The B.S. degrees are intended as preparation for scientific careers in biology or careers in the health professions. The B.A. degree is intended as liberal arts biology major with less emphasis on calculus and more free hours for course work in other disciplines. Each degree in Biology offers a streamlined double major with Business Administration or Crime and Justice Studies. Five-year Fast Track B.S. /M.S. Biology and Molecular Biology degree programs are available.

The UTeach option may be added to the BA degree in Biology. UTeach Dallas Option degree plans are streamlined to allow students to complete both a rigorous Bachelor of Science or Bachelor of Arts degree and all course work for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Minors are offered in Biology, Biomolecular Structure, Microbiology, Molecular and Cell Biology, and Neurobiology.

Faculty

Professors: Lee A. Bulla, Santosh D'Mello, Rockford K. Draper, Juan González, Donald M. Gray, Stephen D. Levene, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Q. Zhang

Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Dennis L. Miller

Assistant Professors: Kelli Palmer, Zhenyu Xuan, Hyuntae Yoo
**Professor Emeritus:** Hans Bremer, Claud S. Rupert

**Senior Lecturers:** Irina Borovkov, Mehmet Candas, Vincent P. Cirillo, Wen-ju Lin, Robert C. Marsh, David Murchison, Elizabeth Pickett, Ruben D. Ramirez, Scott A. Rippel, Ilya Sapozhnikov, Wen-Ho Yu

### Bachelor of Arts or Bachelor of Science in Biology

**Degree Requirements (120 hours)**

I. **Core Curriculum Requirements**: 42 hours

- **Communication (6 hours)**
  - 3 hours Communication Communication (RHET 1302)
  - 3 hours Communication Elective (BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399 or NATS 4310)

- **Social and Behavioral Sciences (15 hours)**
  - 6 hours Government (GOVT 2301 and GOVT 2302)
  - 6 hours American History
  - 3 hours Social and Behavioral Sciences Elective

- **Humanities and Fine Arts (6 hours)**
  - 3 hours Fine Arts (ARTS 1301)
  - 3 hours Humanities (HUMA 1301)

- **Mathematics and Quantitative Reasoning (6 hours)**
  - 6 hours Calculus (MATH 2413 and MATH 2414) - BA or BS
  - or Applied Calculus and Statistics for Life Sciences (MATH 1325 and STAT 3332) - BA only

- **Science (9 hours)**
  - 9 hours Chemistry (CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112 and CHEM 2123) a

II. **Major Requirements:** 53 - 61 hours (53 - 55 for B.A.; 51 for B.S.)

**Major Preparatory Courses** (15-17 hours beyond Core Curriculum)
CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112 General Chemistry I and II with Laboratory

CHEM 2323 and CHEM 2123 and CHEM 2325 and CHEM 2125 Introductory Organic Chemistry I and II with Laboratory

MATH 2413 Differential Calculus and MATH 2414 Integral Calculus (BA or BS)

or MATH 1325 Applied Calculus I and STAT 3332 Statistics for Life Sciences (BA only)

PHYS 2325 Mechanics and PHYS 2125 Physics Laboratory I (BA or BS)

or PHYS 3101 College Physics I and PHYS 1101 Physics Laboratory I (BA only)

PHYS 2326 Electromagnetism and Waves and PHYS 2126 Physics Laboratory I (BA or BS)

or PHYS 3102 College Physics II and PHYS 1102 Physics Laboratory II (BA only)

Major Core Courses (29-32 hours)

BIOL 2281 Introductory Biology Laboratory

BIOL 2111 Introduction to Modern Biology Workshop I

BIOL 2112 Introduction to Modern Biology Workshop II

BIOL 2311 Introduction to Modern Biology I

BIOL 2312 Introduction to Modern Biology II

BIOL 3101 Classical and Molecular Genetics Workshop

BIOL 3102 Eukaryotic Molecular and Cell Biology Workshop

BIOL 3161 Biochemistry Workshop I

BIOL 3162 Biochemistry Workshop II

BIOL 3301 Classical and Molecular Genetics

BIOL 3302 Eukaryotic Molecular and Cell Biology

BIOL 3361 Biochemistry I

BIOL 3362 Biochemistry II

or BIOL 3335 Microbial Physiology

BIOL 3380 Biochemistry Laboratory
BIOL 4380 Cell and Molecular Biology Laboratory (BS only)

Major Related Courses (9-12 hours)

9 hours upper-division BIOL electives (BA only)
12 hours upper-division BIOL electives (BS only)

III. Elective Requirements: 17-25 hours (23-25 for B.A.; 17 for B.S.)

Free Electives 17-25 hours (23-25 for B.A.; 17 for B.S.)

The plan must include sufficient upper-division credit to total 51 upper-division credit hours.

Bachelor of Arts in Biology with UTeach Option

Degree Requirements (121 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (NATS 4390)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 and MATH 2414) or (MATH 1325 Applied Calculus and STAT 3332 Statistics for Life Sciences)

Science (9 hours)
II. Major Requirements: 53-55 hours

Major Preparatory Courses (15-17 hours beyond Core Curriculum)

- **CHEM 1311** and **CHEM 1111**, **CHEM 1312** and **CHEM 1112** General Chemistry I and II with Laboratory
- **CHEM 2323**, and **CHEM 2123** and **CHEM 2325**, and **CHEM 2125** Introductory Organic Chemistry I and II with Laboratory
- **MATH 2413** Differential Calculus and **MATH 2414** Integral Calculus

or **MATH 1325** Applied Calculus I and **STAT 3332** Statistics for Life Sciences

- **PHYS 1301** College Physics I and **PHYS 1101** Physics Laboratory I
- **PHYS 1302** College Physics II and **PHYS 1102** Physics Laboratory II

Major Core Courses (29 hours)

- **Biol 2281** Introductory Biology Laboratory I
- **Biol 2111** Introduction to Modern Biology Workshop I
- **Biol 2112** Introduction to Modern Biology Workshop II
- **Biol 2311** Introduction to Modern Biology I
- **Biol 2312** Introduction to Modern Biology II
- **Biol 3101** Classical and Molecular Genetics Workshop
- **Biol 3102** Eukaryotic Molecular and Cell Biology Workshop
- **Biol 3161** Biochemistry Workshop I
- **Biol 3162** Biochemistry Workshop II
- **Biol 3301** Classical and Molecular Genetics
- **Biol 3302** Eukaryotic Molecular and Cell Biology
- **Biol 3361** Biochemistry I
- **Biol 3362** Biochemistry II

or **Biol 3335** Microbial Physiology
**Biology Major Requirements**

**Minor Related Courses**

- **Biol 3380** Biochemistry Laboratory

**Major Related Courses** (9 hours)

- 9 hours upper-division Biol electives

**III. Elective Requirements:** 24-26 hours

**UTeach Requirements** (24 hours)

- **NATS 1141** UTeach STEP 1
- **NATS 1143** UTeach STEP 2
- **NATS 3341** Knowing and Learning in Mathematics and Science
- **NATS 3343** Classroom Interactions
- **HIST 3328** History and Philosophy of Science and Medicine
- **NATS 4390** Research Methods
- **NATS 4341** Project-Based Instruction
- **NATS 4694** UTeach Apprentice Teaching, 8-12 Science and Mathematics
- or **NATS 4696** UTeach Apprentice Teaching, 4-8 Science and Mathematics
- **NATS 4141** UTeach Apprentice Teaching Seminar

**Free Electives** (0-2 hours)

- The plan must include sufficient upper-division credit to total 51 upper-division credit hours.

**Minor in Biology**

**Minor in Biology**

**Course Requirements:** 18 hours

- **Biol 2311** and **Biol 2111** Introduction to Modern Biology I with Workshop
- **Biol 3301** and **Biol 3101** Classical and Molecular Genetics with Workshop
- **Biol 3361** and **Biol 3161** Biochemistry I with Workshop

Two Biol electives for majors

**Minor in Biomolecular Structure**

- **Biol 2311** and **Biol 2111** Introduction to Modern Biology I with Workshop
- **Biol 3301** and **Biol 3101** Classical and Molecular Genetics with Workshop
- **Biol 3361** and **Biol 3161** Biochemistry I with Workshop
Course Requirements: 18 hours

**BIOL 3336** Protein and Nucleic Acid Structure

**BIOL 4461** Biophysical Chemistry, unless taken to fulfill the Molecular Biology major requirements

**BIOL 4261** Biomolecular Modeling

**CHEM 2323** and **CHEM 2325** Introductory Organic Chemistry I and II

One to two approved BIOL, CHEM, CS, EE, MATH, or PHYS electives

**Minor in Molecular and Cell Biology**

Course Requirements: 18 hours

**CHEM 2323** and **CHEM 2325** Introductory Organic Chemistry I and II

Four approved molecular and cell biology electives

**Minor in Microbiology**

Course Requirements: 18 hours

**BIOL 3V20** General Microbiology with Lab

**BIOL 3335** Microbial Physiology

**BIOL 4350** Medical Microbiology

or **BIOL 4316** Parasites and Symbionts

**BIOL 4345** Immunobiology

**CHEM 2323** Introductory Organic Chemistry I

One approved microbiology elective

**Minor in Neurobiology**

Course Requirements: 18 hours

**BIOL 4370** Developmental Neurobiology

**BIOL 3371** Biology of the Brain

or **NSC 4352** Cellular Neuroscience

**CHEM 2323** and **CHEM 2325** Introductory Organic Chemistry I and II
Fast Track Baccalaureate/Master's Degrees

UT Dallas undergraduate students with strong academic records, including at least 15 hours of upper-division Biology core courses, who intend to pursue graduate work in Biology at UT Dallas, may apply for the Fast Track which involves taking selected graduate courses as an upper-division student. After admission to the graduate program, 15 hours of graduate courses with an earned grade of B or better can be used toward completion of the B.S. and to satisfy requirements for those courses at the graduate level. Graduate courses must be approved by the graduate advisor. This program provides an opportunity to obtain the B.S. degree in Biology after 124 hours of work and an M.S. degree in Molecular and Cell Biology after an additional 21 hours of graduate course and research work. Interested students should contact the Biology undergraduate advisor well in advance of the senior year to prepare a degree plan taking maximal advantage of this 5-year Fast Track program.

Degree Planning

Upper-division biology courses taken at other institutions may be included as part of the degree plan subject to the provisions of the section on Transfer Admissions.

Major-related courses may not include more than 9 hours (B.S.) or 6 hours (B.A.) of upper-division transfer credit and not more than 3 hours (Biology major) or 6 hours (Molecular Biology major) of individual instruction (e.g., BIOL 3V90, BIOL 3V91, BIOL 3V92, BIOL 3V95, BIOL 3V96, BIOL 4302, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, BIOL 4V98, or BIOL 4V99)

Students planning a career in a particular allied health profession should consult the school they expect to attend to apprise themselves of the course requirements for admission.

Admission standards for medical and dental schools are set by the individual professional school, whose specific requirements should be reviewed with the help of the UT Dallas Health Professions Advising Center (HPAC). Most professional schools prefer that admission applications be channeled through the HPAC.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.
2. Biology majors may choose BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399 or NATS 4310 or another approved Biology elective to fulfill the Core Curriculum Communication Elective.
Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.

A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

Indicates a prerequisite class to be completed before enrolling for upper-division classes.

Up to 3 hours of individual instruction may be used in fulfilling this requirement.

NATS 4390 fulfills Core Communication requirement and counts as an Upper-Level Biology Elective.

Two hours of BIOL 3V20 may be used to satisfy the Cell and Molecular Biology Laboratory core requirement for Biology and Molecular Biology majors.

May be substituted with CHEM 2325 Introductory Chemistry II if used to satisfy the Biochemistry core requirement.
School of Natural Sciences and Mathematics

Biology and Business Administration (B.S.)

Bachelor of Science in Biology and Business Administration (Double Major)

Degree Requirements (143 hours)\(^1\)

I. Core Curriculum Requirements\(^2\): 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)
3 hours Communication Elective (BCOM 3311)\(^3\)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Sciences Elective (ECON 2301)\(^3\)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 and MATH 2414)\(^4\)

Science (9 hours)

9 hours Chemistry (CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112 and CHEM 2123)\(^5\)

II. Major Requirements: 89 hours

Biology Major Preparatory Courses (17 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory I\(^3\)
<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tr>
<td>CHEM 1112</td>
<td>General Chemistry Laboratory II</td>
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<td>CHEM 1311</td>
<td>General Chemistry I</td>
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<td>CHEM 1312</td>
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<tr>
<td>CHEM 2123</td>
<td>Introductory Organic Chemistry Laboratory I</td>
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<td>CHEM 2125</td>
<td>Introductory Organic Chemistry Laboratory II</td>
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<td>CHEM 2323</td>
<td>Introductory Organic Chemistry I</td>
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<td>CHEM 2325</td>
<td>Introductory Organic Chemistry II</td>
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<td>MATH 2413</td>
<td>Differential Calculus</td>
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<td>MATH 2414</td>
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<td>PHYS 2325</td>
<td>Mechanics and PHYS 2125 Physics Laboratory I</td>
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<td>PHYS 2326</td>
<td>Electromagnetism and Waves and PHYS 2126 Physics Laboratory II</td>
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**Biology Major Core Courses (29 hours)**

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<td>BIOL 2111</td>
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<td>Introduction to Modern Biology Workshop II</td>
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<td>BIOL 2281</td>
<td>Introductory Biology Laboratory</td>
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<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
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<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 3101</td>
<td>Classical and Molecular Genetics Workshop</td>
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<td>BIOL 3102</td>
<td>Eukaryotic Molecular and Cell Biology Workshop</td>
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<td>BIOL 3161</td>
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<td>BIOL 3162</td>
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<td>BIOL 3301</td>
<td>Classical and Molecular Genetics</td>
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<td>BIOL 3302</td>
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<td>BIOL 3362</td>
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<td>or BIOL 3335</td>
<td>Microbial Physiology</td>
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<td>ACCT 2301</td>
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<td>ACCT 2302</td>
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<td>BA 3100</td>
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<td>Business and Public Law</td>
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<td>ECON 2301</td>
<td>Principles of Macroeconomics</td>
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<td>ECON 2302</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>MATH 2333</td>
<td>Matrices, Vectors and Their Application</td>
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<tr>
<td>or OPRE 3333</td>
<td>Quantitative Business Analysis</td>
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**Business Core Courses (27 hours)**

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<th>Course Code</th>
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<td>BCOM 3311</td>
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<tr>
<td>BCOM 4350</td>
<td>Advanced Business Communication</td>
<td>3</td>
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<tr>
<td>FIN 3320</td>
<td>Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>MIS 3300</td>
<td>Introduction to Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>OPRE 3310</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>OBHR 3310</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MKT 3300</td>
<td>Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4305</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>IMS 3310</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>STAT 3360</td>
<td>Probability and Statistics for Management and Economics</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 3332</td>
<td>Statistics for Life Sciences</td>
<td>3</td>
</tr>
<tr>
<td>or OPRE 3360</td>
<td>Managerial Methods in Decision Making Under Uncertainty</td>
<td>3</td>
</tr>
</tbody>
</table>

**III. Elective Requirements: 12 hours**

**Guided Electives (12 hours)**
Business (9 hours): To be selected from any upper-level JSOM courses. If qualified, the student may select from JSOM graduate courses.

Biology (3 hours): BIOL 4380 Cell and Molecular Biology Laboratory or approved upper-level biology course.

1. Degree is 144 hours if students are required to take NATS 1101.
2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
6. Students may substitute MATH 2413 and MATH 2414 by taking MATH 2417 and MATH 2419.
School of Natural Sciences and Mathematics

Bachelor of Arts in Biology and Criminology (Double Major)

Degree Requirements (128-130 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (CRIM 3300, BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, or NATS 4310)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History (HIST 1301 and HIST 1302)

3 hours Social and Behavior Sciences Elective (ECON 2301 or ECON 2302)

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 and MATH 2414)

or Applied Calculus (MATH 1325) and either Statistics for Life Sciences (STAT 3332) or Introduction to Social Statistics with Laboratory (EPPS 3405)

Science (9 hours)

9 hours Chemistry (CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112 and CHEM 2123)

II. Major Requirements: 71-73 hours

Biology Major Preparatory Courses (15-17 hours beyond Core Curriculum)

CHEM 1111 General Chemistry Laboratory I
<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>CHEM 1112</td>
<td>General Chemistry Laboratory II</td>
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<tr>
<td>CHEM 1311</td>
<td>General Chemistry I</td>
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<tr>
<td>CHEM 1312</td>
<td>General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 2123</td>
<td>Introductory Organic Chemistry Laboratory I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 2125</td>
<td>Introductory Organic Chemistry Laboratory II</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 2323</td>
<td>Introductory Organic Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 2325</td>
<td>Introductory Organic Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>MATH 2413</td>
<td>Differential Calculus and MATH 2414 Integral Calculus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or MATH 1325 Applied Calculus I and either STAT 3332</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Statistics for Life Sciences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or EPS 3405 Introduction to Social Statistics with Lab</td>
<td></td>
</tr>
<tr>
<td>PHYS 2325</td>
<td>Mechanics and PHYS 2125 Physics Laboratory I</td>
<td></td>
</tr>
<tr>
<td>PHYS 2326</td>
<td>Electromagnetism and Waves and PHYS 2126 Physics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laboratory II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or PHYS 1301 College Physics I and PHYS 2125 Physics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laboratory I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or PHYS 1302 College Physics II and PHYS 2126 Physics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laboratory II</td>
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</tr>
</tbody>
</table>

**Biology Major Core Courses (32 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 2111</td>
<td>Introduction to Modern Biology Workshop I</td>
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</tr>
<tr>
<td>BIOL 2112</td>
<td>Introduction to Modern Biology Workshop II</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 2281</td>
<td>Introductory Biology Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 3101</td>
<td>Classical and Molecular Genetics Workshop</td>
<td></td>
</tr>
<tr>
<td>BIOL 3102</td>
<td>Eukaryotic Molecular and Cell Biology Workshop</td>
<td></td>
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<tr>
<td>BIOL 3161</td>
<td>Biochemistry Workshop I</td>
<td></td>
</tr>
<tr>
<td>BIOL 3162</td>
<td>Biochemistry Workshop II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or BIOL 3335 Microbial Physiology</td>
<td></td>
</tr>
</tbody>
</table>
BIOL 3301 Classical and Molecular Genetics
BIOL 3302 Eukaryotic Molecular and Cell Biology
BIOL 3318 Forensic Biology
BIOL 3361 Biochemistry I
BIOL 3362 Biochemistry II
BIOL 3380 Biochemistry Laboratory

Criminology Major Preparatory Course (No hours beyond Core Curriculum)

ECON 2301 Principles of Macroeconomics
or ECON 2302 Principles of Microeconomics

Criminology Core Courses (24 hours)

CRIM 3300 Crime and Civil Liberties
CRIM 3301 Theories of Justice
CRIM 3302 Advanced Criminology
CRIM 3303 Advanced Criminal Justice
CRIM 3304 Research Methods in Crime and Justice Studies
CRIM 3319 Comparative Justice Systems
CRIM 4311 Crime and Justice Policy
CRIM 4322 Senior Research Seminar

III. Elective Requirements: 15 hours

Guided Electives (15 hours)

Biology (6 hours): BIOL 4380 Cell and Molecular Biology Laboratory

Criminology Related Electives (9 hours)

All students must complete at least 51 hours of upper-division credit to graduate.

Freshman students are required to take UNIV 1010 and NATS 1101.
1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.

2. Double majors may choose BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, PSCI 3325, NATS 4310 or another approved Biology elective to fulfill the Core Curriculum Communication Elective.

3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.

5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
School of Natural Sciences and Mathematics

Chemistry (BA, BS)

The Chemistry major builds on a base of chemistry, physics, mathematics, and computer science to provide the student the opportunity to develop essential theoretical and practical skills in the subdisciplines of organic, physical, inorganic, analytical, and macromolecular chemistry. Typically, the practice of chemistry in industry deals with the synthesis, analysis, and control of the many materials used in our technological society.

The Chemistry program at UT Dallas is designed to instruct the student in how chemical experiments are performed, how results are interpreted, and through its integrated laboratory sequence, to emphasize the importance of one subdisciplines in solving problems inherent to another. Meeting these goals, the Chemistry program provides the student with the flexibility to enter industry, go on to graduate school, or pursue medical, dental, and other degrees in the health sciences.

Faculty

Robert A. Welch Chair in Chemistry; Professor of Chemistry: Ray H. Baughman, Dennis Smith Jr.

Cecil and Ida Green Distinguished Chair in Systems Biology; Professor of Chemistry: A. Dean Sherry

Distinguished Chair in Natural Sciences and Mathematics; Dean of the School of Natural Sciences and Mathematics: Bruce M. Novak

Professors: Kenneth J. Balkus, Jr., Rockford K. Draper (Biology), John P. Ferraris, Bruce E. Gnade (Electrical Engineering), Inga H. Musselman

Associate Professors: Jung-Mo Ahn, Michael C. Biewer, Gregg R. Dieckmann, Warren J. Goux, Steven Nielsen, Paul Pantano, John W. Sibert IV

Assistant Professors: Jiyoung Lee, Mihaela C. Stefan, Ronald A. Smaldone, Jie Zheng

Affiliated Professors: Lee A. Bulla (Biology), Yves Chabal (Materials Science & Engineering), Lev Gelb (Materials Science & Engineering), Amy Walker (Materials Science & Engineering), Anvar A. Zakhidov (Physics)

Research Professors: Gary E. Kiefer, Duck Joo Yang

Emeritus Professor: Richard A. Caldwell
Senior Lecturers: Umut Bulut, Sergio Cortes, Sandhya R. Gavva, Yanping Qin, Amandeep Sra, Claudia Taenzler

Degrees

The Chemistry major may choose a program leading either to the BA or BS degree. The latter degree sequence has been approved by the American Chemical Society’s Committee on Professional Training.

BA Program

The BA program offers the minimum fundamental knowledge required for adequate professional function in a career in chemistry. It is possible that students choosing this option may, through suitable use of unspecified hours, prepare for careers in areas as varied as chemistry-related businesses, government, medicine and dentistry, secondary school teaching, and even law or politics.

BS Program

The BS program provides more intensive training in chemistry for the student who intends either to obtain employment at the bachelor’s level in the chemical industry or to pursue graduate study.

UTeach Option

The UTeach option may be added to the BA degree in Chemistry. UTeach Dallas Option degree plans are streamlined to allow students to complete both a rigorous Bachelor of Science or Bachelor of Arts degree and all course work for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Bachelor of Arts or Bachelor of Science in Chemistry

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^2\): 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (NATS 4310 or CHEM 4390)\(^2\)

Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Sciences Elective

**Humanities and Fine Arts (6 hours)**

3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

**Mathematics and Quantitative Reasoning (6 hours)**

6 hours Calculus (MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419)²

**Science (9 hours)**

Introductory Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112, and CHEM 2401)

II. Major Requirements: BS 60 hours; BA 60 hours

**Major Preparatory Courses (26-27 hours beyond the Core Curriculum)**

- CHEM 1111 General Chemistry Laboratory ²
- or CHEM 1115 Honors Freshman Chemistry Laboratory ²
- CHEM 1112 General Chemistry Laboratory ²
- or CHEM 1116 Honors Freshman Chemistry Laboratory ²
- CHEM 1311 General Chemistry ²
- or CHEM 1315 Honors Freshman Chemistry ²
- CHEM 1312 General Chemistry ²
- or CHEM 1316 Honors Freshman Chemistry ²
- CHEM 2123 Introductory Organic Chemistry Laboratory I
- CHEM 2125 Introductory Organic Chemistry Laboratory II
- CHEM 2323 Introductory Organic Chemistry I
- CHEM 2325 Introductory Organic Chemistry II
- CHEM 2401 Introductory Quantitative Methods in Chemistry²

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MATH Sequence - Students may choose one of the following sequences:

I. **MATH 2413** Differential Calculus
    and **MATH 2414** Integral Calculus
    and **MATH 2415** Calculus of Several Variables
    and **MATH 2418** Linear Algebra
    or **STAT 3332** Statistics for Life Sciences

OR

II. **MATH 2417** Calculus I
    and **MATH 2419** Calculus II
    and **MATH 2451** Multivariable Calculus with Applications
    and **MATH 2418** Linear Algebra
    or **STAT 3332** Statistics for Life Sciences

**PHYS 2125** Physics Laboratory I
**PHYS 2126** Physics Laboratory II
**PHYS 2325** Mechanics
**PHYS 2326** Electromagnetism and Waves

Major Core Courses (12 hours)

**CHEM 3321** Physical Chemistry I
**CHEM 3471** Advanced Chemical Synthesis Laboratory
**CHEM 3472** Instrumental Analysis

Major Related Courses (BS 22 hours; BA 21 hours)

Bachelor of Arts (18 hours beyond the Core Curriculum)

**BIOL 3361** or **CHEM 3361** Biochemistry I
or **CHEM 4335** Polymer Chemistry
**CHEM 3341** Inorganic Chemistry I

or **CHEM 3322** Physical Chemistry II

**Guided Electives - 12 credit hours**

May be used in (partial) fulfillment of a Second Major, Minor or Teaching Certificate

**Advanced Writing**

**NATS 4310** Advanced Writing in the Natural Sciences and Mathematics

**Bachelor of Science (19 hours beyond the Core Curriculum)**

**CHEM 3322** Physical Chemistry II

**CHEM 3341** Inorganic Chemistry I

**BIOL 3361** or **CHEM 3361** Biochemistry I

**CHEM 4473** Physical Measurements Laboratory

**CHEM 4390** Research and Advanced Writing in Chemistry

or **CHEM 4399** Research and Advanced Writing in Chemistry for Honors Students

or **CHEM 4V91** (3 hours) Research in Chemistry

**BIOL 3362** or **CHEM 3362** Biochemistry II

or **CHEM 4335** Polymer Chemistry

or **CHEM 4355** Computational Modeling

**III. Elective Requirements: 18 hours**

**6 hours** must be outside the major and be upper-division and/or have prerequisites. The plan must include sufficient upper-division credit to total 51 upper-division credit hours.

**Bachelor of Arts in Chemistry with UTeach Option**

**Degree Requirements (120 hours)**

I. Core Curriculum Requirements: 42 hours
Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (NATS 4390)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 and MATH 2414 or MATH 2417 and MATH 2419)

Science (9 hours)

Introductory Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112, and CHEM 2401)

II. Major Requirements: 57-59 hours

Major Preparatory Courses (28-29 hours beyond the Core Curriculum)

CHEM 1111 General Chemistry Laboratory I

or CHEM 1115 Honors Freshman Chemistry Laboratory I

CHEM 1112 General Chemistry Laboratory II

or CHEM 1116 Honors Freshman Chemistry Laboratory II

CHEM 1311 General Chemistry I

or CHEM 1315 Honors Freshman Chemistry I

CHEM 1312 General Chemistry II

or CHEM 1316 Honors Freshman Chemistry II

CHEM 2123 Introductory Organic Chemistry Laboratory I
CHEM 2125 Introductory Organic Chemistry Laboratory II
CHEM 2323 Introductory Organic Chemistry I
CHEM 2325 Introductory Organic Chemistry II
CHEM 2401 Introductory Quantitative Methods in Chemistry

MATH Sequence - Students may choose one of the following sequences:

I. MATH 2413 Differential Calculus
   and MATH 2414 Integral Calculus
   and MATH 2415 Calculus of Several Variables
   and MATH 2418 Linear Algebra
   or STAT 3332 Statistics for Life Sciences

OR

II. MATH 2417 Calculus
    and MATH 2419 Calculus II
    and MATH 2451 Multivariable Calculus with Applications
    and MATH 2418 Linear Algebra
    or STAT 3332 Statistics for Life Sciences

PHYS 2125 Physics Laboratory I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
PHYS 2326 Electromagnetism and Waves

Major Core Courses (11 hours)

CHEM 3321 Physical Chemistry I
CHEM 3471 Advanced Chemical Synthesis Laboratory
CHEM 3472 Instrumental Analysis
Major Related Courses (18-19 hours beyond core curriculum)

- **Biol 3361** or **Chem 3361** and **Biol 3161** Biochemistry I
- or **Chem 4335** Polymer Chemistry
- **Chem 3341** Inorganic Chemistry I
- or **Chem 3322** Physical Chemistry II

Guided Electives (15 credit hours)

UTeach courses will fulfill this requirement.

III. Elective Requirements: 19-21 hours

**Electives (6 hours)**

These courses must be outside the major and be upper-division and/or have prerequisites. UTeach courses can fulfill this requirement.

**UTeach Requirements (3 hours beyond core curriculum, guided electives, and advanced electives)**

- **NATS 1141** UTeach Step 1
- **NATS 1143** UTeach Step 2
- **NATS 3341** Knowing and Learning in Mathematics and Science
- **NATS 3343** Classroom Interactions
- **HIST 3328** History and Philosophy of Science and Medicine
- **NATS 4390** Research Methods
- **NATS 4341** Project-Based Instruction
- **NATS 4694** UTeach Apprentice Teaching, 8-12 Science and Mathematics
  or **NATS 4696** UTeach Apprentice Teaching, 4-8 Science and Mathematics
- **NATS 4141** UTeach Apprentice Teaching Seminar

**Free Electives (10-12 hours)**

The plan must include sufficient upper-division credit to total 51 upper-division credit hours.
Minor in Chemistry

18 hours that must include

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>BIOL 3161</td>
<td>Biochemistry Workshop I</td>
</tr>
<tr>
<td>BIOL 3361 or CHEM 3361</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>CHEM 3321</td>
<td>Physical Chemistry I</td>
</tr>
<tr>
<td>CHEM 3472</td>
<td>Instrumental Analysis</td>
</tr>
</tbody>
</table>

Fast Track Baccalaureate/Master's Degrees

Undergraduate students at UT Dallas with strong academic records who intend to pursue the MS in Chemistry at UT Dallas may apply for a Fast Track plan of study which involves taking selected graduate courses as an upper-level student. After admission to the graduate program, 15 hours of graduate courses with an earned grade of B or better can be used toward completion of the baccalaureate degree and to satisfy requirements for the master’s degree. Interested students should contact the undergraduate advisor well in advance of the junior year to prepare a sequence permitting maximal advantage to be taken of the catalog’s regulations (see [http://catalog.utdallas.edu/2012/undergraduate/policies/graduate-courses](http://catalog.utdallas.edu/2012/undergraduate/policies/graduate-courses)) regarding Undergraduate Registration for Graduate Courses.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A required Major course that also fulfills Core Curriculum requirements. If hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirement for graduation. Course selection assistance is available from the undergraduate advisor.
3. Hours above the Core Curriculum requirement are counted as part of the Major Preparatory Courses.
4. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
5. Research in Chemistry (CHEM 4V91), Research and Advanced Writing in Chemistry (CHEM 4390), and Research and Advanced Writing in Chemistry for Honors Students (CHEM 4399) are better defined as a project than a course and constitute an important part of the BS degree. The student conducts original research under the supervision of a faculty member, and then must submit a research report which is defended orally. Normally this project will span two or more semesters. A complete set of guidelines is available from the undergraduate advisor.
6. Indicates a prerequisite class to be completed before enrolling for upper division classes.
7. NATS 4390 fulfills Core Communication requirement.
Geosciences (B.A., BS)

Attaining greater understanding of past and present Earth processes is the fundamental goal of geosciences. To achieve this goal the geoscientist studies the minerals, rocks, fluids, and fossils of the Earth and investigates the physical, chemical, and biological processes occurring on and in the Earth.

Professional opportunities in geology exist in the environmental, energy, and mineral resources industries and in government agencies concerned with these fields. In addition, many occupations concerned with law, management, economics, and the environment utilize a background in geosciences.

Specific degree plans will be formulated by the undergraduate advisor in Geosciences. Changing circumstances may require changes to the degree plans.

The UTeach option may be added to the BS degree in Geosciences. UTeach Dallas Option degree plans are streamlined to allow students to complete both a rigorous Bachelor of Science or Bachelor of Arts degree and all course work for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Faculty

Professors: Carlos L. V. Aiken, John F. Ferguson, John Geissman, John William I. Manton, George A. McMechan, John S. Oldow, Robert J. Stern

Associate Professors: Alexander Braun, Thomas H. Brikowski, Georgia Fotopoulos

Professor Emeritus: David E. Dunn, Richard M. Mitterer, Emile A. Pessagno, Dean C. Presnall, Robert H. Rutford

Associate Professor Emeritus: James L. Carter

Senior Lecturers: William R. Griffin, Ignacio Pujana

Bachelor of Arts in Geosciences with UTeach Option

Bachelor of Science in Geosciences
Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (GEOS 4390, GEOS 4399 or NATS 4310)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours; 2 hours extra may be counted as free electives)

Calculus (MATH 2417 and MATH 2419)

Science (9 hours)

8 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112)

1 hour Geoscience (GEOS 1103 Physical Geology Laboratory)

II. Major Requirements: 58-64 hours

Major Preparatory Courses (20 hours beyond Core Curriculum)

Pre-requisite courses to be completed before enrolling in upper-division GEOS courses.

GEOS 1103 Physical Geology Laboratory

PHYS 2325 Mechanics

PHYS 2125 Physics Laboratory I

PHYS 2326 Electromagnetism and Waves

PHYS 2126 Physics Laboratory II
Major Core Courses (38-44 hours)

GEOS 2306 Geodesy and Geospatial Analysis
GEOS 3300 Field Geology I (Summer Field Camp I)
GEOS 3421 Stratigraphy and Sedimentology
GEOS 3470 Structural Geology
GEOS 4300 Field Geology II (Summer Field Camp II)
GEOS 4320 The Physics and Chemistry of the Solid Earth

Geology Option (18-19 hours)

GEOS 3434 Paleobiology
GEOS 3464 Igneous and Metamorphic Petrography
GEOS 4322 The Earth System
GEOS 4430 Hydrogeology and Aqueous Geochemistry

A mathematics course selected from:

GEOS 5306 Data Analysis for Geoscientists (with permission)
MATH 2418 Linear Algebra
MATH 2451 Multivariable Calculus with Applications
PHYS 3330 Numerical Methods in Physics and Computational Techniques

OR

Geophysics Option (24 hours)

MATH 2420 Differential Equations with Applications
MATH 2451 Multivariable Calculus with Applications
PHYS 3330 Numerical Methods in Physics and Computational Techniques
MATH 4362 Partial Differential Equations
PHYS 3411 Theoretical Physics
PHYS 3312 Classical Mechanics
PHYS 3416 Electricity and Magnetism

III. Elective Requirements: 14-20 hours

Electives (6 hours)

All students are required to take at least six hours of advanced electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (8-14 hours)

Both lower- and upper-division courses may count as electives, but students must complete at least 51 hours of upper-division credit to qualify for graduation. Students are strongly encouraged to take GEOS graduate courses as free electives.

http://catalog.utdallas.edu/2012/undergraduate/programs/hsm/geosciences

Bachelor of Science in Geosciences with UTeach Option

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (NATS 4390)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

MATH 1325 and STAT 3332

or MATH 2413 and MATH 2414

Science (9 hours)

8 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, CHEM 1112)

1 hour Geosciences Laboratory (GEOS 1103 Physical Geology Laboratory)

II. Major Requirements: 55-59 hours beyond Core Curriculum

Major Core Courses (33 hours beyond Core Curriculum)

GEOS 1104 History of Earth and Life Laboratory

GEOS 1103 Physical Geology Laboratory

GEOS 1303 Physical Geology

GEOS 1304 History of Earth and Life

GEOS 2306 Geodesy and Geospatial Analysis

GEOS 2409 Rocks and Minerals

GEOS 3421 Stratigraphy and Sedimentology

GEOS 3431 Paleobiology

GEOS 3470 Structural Geology

GEOS 4320 Physics and Chemistry of the Solid Earth

GEOS 4430 Hydrogeology and Geochemistry

Composite Science and Mathematics Requirements (22-26 hours beyond Core Curriculum)

MATH 1325 and STAT 3332 or MATH 2413 and MATH 2414

CHEM 1311 General Chemistry

CHEM 1111 General Chemistry Laboratory
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 1312</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>CHEM 1112</td>
<td>General Chemistry II Laboratory</td>
</tr>
<tr>
<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
</tr>
<tr>
<td>BIOL 2111</td>
<td>Introduction to Modern Biology Workshop I</td>
</tr>
<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
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<tr>
<td>BIOL 2112</td>
<td>Introduction to Modern Biology Workshop II</td>
</tr>
</tbody>
</table>

2 approved Upper-level Biology electives (choose from BIOL 4324, BIOL 3350, BIOL 3351, BIOL 3455 and BIOL 3456)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>PHYS 1301</td>
<td>College Physics I</td>
</tr>
<tr>
<td>PHYS 2125</td>
<td>Physics Laboratory I</td>
</tr>
<tr>
<td>PHYS 1302</td>
<td>College Physics II</td>
</tr>
<tr>
<td>PHYS 2126</td>
<td>Physics Laboratory II</td>
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OR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>PHYS 2325</td>
<td>Mechanics</td>
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<tr>
<td>PHYS 2125</td>
<td>Physics Laboratory I</td>
</tr>
<tr>
<td>PHYS 2326</td>
<td>Electromagnetism and Waves</td>
</tr>
<tr>
<td>PHYS 2126</td>
<td>Physics Laboratory II</td>
</tr>
</tbody>
</table>

III. UTeach Requirements: 21 hours beyond Core Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>NATS 1141</td>
<td>UTeach Step 1</td>
</tr>
<tr>
<td>NATS 1143</td>
<td>UTeach Step 2</td>
</tr>
<tr>
<td>NATS 3341</td>
<td>Knowing and Learning in Mathematics and Science</td>
</tr>
<tr>
<td>NATS 3343</td>
<td>Classroom Interactions</td>
</tr>
<tr>
<td>HIST 3328</td>
<td>History and Philosophy of Science and Medicine</td>
</tr>
<tr>
<td>NATS 4390</td>
<td>Research Methods</td>
</tr>
<tr>
<td>NATS 4341</td>
<td>Project-based Instruction</td>
</tr>
<tr>
<td>NATS 4694</td>
<td>UTeach Apprentice Teaching, 8-12 Science and Mathematics</td>
</tr>
</tbody>
</table>
IV. Free Electives: [0-2 hours]

Students are required to take additional free electives (upper-level if necessary) if needed to reach 120 total degree hours or 51 upper-level credit hours.

Fast Track Baccalaureate/Master's Degrees

The Fast-Track program allows students with strong academic records to take selected graduate courses that may be applied toward the baccalaureate degree and be used to satisfy requirements for the master's degree. Interested students who intend to pursue a master's degree in Geosciences may apply for a Fast Track baccalaureate/master's plan of study via the Geosciences graduate advisor. The planned coursework must be coordinated with the Geosciences undergraduate advisor; the Geosciences graduate advisor should also be notified. A maximum of 15 credit hours may be applied under this program.

Geosciences Minor

Students not majoring in Geosciences are encouraged to choose Geosciences as a minor.

Lower-division courses (8 hours):

- GEOS 1103 Physical Geology Laboratory
- GEOS 1104 History of Earth and Life Laboratory
- GEOS 1303 Physical Geology
- GEOS 1304 History of Earth and Life

Upper-division courses (12 hours)

To be selected in consultation with Geosciences Undergraduate advisor

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. A Major requirement that also fulfills a Core Curriculum requirement.
School of Natural Sciences and Mathematics

Mathematics (BS)

Mathematics is both a profession and an indispensable tool for many types of work. As a tool, mathematics is a universal language that has been crucial in formulating and expressing ideas not only in science and engineering, but also in many other areas such as business and the social sciences. As probably the oldest and most basic science, it provides the key to understanding the major technological achievements of our time.

Of equal importance, knowledge of mathematics may help provide a student with the type of uncompromising and clear-sighted thinking useful in considering the problems of many other disciplines. The Mathematics degree program encompasses mathematics, statistics, and applied mathematics.

Applied mathematics and statistics continue to enjoy a rapid growth. Students have the opportunity of applying their expertise to any of a number of fields of application. For the student to be more effective in such applications, Mathematics also offers degree programs allowing additional emphasis in the areas of actuarial science, computer science, electrical engineering, and management.

Those interested in obtaining both a BS in Mathematics and Teacher Certification in the state of Texas should consult the Teacher Development Center or the UTeach office for specific requirements as soon as possible after formal admission to the University. See the Teacher Education Certification Program section of the catalog for additional information.

The Mathematics degree program also prepares students for graduate studies. An accelerated BS/MS Fast Track program is available which provides the opportunity for undergraduate students to satisfy some of the requirements of the master's degree while they are completing the bachelor's degree in Mathematics.

Faculty

Professors: Larry P. Anmann, Michael Baron, Vladimir Dragovic, Sam Efromovich (Endowed Professorship), Matthew J. Goeckner, M. Ali Hooshyar, Wieslaw Krawcewicz, Susan Minkoff, Patrick L. Odell (Emeritus), Istvan Ozsvath (Emeritus), Robert Serfling, Janos Turi, John W. Van Ness (Emeritus), John Zweck

Associate Professors: Zalman I. Balanov, Yan Cao, Pankaj Choudhary, Mieczyslaw Dabkowski

Assistant Professors: Bhargab Chattopadhyay, Tobias Hagge, Qingwen Hu, Qiongxia Song, Biswas Swati
Clinical Associate Professor: Natalia Humphreys

Senior Lecturers III: David L Lewis, Paul Stanford, Bentley T Garrett,

Senior Lecturers II: Manjula Foley, Yuly Koshevnik, Joanna Robinson, William Monte Scott

Senior Lecturers I: Mohammad Akbar, Diana Cogan, Malgorzata Dabkowska, Anatoly Eydelzon, Richard Ketchersid, Brady McCary, Jigarkumar Patel,

Adjunct Professors: Jose Carlos Gomez Larranage, Adolfo Sanchez Valenzuela

Affiliated Faculty: Herve Abdi (BBS), Raimund J. Ober (ECS/EE), Alain Bensoussan (JSOM), Titu Andreescu (ECS/SME), John Wiorkowski (JSOM)

The Program in Mathematics

Students seeking a degree in Mathematics may specialize in Mathematics, Statistics, or Applied Mathematics, and receive a BS degree. Each specialization allows some flexibility in electives so that students can better adapt their degree plans to their educational goals.

Mathematics Specialization: For students interested in a career in mathematics and for students interested in continuing on to graduate work in mathematics, applied mathematics, math education, and related areas.

Statistics Specialization: For students interested in probability and statistical models and their use in data analysis and decision-making and for students interested in continuing on to graduate work in statistics, biostatistics, actuarial science, and other statistics related areas.

Applied Mathematics Specialization: For students interested in mathematics for the purpose of using it broadly in various areas of application and for students interested in continuing on to graduate work in applied mathematics and related areas.

The UTeach option may be added to the BS degree in Mathematics. UTeach Dallas Option degree plans are streamlined to allow students to complete both a rigorous Bachelor of Science or Bachelor of Arts degree and all course work for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Bachelor of Science in Mathematics

Degree Requirements (120 hours)
All majors with specialization in either Mathematics or Statistics are strongly urged to meet with assigned departmental advisors every semester.

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (NATS 4310 or MATH 4390 or MATH 4399)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2417 and MATH 2419)

Science (9 hours)

Mathematics/Applied Mathematics Specialization

PHYS 2126 Physics Laboratory I

PHYS 2126 Physics Laboratory II

PHYS 2326 Mechanics

or PHYS 2421 Honors Physics I - Mechanics and Heat

PHYS 2326 Electromagnetism and Wave

or PHYS 2422 Honors Physics II - Electromagnetism and Waves

Plus an additional science course approved by the assigned departmental advisor.

Statistics Specialization

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II. Major Requirements: 48 hours

Major Preparatory Courses (15 hours)

CS 1337 Computer Science I
MATH 2417 Calculus I
MATH 2418 Linear Algebra
MATH 2419 Calculus II
MATH 2420 Differential Equations with Applications
MATH 2451 Multivariable Calculus with Applications

Major Core Courses (21 hours)

MATH 3310 Theoretical Concepts of Calculus
MATH 3311 Abstract Algebra I
MATH 3379 Complex Variables
MATH 4301 Mathematical Analysis I
MATH 4302 Mathematical Analysis II
MATH 4334 Numerical Analysis
NATS 4310 Advanced Writing in the Natural Sciences and Mathematics
STAT 4351 Probability

Major Related Courses (12 hours)

Applied Mathematics Specialization
MATH 4341 Topology  
MATH 4355 Methods of Applied Mathematics  
MATH 4362 Partial Differential Equations  
STAT 4382 Stochastic Processes  

**Mathematics Specialization**  
MATH 3312 Abstract Algebra II  
MATH 3380 Differential Geometry  
MATH 4341 Topology  
3 hours upper-division guided elective  

**Statistics Specialization**  
STAT 3355 Data Analysis for Statisticians and Actuaries  
STAT 4352 Mathematical Statistics  
STAT 4382 Stochastic Processes  
3 hour upper-division guided elective  

### III. Elective Requirements: 30 hours  

#### Electives (30 hours)  
All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites. Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.

#### BS in Actuarial Science  
The department offers a BS in Actuarial Science (see the program within this catalog for additional information).

#### Mathematics or Statistics with Computer Science Emphasis  
*Applied Mathematics Specialization or Statistics Specialization together with following courses:*  

CS 2305 Discrete Mathematics for Computing I  

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**Mathematics or Statistics with Electrical Engineering Emphasis**

*Applied Mathematics Specialization or Statistics Specialization together with following courses:*

- **EE 3101** Electrical Network Analysis Laboratory
- **EE 3111** Electronic Circuits Laboratory
- **EE 3120** Digital Circuits Laboratory
- **EE 3301** Electrical Network Analysis
- **EE 3311** Electronic Circuits
- **EE 3320** Digital Circuits
- **EE 4301** Electromagnetic Engineering I

**Mathematics or Statistics with Management Emphasis**

*Mathematics Specialization, Applied Mathematics Specialization or Statistics Specialization together with following courses:*

- **ACCT 2301** Introductory Financial Accounting
- **ACCT 2302** Introductory Management Accounting
- **BLAW 2301** Business and Public Law
- **FIN 3320** Business Finance
- **MIS 3300** Introduction to Management Information Systems
- **OBHR 3310** Organizational Behavior

**NOTE:** Students transferring into Mathematics at the upper division level are expected to have completed all of the 1000- and 2000- level mathematics core course requirements.
Bachelor of Science in Mathematics with UTeach Option

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^1\) 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (NATS 4390)\(^2\)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 2417 and MATH 2419)\(^2\)

Science (9 hours)

*Mathematics/Applied Mathematics Specialization*
- PHYS 2125 Physics Laboratory I
- PHYS 2126 Physics Laboratory II
- PHYS 2325 Mechanics
  - or PHYS 2421 Honors Physics I - Mechanics and Heat
- PHYS 2326 Electromagnetism and Waves
  - or PHYS 2422 Honors Physics II - Electromagnetism and Waves and an additional acceptable science course

*Statistics Specialization*
(PHYS 2325 Mechanics and PHYS 2125 Physics Laboratory I and PHYS 2326 Electromagnetism and Waves and PHYS 2126 Physics Laboratory II)

or (PHYS 2421 Honors Physics I - Mechanics and Heat and PHYS 2125 Physics Laboratory I and PHYS 2422 Honors Physics II - Electromagnetism and Waves and PHYS 2126 Physics Laboratory II)

or (CHEM 1311 and CHEM 1111 General Chemistry I with Laboratory and CHEM 1312 and CHEM 1112 General Chemistry II with Laboratory)

Plus an additional acceptable science course approved by the assigned departmental advisor.

II. Major Requirements: 50 hours

Major Preparatory Courses (17 hours beyond core curriculum)

CS 1337 Computer Science I
MATH 2417 Calculus I
MATH 2418 Linear Algebra
MATH 2419 Calculus II
MATH 2420 Differential Equations with Applications
MATH 2451 Multivariable Calculus with Applications

Major Core Courses (21 hours beyond core curriculum)

MATH 3310 Theoretical Concepts of Calculus
MATH 3311 Abstract Algebra I
MATH 3379 Complex Variables
MATH 4301 Mathematical Analysis I
MATH 4302 Mathematical Analysis II
MATH 4334 Numerical Analysis
NATS 4390 Research Methods

Major Related Courses (12 hours)

Applied Mathematics Specialization
MATH 4341 Topology
MATH 4355 Methods of Applied Mathematics
MATH 4362 Partial Differential Equations
STAT 4382 Stochastic Processes

Mathematics Specialization
MATH 3312 Abstract Algebra II
MATH 3321 Geometry
MATH 4341 Topology
3 hours upper-division guided elective

Statistics Specialization
STAT 3355 Data Analysis for Statisticians and Actuaries
STAT 4352 Mathematical Statistics
STAT 4382 Stochastic Processes
3 hour upper-division guided elective

III. Elective Requirements: 28 hours

Electives (6 hours)
All students are required to take at least six hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites. UTeach courses can fulfill this requirement.

UTeach Requirements (18 hours beyond core curriculum and electives)
NATS 1141 UTeach Step 1
NATS 1143 UTeach Step 2
NATS 3341 Knowing and Learning in Mathematics and Science
NATS 3343 Classroom Interactions
HIST 3328 History and Philosophy of Science and Medicine
NATS 4390 Research Methods

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NATS 4341  Project-Based Instruction

NATS 4694  UTeach  Apprentice  Teaching, 8-12 Science and Mathematics

or  NATS 4696  UTeach  Apprentice  Teaching, 4-8 Science and Mathematics

NATS 4141  UTeach  Apprentice  Teaching Seminar

MATH 3303  Introduction to Mathematical Modeling

Free Electives (4 hours)

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.

Minor in Mathematics

Students not majoring in Mathematics or Statistics may obtain a minor in Mathematics or Statistics by satisfying the following requirements: 18 credit hours of mathematics or statistics, 12 hours of which must be chosen from the following courses:

| Mathematics Minor: MATH 3310 and MATH 4334 and two more upper-division mathematics courses that satisfy degree requirements by students in Mathematics.

| Statistics Minor: STAT 4351 and STAT 4352, and two more upper-division mathematics courses that satisfy degree requirements by students in Statistics.

Fast Track Baccalaureate/Master's Degrees

For students interested in pursuing graduate studies in Mathematics, the Mathematics Department offers an accelerated BS/MS Fast Track that involves taking graduate courses instead of several advanced undergraduate courses. Acceptance into the Fast Track is based on the student's attaining a GPA of at least 3.200 in all mathematics classes and being within 30 hours of graduation. Fast Track students may, during their senior year, take 15 graduate hours that may be used to complete the baccalaureate degree. After admission to the graduate program, these 15 graduate hours may also satisfy requirements for the master's degree. Fast Track programs are offered in mathematics with specializations in applied mathematics and statistics.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. A Major course requirement that also fulfills a Core Curriculum requirement. If hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirements for graduation. Course selection assistance is available from the undergraduate advisor.

3. Two hours of Calculus are counted as electives; six hours are counted in Core Curriculum.

4. Indicates a prerequisite class to be completed before enrolling in upper-division classes.
5. MATH 2417 and MATH 2419 requirements can be fulfilled by completing MATH 2413, MATH 2414, and MATH 2415.

6. Approval of Mathematics department advisor required.

7. Another MATH course, i.e. MATH 3380, may be substituted if MATH 3321 is not offered.
School of Natural Sciences and Mathematics

Molecular Biology (BS)

The Biology Program at UT Dallas emphasizes the unifying molecular and cellular nature of organisms. At the center of the Biology undergraduate curriculum are the biochemical, genetic, and cell biology concepts and tools used to study the genes of prokaryotes and eukaryotes, to study the proteins and ribonucleic acids (RNA) encoded by these genes, and to study how the expression of these genes is regulated during the development and lifetimes of organisms. Molecular Biology represents a fusion of the four disciplines of biochemistry, biophysics, genetics, and cell biology. Modern biology requires a background in other disciplines such as chemistry, mathematics, physics, and computer sciences. Principles from these disciplines have to be merged to understand and apply new biotechnology and genetic engineering techniques. It is desirable for entering students to have a broad interest and background in the sciences.

Both B.S. and B.A. degrees are offered in Biology at UT Dallas; a B.S. degree is offered in Molecular Biology. The B.S. degrees are intended as preparation for scientific careers in biology or careers in the health professions. The B.A. degree is intended as a liberal arts biology major with less emphasis on calculus and more free hours for course work in other disciplines. Each degree in Biology offers a streamlined double major with Business Administration or Crime and Justice Studies. Five-year Fast Track B.S. / M.S. Biology and Molecular Biology degree programs are available.

Minors are offered in Biology, Biomolecular Structure, Microbiology, Molecular and Cell Biology, and Neurobiology.

Faculty

Professors: Lee A. Bulla, Santosh D'Mello, Rockford K. Draper, Juan González, Donald M. Gray, Stephen D. Levene, Lawrence J. Reitzer, Li Zhang, Michael Q. Zhang

Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Dennis L. Miller

Assistant Professors: Kelli Palmer, Zhenyu Xuan, Hyuntae Yoo

Professor Emeritus: Hans Bremer, Claud S. Rupert

Bachelor of Science in Molecular Biology

Degree Requirements (120 hours)

I. Core Curriculum Requirements:
   1. 42 hours

   Communication (6 hours)
   3 hours Communication (RHET 1302)
   3 hours Communication Elective (BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399 or NATS 4310)

   Social and Behavioral Sciences (15 hours)
   6 hours Government (GOVT 2301 and GOVT 2302)
   6 hours American History
   3 hours Social and Behavioral Sciences Elective

   Humanities and Fine Arts (6 hours)
   3 hours Fine Arts (ARTS 1301)
   3 hours Humanities (HUMA 1301)

   Mathematics and Quantitative Reasoning (6 hours)
   6 hours Calculus (MATH 2417 and MATH 2419)

   Science (9 hours)
   9 hours Chemistry (CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112 and CHEM 2123)

II. Major Requirements: 68-69 hours

Major Preparatory Courses (21 hours beyond Core Curriculum)

   CHEM 1111 General Chemistry Laboratory I
   CHEM 1112 General Chemistry Laboratory II
   CHEM 1311 General Chemistry I
   CHEM 1312 General Chemistry II
   CHEM 2123 Introductory Organic Chemistry Laboratory I
CHEM 2125 Introductory Organic Chemistry Laboratory II
CHEM 2323 Introductory Organic Chemistry I
CHEM 2325 Introductory Organic Chemistry II
MATH 2417 Calculus I
MATH 2419 Calculus II
MATH 2418 Linear Algebra
PHYS 2125 Physics Laboratory I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
PHYS 2326 Electromagnetism and Waves

Major Core Courses (35 - 36 hours)

BIOL 2111 Introduction to Modern Biology Workshop I
BIOL 2112 Introduction to Modern Biology Workshop II
BIOL 2281 Introductory Biology Laboratory
BIOL 2311 Introduction to Modern Biology I
BIOL 2312 Introduction to Modern Biology II
BIOL 3101 Classical and Molecular Genetics Workshop
BIOL 3102 Eukaryotic Molecular and Cell Biology Workshop
BIOL 3161 Biochemistry Workshop I
BIOL 3162 Biochemistry Workshop II
BIOL 3301 Classical and Molecular Genetics
BIOL 3302 Eukaryotic Molecular and Cell Biology
BIOL 3361 Biochemistry I
BIOL 3362 Biochemistry II

or BIOL 3335 Microbial Physiology
BIOL 3380 Biochemistry Laboratory

BIOL 3380 Cell & Molecular Biology Laboratory

or BIOL 3V96 (3 hours) Undergraduate Research in Molecular and Cell Biology

or BIOL 4399 (3 hours) Senior Honors Research in Molecular and Cell Biology

or BIOL 4391 (3 hours) Senior Research in Molecular and Cell Biology

BIOL 4461 Biophysical Chemistry

Major Related Courses (12 hours)

12 hours upper-division approved molecular biology-related BIOL or CHEM electives

III. Elective Requirements: 9-10 hours

Free Electives (9 - 10 hours)

All students must complete at least 51 hours of upper-division credit to graduate.

Minor in Biology

Minor in Biology

Course Requirements: 18 hours

BIOL 2311 and BIOL 2111 Introduction to Modern Biology I with Workshop

BIOL 3301 and BIOL 3101 Classical and Molecular Genetics with Workshop

BIOL 3361 and BIOL 3161 Biochemistry I with Workshop

Two BIOL electives for majors

Minor in Biomolecular Structure

Course Requirements: 18 hours

BIOL 3336 Protein and Nucleic Acid Structure

BIOL 4461 Biophysical Chemistry, unless taken to fulfill the Molecular Biology major requirements

BIOL 4261 Biomolecular Modeling

CHEM 2323 and CHEM 2325 Introductory Organic Chemistry I and II

One to two approved BIOL, CHEM, CS, EE, MATH, or PHYS electives
Minor in Molecular and Cell Biology

Course Requirements: 18 hours

**CHEM 2323** and **CHEM 2325** Introductory Organic Chemistry I and II

Four approved molecular and cell biology electives

Minor in Microbiology

Course Requirements: 18 hours

**BIOL 3V20** General Microbiology with Lab

**BIOL 3335** Microbial Physiology

**BIOL 4350** Medical Microbiology or **BIOL 4316** Parasites and Symbionts

**BIOL 4345** Immunobiology

**CHEM 2323** Introductory Organic Chemistry I

One approved microbiology elective

Minor in Neurobiology

Course Requirements: 18 hours

**BIOL 4370** Developmental Neurobiology

**BIOL 3371** Biology of the Brain or **NSC 4352** Cellular Neuroscience

**CHEM 2323** and **CHEM 2325** Introductory Organic Chemistry I and II

**NSC 4353** Neuroscience Laboratory Methods

**NSC 4354** Integrative Neuroscience

Fast Track Baccalaureate/Master's Degrees

UT Dallas undergraduate students with strong academic records, including at least 15 hours of upper-division Biology core courses, who intend to pursue graduate work in Biology at UT Dallas, may apply for the Fast Track which involves taking selected graduate courses as an upper-division student. After admission to the graduate program, 15 hours of graduate courses with an earned grade of B or better can be used toward completion of the B.S. and to satisfy requirements for those courses at the graduate level. Graduate courses must be approved by the graduate advisor. This program provides an opportunity to obtain the B.S. degree in Biology after 124 hours of work and an M.S. degree in Molecular and Cell Biology after an additional 21 hours of graduate course and research work. Interested students should contact the Biology
undergraduate advisor well in advance of the senior year to prepare a degree plan taking maximal advantage of this 5-year Fast Track program.

**Degree Planning**

Upper-division biology courses taken at other institutions may be included as part of the degree plan subject to the provisions of the section on Transfer Admissions.

Major-related courses may not include more than 9 hours (BS) or 6 hours (BA) of upper-division transfer credit and not more than 3 hours (Biology major) or 6 hours (Molecular Biology major) of individual instruction (e.g., BIOL 3V90, BIOL 3V91, BIOL 3V92, BIOL 3V95, BIOL 3V96, BIOL 4302, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, BIOL 4V98, or BIOL 4V99).

Students planning a career in a particular allied health profession should consult the school they expect to attend to apprise themselves of the course requirements for admission.

Admission standards for medical and dental schools are set by the individual professional school, whose specific requirements should be reviewed with the help of the UT Dallas Health Professions Advising Center (HPAC). Most professional schools prefer that admission applications be channeled through the HPAC.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
2. Molecular Biology majors may choose BIOL 4337, BIOL 4390, BIOL 4391, BIOL 4398, BIOL 4399, NATS 4310 or another approved Biology elective to fulfill the Core Curriculum Communication Elective.
3. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.
4. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
6. These substitutes for BIOL 4380 require permission of the Biology Undergraduate Advisor to ensure equivalent training in recombinant DNA analysis.
7. Up to 6 hours of research may be used in fulfilling the major related course requirement.
8. Two hours of BIOL 3V20 may be used to satisfy the upper level elective requirement for Biology and Molecular Biology majors.
9. May be substituted with CHEM 2325 Introductory Chemistry II if used to satisfy the Biochemistry II core requirement for Biology and Molecular Biology majors.
School of Natural Sciences and Mathematics

Molecular Biology and Business Administration (B.S.)

The Biology Program at UT Dallas emphasizes the unifying molecular and cellular nature of organisms. At the center of the Biology undergraduate curriculum are the biochemical, genetic, and cell biology concepts and tools used to study the genes of prokaryotes and eukaryotes, to study the proteins and ribonucleic acids (RNA) encoded by these genes, and to study how the expression of these genes is regulated during the development and lifetimes of organisms. Molecular Biology represents a fusion of the four disciplines of biochemistry, biophysics, genetics, and cell biology. Modern biology requires a background in other disciplines such as chemistry, mathematics, physics, and computer sciences. Principles from these disciplines have to be merged to understand and apply new biotechnology and genetic engineering techniques. It is desirable for entering students to have a broad interest and background in the sciences.

Both B.S. and B.A. degrees are offered in Biology at UT Dallas; a B.S. degree is offered in Molecular Biology. The B.S. degrees are intended as preparation for scientific careers in biology or careers in the health professions. The B.A. degree is intended as liberal arts biology major with less emphasis on calculus and more free hours for course work in other disciplines. Each degree in Biology offers a streamlined double major with Business Administration or Crime and Justice Studies. Five-year Fast Track B.S./M.S. Biology and Molecular Biology degree programs are available.

Minors are offered in Biology, Biomolecular Structure, Microbiology, Molecular and Cell Biology, and Neurobiology.

Bachelor of Science in Molecular Biology and Business Administration (Double Major)

Degree Requirements (144 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (BCOM 3311)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavior Sciences Elective (ECON 2301)\(^3\)

Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
6 hours Calculus (MATH 2417 and MATH 2419)\(^4\)

Science (9 hours)
9 hours Chemistry (CHEM 1311 and CHEM 1111, CHEM 1312 and CHEM 1112 and CHEM 2123) \(^4\)

II. Major Requirements: 93 hours

Biology Major Preparatory Courses (17 hours beyond Core Curriculum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 1111</td>
<td>General Chemistry Laboratory I</td>
</tr>
<tr>
<td>CHEM 1112</td>
<td>General Chemistry Laboratory II</td>
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<tr>
<td>CHEM 1311</td>
<td>General Chemistry I</td>
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<tr>
<td>CHEM 1312</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>CHEM 2123</td>
<td>Introductory Organic Chemistry Laboratory I</td>
</tr>
<tr>
<td>CHEM 2125</td>
<td>Introductory Organic Chemistry Laboratory II</td>
</tr>
<tr>
<td>CHEM 2323</td>
<td>Introductory Organic Chemistry I</td>
</tr>
<tr>
<td>CHEM 2325</td>
<td>Introductory Organic Chemistry II</td>
</tr>
<tr>
<td>MATH 2417</td>
<td>Calculus I</td>
</tr>
<tr>
<td>MATH 2419</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS 2325</td>
<td>Mechanics and PHYS 2125 Physics Laboratory</td>
</tr>
<tr>
<td>PHYS 2326</td>
<td>Electromagnetism and Waves and PHYS 2126 Physics Laboratory</td>
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</tbody>
</table>

Biology Major Core Courses (93 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 2111</td>
<td>Introduction to Modern Biology Workshop I</td>
</tr>
</tbody>
</table>

\(^3\) Human Resources
\(^4\) Required courses for Specific Program
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 2112</td>
<td>Introduction to Modern Biology Workshop II</td>
</tr>
<tr>
<td>BIOL 2281</td>
<td>Introductory Biology Laboratory</td>
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<tr>
<td>BIOL 2311</td>
<td>Introduction to Modern Biology I</td>
</tr>
<tr>
<td>BIOL 2312</td>
<td>Introduction to Modern Biology II</td>
</tr>
<tr>
<td>BIOL 3101</td>
<td>Classical and Molecular Genetics Workshop</td>
</tr>
<tr>
<td>BIOL 3102</td>
<td>Eukaryotic Molecular and Cell Biology Workshop</td>
</tr>
<tr>
<td>BIOL 3161</td>
<td>Biochemistry Workshop I</td>
</tr>
<tr>
<td>BIOL 3162</td>
<td>Biochemistry Workshop II</td>
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<tr>
<td>BIOL 3301</td>
<td>Classical and Molecular Genetics</td>
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<td>BIOL 3302</td>
<td>Eukaryotic Molecular and Cell Biology</td>
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<tr>
<td>BIOL 3361</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>BIOL 3362</td>
<td>Biochemistry II</td>
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<tr>
<td>or BIOL 3335</td>
<td>Microbial Physiology</td>
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<tr>
<td>BIOL 3380</td>
<td>Biochemistry Laboratory</td>
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<tr>
<td>BIOL 4461</td>
<td>Biophysical Chemistry</td>
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**Business Major Preparatory Courses (16 hours beyond Core Curriculum)**

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<tr>
<td>ACCT 2301</td>
<td>Introductory Financial Accounting</td>
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<td>ACCT 2302</td>
<td>Introductory Management Accounting</td>
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<tr>
<td>BA 3100</td>
<td>Professional Development</td>
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<td>BLAW 2301</td>
<td>Business and Public Law</td>
</tr>
<tr>
<td>ECON 2301</td>
<td>Principles of Macroeconomics</td>
</tr>
<tr>
<td>ECON 2302</td>
<td>Principles of Microeconomics</td>
</tr>
<tr>
<td>OPRE 3333</td>
<td>Quantitative Business Analysis</td>
</tr>
<tr>
<td>or MATH 2333</td>
<td>Matrices, Vectors and Their Application</td>
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</table>

**Business Core Courses (27 hours)**

<table>
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<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
BCOM 3311 Business Communication

BCOM 4350 Advanced Business Communication

FIN 3320 Business Finance

MIS 3300 Introduction to Management Information Systems

OPRE 3310 Operations Management

OBHR 3310 Organizational Behavior

MKT 3300 Principles of Marketing

BPS 4305 Strategic Management

IMS 3310 International Business

STAT 3360 Probability and Statistics for Management and Economics

or STAT 3332 Statistics for Life Sciences

or OPRE 3360 Managerial Methods in Decision Making Under Uncertainty

III. Elective Requirements: 9 hours

Guided Electives (9 hours)

Business (6 hours): To be selected from upper-level JSOM courses. If qualified, the student may select from JSOM graduate courses.

Biology (3 hours): To be selected from BIOL 4380, BIOL 3V96 (3 hours), BIOL 4391 (3 hours), or BIOL 4399 (3 hours).

All students must complete at least 51 hours of upper-division credit to graduate.

1. Degree is 145 hours if students are required to take NATS 1101.
2. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major requirements at UT Dallas.
3. A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.
4. Six hours of Calculus are counted under Mathematics Core, and 2 hours of Calculus are counted as Major Preparatory Courses.
5. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
6. Requires permission of the Biology Undergraduate Advisor to ensure training in recombinant DNA analysis.
School of Natural Sciences and Mathematics

Physics (BA, BS)

The science of physics seeks understanding of the behavior of matter and energy at the most general and fundamental level. The physicist is trained to explore the physical universe in which people live and seeks interpretations of the natural phenomena found there. While much is known about the physical universe, many phenomena still remain to be investigated, understood, and exploited to the ultimate benefit of humankind. This is the challenge that a modern physicist faces.

Faculty

Cecil and Ida Green Chair in Physics: Roderick A. Heelis

Distinguished Chair in Physics: Myron B. Salamon

Green Distinguished Chair in Academic Leadership: B. Hobson Wildenthal


Associate Professors: Yuri Gartstein, Mustapha Ishak-Boushaki, Lindsay King, David Lary, Chuanwei Zhang

Assistant Professors: Anton Malko, Fabiano Rodregues, Jason Slinker

Professor Emeritus: Ervin Fenyves, Walter Heikkila, Brian Tinsley

Senior Lecturers: Paul MacAlevey, Beatrice Rasmussen

Affiliated Faculty: Cyrus D. Cantrell (Engineering), Yves Chabal (material Science), John Ferraris (Chemistry), Massimo Fischetti (Material Science), Tobias J. Hagee (Mathematics), Wenchuang Hu (Engineering), Stephen Levene (Biology), Dean Sherry (Chemistry), Mary Urquhart (Science/Math Education), Duck-Joo Yang (Chemistry)

The Degrees

The student majoring in Physics must meet the general university requirements for admission and for the specific degree the student is seeking. The Physics Program offers both the Bachelor of Arts and the Bachelor of Science degrees.
Bachelor of Science

The Bachelor of Science is intended for students interested in a professional career in physics or closely related fields. It provides an excellent background for graduate programs in physics, biophysics, geophysics, engineering, medicine and other health related degree programs.

Bachelor of Arts

The Bachelor of Arts program provides an opportunity for a strong base in physics for students wishing to pursue graduate studies (non-physics) in, for example, business administration, economics, finance, oceanography, and patent or high technology law. Additionally, students seeking certification as high school teachers with physics as a major specialization and those seeking employment in industry, government service, and computer technology have the opportunity to obtain the necessary physics background through the BA program. The lower-division course requirements for the BA degree are the same as those for the BS degree. At the upper-division level, 15 hours of advanced physics courses are replaced with 15 hours of science electives.

UTeach Option

The UTeach option may be added to the BA degree in Physics. UTeach Dallas Option degree plans are streamlined to allow students to complete a rigorous Bachelor of Arts degree and all course work for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Graduate Studies Track

The recommended course of study toward a Bachelor of Science degree for those students who intend to pursue graduate studies in Physics begins with a two-semester Honors sequence of fundamentals of physics that gives the student a more extensive foundation in basic physics. The remainder of the program is the same as the regular BS program. A total of 120 credit hours are required.

Algebra Based Physics

An algebra based general physics course (PHYS 1301, PHYS 1302) with lab (PHYS 2125, PHYS 2126) is offered for students interested in the health sciences and those curious about the physical world in which we live. It stresses understanding the workings of nature and the physical processes and phenomena occurring therein.

Minor in Physics (20 hours)

A minor is offered that consists of PHYS 2325, PHYS 2125, PHYS 2326, PHYS 2126, PHYS 3411, and three other upper-division physics courses.
Fast Track Baccalaureate/Master's Degrees

For students interested in pursuing graduate studies in physics, the Physics Department offers an accelerated BS/MS Fast Track that involves taking graduate courses in lieu of several advanced undergraduate courses. Acceptance into the Fast Track is based on the student's attaining a GPA of at least 3.000 on a minimum of 30 hours of upper-division courses that include PHYS 3411, PHYS 3312, PHYS 3330, PHYS 3416 and PHYS 4311. Eligible students may take up to 15 credit hours of selected graduate courses that may be used to complete the baccalaureate degree and also satisfy requirements for the master's degree. These credits will partially satisfy the MS degree requirements when the student completes the BS degree. Interested students should contact their advisor during their junior year to apply to the Fast Track program.

Bachelor of Arts in Physics

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)

3 hours Communication (RHET 1302)

3 hours Communication Elective (NATS 4310, PHYS 4390 or PHYS 4399)

Social and Behavioral Sciences (15 hours)

6 hours Government (GOVT 2301 and GOVT 2302)

6 hours American History

3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)

3 hours Fine Arts (ARTS 1301)

3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)

6 hours Calculus (MATH 2413 or MATH 2417 and MATH 2414 or MATH 2419)\(^1\)

Science (9 hours)

8 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, and CHEM 1112)\(^2\)

1 hour Physics (PHYS 2125)\(^3\)

II. Major Requirements: 66 hours
Major Preparatory Courses (25 hours)

MATH 2413 Differential Calculus
or MATH 2417 Calculus I
MATH 2414 Integral Calculus
or MATH 2419 Calculus II

MATH 2415 Calculus of Several Variables
or MATH 2451 Multivariable Calculus with Applications

MATH 2418 Linear Algebra

MATH 2420 Differential Equations with Applications

PHYS 1100 The Fun of Physics

PHYS 2303 Contemporary Physics

PHYS 2325 Mechanics and PHYS 2125 Physics Laboratory I
or PHYS 2421 Honors Physics I - Mechanics and Heat and PHYS 2125 Physics Laboratory I

PHYS 2326 Electromagnetism and Waves and PHYS 2126 Physics Laboratory II
or PHYS 2422 Honors Physics II - Electromagnetism and Waves and PHYS 2126 Physics Laboratory II

Major Core Courses (26 hours)

PHYS 3312 Classical Mechanics

PHYS 3327 Electronics with Laboratory

PHYS 3330 Numerical Methods in Physics and Computational Techniques

PHYS 3411 Theoretical Physics

PHYS 3416 Electricity and Magnetism

PHYS 4311 Thermodynamics and Statistical Mechanics

PHYS 4373 Physical Measurements Laboratory

PHYS XXXX Physics Elective
Major Related Courses (15 hours)

15 hours of upper division Science Electives

Advanced Writing

PHYS 4390 Senior Research and Advanced Writing
or PHYS 4399 Senior Honors in Physics
or NATS 4310 Advanced Writing in the Natural Sciences and Mathematics
or Summer Research Project
or COOP program with written final report

III. Elective Requirements: 12 hours

Electives (6 hours)

All students are required to take at least six hours of advanced electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (6 hours)

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.

Physics Electives

PHYS 3317 Physics of the Human Body
PHYS 3380 Astronomy
PHYS 4301 Quantum Mechanics I
PHYS 4302 Quantum Mechanics II
PHYS 4335 Remote Sensing of the Earth
PHYS 4352 Concepts of Modern Physics
PHYS 4371 Solid State Physics
PHYS 4381 Space Science
PHYS 4383 Plasma Physics
PHYS 4395 Cosmology
PHYS 4386  Elementary Particle Physics
PHYS 4V07  Senior Research Projects
PHYS 4V10  Special Topics in Physics

Other Courses
PHYS 1101  College Physics Laboratory I
PHYS 1102  College Physics Laboratory II
PHYS 1301  College Physics I
PHYS 1302  College Physics II

Bachelor of Science in Physics

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^2\): 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (NATS 4310, PHYS 4390 or PHYS 4399)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 2413 or MATH 2417 and MATH 2414 or MATH 2419)\(^1\)

Science (9 hours)
- 8 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, and CHEM 1112)\(^1\)
1 hour Physics (PHYS 2125)

II. Major Requirements: 66 hours

Major Preparatory Courses (25 hours)

MATH 2413 Differential Calculus

or MATH 2417 Calculus I

MATH 2414 Integral Calculus

or MATH 2419 Calculus II

MATH 2415 Calculus of Severable Variables

or MATH 2451 Multivariable Calculus with Applications

MATH 2418 Linear Algebra

MATH 2420 Differential Equations with Applications

PHYS 1100 The Fun of Physics

PHYS 2303 Contemporary Physics

PHYS 2325 Mechanics and PHYS 2125, Physics Laboratory

or PHYS 2421 Honors Physics I - Mechanics and Heat and PHYS 2125 Physics Laboratory

PHYS 2326 Electromagnetism and Waves and PHYS 2126 with Physics Laboratory

or PHYS 2422 Honors Physics II - Electromagnetism and Waves and PHYS 2126 Physics Laboratory

Major Core Courses (23 hours)

PHYS 3312 Classical Mechanics

PHYS 3327 Electronics with Laboratory

PHYS 3330 Numerical Methods in Physics and Computational Techniques

PHYS 3411 Theoretical Physics

PHYS 3416 Electricity and Magnetism

PHYS 4311 Thermodynamics and Statistical Mechanics

PHYS 4373 Physical Measurements Laboratory
Major Related Courses (18 hours)

PHYS 4301 Quantum Mechanics I
PHYS 4302 Quantum Mechanics II
PHYS 4328 Optics
PHYS 4352 Concepts of Modern Physics

6 hours Physics Electives

Advanced Writing (fulfills 3 hours of Core Communications requirement)

PHYS 4390 Senior Research and Advanced Writing
or PHYS 4399 Senior Honors in Physics
or NATS 4310 Advanced Writing in the Natural Sciences and Mathematics
or Summer Research Project
or COOP program with written final report

III. Elective Requirements: 12 hours

Electives (6 hours)

All students are required to take at least six hours of advanced electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Free Electives (6 hours)

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.

Physics Electives

PHYS 3317 Physics of the Human Body
PHYS 3380 Astronomy
PHYS 4335 Remote Sensing of the Earth
PHYS 4395 Cosmology
PHYS 4386 Elementary Particle Physics
PHYS 4371 Solid State Physics
PHYS 4381 Space Science
PHYS 4383 Plasma Physics
PHYS 4V07 Senior Research Projects
PHYS 4V10 Special Topics in Physics

Other Courses
PHYS 1101 College Physics Laboratory I
PHYS 1102 College Physics Laboratory II
PHYS 1301 College Physics I
PHYS 1302 College Physics II

Bachelor of Arts in Physics with UTeach Option

Degree Requirements (123 hours)

I. Core Curriculum Requirements: 42 hours

Communication (6 hours)
3 hours Communication (RHET 1302)
3 hours Communication Elective (NATS 4390)

Social and Behavioral Sciences (15 hours)
6 hours Government (GOVT 2301 and GOVT 2302)
6 hours American History
3 hours Social and Behavioral Sciences Elective

Humanities and Fine Arts (6 hours)
3 hours Fine Arts (ARTS 1301)
3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
6 hours Calculus (MATH 2413 and MATH 2414)

Science (9 hours)
8 hours Chemistry (CHEM 1311, CHEM 1111, CHEM 1312, and CHEM 1112)

1 hour Physics (PHYS 2125)

II. Major Requirements: 66 hours

Major Preparatory Courses (25 hours beyond core curriculum)

MATH 2413 Differential Calculus

or MATH 2417 Calculus I
MATH 2414 Integral Calculus

or MATH 2419 Calculus II

MATH 2415 Calculus of Several Variables

or MATH 2451 Multivariable Calculus with Applications

MATH 2418 Linear Algebra

MATH 2420 Differential Equations with Applications

PHYS 1100 The Fun of Physics

PHYS 2303 Contemporary Physics

PHYS 2325 Mechanics and PHYS 2125 Physics Laboratory

or PHYS 2421 Honors Physics I - Mechanics and Heat and PHYS 2125 Physics Laboratory

PHYS 2326 Electromagnetism and Waves and PHYS 2126 Physics Laboratory II

or PHYS 2422 Honors Physics II - Electromagnetism and Waves and PHYS 2126 Physics Laboratory II

Major Core Courses (26 hours)

PHYS 3411 Theoretical Physics

PHYS 3312 Classical Mechanics

PHYS 3327 Electronics with Laboratory

PHYS 3330 Numerical Methods in Physics and Computational Techniques

PHYS 3416 Electricity and Magnetism

PHYS 4311 Thermodynamics and Statistical Mechanics
PHYS 4373 Physical Measurements Laboratory

PHYS Elective

**Major Related Courses (15 hours)**

15 hours of upper division Science Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATS 4694</td>
<td>UTeach Apprentice Teaching</td>
</tr>
<tr>
<td>NATS 4696</td>
<td>UTeach Apprentice Teaching</td>
</tr>
</tbody>
</table>

UTeach Apprentice Teaching can fulfill 6 of these hours.

III. Elective Requirements: 15 hours

**Electives (6 hours)**

All students are required to take at least six hours of advanced electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites. UTeach courses can be used to fulfill these requirements.

**UTeach Requirements (9 hours beyond core curriculum, science electives, and advanced electives)**

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<tr>
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<td>UTeach Step 1</td>
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<tr>
<td>NATS 1143</td>
<td>UTeach Step 2</td>
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<tr>
<td>NATS 3341</td>
<td>Knowing and Learning in Mathematics and Science</td>
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<td>NATS 3343</td>
<td>Classroom Interactions</td>
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<tr>
<td>HIST 3328</td>
<td>History and Philosophy of Science and Medicine</td>
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<tr>
<td>NATS 4390</td>
<td>Research Methods</td>
</tr>
<tr>
<td>NATS 4341</td>
<td>Project-Based Instruction</td>
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</table>

**NATS 4694** UTeach Apprentice Teaching, 8-12 Science and Mathematics

or **NATS 4696** UTeach Apprentice Teaching, 4-8 Science and Mathematics

**NATS 4141** UTeach Apprentice Teaching Seminar

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Two hours of Calculus are counted as Major Preparatory credit; six hours are counted in Core Curriculum. Students may choose either calculus sequence MATH 2413, MATH 2414, and MATH 2415 or MATH 2417, MATH 2419 and MATH 2451.
3. Required preparatory coursework.
4. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
5. Counted in Core Curriculum
6. Two hours of Calculus are counted as Major Preparatory credit; six hours are counted in Core Curriculum.
7. NATS 4390 fulfills Core Communication requirement.
8. Counts as 6 hours of Science Electives Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation.
School of Natural Sciences and Mathematics

Certificate in Biomedical Sciences

The post-baccalaureate Certificate in Biomedical Sciences (CBioMed), administered by the School of Natural Sciences and Mathematics, allows students who have already earned a bachelor’s degree to further develop their scientific knowledge in preparation for application to schools of medicine, dentistry, or podiatry. A rigorous curriculum provides students with the opportunity to focus on content mastery. Program requirements also include clinical, community service, and/or research hours, independent from course credit and initiated by the student. Certificate students access the services of the Health Professions Advising Center (HPAC), receiving assistance with the application process.

Application for the program is through the ApplyTexas online application at http://www.utdallas.edu/admissions. Applicants apply as “Transfer, Undergraduate” students in the School of Natural Sciences and Mathematics, and select the “Undergraduate Certificate in Biomedical Sciences.” A supplemental application, as well as the booklet “Information and Program Guidelines,” can be found on the Health Professions Advising Center (HPAC) webpage http://www.utdallas.edu/prehealth. The CBioMed program is administered through HPAC.
# Additional changes made to undergraduate courses
## 2013 Undergraduate Catalog

## School of Arts and Humanities

<table>
<thead>
<tr>
<th>Year</th>
<th>Meta</th>
<th>Catalog Course Description</th>
<th>Req Status</th>
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<td>ARHM 1100 Freshman Seminar (1 semester hour) This course is a graduation requirement for all freshmen in the School of Arts and Humanities (A&amp;H). Incoming freshmen will learn about the intellectual and cultural environment in the School of Arts and Humanities through lectures, group projects, activities, guest panels, and attendance at artistic and cultural events. Students will also learn about A&amp;H majors (Art and Performance, Arts and Technology, Emerging Media and Communication, Historical Studies, and Literary Studies), research opportunities, careers, and internships. This course is open to all non-A&amp;H majors. Credit/No Credit. Co-requisite: Corequisite: UNIV 1010. (1-0)</td>
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<td>CGS 1100 First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Corequisite: UNIV 1010. (Same as CLDP 4400, 1100 and NSC 4400, 1100 and PSY 4400, 1100 and SPAU 1100) Credit/No Credit. Co-requisite: UNIV 1010. (1-0)</td>
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<td>CLDP 1100 First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Corequisite: UNIV 1010. (Same as PSY 1100, NSC 1100, CGS 1100, 1100 and NSC 1100 and PSY 1100 and SPAU 1100) Credit/No Credit. Co-requisite: UNIV 1010. (1-0)</td>
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<td>NSC 1100 First Year Seminar (1 semester hour) This course is designed to introduce incoming</td>
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<td>Brain Sciences (BBS). Students will learn about plans of study and career paths for</td>
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<td>majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child</td>
<td>approve:</td>
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<td>Learning and Development, and Cognitive Science. Required for all freshman Behavioral and</td>
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<td>Brain Sciences majors; open to all non-BBS majors. Corequisite: UNIV 1010. (Same as</td>
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<td>CLDP 4400, PSY 4400, 1100 and CGS 4400, 1100 and PSY 1100 and SPAU 1100)</td>
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<td>Credit/No Credit. Co-requisite: UNIV 1010. (1-0) Y</td>
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School of Economic, Political and Policy Sciences
### 2012-2013

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<td>econ4396</td>
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<td>ECON 4396 Selected Topics in Economics (3 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit (9 hours maximum). <strong>Instructor consent required:</strong> (3-0) R</td>
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<td>epps1110</td>
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<td>EPPS 1110 Freshman Seminar (1 semester hour)</td>
<td>This course is a graduation requirement for all first time in college EPPS freshman. This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Economic, Political and Policy Sciences. Students will learn about EPPS majors, research opportunities, careers, and internships. The course covers introductory information applied to criminology, political science, public affairs/public administration, nonprofit management, economics, global economy, and sociology. This course is also open to all non-EPPS majors. <strong>Credit/No Credit only.</strong> Co-requisite: <strong>Corequisite:</strong> UNIV 1010. (1-0) Y</td>
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<td>geog3304</td>
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<td>GEOG 3304 Tools for Spatial Analysis (3 semester hours)</td>
<td>An introduction to the primary methods used in geographic analysis. Topics include spatial statistics, cartography, and geographic information systems (GIS). This course is designed to provide a foundation for all other upper level Geography courses. Prerequisite: EPPS 3405 or STAT 1342. <strong>(Same as GISC 3304 and GEOS 3304)</strong> (3-0) Y</td>
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<td>gisc2301</td>
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<td>GISC 2301 Introduction to Geospatial Information Science (3 semester hours)</td>
<td>A broad introduction to geospatial information science, including GIS, remote sensing, GPS, spatial data analysis, cartography, and other topics. <strong>(Same as GEOS 2301)</strong> (2-2) Y</td>
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**Additional changes made to undergraduate courses 2013 Undergraduate Catalog**

Forwarded from CEP to Senate, March 5, 2013
### GISC 3301 Introduction to Remote Sensing (3 semester hours)
Topics include principles of remote sensing and sensors, image visualization and statistics, radiometric and geometric correction, enhancement, classification, change detection, and innovative image processing approaches. (3-0) Y

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### GISC 3304 Tools for Spatial Analysis (3 semester hours)
An introduction to the primary methods used in geographic analysis. Topics include spatial statistics, cartography, and geographic information systems (GIS). This course is designed to provide a foundation for all other upper level Geography courses. Prerequisite: EPPS 3405 or STAT 1342. (Same as GEOG 3304 and GEOS 3304) (3-0) Y

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### GISC 2301, or equivalent with instructor’s consent. (3-0) Y

### GISC 4317 Computer Programming for GIS GeoComputation (3 semester hours)
Introduction to fundamental programming skills and their application implementation in GIS related software development. Topics covered include fundamental programming structures (such as branching and looping), functions and subroutines, arrays geometric properties, geospatial modeling, visual programming, scripting and collections. Emphasis on rapid GIS interface customization and geoprocessing function development with standard programming languages. application development. Students are expected to design and implement a project. Prerequisite: CE/CS 2336, GISC 2301 or GISC 3304 or GEOG 3304. (3-0) Y

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### Additional changes made to undergraduate courses

#### 2013 Undergraduate Catalog

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<td>add_renum ber * gisc4325 (r0) gisc4325.2</td>
<td>GISC 4325 Introduction to Remote Sensing (3 semester hours) Topics include principles of remote sensing and sensors, image visualization and statistics, radiometric and geometric correction, enhancement, classification, change detection, and innovative image processing approaches. (Same as GEOS 4325) (3-0) Y</td>
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<td>add * gisc4326 (r0) gisc4326.2</td>
<td>GISC 4326 Cartography and GeoVisualization (3 semester hours) Examines the theoretical concepts and practical applications of cartographic and geographic visualization. Topics covered include concepts for geographic data representation, symbolization and map design, and methods for geographic visualization and display. 3D visualization, cartographic animation, and web-based mapping may also be included. Lab sessions explore the implementation of cartographic and geographic visualization with industry standard GIS software. Prerequisite: GISC 2301 or GEOG 3304 or GEOS 3304 or GISC 3304. (3-0) Y</td>
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<td>GISC 4382 Applied Geographic Information Systems (3 semester hours) Further develops hands-on skills with industry-standard GIS software for application in a wide variety of areas including urban infrastructure management, marketing and location analysis, environmental management, geologic and geophysical analysis and the Economic, Political and Policy Sciences. Prerequisite: GISC 2301, or equivalent with instructor's consent. (3-0) Y</td>
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<td>GISC 4384 Urban and Environmental GIS (3 semester hours) Application of GIS in solving real world urban and/or environmental problems. Advanced techniques such as geospatial analysis, modeling, simulation and visualization will be covered. State-of-the-art software will be introduced through hands-on laboratory experiences. Prerequisite: GISC 2301 or GEOG 3304 or GISC 3304. (3-0) Y</td>
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Forwarded from CEP to Senate, March 5, 2013
### Additional changes made to undergraduate courses

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<td>add *gisc4385 (r0) gisc4385.2</td>
<td>GISC 4385 Advances in GIS (3 semester hours) This course introduces advances in contemporary geographic information system and sciences. Topics covered may include advanced GIS applications in social and natural environments, algorithms and their implementations in GIS, computational aspects of GIS such as uncertainty and data quality assessment. Prerequisite: GISC 2301 or GEOG 3304 or GISC 3304 (3-0) Y</td>
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#### Erik Jonsson School of Engineering and Computer Science

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<td>edit *mech1208 (r3) mech1208 .4</td>
<td>MECH 1208 Introduction to Mechanical Engineering (2 semester hours) The purpose of this course is to give students a general understanding of the broad range of technical areas and applications specific to the mechanical engineering profession. Course activities include team-oriented competitions, and lectures by mechanical engineering experts. Prerequisite: ECS 1200. Prerequisities or corequisites: (PHYS 2325 and PHYS 2125) and (MATH 2419 or MATH 2414). (1-1) Y</td>
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<td>MECH 2310 Statics and Introductory Dynamics (3 semester hours) Lecture course. Course material includes static vector representations of forces and moments, free body diagrams, equilibrium of particles, trusses center of mass, centroids, distributed load systems, equivalent force systems, equilibrium of rigid bodies, trusses, frames and machines, internal forces in beams, friction equivalent systems, particle dynamics, work, energy, angular momentum, moment of inertia, and dynamics of rigid bodies. Major topics: force systems structural members, shear forces and static equilibrium, truss and frame structures, introduction to dynamics, kinematics bending moments in beams, friction, area and kinetic mass moments of particles, kinematics and kinetics inertia, the principle of rigid bodies. Prerequisite: virtual work. Prerequisities: MECH 1208 and (PHYS 2325 and PHYS 2325/2125 or PHYS 2414 2415 or MATH 2414 and MATH 2419). (3-0) Y</td>
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## Additional changes made to undergraduate courses
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<td>MECH 2320 Strength of Materials (3 semester hours) Lecture course. Introduction to stress and deformation analysis of basic structural elements subjected to axial, torsional, bending, and pressure loads. <strong>Prerequisite:</strong> (MATH 2415 or MATH 2419) and MECH 2310. Corequisite: MECH 2120. (3-0) Y</td>
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<td>MECH 2330 Dynamics (3 semester hours) Lecture course. Kinematics and kinetics of particles, planar rigid bodies, three-dimensional rigid bodies and equations of motion. Methods utilizing force and acceleration, work and energy and impulse and momentum. Single degree of freedom vibration systems are and simulation tools are introduced. <strong>Prerequisites:</strong> MECH 2310. <strong>Prerequisite or corequisite:</strong> ENGR 2300 and MATH 2420. (3-0) Y</td>
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<td>MECH 3150 Mechanical Engineering Systems Laboratory (1 semester hour) Project-based course associated with MECH 3350. Laboratory course focused on students performing a team design project of a complex mechanical system. <strong>Complete analysis of the devices will be documented.</strong> <strong>Prerequisite:</strong> MECH 3350; it is recommended that the laboratory is taken the next long semester after completion of MECH 3350. (0-1) Y</td>
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<td>-- request to remove this course from catalog --  MECH 3151 Mechanical Systems Laboratory (1 semester hour) Project-based course associated with MECH 3351. Laboratory course focused on students performing a team design project of a complex mechanical system. <strong>Complete analysis of the systems will be documented.</strong> <strong>Pre- or corequisite:</strong> MECH 3351; it is recommended that the laboratory is taken the next long semester after completion of MECH 3351. (0-1) Y</td>
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Forwarded from CEP to Senate, March 5, 2013
| 2012-2013 | edit * mech3301 (r3) mech3301 .4 | MECH 3301 Mechanics of Materials (3 semester hours) Lecture course. Course material includes determination of stresses, deflections, and stability of deformable bodies, including theory of advanced beams, elasticity and matrix structural analysis. **Prerequisite:** Prerequisites: MECH 2320, Pre- or corequisites: 2320 and ENGR 3300, ENGR 3341. 3300. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mrx062000 2013-01-28 11:36:06 |
| 2012-2013 | remove * mech3302 (r4) mech3302 .5 | **-- request to remove this course from catalog --** MECH 3302 Intermediate Dynamics (3 semester hours) Lecture course. A continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers. Topics include three-dimensional kinematics of a rigid body, planar kinetics of a rigid body, three-dimensional kinetics of a rigid body, equations of motion. Prerequisites: ENGR 3300, MECH 2310. Recommended corequisite: MECH 2320. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mrx062000 2013-01-28 11:34:24 |
| 2012-2013 | edit * mech3305 (r4) mech3305 .5 | MECH 3305 Computer Aided Design (3 semester hours) Lecture course. Course material includes an introduction to Computer-Aided Mechanical Design (CAMD) tools (hardware/software) and their applications to mechanical systems design. Prerequisites: ECS-1200, MATH 2420, MECH 1208 and ENGR 2300 and PHYS 2325. Pre-Prerequisite or corequisite: CS 1325 or CE/CS 1327. (CE 1337 or CS 1337). Corequisite: MECH 3105. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mrx062000 2013-01-28 11:41:36 |
| 2012-2013 | edit * mech3310 (r4) mech3310 .5 | MECH 3310 Thermodynamics (3 semester hours) Lecture course. This course focuses on introductory concepts and definitions of thermodynamics, energy and the availability and reversible work, machine, and cycle processes; real gas behavior; first law of thermodynamics, phase-change, internal energy, energy balance, entropy, ideal gas, control volume analysis, second law of thermodynamics, vapor, gas and refrigeration power systems. Prerequisites: MECH 1208 and ENGR 3300, 3300 and PHYS 2325. Pre-Prerequisite or corequisite: CHEM 1311. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mrx062000 2013-01-28 11:42:50 |
### MECH 3315 Introduction to Fluid Mechanics (3 semester hours)

Lecture course. Course material includes an introduction to the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics, ideal fluid flow including potential flow theory, and computer solutions in ideal fluid flow. **Prerequisite:** MECH 2330 and ENGR 3300. **Pre-Prerequisite** or **corequisite:** ENGR 2300, **corequisite:** MECH 3310. (3-0) Y

### MECH 3350 Design Kinematics and Dynamics of Mechanical Components Systems (3 semester hours)

Lecture course. This course focuses on failure analysis, Motion and design interaction of machine components, design mechanisms for specified performance, analyze given mechanisms elements and mechanisms. Kinematics, statics, and dynamics are applied for position, velocity, acceleration analysis and static design of the parts of machines such as planar mechanisms, cams and dynamic forces, gears. **Prerequisites:** ENGR 2300 and MATH 2420 and MECH 2320, 2330 and ENGR 3300. **Pre- or corequisite:** PHYS 2326. (3-0) Y

### MECH 3351 Design of Mechanical Systems (3 semester hours)

Lecture course. **Comprehensive study in the design and analysis of tools for mechanical components and systems.** Introduction to Design criteria based on reliability engineering, Introduction and functionality are introduced. Basic principles of stress and deflection analysis, application to finite element analysis. Perform a competitive team mechanical components and systems. Failure design project. **Prerequisite:** theory based on static and dynamic loads, stochastic considerations, and design of mechanical components such as shafts, bearing and shaft-bearing systems, gear and gear systems and mechanical joints. **Prerequisites:** MECH 3350. **Recommended** 2320 and ENGR 3300. **Prerequisite or corequisite:** MECH 3151, 3350. (3-0) Y

### MECH 4110 Systems and Controls Laboratory (1 semester hour)

Laboratory course associated with MECH 4310. Course focused on the modeling and parameter estimation of dynamical systems, and the design and implementation of control systems. **Prerequisite:** MECH 4310; it is recommended that the laboratory is taken the next long semester after completion of MECH 4310. (0-1) Y
### MECH 4310 Systems and Controls (3 semester hours)

### MECH 4330 Intermediate Fluid Mechanics (3 semester hours)
Lecture course. This course covers ideal fluid flow, including potential flow theory, computer solutions in ideal fluid flow, viscous flow and boundary layer theory and introduction to turbulence. Prerequisites: MECH 3310 and MECH 3315. (3-0) Y

### MECH 4340 Mechanical Vibrations (3 semester hours)
Lecture course. This course covers harmonic and periodic motion including both damped and undamped free and forced vibration, single- and multi-degree-of-freedom systems and matrix techniques suitable for computer simulations. Prerequisites: ENGR 3341, 2300 and MATH 2420 and ENGR 3341 and MECH 3302, 2330. (3-0) Y

### MECH 4360 Introduction to Nanostructured Materials (3 semester hours)
Lecture course. The emphasis in this course is to introduce the science of the building blocks of nanostructured materials, their chemical and structural characterization, material behavior, and the technological implications of these materials. Special attention is devoted to presenting new developments in this field and future perspectives. Prerequisites: CHEM 4211, 1311 and MECH 3301. (3-0) Y
## Additional changes made to undergraduate courses
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<td>edit * mech4370 (r2) mech4370 .3</td>
<td>MECH 4370 Introduction to MEMS (3 semester hours) Lecture course. This course will target an audience of motivated senior-level undergraduates, with the goal of providing an introduction to M/NEMS fabrication techniques, selected device applications, and the design tradeoffs in developing systems. Prerequisites: CHEM 1311, 1311 and MECH 3310, 3310 and MECH 3350. (3-0) Y</td>
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<td>edit * mech4381 (r3) mech4381 .6</td>
<td>MECH 4381 Senior Design Project I (3 semester hours) Project-based capstone course. Student groups design, build, and test a device that solves an open-ended mechanical engineering design problem. MECH 4381 focuses on background research and engineering analysis, MECH 4382 on prototype construction and testing. As a designated MECH Writing-Intensive Course, MECH 4381 and MECH 4382 also focus on the refinement of students' engineering communications skills and their use of writing as a critical-thinking and learning tool. Prerequisites: MECH 3305 and MECH 3320 and MECH 3351 and MECH 4310 and ECS 3390. (3-0) Y</td>
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<td>edit * mech4382 (r2) mech4382 .4</td>
<td>MECH 4382 Senior Design Project II (3 semester hours) Project-based capstone course. Student groups design, build, and test a device that solves an open-ended mechanical engineering design problem. MECH 4381 focuses on background research and engineering analysis, MECH 4382 on prototype construction and testing. As a designated MECH Writing-Intensive Course, MECH 4381 and MECH 4382 also focus on the refinement of students' engineering communications skills and their use of writing as a critical-thinking and learning tool. Prerequisite: MECH 4381. (3-0) Y</td>
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**Jindal School of Management**

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Forwarded from CEP to Senate, March 5, 2013
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<td>add</td>
<td>acct3100</td>
<td>ACCT 3100 Professional Development (1 semester hour)</td>
<td>Accounting</td>
<td>3</td>
<td>This course is required for all students majoring in Accounting in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit.</td>
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<tr>
<td>2013</td>
<td>edit</td>
<td>acct4380</td>
<td>ACCT 4380 Internship in Accounting (3 semester hours)</td>
<td>Accounting</td>
<td>6</td>
<td>This course provides students with an opportunity to expand and apply their skills in accounting in a professional setting. The accounting student will be required to apply knowledge obtained at the University in an actual job situation. Instructor consent is required. Credit/No Credit.</td>
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<td>ba3100</td>
<td>BA 3100 Professional Development (1 semester hour)</td>
<td>Business Administration</td>
<td>3</td>
<td>This course is required for all students majoring in Business Administration in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit.</td>
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### Additional changes made to undergraduate courses

#### 2013 Undergraduate Catalog

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<th>add *</th>
<th><strong>ba4010</strong> (r1) ba4010.5</th>
<th><strong>BA 4010 SIFE ENACTUS</strong> Participation (0 semester hours) This course is designed for students participating in <strong>Students In Free Enterprise Enactus</strong> for zero course credit. Students in <strong>SIFE Enactus</strong> partner with business and education leaders to take lessons learned in the classroom out to local communities in need of assistance. Instructor consent required. May be repeated. Graded Credit/No Credit. <em>(0-1) (1-0) S</em></th>
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<td><strong>fin3100</strong> (r0) fin3100.3</td>
<td><strong>FIN 3100 Professional Development</strong> (1 semester hour) This course is required for all students majoring in Finance in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. <strong>Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit. (1-0) S</strong></td>
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<td>2012-2013</td>
<td>add *</td>
<td><strong>fin4380</strong> (r1) fin4380.5</td>
<td><strong>FIN 4380 Practicum in Investment Domestic Fund Management</strong> (3 semester hours) For students involved in the practice of investment management for the university. This course requires faculty consent and may be repeated for credit up to a maximum of 6 hours. <em>(6 hours maximum).</em> Prerequisite: FIN 4300 with a B or better <em>(3-3) (3-0) R</em></td>
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<td><strong>ims3100</strong> (r0) ims3100.3</td>
<td><strong>IMS 3100 Professional Development</strong> (1 semester hour) This course is required for all students majoring in Global Business in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. <strong>Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit. (1-0) S</strong></td>
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### MIS 3100 Professional Development (1 semester hour)
This course is required for all students majoring in Management Information Systems in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. **Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit.** (1-0) S

### MKT 3100 Professional Development (1 semester hour)
This course is required for all students majoring in Marketing in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. **Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit.** (1-0) S

### MKT 4332 Advanced Personal Selling Skills (3 semester hours)
This course covers advanced personal selling skills, practices and programs. Emphasis will be placed on sales, presentations, demonstrations, advanced sales techniques, advanced communication and relationship-building skills. Various corporate sales strategies for both consumer and business sales will be explored. This course is intended to prepare students for competitive sales situations and competitions and is primarily intended for students interested in sales careers. Prerequisites: MKT 3300, 3300 and MKT 3330 and (BCOM 3311 or ACCT 3311), BCOM 3311, and instructor consent required. (3-0) Y
Additional changes made to undergraduate courses
2013 Undergraduate Catalog

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<td>2012-2013</td>
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<td>OPRE 3100 Professional Development (1 semester hour) This course is required for all students majoring in Supply Chain management in the Naveen Jindal School of Management. This course is designed to enhance the student's experience in the Naveen Jindal School of Management. Students will work on networking skills, verbal and written communication skills, business etiquette training, and learn how to increase their human capital. Students will also work on projects geared towards career management and overall professional development as a business major. The goal of this class is to make the student a more marketable and valuable professional to the global economy. Students will learn and attend class using hybrid system of online training and on campus training. Only one professional development course (credit) may be applied toward your degree plan. Not repeated for credit. (1-0) S</td>
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Added 17 JSOM courses, 3-5-13

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<td>2013-open</td>
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<td>FIN 3390 Introduction to Financial Modeling (3 semester hours) Develops the ability to use quantitative methods and software (particularly spreadsheet) for financial decision making. Prerequisites: (MATH 2333 or OPRE 3333) and ((STAT 3360 or OPRE 3360) with a C or better), FIN 3320 with a C+ or better). FIN 3320. (3-1) S</td>
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<td>FIN 4300 Investment Management (3 semester hours) Examines a wide range of issues concerning management of investments and so provides an understanding of the role of modern financial theory in pricing financial assets and managing portfolios. Prerequisite: FIN 3320 with a C+ or better and (prerequisite or corequisite: FIN 3390). (3-0) S</td>
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### FIN 4310 Intermediate Business Finance (3 semester hours)
Builds on FIN 3320 to develop additional topics in business financial decision making. It integrates a variety of advanced topics in developing a firm's financial strategy. Prerequisite: FIN 3320 with a C+ or better and (prerequisite or corequisite: FIN 3390). (3-0) S

### FIN 4320 Management of Financial Institutions (3 semester hours)
Study of the financial management of commercial banks and other financial intermediaries, with an emphasis on the analysis of financial performance, lending decisions, asset-liability management, and the management of institutional capital requirements. Strategic considerations such as evolving information technology, the changing regulatory environment and the impact of global competition in financial services will also be examined. Prerequisite: FIN 3350 with a C or better. (3-0) T

### FIN 4340 Options and Futures Markets (3 semester hours)
Examines valuation of derivative securities, such as options and futures contracts, and the use of these instruments in managing business and financial risks. Topics include pricing of futures contracts, swaps, and options, and use of derivative instruments in hedging, portfolio insurance, and exotic options. Prerequisite: FIN 4300 or (FIN 4310 with a C or better). FIN 4310. (3-0) Y

### FIN 4345 Financial Information and Trading (3 semester hours)
This course examines the sources and uses of financial information in valuing and trading securities, as well as the structure of trading in security markets. Prerequisite: FIN 3390 with a C or better. 3390. (3-0) Y
### Additional changes made to undergraduate courses

#### 2013 Undergraduate Catalog

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<tr>
<td>FIN 4380 Domestic Fund Management (3 semester hours) For students involved in the practice of investment management for the university. This course requires faculty consent and may be repeated for credit (6 hours maximum). Prerequisite: FIN 4300 with a B or better 4300. (3-0) R</td>
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<td>OBHR 3330 Introduction to Human Resource Management (3 semester hours) This course is an overview of human resource management. Students will learn theories and practices in many different &quot;core&quot; areas of human resource management including staffing, performance management, work and job design, training, compensation, and labor relations. The course also examines how the human resource function contributes to the company's business strategy and competitive advantage. Prerequisite: OBHR 3310 with a grade of C or better. 3310. (3-0) T</td>
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<td>OBHR 4310 Business Ethics (3 semester hours) This course examines ethical and socio-political issues and concepts that relate to management in a global business environment. Leaders increasingly need to be aware of potential threats and opportunities in their environments and many stem from value and cultural differences that most managers are not trained to resolve. Prerequisites: OBHR 3310 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) S</td>
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<td>OBHR 4331 Compensation and Benefits Administration (3 semester hours) This course focuses on how managers can strategically utilize compensation to attract, retain, and motivate qualified employees. Students will gain an understanding of the multidisciplinary theories underlying pay system design and implementation. Attention will be given to principles underlying successful compensation systems, including internal alignment, external competitiveness, and pay-for-performance. Prerequisites: OBHR 3310 with a grade of C or better and OBHR 3330 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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### OBHR 4333 Performance Management (3 semester hours)
This course examines the continuous process of identifying measuring, and developing the performance of individuals and teams and aligning their performance with the strategic goals of the organization. Special attention will be placed on developing performance management systems for small and large, for-profit and not-for-profit, and domestic and global organizations, and in all industry segments. Prerequisites: OBHR 3310 with a grade of C or better and OBHR 4350 with a grade of C or better 4350 and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) 

### OBHR 4334 Talent Acquisition and Management (3 semester hours)
This course focuses on the effective management of the flow of talent into and through organizations. It covers human resource planning, recruiting and selection, career transitions and other workforce movement. An important goal of the class will be to provide opportunities to develop hands-on skills that are relevant to effectively managing talent flow. Acquisition and development of human resources in organizations and career management for individuals. Some emphasis on using data systems to perform human resource planning, job analysis, recruitment, selection, training, socialization, career development, and withdrawal from work. Prerequisites: OBHR 3310 with a grade of C or better and OBHR 3330 with a grade of C or better 3330 and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) 

### OBHR 4350 Introduction to Leading and Managing (3 semester hours)
This course will deal with theories and techniques of leadership and management. The course will start with a general overview of major theories on leadership and management. The main focus of this course is on the relationship between individual action and group and organizational performance. Prerequisites: OBHR 3310 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) 

### OBHR 4354 Leading Organizational Change (3 semester hours)
This course will emphasize practical skills required to be an effective change agent. Theories and techniques of planned and transformative organizational change will be discussed, along with topics that include change agent entry in change projects, negotiating role expectations, contracting, diagnostic interviewing and needs assessment, overcoming resistance to change, large group intervention processes, and cross-cultural differences in leadership expectations. Prerequisite: OBHR 3310 with a grade of C or better 3310. (3-0)
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<td>OBHR 4356 Power and Influence in Organizations (3 semester hours) This course will examine the role that power plays in organizations and the ways in which influence can be developed and used to increase individual power. Focus will be placed on how individuals can increase their power from anywhere within the organization. Topics will include functions of power, sources of power, assessing power in organizations, and personal influence strategies and tactics. Prerequisite: OBHR 3310 with a grade of C or better. 3310. (3-0) Y</td>
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<td>2013-</td>
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<td>OBHR 4358 Transformational Leadership, Ethics, and Social Responsibility in Practice (3 semester hours) This is a hands-on course to help students understand how transformational leaders can change the people around him/her to create productive societies with sustainable institutions and practices. This course starts with an introduction to transformational leadership concepts and basic ideas from both western and eastern moral philosophical traditions. Armed with a good understanding of these leadership and ethical concepts students will be given opportunities to work on a real project with one of the not-for-profit charitable organizations in the DFW area. This will not only help them practice what they have learned in the classroom setting but also help the community and practice transformational leadership behavior. Prerequisites: OBHR 3310 and OBHR 4300 and OBHR 4350 with grades of C or better. 4350. (3-0) Y</td>
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<td>OBHR 4360 Advanced Organizational Behavior and Leadership (3 semester hours) Focus is on the successes and failures of enterprises and the people who run them. We examine the essential elements of leadership in businesses that either lead to sustainable competitive advantage or take the company into crisis and decline. Prerequisites: OBHR (OBHR 3310 with a grade of C or better and OBHR 4350 with a grade of C or better 4350) and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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**School of Natural Sciences and Mathematics**
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<td>BIOL 3101 Classical and Molecular Genetics Workshop (1 semester hour) Problem solving and discussion related to the subject matter in BIOL 3301. Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312, 2312 or their equivalents. Corequisite: BIOL 3301. (1-0) S</td>
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<td>2012-2013</td>
<td>biol3102</td>
<td>BIOL 3102 Eukaryotic Molecular and Cell Biology Workshop (1 semester hour) Problem solving and discussion related to the subject matter in BIOL 3302. Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. Corequisite: BIOL 3302. (1-0) S</td>
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<td>biol3161</td>
<td>BIOL 3161 Biochemistry Workshop I (1 semester hour) Problem solving methodology in biochemistry; discussion of recent advances in areas related to the subject matter in BIOL/CHEM 3361 or CHEM 3361. Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. Corequisite: BIOL/CHEM 3361 or CHEM 3361. (1-0) S</td>
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<td>biol3162</td>
<td>BIOL 3162 Biochemistry Workshop II (1 semester hour) Problem solving methodology in biochemistry; discussion of recent advances in areas related to the subject matter in BIOL/CHEM 3362 or CHEM 3362. Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. Corequisite: BIOL/CHEM 3361 or CHEM 3362. (1-0) Y</td>
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<tr>
<td>2012-</td>
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<td>BIOL 3302 Eukaryotic Molecular and Cell Biology (3 semester hours) Structural</td>
<td>Regulation of cellular activities; membranes and transport; cellular replication; examples of cell specialization such as blood (immunoglobulins) and muscle cells. Prerequisites: BIOL 3301 and BIOL/CHM 3361. Corequisite: BIOL 3102. (3-0)</td>
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<td>BIOL 3310 Nanomedicine (3 semester hours) Nanomedicine is an emerging area where</td>
<td>Nanomedicine is an emerging area where biology and nanotechnology converge, combining multidisciplinary fields such as biology, medicine, chemistry, physics, and engineering. The rapid development of nanomedicine also has ethical and environmental implications. The course provides an introduction and overview of nanomedicine for undergraduate Curriculum V honors students. The course consists of a 3-hour lecture series one day a week, plus a workshop. The lectures begin with the basics of protein and lipid structure, providing a review for understanding how biomacromolecules combine to form the structural and functional units of the intact cell that are important for nanomedicine applications. Guest lecturers from academia and industry will also present talks in their specialty areas, including a lecture on emerging ethical issues related to the practice of nanomedicine. The last part of the course consists of student presentations on topics of interest. Pre-Requisite or co-requisite: BIOL 3361. (3-0)</td>
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<td>BIOL 3321 Microbial Genetics Laboratory (3 semester hours) Laboratory with an introductory lecture that will focus on the genetic methods used for analysis of complex biological processes in bacteria. Includes the utilization of chemical and physical mutagens; transformation; transduction; conjugation; transposons; gene fusions; molecular cloning; polymerase chain reaction; southern, northern and western blot analyses; and post-genomic genetics. The course will also emphasize how these sophisticated techniques can be used to dissect pathogenic mechanisms and enhance environmental remediation. Prerequisites: BIOL 2281, 2281 and BIOL 2311 and BIOL 2312 or their equivalents. (1-2) T</td>
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<td>biol3335</td>
<td>BIOL 3335 Microbial Physiology (3 semester hours) Life processes of microbes: fermentations, N2 assimilation, and other biochemical pathways specific to bacteria; cellular structure and differentiation, among others. Substitutes for BIOL/Chem BIOL 3362 or CHEM 3362 for Biology majors. Prerequisites: BIOL 2311 and BIOL/Chem 3361, (BIOL 3361 or CHEM 3361). (3-0) T</td>
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<td>BIOL 3336 Protein and Nucleic Acid Structure (3 semester hours) Examines the different types of protein motifs, protein and DNA folding and stability, and the relation of structure to function. Circular dichroism, NMR, and crystallographic methods of structural determination are presented. Types of proteins considered include transcription factors, proteinases, membrane proteins, proteins in signal transduction, proteins of the immune system, and engineered proteins. Students also receive instruction in the viewing and manipulation of protein and DNA structures using various modeling programs and data from national web sites. Prerequisite: BIOL/Chem BIOL 3361 or CHEM 3361. (3-0) T</td>
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<td>BIOL 3371 Biology of the Brain (3 semester hours) Explores the structure and function of the brain. Includes discussions of the molecular and cell biology of neurons, organization of the nervous system and anatomy of the brain, basic electrophysiology of the neuron, function and action of neurotransmitters, operation of sensory and motor systems, and the molecular and cellular basis of neurodegenerative disorders. Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. (3-0) T</td>
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<td>BIOL 3380 Biochemistry Laboratory (3 semester hours) Current techniques in the purification and characterization of enzymes to demonstrate fundamental principles that are utilized in modern biochemistry and molecular biology research laboratories. Practical skills taught include micropipetting, basic solution preparation, conducting pH measurements, isolating crude enzyme extracts, and performing standard activity assays. Advanced experiments with Green Fluorescent Protein and Lactate Dehydrogenase include Ni+++-NTA affinity chromatography, ion chromatography, protein detection using Bradford, Lowry, and spectrophotometric assays, SDS-PAGE separation, Western Blot analysis, and enzyme kinetics. Prerequisite: BIOL 2281. Prerequisite or corequisite: BIOL/Chem BIOL 3361 or CHEM 3361. (1-2) S</td>
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<th>BIOL 3V00 Topics in Biological Sciences (1-6 semester hours) May be repeated as topics vary (9 hours maximum). Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. ([1-6]-[0]) S</th>
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<td>BIOL 3V01 Topics in Biological Sciences with Lab (1-6 semester hours) May be repeated as topics vary (6 hours maximum). Prerequisites: BIOL 2281, 2281 and BIOL 2311, 2311 and BIOL 2312 or their equivalents. ([1-5]-[1-5]) R</td>
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<td>BIOL 3V20 General Microbiology with Lab (4-5 semester hours) Majors course in general microbiology. Lectures include topics recommended by the Education Division of the American Society for Microbiology: microbial structure, diversity, growth and growth control, metabolism, genetics, and gene regulation. Among additional topics covered are virology, immunology and microbial diseases (plant and animal) including epidemiology, transmission, and host-microbe interactions. The laboratory focuses on developing laboratory skills in classical microbiology by the individual student. Exercises include various staining and pure culture techniques, biochemical and other in vitro testing, as well as isolation and identification of unknown organisms. Topics may vary. May be repeated for credit. Prerequisites: (BIOL 2281 and BIOL 2281, BIOL 2311, 2311 and BIOL 2312 or their equivalents) and CHEM 2323. (2-[2-3]) Y</td>
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<td><strong>BIOL 3V81 Clinical Medicine I</strong> (1-6 semester hours) Clinical Medicine is a component of the UT Partnership in Advancing Clinical Transition (UT PACT) program that addresses clinical competencies in the medical profession, including communication skills, professional identity formation, interprofessional teamwork, and medical ethics. Students participate in small group sessions, clinical preceptorships, and hospital rotations at UT Southwestern Medical Center. Enrollment is limited to students who have completed at least one year of the UT PACT Program. May be repeated for credit with permission of UT PACT advisor. ([1-6]-0) Y</td>
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<td><strong>BIOL 3V82 Clinical Medicine II</strong> (1-6 semester hours) Clinical Medicine II addresses clinical competencies in the medical profession, building on skills already addressed in Clinical Medicine I and other parts of the UT PACT curriculum. Topics to be addressed include the application of basic science to clinical practice, interpersonal skills in medicine, cultural competency, and professionalism and medical ethics in clinical settings. Students participate in small group sessions and clinical preceptorships and rotations at UT Southwestern Medical Center. Enrollment is limited to students who have completed their second year in the UT PACT Program. May be repeated for credit with permission of UT PACT advisor. Prerequisite: BIOL 3V81. ([1-6]-0) Y</td>
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<td>biol4261</td>
<td><strong>BIOL 4261 Biomolecular Modeling</strong> (2 semester hours) Designed to provide some of the computational tools needed to study the large number of biomolecular structures now available in databanks. Molecular Simulations Insight II software will be used to visualize and manipulate protein and nucleic acid structures. Students will build examples of small 3-dimensional molecules from amino acid, nucleotide, and sugar residues. Procedures for energy minimization will be studied. Homologous protein structures will be compared, and mutated structures will be modeled. Other modeling approaches such as Monte Carlo and molecular or Brownian dynamics may be included. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (1-1) T</td>
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<td>biol4308</td>
<td><strong>BIOL 4308 Developmental Biology</strong> (3 semester hours) Molecular mechanisms controlling development in eukaryotes, with emphasis on the early stages of morphogenesis. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T</td>
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<td>2012-13</td>
<td>BIOL4316</td>
<td>Parasites and Symbionts (3 semester hours) A survey of microorganisms that live in close association with other organisms. From bacteriophages to trypanosomes, this course will cover a wide range of plant and animal parasites and symbionts and their interactions at the molecular level. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T</td>
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<td>BIOL4332</td>
<td>RNA Structure and Catalysis (3 semester hours) A survey of the determinants of RNA secondary and tertiary structure and their role in RNA processing and catalysis. The mechanisms of posttranscriptional RNA processing including base modifications, mRNA capping and poly A addition, 5' and 3' end maturation, intron excision, and RNA editing will be covered as well as the mechanisms of RNA catalysis. The mechanisms of large ribozymes such as Group I and Group II introns and RNAase of P RNA will be contrasted to the mechanisms of small ribozymes such as hairpins and hammerheads. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T</td>
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<td>2012-13</td>
<td>BIOL4333</td>
<td>Replication, Recombination, and Repair (3 semester hours) A fundamental unifying principle of molecular biology, genetics, molecular medicine, and evolution is DNA metabolism. This course will provide an extensive overview of the mechanisms that control the processes of DNA repair, replication, and recombination. The most recent publications in these fields will be discussed in order to provide the students with a strong working knowledge of these processes. The course structure will consist of a mixture of faculty lectures and student literature presentations. Student evaluations will be based upon examinations, class participation, and the written and oral presentations. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T</td>
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<td>2012-13</td>
<td>BIOL4336</td>
<td>Membrane Biology (3 semester hours) A survey of the structural components of biomembranes and the forces that dictate membrane structure. General membrane functions, such as compartmentalization and membrane transport, are analyzed in view of the principles of membrane structure. The structure, function, and biogenesis of the membrane organelles in cells are covered in detail. Diseases whose pathology originates with biomembranes, such as cystic fibrosis and heart disease, are discussed as examples illustrating membrane structure and function. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T</td>
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### BIOL 4338 Cell Signaling (3 semester hours)
How cells sense, interpret, and respond to various intra- and extracellular signals. Focus will be placed on signal transduction pathways controlling growth, development, and diseases. The course will consist of lectures and in-class discussion of research articles. 

**Prerequisites:** (BIOL 3301 and BIOL 3301, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T

### BIOL 4340 Proteomics (3 semester hours)
Covers the modern techniques for analyzing the protein complement of cells, to understand cell development and physiology in healthy and diseased states. Topics include protein isolation techniques; IEF-SDS PAGE; protein structure determination by X-ray crystallography and NMR; techniques for identification of protein interactions; the use of mass spectrometry to quantitate, sequence, and identify post-translational modifications of proteins; the development of protein chips and how they can be used for protein identification and quantitation. **Prerequisite:** BIOL/CHEM 3361 or CHEM 3361. (3-0) T

### BIOL 4342 Regulation of Gene Expression (3 semester hours)
How genetic information is regulated in prokaryotic and eukaryotic systems. Topics include mechanisms of transcription, promoter architecture, function and regulation of transcription factors, organization of chromosomes, pathways that control gene expression during growth and development, genome organization and whole-genome expression analysis, and related areas. The course emphasizes presentation and critical discussion of techniques and results from the recent scientific literature. 

**Prerequisites:** (BIOL 3301 and BIOL 3301, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T

### BIOL 4355 Molecular Biology of Neurological and Hematological Diseases (3 semester hours)
Neurological and hematological diseases affect millions of Americans each year, often fatally. The course will bring students up to date on current knowledge of the molecular biology of neurological diseases such as Alzheimer's, Parkinson's, Amyotrophic lateral sclerosis and Huntington's disease. Hematological diseases such as hemolytic anemias including sickle cell disease and thalassemia, platelet disorders and clinical case studies will be covered, along with efforts towards gene therapy. The course comprises lectures, student presentations, and presentations by world experts in the field. 

**Prerequisites:** (BIOL 3301 and BIOL 3301, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (3-0) T
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<td>BIOL 4375 Bioinformatics (3 semester hours)</td>
<td>BIOL 4375 Bioinformatics (3 semester hours) A practical approach to quantitative and statistical analysis of biological sequence and structural information. Classroom lectures are accompanied by practical demonstrations and computer lab exercises. Topics include genomic information content, data searches and sequence alignment, mutations and distance-based phylogenetic analysis, genomics and gene recognition, polymorphisms and forensic applications, nucleic-acid and protein array analysis, and structure prediction of biological macromolecules. Prerequisites: BIOL 3301, BIOL/CHEM 3301 and (BIOL 3361 or CHEM 3361) and two semesters of calculus. Suggested additional preparation: one semester of introductory statistics. (3-0) T</td>
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<td>biol4380</td>
<td>BIOL 4380 Cell and Molecular Biology Laboratory (3 semester hours)</td>
<td>BIOL 4380 Cell and Molecular Biology Laboratory (3 semester hours) Current techniques that are utilized in a modern molecular biology research laboratory. Practical skills taught include monitoring bacterial growth, phenotype testing, plasmid isolation, restriction digest analysis, DNA cloning, and DNA fingerprinting using the polymerase chain reaction (PCR). Advanced techniques include fundamental microscopy, DNA transfection and general characterization of animal cell cultures, sub-cellular fractionation using differential centrifugation, basic immunological techniques, and chemical mutagen testing. Prerequisite: BIOL 3380. Pre-Prerequisite or corequisite: BIOL 3302. (1-2) S</td>
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<td>biol4382</td>
<td>BIOL 4382 Advanced Molecular Biology Laboratory (3 semester hours)</td>
<td>BIOL 4382 Advanced Molecular Biology Laboratory (3 semester hours) Advanced techniques for the study of biological systems: spectroscopy, ultracentrifugation, radioactive labeling, and construction and screening of cDNA expression libraries. Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. (1-2) Y</td>
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<td>biol4461</td>
<td>BIOL 4461 Biophysical Chemistry (4 semester hours)</td>
<td>BIOL 4461 Biophysical Chemistry (4 semester hours) For students interested in the interface between biochemistry and structural biology. Provides an advanced treatment of the physical principles underlying modern molecular biology techniques. Topics include classical and statistical thermodynamics, biochemical kinetics, transport processes (e.g., diffusion, sedimentation, viscosity), chemical bonding, and spectroscopy. Prerequisites: MATH (MATH 2417 and MATH 2419 or equivalent), PHYS 2419 and (PHYS 2325 and PHYS 2326, or equivalent) and BIOL/CHEM 3361. (BIOL 3361 or CHEM 3361). (4-0) Y</td>
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<td>BIOL 4V00 Special Topics in Biology (1-6 semester hours) May be repeated as topics vary (9 hours maximum). Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. ([1-6]-0) S</td>
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<td>BIOL 4V40 Special Topics in Molecular and Cell Biology (1-6 semester hours) May be repeated as topics vary (9 hours maximum). Prerequisites: (BIOL 3301 and BIOL 3301, BIOL 3302, 3302) and BIOL/CHEM (BIOL 3361 or CHEM 3361) or their equivalents, or instructor consent required. ([1-6]-[0-5]) S</td>
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**CHEM 2130 Introductory Organic Chemistry for Medical Science Laboratory** (1 semester hour) The experimental skills associated with organic functional group reactions. Topics covered include fundamental skills, as well as selected experiments developed in a traditional two-semester Introductory Organic Chemistry Laboratory sequence (CHEM 2123 and CHEM 2125). Required course for students in the Partnership in Advancing Clinical Transition (UT-PACT) Program. Does not satisfy the basic organic chemistry laboratory requirements for pre-health profession students. Prerequisite: Instructor consent required. Corequisite: CHEM 2330. (0-4) Y

**CHEM 2330 Introductory Organic Chemistry for Medical Science** (3 semester hours) Covers fundamental concepts and selected material developed in a traditional two-semester Introductory Organic Chemistry lecture sequence (CHEM 2323 and CHEM 2325). Required course for students in the Partnership in Advancing Clinical Transition (UT-PACT) Program. Does not satisfy the basic organic chemistry lecture requirements for pre-health profession students. Prerequisites: (CHEM 1312 or CHEM 1316) and instructor consent required. Corequisite: CHEM 2130. (3-0) Y

**GEOS 2301 Introduction to Geospatial Information Science** (3 semester hours) A broad introduction to geospatial information science, including GIS, remote sensing, GPS, spatial data analysis, cartography, and other topics. (Same as GISC 2301) (2-2) Y

**GEOS 3304 Tools for Spatial Analysis** (3 semester hours) An introduction to the primary methods used in geographic analysis. Topics include spatial statistics, cartography, and geographic information systems (GIS). This course is designed to provide a foundation for all other upper level Geography courses. Prerequisite: EPPS 3405 or STAT 1342. (Same as GEOG 3304 and GISC 3304) (3-0) Y
### GEOS 4325 Introduction to Remote Sensing (3 semester hours)

Topics include principles of remote sensing and sensors, image visualization and statistics, radiometric and geometric correction, enhancement, classification, change detection, and innovative image processing approaches. (Same as GISC 4325) (3-0) Y

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### NATS 1101 Natural Sciences & Mathematics Freshman Seminar (1 semester hour)

This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Natural Sciences and Mathematics (NS&M). Students will learn about plans of study and career paths for majors in Biology, Chemistry, Physics, Mathematics, Geosciences, and Science and Mathematics Education. Basic study, problem solving and other skills needed to succeed as an NSM major will be covered. An overview of the connections within the disciplines of Natural Sciences & Mathematics will be presented, as well as their relationship to engineering, medicine and health, and other fields. Required for all first time in college freshmen in NS&M. **Co-requisite:** Corequisite: UNIV 1010. (1-0) Y

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### NATS 3341 Knowing and Learning in Mathematics and Science (3 semester hours)

This course expands the prospective teacher’s understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning. Topics include psychological foundations of learning; problem solving in mathematics and science education utilizing technology; principles of expertise and novice understanding of subject matter; implications of high-stakes testing; and foundations of formative and summative assessment. Three lecture hours a week for one semester; additional hours may be required. Restricted to students in the UTeach Dallas program. Prerequisites: A university grade point average of at least 2.750, a GPA of 3.000 or better in UTeach coursework, and consent of the UTeach advisor. **Corequisite:** (3-0) S

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### NATS 4141 UTeach Apprentice Teaching Seminar (1 semester hour)

Discussions include student teaching experiences, and contemporary critical issues in education. Time is also allocated for completion of the portfolio project. One class hour a week for one semester. Prerequisites: (NATS 3343 and NATS 4390 and NATS 4341), a university grade point average of at least 2.750, a GPA of 3.000 or better in UTeach coursework, and consent of the UTeach advisor. **Corequisite:** NATS 4694 or NATS 4696. (1-0) S

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### Additional changes made to undergraduate courses
#### 2013 Undergraduate Catalog

| Year   | NetID/Date   | Catalog Course Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Req Status | Req Created NetID/Date |
|--------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|           |                           |
| 2012-2013 | mxv062000 5 08:44:57 | **PHYS 3125 Electronics Laboratory (1 semester hour)** Laboratory course to accompany PHYS 3325. Students will use common laboratory equipment to diagnose and troubleshoot breadboard circuits they build in lab. The lab exercises are closely tied to the topics covered weekly in PHYS 3325 lectures. The final lab of the semester is a design lab in which students design, build, and test a sequential logic circuit to solve a specific problem. Corequisite: PHYS 3325. (0-3) Y                                                                                                                                                                                                                                                                                                                                                      | phase: process edit: complete approve: complete process: complete publish: unpublished audit: |           |
| 2010-2013 | mxv062000 12 12:21:19 | **PHYS 3325 Electronics (3 semester hours)** Topics include direct and alternating current circuits, diodes and transistors, feedback, passive and active filters, simple amplifiers, and combinatorial and sequential digital electronics. Prerequisite: PHYS 2326 or PHYS 2422. Corequisite: PHYS 3125. (3-0) Y                                                                                                                                                                                                                                                                                                                                                                                                               | phase: process edit: complete approve: complete process: complete publish: unpublished audit: |           |
| 2013-2013 | mxv062000 12 12:28:30 | **PHYS 3327 Electronics with Laboratory (3 semester hours)** Topics include direct and alternating current circuits, diodes and transistors, feedback, passive and active filters, simple amplifiers, and combinatorial and sequential digital electronics. Includes laboratory where students learn to build circuits and to diagnose and troubleshoot problems inherent in the circuits using typical laboratory instruments. Prerequisite: PHYS 2326 or PHYS 2422. (2-3) Y                                                                                                                                                                                                                                                                                                                                                       | phase: process edit: complete approve: complete process: ongoing publish: unpublished audit: |           |

### Office of Undergraduate Education

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Forwarded from CEP to Senate, March 5, 2013
### UNIV 1010 Freshman Seminar (0 semester hours)
This course is a graduation requirement for all first time in college freshman. This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the university and the impacts it will have on their lives as students. The course incorporates presentations by leading UT Dallas faculty members on research developments of major current interest, small section meetings to discuss these presentations and matters of general concern to UT Dallas freshmen, and a substantial component of on-line learning focused on developing the strategies and tactics that will lead to successful careers at UT Dallas and beyond. This class or ECS 1200 is required of all first time in college freshman students. Credit/No Credit only. Corequisite: ARHM 1100 or BA 1100 or BIS 1100 or CGS 1100 or CLDP 1100 or EPPS 1110 or NATS 1101 or NSC 1100 or PSY 1100 or SPAU 1100 or UNIV 1100. (2-0) Y

### UNIV 2010 Seminar for Pre-Law Professionals (0 semester hours)
This course is designed to help students discover and develop the skills necessary to succeed in the law school application process and law school. Students will explore various topics in a legal education and professional development context including issues of appropriate personal attributes and expectations, interpersonal communication, and self-appraisal. **May not be repeated.** Prerequisites: Sophomore standing and instructor consent required. (2-0) Y

### UNIV 2012 Seminar: Evaluating Competencies for Entry to Health Professions Schools (0 semester hours)
This seminar is designed to help students explore professional competencies desired in healthcare fields, with particular emphasis on medicine, dentistry, podiatry and other professions requiring advanced degrees. Students will engage in learning centered around behavioral and ethical concepts, including integrity and social responsibility, as these relate to the delivery of healthcare and students pre-professional preparation in the context of the UT Dallas Health Professions Evaluation Process and application to health professions schools. Prerequisite: Junior standing. (2-0) Y
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<td>ahst2v71 000299 ahst2v71.2</td>
<td>AHST 2V71 Independent Study in Art History (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). <strong>Prerequisite:</strong> Instructor consent required. ([1-3]-0) R</td>
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<td>AHST 3317 Pioneers of Modern Art (3 semester hours) Focus on the work of the Post-Impressionists (Seurat, Gauguin, Van Gogh, and Cézanne) and the Symbolists with special emphasis on the artists' contribution to the discourse of ideas and the crisis of meaning in the late 19th century. Prerequisite: ARTS 1301 or equivalent. (3-0) T</td>
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<td>2011-2013</td>
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<td>AHST 4342 Topics in Art History (3 semester hours) Subjects will vary from semester to semester. May be repeated for credit as topics vary (6-9 hours maximum). Prerequisite: ARTS 1301 or equivalent. (3-0) R</td>
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<td>AHST 4V71 Independent Study in Art History (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisites: Upper-division standing, and instructor consent required. ([1-3]-0) R</td>
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<td>AP 2V71 Independent Study in Art and Performance (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). <strong>Prerequisite:</strong> Instructor consent required. ([1-3]-0) R</td>
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<td>2012-2013</td>
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<td>AP 3300 Elements of Art and Performance (3 semester hours) An analysis of the elements of space, time, image, text, and gesture as they relate to art making in the various visual and performing arts. These elements will also serve as a starting point from which students will investigate notions of creativity, expression, and aesthetics in a workshop setting. <strong>Explorations into This course explores</strong> what constitutes a work of art, and ways in which a work of art can be perceived and interpreted. <strong>This course AP 3300</strong> is a requirement for all AP majors and is restricted to majors within the School of Arts &amp; Humanities (Arts &amp; Humanities, Art, and Performance, Literary Studies, Historical Studies, Arts and Technology, and Emerging Media and Communication). AP 3300 should be taken prior to completing the first 12 hours of upper-division course work. It is normally offered only during the fall and spring semesters. Prerequisite: ARTS 1301 or equivalent. (3-0) S</td>
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<td>AP 4V71 Independent Study in Art and Performance (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisites: Upper-division standing and completion of all lower division requirements in AP. Instructor consent required. ([1-3]-0) R</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<td>AP4V99</td>
<td>AP 4V99 Senior Honors in Art and Performance (1-3 semester hours)</td>
<td>Intended for students conducting independent research for honors theses or projects. Signature of instructor and secondary reader on proposed project outline required. <strong>Prerequisite:</strong> Instructor consent required.</td>
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<td>ARHM110</td>
<td>ARHM 110 Freshman Seminar (1 semester hour)</td>
<td>This course is a graduation requirement for all freshmen in the School of Arts and Humanities (A&amp;H). Incoming freshmen will learn about the intellectual and cultural environment in the School of Arts and Humanities through lectures, group projects, activities, guest panels, and attendance at artistic and cultural events. Students will also learn about A&amp;H majors (Art and Performance, Arts and Technology, Emerging Media and Communication, Historical Studies, and Literary Studies), research opportunities, careers, and internships. This course is open to all non-A&amp;H majors. Credit/No Credit. <strong>Corequisite:</strong> UNIV 1010.</td>
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<td>ARTS2315</td>
<td>ARTS 2315 Topics in Visual Art (3 semester hours)</td>
<td>An introduction to specialized topics in the visual arts. May include historical or cultural elements of visual arts, a genre or artist, or digital aspects of visual art. May be repeated for credit as topics vary (9 hours maximum).</td>
<td><strong>Prerequisite:</strong> ARTS 1316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2381.</td>
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<td>ARTS3311</td>
<td>ARTS 3311 Theory and Practice of Visual Arts (3 semester hours)</td>
<td>This studio art course provides a context for the creation, discussion and critique of visual art. The course aims to fuse engagement in artistic production with reflection on theoretical and socio-cultural issues relevant to contemporary art practices. Prerequisite: ARTS 4316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2381.</td>
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<td>ARTS3340</td>
<td>ARTS 3340 Topics in Studio Art (3 semester hours)</td>
<td>This course will investigate special topics exploring the wide variety of ideas, concepts, principles and techniques inherent in different media in the visual arts. Sections may be devoted exclusively to sculpture, photography, computer imaging, or painting. May be repeated for credit as topics vary (9 hours maximum).</td>
<td><strong>Prerequisite:</strong> ARTS 4316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2381.</td>
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<td>ARTS3363</td>
<td>ARTS 3363 Design, Text, and Image (3 semester hours)</td>
<td>This course explores the concepts and techniques of design as manifest in history and emerging in contemporary experimental design practices. <strong>We will emphasize:</strong> The course emphasizes the use of technology and explores individual vision, creative variation strategies, and command of the visual language (allowing one to communicate visually, providing content and attitude overtly or covertly). Topics may include typography, graphic design, logos, information design, color theory, as well as composition, 2D and 3D-design. May be repeated for credit as topics vary (6 hours maximum).</td>
<td><strong>Prerequisite:</strong> ARTS 4316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2381.</td>
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<td>ARTS 3365</td>
<td>Advanced Drawing (3 semester hours) This course explores the traditional and nontraditional concepts and techniques of drawing with the intent to encourage a personal vision in the medium. Lectures discuss contemporary artistic practices and provide research for innovative drawing as a means of communication, expression, installation and unique conceptual form. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: ARTS 4346, 1316 or ARTS 2380, 2380 or instructor consent required. (0-3) Y</td>
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<td>ARTS 3366</td>
<td>Drawing Concepts (3 semester hours) This course is an investigation of the various approaches to working with imagery in the field of drawing. By looking at traditional and contemporary works, students will build skills and technical facility while addressing the concepts, process, materials, techniques, and meaning behind the various subjects and approaches to the art of drawing. Principles Course content include principles and techniques involved in the drawing process. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: ARTS 4346, 1316 or ARTS 2380, 2380 or instructor consent required. (0-3) Y</td>
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<td>ARTS 3367</td>
<td>Figure Drawing (3 semester hours) An introductory class for students who have had some basic drawing experience. The course will cover an introduction to the many diverse representations and applications of the human figure through art. Topics include linear dynamics, various contour line applications, rendering, shading and compositional etiquette using a variety of materials and techniques. Prerequisite: ARTS 1316, 1316 or ARTS 2380, 2380 or instructor consent required. (0-3) Y</td>
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<td>ARTS 3368</td>
<td>Mixed Media (3 semester hours) An investigation of the interaction and combination of several traditional visual media using techniques derived from 2D and 3D dimensional studio arts. May be repeated for credit (6 hours maximum). Prerequisite: ARTS 4346, 1316 or ARTS 2380, 2380 or instructor consent required. (0-3) Y</td>
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<td>ARTS 3369</td>
<td>Intermediate Painting (3 semester hours) This course explores traditional and nontraditional concepts and techniques of painting and the development of personal vision. Lectures will discuss historical and contemporary artists, as well as encourage research into the concepts behind how art is investigated and how to manipulate visual imagery in a work of art. Topics may include color theory, 2D design, and the nature of representation. May be repeated for credit (9 hours maximum). Prerequisite: ARTS 2316 or instructor consent required. (0-3) S</td>
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<td>ARTS 3373</td>
<td>Printmaking (3 semester hours) Explores traditional and nontraditional techniques of printmaking through the various topics of screen printing, etching, woodcut, collagraph, or monoprint. May be repeated for credit (6 hours maximum). Prerequisite: ARTS 4346, 1316 or ARTS 2380, 2380 or instructor consent required. (0-3) T</td>
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<td>ARTS 3375</td>
<td>Sculpture (3 semester hours) Explores the traditional and nontraditional techniques of three-dimensional work in wood, clay, metal, plastics, fiber, stone. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: ARTS 4346, 1316 or ARTS 2316, 2316 or ARTS 2380, 2380 or ARTS 2381 or instructor consent required. (0-3) Y</td>
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<td>2004-2013</td>
<td>arts3376 000779 arts3376.3</td>
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<td>ARTS 3376 Time-Based Art</td>
<td>Exploration of the conceptual demands inherent in the creation of time based visual art. Topics may include computer animation, video processes, interactive visual arts, and the potential of narrative models. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: ARTS 4316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2384, 2381 or instructor consent required. (0-3) T</td>
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<td>ARTS 3377 Digital Photography</td>
<td>Explores digital photographic processes, with an emphasis on contemporary issues in art and technology. Course includes instruction in camera operation, lighting, image editing software, and output to web and print. May be repeated for credit (6 hours maximum). Prerequisite: ARTS 1316 or ARTS 2316 or ARTS 2350 or ARTS 2380 or ATEC 2382 or instructor consent required. (0-3) T</td>
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<td>ARTS 3381 Video Painting</td>
<td>This course will focus on the visual dialogue of painting as it applies to motion graphics and moving images. Images, color grids, and found video will be transformed by applying effects, filters, and modes. A variety of image material will be utilized such as still photography, text, color grids, and appropriated open source video. May be repeated for credit (6 hours maximum). Prerequisite: ARTS 2380, 2380 or instructor consent required. (0-3) Y</td>
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<td>ARTS 3382 Color as Subject</td>
<td>This studio course explores the history of color in art and culture. It provides students in various majors a workshop forum for an intense personal investigation of color as subject, meaning and influence in their selected discipline. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: ARTS 1316, 1316 or ARTS 2316, 2316 or ARTS 2350, 2350 or ARTS 2380, 2380 or ARTS 2381 or instructor consent required. (0-3) T</td>
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<td>ARTS 4368 Advanced Visual Arts</td>
<td>May focus on advanced explorations in a specific medium, such as printing, photography, drawing, sculpture, or video. An emphasis may be placed on particular themes, such as narrative or collaboration, or genres, such as landscape or portraiture, or advanced technical processes. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: A 3000-level studio art course in an appropriate medium ARTS 3371 or ARTS 3372 or ARTS 3377 or ARTS 3379 or instructor consent required. (0-3) T</td>
<td>edit review pending sdl063000 2012-11-06 15:16:11</td>
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<tr>
<td>2012-2013</td>
<td>arts4369 014134 arts4369.2</td>
<td>2</td>
<td>ARTS 4369 Advanced Painting</td>
<td>This course will explore the creative possibilities that are open to artists today, ranging from painting, computer imagery, ink jet prints, and video painting. Students will learn about the intentions, motivations, and strategies artists use in creating their work and will learn to formulate their own creative process. Discussion topics may include internal and external sources of inspiration, crafting an artistic self, and expressing an artistic attitude. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. (0-3) Y</td>
<td>edit review pending sdl063000 2012-11-06 15:16:51</td>
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<td>2012-2013</td>
<td>arts4372 000787 arts4372.5</td>
<td>3</td>
<td>ARTS 4372 Advanced Photography</td>
<td>Explores advanced concepts relating to contemporary artistic and photographic practice, with special emphasis placed on portfolio development. Instruction may include digital or film-based photography (35mm, medium photography) and studio lighting. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: A 3000-level studio art course in an appropriate medium ARTS 3371 or ARTS 3372 or ARTS 3377 or ARTS 3379 or instructor consent required. (0-3) T</td>
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<tr>
<td>arts4v71</td>
<td>ARTS 4V71 Independent Study in Visual Arts (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing, and completion of all lower-division requirements in AP standing and instructor consent required. ([1-3]-0) R</td>
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<tr>
<td>atec2322</td>
<td>ATEC 2322 Theories of Emerging Media and Communication (3 semester hours)</td>
<td>The course will examine the history and theory of digital communications with a critical view of their effects on society. The focus will be on the role of the Internet in contemporary life. Pre/Co-requisite: ATEC 2231. (3-0) Y</td>
<td>edit review pending mxv062000 2012-11-22 11:51:24</td>
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<tr>
<td>atec2385</td>
<td>ATEC 2385 Sound Design (3 semester hours)</td>
<td>Introduction to sound design whose main goal is to show and explain the role of sound in single or multiple aspects of the field, including multimedia productions, animation, video games, movies, and live performances. (0-3) S</td>
<td>edit review pending tnr051000 2012-11-06 12:53:39</td>
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<tr>
<td>atec3317</td>
<td>ATEC 3317 Modeling and Texturing I (3 semester hours)</td>
<td>An introduction to 3D computer modeling and texturing. Students will learn how to model hard surface objects with emphasis on creating clean geometric meshes. Basic texturing fundamentals and techniques will be covered, including UV editing, texture map creations, and application and shader types. Prerequisite: ATEC 2326 or ATEC 2382. (0-3) S</td>
<td>edit review pending tnr051000 2012-11-06 12:54:50</td>
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<tr>
<td>atec3327</td>
<td>ATEC 3327 Lighting and Composition I (3 semester hours)</td>
<td>An introduction to the process of lighting, rendering and compositing computer generated images. Students will learn to create custom lighting setups and how lighting affects mood, time, and viewer perception. Additional topics include global illumination, final gather, and render layers. Prerequisite: ATEC 2226, 2326 or ATEC 2382. (0-3) Y</td>
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<tr>
<td>atec3328</td>
<td>ATEC 3328 Rigging I (3 semester hours)</td>
<td>This course is an introduction to the concepts, tools and techniques used in 3D animation for setting up clean and efficient 3D rigs that are easily able to be animated. Topics will include hierarchical structures, joints and bones, constraints, creating useful and predictable deformations and setting up simple and intuitive control structures for use in animation. Prerequisite: ATEC 2326, 2326 or ATEC 2382. (0-3) Y</td>
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<tr>
<td>atec3361</td>
<td>ATEC 3361 Internet Studio I (3 semester hours)</td>
<td>Introduction to researching, designing, producing, and distributing Internet content. Through readings, class discussions, and class projects, this class focuses on the various means and techniques for publishing networked digital material. The course will help students develop the ability to create and present a networked portfolio of their digital work. Prerequisite: ATEC 2382. (0-3) Y</td>
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<tr>
<td>atec3363</td>
<td>ATEC 3363 Basic Interaction Design (3 semester hours)</td>
<td>Study of human-machine interaction for art and design a variety of applications. Students explore existing models for interaction as used in rapid prototyping, user interface (UI) and user experience (UX) design skills that can be applied to web-based publishing, mobile app development, game development, and entertainment and artistic performances. The creation of new models of interaction using multi-modal New devices (haptic devices) is pursued, and interactions are explored. Prerequisite: ATEC 2382. (0-3) Y</td>
<td>edit review pending mxv062000 2012-11-22 11:54:18</td>
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<tr>
<td>atec4326</td>
<td>ATEC 4326 Advanced Emerging Media Production</td>
<td>The course explores production studio and field practices in the development of emerging forms of digital media and communications. Students will work individually and in teams to produce new media projects using a variety of different methods and technologies. Areas of investigation may include social media, mobile media, and trans-media projects. Prerequisite: ATEC 3326.</td>
<td>(0-3) Y</td>
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<tr>
<td>atec4337</td>
<td>ATEC 4337 Computer Animation</td>
<td>This course focuses on applications of the principles of animation. Students learn to create expressive motions through the production of 3D key-frame animations. Prerequisite: ATEC 2326 or ATEC 2382.</td>
<td>(0-3) Y</td>
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<tr>
<td>atec4345</td>
<td>ATEC 4345 Motion Capture Animation</td>
<td>Group projects in which students learn the motion capture pipeline from setting up cameras and capturing data, to editing data and applying data to animated characters. Students will follow the 3D computer animation production process to complete short animations. End products are expected to be high quality animations appropriate for professional demo reels. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required.</td>
<td>(0-3) S</td>
<td>3</td>
<td>edit review pending</td>
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<tr>
<td>atec4351</td>
<td>ATEC 4351 Animation Studio I</td>
<td>Animation Studio is a two-semester course sequence in which students will create a finished 3D animated short. All areas of production will be involved, including preproduction, layout, modeling, rigging, animation, texturing, lighting, compositing, VFX, and rendering. The story for the project(s) will be selected through a process where a faculty jury selects the winning idea from student story submissions. Students will need to apply for specific positions to gain entrance into the course. A faculty jury will select students to fill the open positions. The number and types of positions may vary based on the selected story's needs. May be repeated for credit (6 hours maximum). Prerequisites: ATEC 3317, 3317 and/or ATEC 3327, 3327 and/or ATEC 4337, or 4337 and/or ATEC 3328 and instructor consent required.</td>
<td>(0-3)</td>
<td>3</td>
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<tr>
<td>atec4367</td>
<td>ATEC 4367 Advanced Game Development</td>
<td>Continuing study in methods and techniques used in the design and creation of interactive games. Topics may include translating analog mechanics and strategies into digital media; innovations in casual, serious, and art game development; social and interpersonal dynamics game structures; and advanced techniques in iteration, prototyping, and game balancing. May be repeated for credit (6 hours maximum). Prerequisite: ATEC 3351 or ATEC 3352 or instructor consent required.</td>
<td>(0-3)</td>
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<tr>
<td>comm2313</td>
<td>COMM 2313 (SPCH 1315) Public Speaking</td>
<td>Designed to introduce students to the principles of public speaking. Emphasizes preparation (including audience analysis, research, outlining, and practice) and performance. Course Students will focus on performance-based formal speeches, presentations, selected readings, examinations, prepare and classroom exercises, present various types of speeches, including those that relate to informative, persuasive, and special occasion speaking.</td>
<td>(3-0) T</td>
<td>3</td>
<td>edit review pending</td>
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<tr>
<td>comm2v71</td>
<td>COMM 2V71 Independent Study in Communications</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required.</td>
<td>(1-3) R</td>
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<td>2011-13</td>
<td>comm33 42 003190 comm33 42.7</td>
<td>COMM 3342 Advanced Topics in Communication (3 semester hours)</td>
<td>Focuses on major issues in communication, such as intercultural communication, communication within organizations, and social and cultural implications of mediated and technology-based communication. May be repeated for credit as topics vary (6 (9 hours maximum). Prerequisite: Upper-division standing, RHET 1302. (3-0) R</td>
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<tr>
<td>2013-13</td>
<td>comm33 51 comm33 51.1</td>
<td>COMM 3351 Communication Theory (3 semester hours)</td>
<td>This course surveys the study of human communication theory. Students will be introduced to major concepts and theories associated with interpersonal, intercultural, group/organizational, rhetorical and mass communication. Students will learn to apply these communication concepts and theories to their everyday lives and future professional pursuits. Prerequisite: RHET 1302 (3-0) R</td>
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<tr>
<td>2013-13</td>
<td>comm33 52 comm33 52.1</td>
<td>COMM 3352 Media and Culture (3 semester hours)</td>
<td>Media and Culture will examine mass media historically and culturally. The origins and evolution of sounds and images, words and pictures, and the business and democratic expression of mass media will be explored to understand how mass media shapes our culture. Prerequisite: RHET 1302 (3-0) R</td>
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<tr>
<td>2012-13</td>
<td>comm43 13 003194 comm43 13.6</td>
<td>COMM 4313 Advanced Public Speaking (3 semester hours)</td>
<td>Course This course is for students who have mastered basic public speaking skills. It will explore and fine-tune a wider range of styles and skills. The course will be performance-centered and will include presentations, selected readings, examinations, and classroom exercises on a more advanced level. Prerequisite: COMM 2312, COMM 2313, 2313 or instructor consent required. (3-0) R</td>
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<td>2011-13</td>
<td>comm43 14 003195 comm43 14.5</td>
<td>COMM 4314 Persuasion (3 semester hours)</td>
<td>The course will emphasize the critical evaluation of persuasive messages and the design of persuasive appeals. By merging theory and practice, students will focus on an understanding of persuasive techniques as a mean for influencing attitudes, beliefs, opinions, and actions in a variety of contexts, including business, politics, and interpersonal interactions, and via media and technology-based communication. Prerequisite: RHET 1302, 1302 and upper-division standing. (3-0) R</td>
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<td>2012-13</td>
<td>comm43 51 013785 comm43 51.2</td>
<td>COMM 4351 U.S. Culture &amp; Communication (3 semester hours)</td>
<td>This interdisciplinary course examines the relationship between American culture and communication in terms of concepts and theories related to anthropology, communication, linguistics, psychology, and sociology. Topics covered include the characterization of culture; descriptions of American culture; the relationship between American culture and communication; and research about co-cultures, subcultures, and regional dialects. Prerequisite: Upper-division standing and RHET 1302 or equivalent and upper-division standing. (3-0) R</td>
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<tr>
<td>2012-13</td>
<td>comm4v 71 003192 comm4v 71.5</td>
<td>COMM 4V71 Independent Study in Communication (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Instructor Prerequisites: Upper-division standing and instructor consent required. ([1-3]-0) R</td>
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<tr>
<td>2013-13</td>
<td>crwt2v71 003411 crwt2v71.4</td>
<td>CRWT 2V71 Independent Study in Creative Writing (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor Consent Required. ([1-3]-0) R</td>
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<tr>
<td>crwt3308</td>
<td>CRWT 3308 Creating Nonfictions</td>
<td>A creative workshop built around the aesthetic techniques and aesthetic processes used to create personal essays, biographies, and autobiographies as works of art. Topics will vary and often will include work by visual artists, filmmakers, composers, or other writers. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: CRWT 2301 or instructor consent required.</td>
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<td>CRWT 2301 or instructor consent required. (3-0) T</td>
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<tr>
<td>crwt3360</td>
<td>CRWT 3360 Art Criticism</td>
<td>This seminar provides a context for practice in the writing of art criticism. Subjects selected for examination may include visual arts, film, dance, theater, music, fiction, and poetry. Prerequisite: ARTS 1301 and CRWT 2301 or equivalent. May be repeated for credit (6 hours maximum).</td>
<td>3</td>
<td>ARTS 1301 and CRWT 2301 or equivalent. May be repeated for credit (6 hours maximum). (3-0) R</td>
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<tr>
<td>crwt4307</td>
<td>CRWT 4307 Creating Short Stories: Advanced</td>
<td>An advanced workshop on the creation and theory of the short story that will focus both on structure and on creative techniques and creative process involved in writing sophisticated, challenging, and linguistically developed short stories. May be repeated for credit (6-9 hours maximum). Prerequisite: CRWT 3307 or instructor consent required.</td>
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<td>CRWT 3307 or instructor consent required. (3-0) T</td>
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<tr>
<td>crwt4353</td>
<td>CRWT 4353 Creating Poetry: Advanced</td>
<td>An advanced workshop on the creation, history, and theory of poetry that will focus on the creative techniques and the creative process involved in writing formalist, lyrical, free verse, and experimental poetry. May be repeated for credit (6-9 hours maximum). Prerequisite: CRWT 3351 or instructor consent required.</td>
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<td>CRWT 3351 or instructor consent required. (3-0) T</td>
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<tr>
<td>crwt4v71</td>
<td>CRWT 4V71 Independent Study in Creative Writing</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing and completion of all lower-division requirements in AP standing and instructor consent required.</td>
<td>1-3</td>
<td>Upper-division standing and completion of all lower-division requirements in AP standing and instructor consent required. (1-3-0) R</td>
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<tr>
<td>danc231</td>
<td>DANC 2311 Topics in Dance</td>
<td>An introduction to specialized topics in dance. May include historical or cultural elements of dance, performance studies, a genre or choreographer or digital aspects of dance. May be repeated for credit as topics vary (9 hours maximum).</td>
<td>3</td>
<td>DANC 2311 Topics in Dance. May include historical or cultural elements of dance, performance studies, a genre or choreographer or digital aspects of dance. May be repeated for credit as topics vary (9 hours maximum). (3-0) R</td>
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<tr>
<td>danc2v7</td>
<td>DANC 2V71 Independent Study in Dance</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required.</td>
<td>1-3</td>
<td>DANC 2311 Topics in Dance. May include historical or cultural elements of dance, performance studies, a genre or choreographer or digital aspects of dance. May be repeated for credit as topics vary (9 hours maximum). (3-0) R</td>
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<tr>
<td>danc333</td>
<td>DANC 3332 Dance Technique 2</td>
<td>Designed for students who have some experience and wish to develop additional experiences skills and technique in various forms of dance at a high beginning/low intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: Minimum of 9 hours in any combination of DANC 2331 or DANC 2332 or DANC 2333 or DANC 2334 or instructor consent required.</td>
<td>3</td>
<td>DANC 2332 Dance Technique 2 (3 semester hours) Designed for students who have some experience and wish to develop additional experiences skills and technique in various forms of dance at a high beginning/low intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: Minimum of 9 hours in any combination of DANC 2331 or DANC 2332 or DANC 2333 or DANC 2334 or instructor consent required. (0-3) T</td>
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<tr>
<td>DANC 3333</td>
<td>Modern Dance 2 (3 semester hours)</td>
<td>Designed for students who have some experience and wish to develop additional experience technique and skills in Modern dance at a high beginning/low intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: Minimum of 9 hours in any combination of DANC 2332 or DANC 2334 or instructor consent required. (0-3) T</td>
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<tr>
<td>DANC 3334</td>
<td>Jazz Dance 2 (3 semester hours)</td>
<td>Designed for students who have some experience and wish to develop additional experience and skills in Jazz dance at a high beginning/low intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: Minimum of 9 hours in any combination of DANC 2332 or DANC 2333 or DANC 2334 or instructor consent required. (0-3) T</td>
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<tr>
<td>DANC 3335</td>
<td>Ballet 2 (3 semester hours)</td>
<td>Designed for students who have some experience and wish to develop additional experience and skills in Ballet at a high beginning/low intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: Minimum of 9 hours in DANC 2334 or instructor consent required. (0-3) T</td>
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<tr>
<td>DANC 3340</td>
<td>Dance in Historical Context (3 semester hours)</td>
<td>Studies in the history of dance. Topics may include the development of western or world dance forms, specific periods, styles, traditions, and/or artists. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: ARTS 1301 or DANC 1310 or equivalent. (3-0) Y</td>
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<tr>
<td>DANC 3342</td>
<td>Advanced Topics in Dance (3 semester hours)</td>
<td>Topics in Dance (3 semester hours) Topics may vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: ARTS 1301 or DANC 1310 or equivalent or instructor consent required. (0-3) R</td>
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<td>DANC 3345</td>
<td>Dance Performance (3 semester hours)</td>
<td>Exploration of various choreographic styles and ideas of performance. Emphasis may be placed on the application of dance techniques in choreographed works. Methods may focus on the choreographic process to enrich the performer’s range of technique and expression and encourage understanding of choreographic principles and practices. Audition may be required for enrollment in this course. May be repeated for credit (9 hours maximum). Prerequisite: Audition or instructor Instructor consent required. (0-3) T</td>
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<tr>
<td>DANC 3347</td>
<td>Dance Composition (3 semester hours)</td>
<td>Students will study basic concepts and applications for dance composition at a beginning level. Principles and skills will be taught through projects, analysis, and the creation of a complete work. May be repeated for credit (9 hours maximum). Prerequisite: DANC 3332, 3332 or DANC 3333, 3333 or DANC 3334, 3334 or DANC 3335, 3335 or instructor consent required. (0-3) Y</td>
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<tr>
<td>DANC 4316</td>
<td>Jazz Dance 3 (3 semester hours)</td>
<td>Designed for students who wish to develop additional experience and skills in Jazz dance at an intermediate level. May be repeated for credit (9 hours maximum). Prerequisite: DANC 3333, 3333 or DANC 3334, 3334 or DANC 3335, 3335 or instructor consent required. (0-3) Y</td>
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### Undergraduate Catalog 2013 - Course Change Requests

<table>
<thead>
<tr>
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<tr>
<td>2012-2013</td>
<td>danc431 7 013794 danc431 7.2</td>
<td>DANC 4317 Dance Performance 2</td>
<td>(3 semester hours) Designed for students who wish to develop additional experience and skills in performance and the creative process. Students will experience the following at an intermediate to advanced level: various choreographic styles, ideas of performance, performance practices, and application of dance techniques in choreographed works. A more advanced approach will be applied to methods that focus on the choreographic process to enrich the performer’s range of technique and expression, along with the understanding of choreographic principles and practices. Audition may be required for enrollment in this course. May be repeated for credit (9 hours maximum). Prerequisite: DANC 3345 or instructor consent.</td>
<td>(0-3) Y</td>
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<td>2012-11-06 15:35:35</td>
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<td>2012-2013</td>
<td>danc431 8 013795 danc431 8.2</td>
<td>DANC 4318 Dance Technique 4</td>
<td>(3 semester hours) Designed for students who wish to develop additional experience in various forms of dance. May be repeated for credit (9 hours maximum). Prerequisite: DANC 3332, DANC 4314, DANC 4315, or DANC 4316 or instructor consent.</td>
<td>(0-3) Y</td>
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<td>2012-11-06 15:36:37</td>
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<td>2012-2013</td>
<td>dram2v7 1 003885 dram2v7 1.3</td>
<td>DANC 4V71 Independent Study in Dance</td>
<td>(1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing, and completion of all lower-division requirements in AP, standing and instructor consent required.</td>
<td>([1-3]-0) R</td>
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<td>2010-2013</td>
<td>dram237 3 003941 dram237 3.4</td>
<td>DRAM 2373 Languages of the Body</td>
<td>(3 semester hours) Explores the fundamental principles and techniques of movement and/or voice systems and their relationship to diverse forms of theater, performance, media, and alternative staging. Presented in a participatory workshop setting. Prerequisite: DRAM 1310 or equivalent. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: DRAM 1310 or equivalent.</td>
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<td>2003-2013</td>
<td>dram2v7 1 003922 dram2v7 1.2</td>
<td>DRAM 2V71 Independent Study in Drama</td>
<td>(1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required.</td>
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<td>2012-2013</td>
<td>dram331 0 003944 dram331 0.6</td>
<td>DRAM 3310 Theater/Performance Ensemble</td>
<td>(3 semester hours) This course is for people who are acting, producing or managing a production. The time will be reserved for rehearsals, script analysis, concept design and general studies. Additional rehearsals, outside of the assigned class time, will be necessary to produce the show. This course provides practical use of theatrical studies. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: Audition or instructor consent required.</td>
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<td>2012-2013</td>
<td>dram332 5 003947 dram332 5.5</td>
<td>DRAM 3325 Directing and Producing</td>
<td>(3 semester hours) This course presents the principles and working methods of directing and producing theater, performance, and inter-media expressions. Emphasis will be on the development of skills required to bring a text or idea to presentation. Areas of focus will include imagination and conception, image and metaphor, analysis, planning, development-rehearsal process, and production. Will require out of class lab hours. Prerequisite: DRAM 1351 or instructor consent required.</td>
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<td>2012-2013</td>
<td>dram334 2 003948 dram334 2.5</td>
<td>DRAM 3342 Advanced</td>
<td>Topics in Theater (3 semester hours) Topics may vary from semester to semester. They include specialized courses in technical theater, production, performance and administration and are offered at the discretion of the instructor. Past courses include Voice Over and Stage Management. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: DRAM 1310 or equivalent or instructor consent required. (3-0) R</td>
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<td>2012-2013</td>
<td>dram335 1 013160 dram335 1.3</td>
<td>DRAM 3351 Light Design (3 semester hours)</td>
<td>Students will learn the fundamentals of designing lighting for various events. Concerts, dance and theatrical productions will be covered. Proper procedures for creating a fully functional lighting design from concept and justification to plotting and implementation, color theory, texture, proper instrumentation, drafting, and justification are a few of the skills that students will learn through the course of the semester. Prerequisite: (DRAM 1310 and DRAM 3310, DRAM 3324, 3324) or instructor consent required. (3-0) R</td>
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<td>2012-2013</td>
<td>dram4v7 1 003954 dram4v7 1.4</td>
<td>DRAM 4V71 Independent Study in Drama (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing, completion of all lower-division requirements in AP, standing and instructor consent required. (1-3)-0 R</td>
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<td>2010-2013</td>
<td>emac432 5 012767 emac432 5.4</td>
<td>EMAC 4325 Digital Writing (3 semester hours)</td>
<td>This class will introduce the forms and strategies of digital composition. Through this writing-intensive course students will learn to write in and about digital networked spaces, focusing on changes that the switch from analog to digital has brought to representation. This course will explore writing in the digital age across a range of technologies, environments, and spaces. Prerequisite: RHET 1302, (RHET 1302 and ATEC 2321, 2321 and ATEC 2322, 2322) and upper-division standing. (3-0) Y</td>
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<td>2012-2013</td>
<td>film2v71 005283 film2v71. 3</td>
<td>FILM 2V71 Independent Study in Film (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. (1-3)-0 R</td>
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<td>FILM 3321 Film in Historical Context (3 semester hours)</td>
<td>Historical studies of major films, genres, and movements from the silent era to the present. Topics may include the history of documentary, fiction, or experimental film and video; or film genres such as the musical, the horror film, or the melodrama viewed in their historical context. Courses on film movements focus on a national cinema at a specific time (such as German Expressionism, Soviet Socialist Realism, Italian Neo-Realism, the French New Wave, or film noir). May be repeated for credit as topics vary (9 hours maximum). Prerequisite: FILM 2332 or equivalent. Instructor consent required. (3-0) Y</td>
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<td>FILM 3325 Film Authorship (3 semester hours)</td>
<td>Film history studied through one to two or more directors per course, from their earliest to their final or most recent or final films. Lectures, discussions, and film screenings are designed to explore films as part of cultural history, cinema and media history, and the history of criticism, including theories about the nature of film directors topics vary (6-9 hours maximum). Prerequisite: FILM 2332 or equivalent. (3-0) R</td>
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<td>film4v71 005291 film4v71.3</td>
<td>FILM 4V71 Independent Study in Film (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing and completion of all lower-division requirements in AP, standing and instructor consent required. (1-3-0) R</td>
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<td>HIST 2V71 Independent Study in Historical Studies (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. (1-3-0) R</td>
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<td>2003-13</td>
<td>hist3301 006820 hist3301.3</td>
<td>HIST 3301 Historical Inquiry (3 semester hours)</td>
<td>Readings, commentary, and discussion aimed at introducing a variety of texts and sources with an emphasis on the major methods appropriate to their use. This course should be taken prior to completing the first 12 hours of upper-division course work in the program. It is normally offered only during the fall and spring semesters. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) S</td>
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<td>hist3312 006826 hist3312.4</td>
<td>HIST 3312 Early China (3 semester hours)</td>
<td>Themes in the history of China to the end of the third century of the common era. Common Era. Emphasis on social, intellectual, and cultural developments of China’s axial age (the late Zhao dynasty) and first great empire (the Han dynasty). Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>HIST 3313 Medieval China (3 semester hours)</td>
<td>Themes in the history of China from the decline of the Han dynasty through the period of disunion and reunification under the Sui and Tang dynasties. Emphasis on social, intellectual, and cultural developments of China’s medieval age. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>hist3314 006828 hist3314.3</td>
<td>HIST 3314 Traditional China (3 semester hours)</td>
<td>Surveys the history of Chinese civilization from its Neolithic beginnings through the tenth century of the common era. Common Era. Prerequisite: HIST 1304, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>hist3315 006829 hist3315.5</td>
<td>HIST 3315 Modern China (3 semester hours)</td>
<td>Surveys the history of Chinese civilization from the tenth through twentieth centuries. Prerequisite: HIST 1304, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>hist3317 006831 hist3317.2</td>
<td>HIST 3317 The Crusades (3 semester hours)</td>
<td>A survey of Medieval European crusading activities in the Iberian Peninsula, the Baltic region, the Near East, and the Balkans. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) R</td>
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<td>hist3318 006832 hist3318.3</td>
<td>HIST 3318 Medieval Europe (3 semester hours)</td>
<td>The history of Europe from the fall of the Roman Empire to the late medieval period, including feudalism, the investiture controversy, the conflicts of papacy and empire, and the rise of national monarchies. Prerequisite: HIST 1304, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>hist3319</td>
<td>HIST 3319 Early Modern Europe (3 semester hours)</td>
<td>An analysis of the general themes and issues in late medieval and early modern European history from about 1400 to the French Revolution; emphasis on new methods and approaches, especially recent attempts to refine social analysis and to study both popular and elite culture. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>hist3320</td>
<td>HIST 3320 Modern Europe (3 semester hours)</td>
<td>A study of selected aspects of political, diplomatic, economic, and social history of Europe from the French Revolution to the Second World War. Geographical emphasis on England, France, and Germany. Topical focus on industrialization, modernization, and democratization in the 19th century, and on the emergence of mass society, war, and totalitarianism in the 20th century. Prerequisite: HIST 4301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>hist3324</td>
<td>HIST 3324 Women in European Society (3 semester hours)</td>
<td>An historical examination of the varied experiences of European women, focusing on work, family life, political action, sexuality, and cultural expression. May emphasize early modern or modern period. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) R</td>
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<td>hist3328</td>
<td>HIST 3328 History and Philosophy of Science and Medicine (3 semester hours)</td>
<td>An exploration of the development of philosophical ideas in science and medicine. Topics may include comparison of Eastern and Western philosophies of natural knowledge and medicine and scientific and medical concepts in philosophical and ethical contexts. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or PHIL 4301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (Same as PHIL 3328) (3-0) T</td>
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<td>hist3331</td>
<td>HIST 3331 European Social History (3 semester hours)</td>
<td>A review of the major problems studied, methods used, and findings reached by the new social historians of Europe. The principal focus of their work and of this course is on the pre-industrial era. Prerequisite: HIST 4301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>hist3332</td>
<td>HIST 3332 History of the Electronic Age (3 semester hours)</td>
<td>This course will examine the history of the electronic age and will include topics on the telegraph, telephone, radio, television, computers, cybernetics, information theory, artificial intelligence and the Internet. Prerequisite: HIST 1301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334 or equivalent. (3-0) Y</td>
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<td>hist3333</td>
<td>HIST 3333 European Social and Political Thought (3 semester hours)</td>
<td>A study of such concepts in social and political theory as authority, justice, equality, law, revolution, natural rights, state, and nation. May include texts by Locke, Burke, Bentham, Mill, Marx, and Nietzsche. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) R</td>
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<td>hist3334 006847 hist3334. 4</td>
<td>HIST 3334 Nineteenth-Century European Culture and Society (3 semester hours)</td>
<td>An exploration of the interplay between social change and cultural developments in various European societies during the 19th century. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3336 Twentieth-Century European Culture and Society (3 semester hours)</td>
<td>An exploration of the interplay between social change and cultural developments in various European societies during the 20th century. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3337 Technology and Western Civilization (3 semester hours)</td>
<td>A survey of the role played by technology in shaping Western culture from antiquity through the industrial revolution. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3344 History of Science in Europe (3 semester hours)</td>
<td>Surveys the development of the mathematical and natural sciences in European culture. Subject matter will vary from semester to semester, but topics may include astronomy, physics, chemistry, biology, medicine, natural history, geology, evolution and genetics. Time periods may range from human pre-history to the Scientific Revolution and from the Scientific Revolution to the present. Course content will not overlap with HIST 3337. No technical background required. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist3351 006864 hist3351. 5</td>
<td>HIST 3351 Ottoman Empire I (3 semester hours)</td>
<td>A survey of Ottoman history from 1360 to 1566. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist3352 013800 hist3352. 2</td>
<td>HIST 3352 Ottoman Empire II (3 semester hours)</td>
<td>A survey of Ottoman history from 1566 to 1923. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) T</td>
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<td>HIST 3355 Persians, Turks, and Mongols (3 semester hours)</td>
<td>Topics in the history of the Near and Middle East, and Central Asia. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 3358 Latin American History (3 semester hours)</td>
<td>A survey of Latin America from its pre-Columbian past to the present, with emphasis on the process of change from a traditional to a modern society. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist3364 006876 hist3364. 3</td>
<td>HIST 3364 History of American Religion (3 semester hours)</td>
<td>An examination of the development of American religious institutions and their relation to the nation's social, political, and cultural history. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist3365 006877 hist3365.3</td>
<td>HIST 3365 The American West (3 semester hours) This course will survey the major political, economic, and cultural developments in the history of the American West from the Spanish Colonial period up to the present day. The course will touch on the key turning points in the region's history, focusing on the evolution of race and gender relations, the persistence and growth of ethnic and cultural minority groups, and the role of the federal government in the West's economic, political, and cultural development. Prerequisites: HIST 1301, 1302 or HIST 1304, 1302 or HIST 2301, 2330, 2331 or HIST 2332, 2332 or equivalent. (3-0) T</td>
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<td>2007-2013</td>
<td>hist3366 006878 hist3366.4</td>
<td>HIST 3366 Themes in the Social History of the United States (3 semester hours) A survey of social history, focusing upon the American experience. The course explores changes in the family, work, sex roles, mobility, migration, urbanization, and industrialization. Topics may vary. Prerequisite: HIST 1301, 1302 or HIST 1304, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>2004-2013</td>
<td>hist3367 006879 hist3367.4</td>
<td>HIST 3367 Continental Expansionism in American History (3 semester hours) An exploration of the processes that saw the Anglo-American colonial settlements transform themselves into a vast continental power. The course covers the period from 1607 to 1890. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist3369 006881 hist3369.4</td>
<td>HIST 3369 United States Foreign Relations (3 semester hours) A survey of American diplomatic history since the 1890s. The course analyzes the United States' relations with Africa, Asia, Europe, Latin America, the Middle East, and Soviet Russia. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3370 The American Experience in Vietnam (3 semester hours) An analysis of the political, diplomatic, economic, and cultural impact the Vietnam War had on American society. Students will analyze monographs, memoirs, novels, documentaries, and feature films. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3374 American Technological Development (3 semester hours) A survey of the role played by technology in shaping American culture from colonial times to the present. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3376 American Intellectual History, Colonial to the Civil War (3 semester hours) A survey of some of the principal developments in American thought from the colonial era to the civil war. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3377 American Intellectual History, Civil War to the Present (3 semester hours) An exploration of the origins of contemporary American intellectual life through the study of changing ideas about society, politics, science, religion, and art from the civil war to the present. Prerequisite: HIST 1304, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3379 United States Relations with Latin America (3 semester hours)</td>
<td>An analysis of the United States' political, economic, military, and cultural relations with Latin America, with emphasis on the period since the 1890s. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3380 The Nuclear Age in America (3 semester hours)</td>
<td>An examination of the historical roots of the modern nuclear age. Topics will include the development of the atomic bomb and the role of nuclear weapons in postwar diplomacy. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3382 The United States Since 1945 (3 semester hours)</td>
<td>An analysis of the key political, diplomatic, socioeconomic, technological, and cultural changes that have shaped contemporary U.S. society. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3384 U.S. Women from Settlement to Present (3 semester hours)</td>
<td>A survey of the changing social, political, and economic roles of American women. Particular attention will be paid to the diversity of women’s roles, focusing on how women of different races, classes, and sexualities interpreted their &quot;American experience.&quot; Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3386 World History to 1500 (3 eredit semester hours)</td>
<td>A survey of social, economic, political, and cultural life in major world civilizations from their origins through 1500. Prerequisite: HIST 4301, 1301 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2331 or equivalent. (3-0) R</td>
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<td>HIST 3387 World History from 1500 (3 eredit semester hours)</td>
<td>A survey of social, economic, political, and cultural life in major world civilizations from 1500 through the present. Prerequisite: HIST 4301, 1301 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 3389 History of Science in the U.S. (3 semester hours)</td>
<td>Surveys the development of the mathematical and natural sciences in American culture. Subject matter will vary from semester to semester, but topics may include astronomy, physics, chemistry, biology, medicine, natural history, geology, evolution, and genetics. Course content will not overlap with HIST 3337. No technical background required. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) R</td>
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<td>HIST 3390 Twentieth-Century African-American History (3 semester hours)</td>
<td>A study of themes in the history of African-Americans in the twentieth century. The course will focus on the civil rights movement, though other themes will also be explored. Emphasis will be on African-American perspectives and the ongoing struggle for self-determination by African-Americans. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) R</td>
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<td>HIST 3391 Modern Mexico (3 semester hours)</td>
<td>An overview of the political, economic, social, and cultural history of Mexico from the era of Independence (roughly 1810 to present). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>hist3394.3</td>
<td>HIST 3394 Native American History from the Pre-Columbian Period through 1795</td>
<td>(3 semester hours) Examines the arrival of Native Americans in the New World and the cultures</td>
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<td>006899</td>
<td>that emerged and declined there in the pre-Columbian period. Will also discuss</td>
<td>that emerged and declined there in the pre-Columbian period. Will also discuss the intellectual</td>
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<td>hist3394.3</td>
<td>the intellectual framework within which Europeans envisioned Native Americans.</td>
<td>framework within which Europeans envisioned Native Americans. Prerequisite: HIST 4301, 1301 or</td>
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<td>HIST 4302, 1302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 3395 Native American History in the Nineteenth Century (3 semester hours)</td>
<td>(3 semester hours) Examines the interaction of Native Americans and &quot;whites&quot; during the</td>
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<td>006900</td>
<td>Ninth Century, primarily in the region west of the Appalachians to the Pacific.</td>
<td>nineteenth century, primarily in the region west of the Appalachians to the Pacific. Will focus</td>
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<td>hist3395.4</td>
<td>Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0)</td>
<td>on the cultures of the desert Southwest in the Spanish colonial period.</td>
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<td>hist3396.3</td>
<td>HIST 3396 Native Americans in the Twentieth Century (3 semester hours)</td>
<td>Discusses the allotment or destruction of the reservation system in much of the United States</td>
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<td>006901</td>
<td>(3 semester hours) Discusses the allotment or destruction of the reservation</td>
<td>at the turn of the century and will also focus on government attempts to force Native Americans</td>
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<td>hist3396.3</td>
<td>system in much of the United States at the turn of the century and will also</td>
<td>to discard their indigenous identity. Prerequisite: HIST 1301, 1301 or HIST 4302, 1302 or</td>
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<td>2008-2013</td>
<td>hist3398.2</td>
<td>HIST 3398 Colonial Latin American History (3 semester hours) A survey of Latin</td>
<td>HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>006903</td>
<td>America from its pre-Columbian past to independence (roughly 1821), the course</td>
<td>A survey of Latin America from its pre-Columbian past to independence (roughly 1821), the course</td>
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<td>hist3398.2</td>
<td>will emphasize the process of merging pre-Columbian and European cultures</td>
<td>will emphasize the process of merging pre-Columbian and European cultures throughout the</td>
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<td>006903</td>
<td>throughout the colonial period. Prerequisite: HIST 4301, 1301 or HIST 4302,</td>
<td>colonial period. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>006904</td>
<td>America from independence (roughly 1821) to the present, the course will</td>
<td>(roughly 1821) to the present, the course will emphasize the intersection of far-reaching political</td>
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<td>hist3399.2</td>
<td>emphasize the intersection of far-reaching political trends with local cultures</td>
<td>trends with local cultures in the nineteenth and twentieth centuries. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 4330 The Holocaust (3 semester hours) Study of the political, social,</td>
<td>The Holocaust (3 semester hours) Study of the political, social, historical, and cultural</td>
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<td>006919</td>
<td>historical, and cultural events leading to and constituting the Holocaust.</td>
<td>events leading to and constituting the Holocaust. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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<td>HIST 4331 Holocaust and Representation (3 semester hours) Study of the</td>
<td>Holocaust and Representation (3 semester hours) Study of the depiction and representation of the</td>
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<td>depiction and representation of the Holocaust in art, literature, poetry, and</td>
<td>Holocaust in art, literature, poetry, and film. Prerequisite: HIST 1301 or HIST 1302 or HIST 2301 or HIST 2331 or equivalent. (3-0) T</td>
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<td>HIST 4336 The U.S. Jewish Experience (3 semester hours) This course will</td>
<td>The U.S. Jewish Experience (3 semester hours) This course will explore the creation and evolution</td>
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<td>explore the creation and evolution of American Jewish culture and investigate</td>
<td>of American Jewish culture and investigate the impact of successive waves of migration upon the</td>
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<td>the impact of successive waves of migration upon the making of American Jewry.</td>
<td>making of American Jewry. Students will study the process of cultural renewal and religious</td>
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<td>Students will study the process of cultural renewal and religious reform,</td>
<td>reform, assimilation, anti-Semitism, American Jewish responses to the Great Depression, the</td>
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<td>hist4336.3</td>
<td>assimilation, anti-Semitism, American Jewish responses to the Great Depression,</td>
<td>Holocaust, the Holocaust, and the interaction between Israel and American Jewish communities in</td>
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<td>and the interaction between Israel and American Jewish communities in the</td>
<td>the postwar period. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2303 or HIST 2334, 2331 or equivalent. (3-0) T</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<td>hist4339 006922 hist4339.3</td>
<td>HIST 4339 Berlin: History of a City (3 semester hours)</td>
<td>This course will explore issues of industrialization, urban renewal and planning, space, class, and migration in addition to looking at key factors such as class, gender, ethnicity, consumer cultures, crime, and the representations of the city in literature, art, and film. The course will focus on major events and conflicts that have left their mark on the city, such as the rise of the modern metropolis, economic depressions and social unrest, the two World Wars, Nazism and the Holocaust, and the Cold War and its aftermath. Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>hist4344 006925 hist4344.2</td>
<td>HIST 4344 Topics in European History (3 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>hist4345 006926 hist4345.2</td>
<td>HIST 4345 Origins of the Jim Crow South (3 semester hours)</td>
<td>An examination of the origins of segregation and disenfranchisement in the American South following Reconstruction through World War II. Attention will be paid to both the legal and extralegal edifices upholding white supremacy and the evolution of a racist consumer culture. The course will also explore African-American resistance to Jim Crow. Prerequisite: HIST 1301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>hist4346 006927 hist4346.3</td>
<td>HIST 4346 American Culture 1877-1919 (3 semester hours)</td>
<td>A survey of the Gilded Age or Progressive Era, 1877-1919. Themes will include the expansion of industrial capitalism, the influx of &quot;new immigrants&quot; and patterns of &quot;Americanization,&quot; middle-class social reform, emergence of the U.S. as an imperial power, explosion of nativist and racist sentiments, and the political mobilization of labor. Prerequisite: HIST 4304, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4349 Jewish History (3 semester hours)</td>
<td>This course will examine the profound transformation that Jews, as communities and individuals, experienced from the late eighteenth century to the postwar period while exploring the political and ideological, as well as cultural and religious developments. Central themes include the Jewish Enlightenment, the process of emancipation, religious reform, modern anti-Semitism, the Holocaust, Zionism, and the founding of the State of Israel. Prerequisite: HIST 4304, 1301 or HIST 4302, 1302 or HIST 2304, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) T</td>
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<td>HIST 4357 Topics in African and African-American History (3 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4358 Topics in Asian History (3 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4359 Topics in Latin American History (3 semester hours) Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 1302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>hist4360</td>
<td>HIST 4360 Topics in American Women's History (3 semester hours) Subject matter will vary from semester to semester and may include Women and the American Frontier, Popular Culture and Mass Media, and American Religious Societies. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4376 Topics in History (3 semester hours) Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4377 Topics in Early American History (3 semester hours) Focuses on the formative era of the American nation. Social, cultural, political, and economic issues are examined within the context of important transformations over time. Topics will vary and may include British Colonial America (1609-1763), The Era of the American Revolution, and The Early American Republic (1785-1828). May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4378 Topics in American History (3 semester hours) Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 4301, 1301 or HIST 4302, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>HIST 4380 Topics in Intellectual History (3 semester hours) Subject matter will vary from semester to semester. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: HIST 4201, 1301 or HIST 4202, 1302 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or equivalent. (3-0) R</td>
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<td>hist4v71</td>
<td>HIST 4V71 Independent Study in Historical Studies (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Instructor (HIST 1301 or HIST 1302 or HIST 2301 or HIST 2330 or HIST 2331), upper-division standing, and instructor consent required. ([1-3]-0) R</td>
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<td>hist4v99</td>
<td>HIST 4V99 Senior Honors in Historical Studies (1-3 semester hours) Intended for students conducting independent research for honors theses or projects. Prerequisite: Signature of the instructor and secondary reader on proposed project outline required. Prerequisite: Instructor consent required. ([1-3]-0) R</td>
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<td>huma334</td>
<td>HUMA 3342 Topics in the Humanities (3 semester hours) Subject matter will vary from semester to semester. May be repeated for credit (6 (9 hours maximum). Prerequisite: HUMA 1301 or equivalent or instructor consent required. (3-0) R</td>
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<td>lang2V71</td>
<td>LANG 2V71 Independent Study in Language (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. ([1-3]-0) R</td>
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<td>lang3342</td>
<td>LANG 3342 Advanced Language Instruction (3 semester hours)</td>
<td>This course is a continuation of instruction in foreign languages not taught on a regular basis. Languages will vary. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: Instructor consent required. (3-0) R</td>
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<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: LANG 2312 or equivalent or Upper-division standing and instructor consent required. ([1-3]-0) R</td>
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<td>LIT 2V71 Independent Study in Literary Studies (1-3 semester hours)</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. ([1-3]-0) R</td>
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<td>lit3309</td>
<td>LIT 3309 Studies in the Short Story (3 semester hours)</td>
<td>Studies of the short story in terms of authorial strategies and reader responses. May examine such topics as how authors' strategies in shaping narratives manipulate perceptions and how modes of fiction influence reader responses. Consideration of styles in the story's historical development and how they shape and reshape expectations. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: HUMA 1301 or equivalent. (3-0) T</td>
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<td>lit3314</td>
<td>LIT 3314 Studies in Poetry (3 semester hours)</td>
<td>Examines representative selections of poetry with particular reference to techniques of diction, syntax, sound, and organization. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HUMA 1301 or equivalent. (3-0) Y</td>
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<td>lit3324</td>
<td>LIT 3324 American Realism and Naturalism (3 semester hours)</td>
<td>Considers the development of late 19th- and early 20th-century writers in a society increasingly urban, cosmopolitan, and pluralistic. Writers may include Cooper, Neihardt, Steinbeck, Proulx, Twain, Howells, James, Crane, Dreiser, and Anderson. Prerequisite: HUMA 1301 or equivalent. (3-0) T</td>
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<td>lit4329</td>
<td>LIT 4329 Major Authors (3 semester hours) Study of one or more major literary figures such as Faulkner, Cervantes, Chaucer, Dante, Milton, Goethe, Blake, Balzac, Borges, Mann, Eliot, Austen, Dostoevsky, Paz, and Tolstoy. May be repeated for credit as subjects vary (9 hours maximum). Prerequisite: Upper-division standing or instructor consent required. (3-0)</td>
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<td>LIT 4V71 Independent Study in Literary Studies (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing and instructor consent required. (1-3)-0</td>
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<td>musi211</td>
<td>MUSI 2113 Pep Band (1 semester hour) The UT Dallas Pep Band (or Spirit Band) is comprised of winds, brass and percussion. This performing group, in conjunction with Student Life and Student Activities, will provide music for a variety of events on campus throughout the year. May be repeated for credit (9 hours maximum). (0-3)</td>
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<td>musi2v7</td>
<td>MUSI 2V71 Independent Study in Music (1-3 semester hours) Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). (1-3)-0</td>
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<td>musi332</td>
<td>MUSI 3323 The Guitar: Medieval to Modern (3 semester hours) The study of guitars and the art of playing guitars in Europe and in the Americas. Allied instruments such as the lute, viheula, Baroque guitar, and the Romantic guitar will also be studied. Prerequisites: ARTS 1304, 1301 or MUSI 1306, 1306 or MUSI 2322, 2322 or instructor consent required. (3-0)</td>
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<td>musi332</td>
<td>MUSI 3324 Jazz History: Roots to Swing (3 semester hours) The history of jazz music with a focus on early jazz and musical developments prior to bebop. Topics include jazz music and musicians prior to bebop and the identification of elements of jazz such as improvisation and song forms. Prerequisites: ARTS 1304, 1301 or MUSI 1306, 1306 or MUSI 2322, 2322 or instructor consent required. (3-0)</td>
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<td>MUSI 3325 Jazz History: Bebop through Modern Jazz since BeBop (3 semester hours) The history of jazz music with a focus on modern jazz and musical developments which occurred since the bebop era. Topics include jazz music and musicians since the bebop era and the identification of elements of jazz such as improvisation, song forms, instruments and instrumental techniques, swing feeling, and different jazz styles. Prerequisites: ARTS 1304, 1301 or MUSI 1306, 1306 or MUSI 2322, 2322 or instructor consent required. (3-0)</td>
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<td>MUSI 3342 Advanced Topics in Music (3 semester hours) Topics may include theory and composition, a specific composer, or a genre such as guitar literature, new music or jazz. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: Three hours of lower-division music coursework or instructor consent required. (3-0)</td>
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### MUSI 4349 Advanced Chamber Orchestra/Chamber Music Ensemble (3 semester hours)
Provides performance opportunities for advanced instrumentalists and singers. Repertoire will range from duos and trios to larger ensembles in musical styles from medieval to contemporary. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. (0-3) S

### MUSI 4385 Chamber Singers II (3 semester hours)
Chamber Singers II are a performing ensemble of approximately 24 singers with substantial choral experience, performing on a regular basis at the University and in the community, and often with instrumental and other choral ensembles. Some concerts may involve staging and memorization. May be repeated for credit (9 hours maximum). Prerequisite: MUSI 3385 Chamber Singers I or instructor consent required. (0-3) S

### MUSI 4V71 Independent Study in Music (1-3 semester hours)
Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing and completion of all lower-division requirements in AP, standing and instructor consent required. ([1-3]-0) R

### PHIL 3304 Contemporary Conceptions of Human Nature (3 semester hours)
Emphasis on contemporary conceptions of human nature and the human condition, stressing the cultural and historical settings. Prerequisite: PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (3-0) R

### PHIL 3328 History and Philosophy of Science and Medicine (3 semester hours)
An exploration of the development of philosophical ideas in science and medicine. Topics may include comparison of Eastern and Western philosophies of natural knowledge and medicine and scientific and medical concepts in philosophical and ethical contexts. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: HIST 1301, 1301 or HIST 2301, 2301 or HIST 2330, 2330 or HIST 2331, 2331 or PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (Same as HIST 3328) (3-0) T

### PHIL 3373 Philosophy of Mind (3 semester hours)
An examination of one or more major issues in the philosophy of mind and of cognitive sciences, such as the mind/body problem, the nature of consciousness, the problem of other minds, the social aspects of mind, the possibility of artificial intelligence, emotions, and the internalism/externalism debate. Prerequisite: PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (3-0) R

### PHIL 3375 Ethics in Contemporary America (3 semester hours)
An examination of various ethical problems which have been a part of 20th-century American consciousness, against the backdrop of social and political events. Issues may include abortion, capital punishment, sexual morality, world hunger, and war. Prerequisite: PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (3-0) T

### PHIL 3392 Reason, Reasoning, and Logic (3 semester hours)
An examination of the nature of rationality and a discussion of some of the various types of reasoning systems. Techniques designed to improve skills in presenting and evaluating arguments. Prerequisite: PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (3-0) R
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<td>phil4308</td>
<td>Theories of Knowledge</td>
<td>A study of central topics in the theory of knowledge, including skepticism and the limits of knowledge, relativism and objectivity, and the role of perception, memory, introspection and reason as sources of knowledge. Prerequisite: PHIL 1301, 1301 or PHIL 2316, 2316 or PHIL 2317 or equivalent. (3-0)</td>
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<td>phil4310</td>
<td>Philosophy of Technology</td>
<td>An examination of the nature of technology and its role in personal life and society. Focus on the conceptualization of technology, the relation of science to technology, the impact of technology on science and ethics, and the influence of technology on culture. Prerequisite: PHIL 4301, 1301 or PHIL 2316, 2316 or PHIL 2317 or instructor consent required. (3-0)</td>
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<td>phil4380</td>
<td>Topics in Philosophy</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit as topics vary (6 hours maximum). Prerequisite: Upper-division standing PHIL 1301 or instructor consent required. (3-0)</td>
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<td>phil4v71</td>
<td>Independent Study in Philosophy</td>
<td>Independent study under a faculty member's direction. Signature of instructor and ADU on proposed project outline required. May be repeated for credit (9 hours maximum). Prerequisite: Upper-division standing and instructor consent required. ([1-3]-0)</td>
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<td>span131</td>
<td>Beginning Spanish II</td>
<td>This course is a continuation of Beginning Spanish I. It will integrate acquisition of the four language skills (listening, speaking, reading, and writing) with study of Spanish culture and civilization. Prerequisite: SPAN 1312 or equivalent or instructor consent required. (3-0)</td>
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<td>span231</td>
<td>Intermediate Spanish I</td>
<td>This course is a continuation of Beginning Spanish. It will include review and application of skills in listening comprehension, speaking, reading, and writing. The course emphasizes conversation, vocabulary acquisition, reading, composition, and culture. Prerequisite: SPAN 1312 or equivalent or instructor consent required. (3-0)</td>
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<td>span436</td>
<td>Advanced Spanish Culture</td>
<td>This course will provide students with a basic knowledge of and appreciation for the Spanish language, culture and civilization as found in Spain, Latin America, and the Hispanic communities in the U.S.A. The traditional elements and new trends of the culture as revealed in the arts, music, film and literature will be covered. Classes will be conducted in Spanish with occasional use of English for clarification of difficult concepts only. Prerequisite: SPAN 3364 or equivalent or instructor consent required. (3-0)</td>
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<td>arts2311</td>
<td>Topics in Visual Art</td>
<td>An introduction to specialized topics in the visual arts. May include historical or cultural elements of visual arts, a genre or artist, or digital aspects of visual art. May be repeated for credit as topics vary (9 hours maximum). (3-0)</td>
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<td>2012-2013</td>
<td>cgs1100 013957, cgs1100.4</td>
<td>CGS 1100 First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Credit/No Credit. Corequisite: UNIV 1010. (Same as CLDP 4100, 1100 and NSC 4100, 1100 and PSY 4100, 1100 and SPAU 1100) Credit/No Credit. Co-requisite: UNIV 1010. (1-0) Y</td>
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<td>cgs3342 002106, cgs3342.6</td>
<td>CGS 3342 Cognitive and Neural Modeling Laboratory (3 semester hours) Computational Neuroscience, Cognitive Neural Modeling, and Mathematical Psychology modeling methodologies are introduced through the use of computer-based simulation modeling experiments. <strong>Prerequisites:</strong> Linear Algebra (MATH 2418) and Computer Programming experience are recommended but not required. (3-0) T</td>
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<td>CGS 3361 Cognitive Psychology (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. Prerequisite: <strong>PSY CGS 2301 or CGS PSY 2301.</strong> (Same as PSY 3361) (3-0) Y</td>
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<td>CGS 4188 Dean's Scholars' Seminar (1 semester hour) A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester. (Same as CLDP 4488, 4188 and PSY 4488, 4188 and NSC 4488, 4188 and SPAU 4188) (1-0) Y</td>
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<td>cgs4313 002118, cgs4313.7</td>
<td>CGS 4313 Neural Net Mathematics (3 semester hours) Vector calculus and vector calculus-based probability theory with artificial neural network modeling applications. Intended to provide mathematics preparation for CGS 4314 and CGS 4315. Prerequisite: Either (1) <strong>MATH 2418, CGS 3342 and (MATH 2418 and MATH 2451, STAT 2451) and (STAT 4351 or CS 3341 or EE 3341, CGS 3342, 3341)</strong> or (2) instructor consent required. (3-0) T</td>
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<td>2012-2013</td>
<td>cgs4315</td>
<td>CGS 4315 Intelligent Systems Design (3 semester hours)</td>
<td>Mathematical tools for the design and evaluation of artificially intelligent deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include: (1) Markov Random Field probability representations, and (2) asymptotic mathematical statistical theory for: parameter estimation, model selection, and hypothesis testing.</td>
<td>CS/CGS (CGS 4314 or CS 4314) or instructor consent required. (Same as CS 4315)</td>
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<tr>
<td>2012-2013</td>
<td>cgs4353</td>
<td>CGS 4353 Human Computer Interactions II (3 semester hours)</td>
<td>Detailed exploration of human-computer interaction (HCI) through readings in journal articles and research reports. Practical experience in methodology typically used in the design of usable systems. Prerequisite: CS/CGS (CGS 4352 or CS 4352) or instructor consent required. (Same as CS 4353)</td>
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<td>2012-2013</td>
<td>cgs4364</td>
<td>CGS 4364 Attention and Memory (3 semester hours)</td>
<td>Factors influencing the capacity to pick up, organize, and remember complex information. Prerequisite: CGS/PSY 3361, (CGS 3361 or PSY 3361) or instructor consent required. (Same as PSY 4364)</td>
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<td>2012-2013</td>
<td>cgs4375</td>
<td>CGS 4375 Honors Seminar (3 semester hours)</td>
<td>A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a research question(s), and 3) a faculty sponsor and second reader. This course is required for students seeking BBS School Honors (see Honors Program Manual for more information). Permission of Director of the Honors Program required. Offered only in spring semester. (Same as PSY 4375, CLDP 4375, 4375 and NSC 4375, 4375 and PSY 4375 and SPAU 4375)</td>
<td>(3-0) R</td>
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<tr>
<td>2012-2013</td>
<td>cgs4385</td>
<td>CGS 4385 Neuropsychology (3 semester hours)</td>
<td>This course is a comprehensive introduction of the relationship between brain and behavior. Topics include the foundations of neuropsychology, the brain's organization and functional systems, and neuropsychological perspectives of memory, attention, language, emotion, and spatial functions, and their related disorders. Prerequisite: NSC 3361. (Same as NSC 4385/PSY 4385 and PSY 4385)</td>
<td>(3-0) T</td>
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<tr>
<td>2012-2013</td>
<td>cgs4386</td>
<td>CGS 4386 Adult Development and Aging (3 semester hours)</td>
<td>This course is designed to provide an overview of theories, methods, and research on the psychological, social, and biological aspects of adult development and aging. A selection of topics to be covered includes lifespan developmental theories, research methodology, cognitive aging, compensation and successful aging, personality development, health, coping, social-emotional development, and to understand the nature and multiple influences of development throughout the adult lifespan. Prerequisite: PSY 2301</td>
<td>(Same as NSC 4386/SPAU 4386/PSY 4386)</td>
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<tr>
<td>cgs4394.6</td>
<td>CGS 4394 Internship in Cognitive Science</td>
<td>Students earn course credit for field experience in an approved setting. Requires working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to students in good academic standing with a GPA of at least 2.500 who have reached junior or senior standing (more than 53 hours).</td>
<td>(Same as CLDP 4394, PSY 4394, 4395 and NSC 4394 and PSY 4394 and SPAU 4396) (3-0) S</td>
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<tr>
<td>cgs4395.5</td>
<td>CGS 4395 Co-op Fieldwork</td>
<td>Students earn course credit for field experience in an approved business or government setting. Requires working at least 8 hours per week. Students will keep a journal of their workplace experience, maintain contact with the instructor, and prepare a written report that focuses on the accomplishments and insights gained through their co-op experience. Open to students in good academic standing with a GPA of at least 2.500. Credit will not be awarded retroactively. Apply for placements through the Career Center office. May be repeated for credit (6 hours maximum).</td>
<td>(Same as CLDP 4395 and PSY 4395) (3-0) Y</td>
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<td>cgs4v90.7</td>
<td>CGS 4V90 Special Topics in Cognitive Science</td>
<td>May be repeated for credit as topics vary (9 hours maximum).</td>
<td>(Same as CLDP/PSY 4V90, NSC 4V90, PSY 4V90, and SPAU 4V90) (3-0) Y</td>
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<td>cldp1100.3</td>
<td>CLDP 1100 First Year Seminar</td>
<td>This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors.</td>
<td>Credit/No Credit. Corequisite: UNIV 1010. (Same as PSY 1100, NSC 1100, CGS 1100, 1100 and NSC 1100 and PSY 1100) Credit/No Credit. Co-requisite: UNIV 10.</td>
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<td>cldp3310.4</td>
<td>CLDP 3310 Child Development</td>
<td>Introduction to psychological theory and research on physical, cognitive, social and emotional development from birth to adolescence. Students can take either CLDP/PSY (CLDP 3310 or CLDP/PSY 4334, PSY 3310) or (CLDP 4334 or PSY 4334). (Same as PSY 3310)</td>
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<td>cldp3332.4</td>
<td>CLDP 3332 Social and Personality Development</td>
<td>The study of the forces affecting the socialization of children. Emphasis will be placed on children's interactions with others and how this influences their development in such areas as self-concept, identity, and morality.</td>
<td>(Same as PSY 3332) (3-0) S</td>
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<td>cldp3336.3</td>
<td>CLDP 3336 Infancy</td>
<td>Review of relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive and social domains from birth through two years of age.</td>
<td>(Same as PSY 3336) (3-0) R</td>
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<td>CLDP 3342</td>
<td>Exceptional Children</td>
<td>Examines the characteristics of exceptional children and their education, including children with disabilities (learning, emotional/behavioral, communication and physical) as well as those who are gifted. The causes and assessment of exceptionality are examined, along with educational and social policy considerations.</td>
<td>CLDP/PSY (CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
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<tr>
<td>CLDP 3362</td>
<td>Cognitive Development</td>
<td>A contrast of Piagetian, behaviorist, and information-processing approaches to the development of cognitive processes throughout childhood.</td>
<td>CLDP/PSY (CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
<td>3</td>
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<tr>
<td>CLDP 3365</td>
<td>Child Learning</td>
<td>Examines the nature of child learning and implications for improving the teaching and learning process. Major theories and research on conditioning paradigms, learning and remembering, attention, knowledge representation and retrieval, and problem solving. Illustrations of how these processes relate to teaching and the acquisition of expertise in content areas such as reading, mathematics, and science. Child assessment, identification of learning styles, and tests and measurements are also considered.</td>
<td>CLDP/PSY (CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
<td>3</td>
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<tr>
<td>CLDP 3366</td>
<td>Motivation and Achievement</td>
<td>Examines theories and research on achievement and achievement motivation. Topics include methods of assessing school achievement, theories of achievement motivation, socio-cultural and situational influences. Also explores classroom applications.</td>
<td>CLDP/PSY CLDP 3339 or PSY 3339.</td>
<td>3</td>
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<tr>
<td>CLDP 4188</td>
<td>Dean's Scholars' Seminar</td>
<td>A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester.</td>
<td>CLDP/PSY CLDP 3339 or PSY 3339 and CGS 4188, 4188 and NSC 4188, 4188 and SPAU 4188</td>
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<td>CLDP 4308</td>
<td>Language Disorders in Children</td>
<td>Language impairment in children, including etiology, characteristics, evaluation and treatment procedures with special emphasis on factors that interfere with normal development of language skills.</td>
<td>CLDP/PSU CLDP 3303 or SPAU 3303 or instructor consent required.</td>
<td>3</td>
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<td>cldp4344</td>
<td>CLDP 4344 Child Psychopathology (3 semester hours)</td>
<td>3</td>
<td>(CLDP/PSY CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent. (Same as PSY 4344)</td>
<td>Present various views of clinical issues in childhood from sociological, anthropological, and psychological perspectives. Historical views of children are examined in terms of the evolution of current perspectives in childhood psychopathology. Prerequisite: CLDP/PSY (CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent. (Same as PSY 4344) (3-0) Y</td>
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<td>CLDP 4375 Honors Seminar (3 semester hours)</td>
<td>3</td>
<td>CLDP 4375 Honors Seminar (3 semester hours) A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a research question(s), and 3) a faculty sponsor and second reader. This course is required for students seeking BBS School Honors (see Honors Program Manual for more information). Permission of Director of the Honors Program required. Offered only in spring semester. (Same as PSY 4375, CGS 4375, 4375, and NSC 4375, 4375 and PSY 4375 and SPAU 4375) (3-0) Y</td>
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<td>cldp4394</td>
<td>CLDP 4394 Internship (3 semester hours)</td>
<td>3</td>
<td>CLDP 4394 Internship (3 semester hours) Students earn course credit for field experience in an applied setting. Requires working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to students in good academic standing with a GPA of at least 2.500 who have reached junior or senior standing (more than 53 hours). Apply for placements on the BBS website. Graded Credit/No Credit only. (Same as CGS 4394, 4394 and NSC 4394, 4394 and PSY 4394 and SPAU 4396) (3-0) S</td>
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<td>CLDP 4395 Co-op Fieldwork (3 semester hours)</td>
<td>3</td>
<td>CLDP 4395 Co-op Fieldwork (3 semester hours) Students earn course credit for field experience in an approved business or government setting. Requires working at least 8 hours per week. Students will keep a journal of their workplace experience, maintain contact with the instructor, and prepare a written report that focuses on the accomplishments and insights gained through their co-op experience. Open to students in good academic standing with a GPA of at least 2.500. Credit will not be awarded retroactively. Apply for placements through the Career Center. May be repeated for credit (6 hours maximum). Graded Credit/No Credit only. (Same as CGS 4395, 4395 and PSY 4395) (3-0) Y</td>
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<td>cldp4v90</td>
<td>CLDP 4V90 Special Topics in Child Learning and Development (1-6 semester hours)</td>
<td>1-6</td>
<td>CLDP 4V90 Special Topics in Child Learning and Development (1-6 semester hours) Topics vary from semester to semester. The class schedule for the current semester will list the special topic that will be offered. May be repeated for credit as topics vary (9 hours maximum). (Same as CGS 4V90, 4V90, PSY 4V90, and SPAU 4V90) (1-6)-0 R</td>
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<td>NSC 1100 First Year Seminar (1 semester hour)</td>
<td>1</td>
<td>NSC 1100 First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Credit/No Credit. Corequisite: UNIV 1010. (Same as CLDP 4490, PSY 4490, 1100 and CGS 4490, 1100 and PSY 1100 and SPAU 1100) Credit/No Credit. Co-requisite: UNIV 1010. (1-0) Y</td>
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<td>NSC 4188</td>
<td>Dean's Scholars' Seminar (1 semester hour)</td>
<td>A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester. (Same as CLDP 4188, 4188 and CGS 4188, 4188 and PSY 4188, 4188 and SPAU 4188)</td>
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<td>NSC 4375</td>
<td>Honors Seminar (3 semester hours)</td>
<td>A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a research question(s), and 3) a faculty sponsor and second reader. This course is required for students seeking BBS School Honors (see Honors Program Manual for more information). Permission of Director of the Honors Program required. Offered only in spring semester. (Same as CLDP 4375, 4375 and CGS 4375, 4375 and PSY 4375, 4375 and SPAU 4375)</td>
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<tr>
<td>NSC 4378</td>
<td>Neurotoxicology (3 semester hours)</td>
<td>An overview of modern toxicology as it affects the nervous system. Adverse effects of xenobiotics and neurotoxins, hypo or hyperactivation of neuromodulatory and hormonal systems. Prerequisite: NSC 4352 or NSC 4363.</td>
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<td>NSC 4385</td>
<td>Neuropsychology (3 semester hours)</td>
<td>This course is a comprehensive introduction of the relationship between brain and behavior. Topics include the foundations of neuropsychology, the brain's organization and functional systems, and neuropsychological perspectives of memory, attention, language, emotion, and spatial functions, and their related disorders. Prerequisite: NSC 3361 (Same as CGS 4385/PSY 4385 and PSY 4385)</td>
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<td>NSC 4386</td>
<td>Adult Development and Aging (3 semester hours)</td>
<td>This course is designed to provide an overview of theories, methods, and research on the psychological, social, and biological aspects of adult development and aging. A selection of topics to be covered includes lifespan developmental theories, research methodology, cognitive aging, compensation and successful aging, personality development, health, coping, social-emotional development, and to understand the nature and multiple influences of development throughout the adult lifespan. Prerequisite: PSY 2301 (Same as CGS 4386 and PSY 4386/SPAU 4386/CGS 4386 4386 and SPAU 4386.)</td>
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<td>NSC 4394</td>
<td>Internship in Neuroscience (3 semester hours)</td>
<td>Students earn course credit for field experience in an applied setting. Requires working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to all students who have reached junior or senior standing (more than 53 hours). Apply for placements in the Dean's office. Must be taken on a credit/no credit basis. (Same as CGS 4394, 4394 and CLDP 4394, 4394 and PSY 4394 and SPAU 4396)</td>
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Undergraduate Catalog 2013 - Course Change Requests

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<td>2012-2013</td>
<td>nsc4v90</td>
<td>NSC 4V90 Special Topics in Neuroscience</td>
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<td>May be repeated for credit as topics vary (9 hours maximum)</td>
<td>[Same as CGS 4V90, CLDP 4V90, PSY 4V90, and SPAU 4V90] ([1-6]-0)</td>
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<tr>
<td>2012-2013</td>
<td>psy1100</td>
<td>PSY 1100 First Year Seminar</td>
<td>1 semester hour</td>
<td>This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors.</td>
<td>Credit/No Credit. Corequisite: UNIV 1010.</td>
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<td>2012-2013</td>
<td>psy2317</td>
<td>PSY 2317 (PSYC 2317) Statistics for Psychology</td>
<td>3 semester hours</td>
<td>Introduces concepts and calculations of descriptive statistics, including mean, sum of squares, variance, standard deviation, correlation and regression. It also includes the logic of statistical decision making, the use of binomial and Gaussian distributions, and fundamental considerations in the design of psychological experiments.</td>
<td>Prerequisite: MATH 1306, 1306 or MATH 1314 or equivalent.</td>
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<td>2012-2013</td>
<td>psy3310</td>
<td>PSY 3310 Child Development</td>
<td>3 semester hours</td>
<td>Introduction to psychological theory and research on physical, cognitive, social, and emotional development from birth to adolescence. Students can take either CLDP/PSY (CLDP 3310 or CLDP/PSY 4334, PSY 3310) or (CLDP 4334 or PSY 4334).</td>
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<tr>
<td>2012-2013</td>
<td>psy3332</td>
<td>PSY 3332 Social and Personality Development</td>
<td>3 semester hours</td>
<td>The study of the forces affecting the socialization of children. Emphasis will be placed on children's interactions with others and how this influences their development in such areas as self-concept, identity, and morality.</td>
<td>Prerequisite: CLDP/PSY (CLDP 3310 or CLDP/PSY 3310) or (CLDP 3339 or CLDP/PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
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<tr>
<td>2012-2013</td>
<td>psy3336</td>
<td>PSY 3336 Infancy</td>
<td>3 semester hours</td>
<td>Review of relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive, and social domains from birth through two years of age.</td>
<td>Prerequisite: CLDP/PSY (CLDP 3310 or CLDP/PSY 3310) or (CLDP 3339 or CLDP/PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
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<td>2012-2013</td>
<td>psy3342</td>
<td>PSY 3342 Exceptional Children</td>
<td>3 semester hours</td>
<td>Examines the characteristics of exceptional children and their education, including children with disabilities (learning, emotional/behavioral, communication and physical) as well as those who are gifted. The causes and assessment of exceptionality are examined, along with educational and social policy considerations.</td>
<td>Prerequisite: CLDP/PSY (CLDP 3310 or CLDP/PSY 3310) or (CLDP 3339 or CLDP/PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
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<td>2012-2013</td>
<td>psy3362</td>
<td>PSY 3362 Cognitive Development</td>
<td>3 semester hours</td>
<td>A contrast of Piagetian, behaviorist, and information-processing approaches to the development of cognitive processes throughout childhood.</td>
<td>Prerequisite: CLDP/PSY (CLDP 3310, CLDP/PSY 3339, CLDP/PSY (CLDP 3310 or PSY 3310) or (CLDP 3339 or PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent.</td>
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<td>Year</td>
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<td>2012-2013</td>
<td>psy3366 011128 psy3366.5</td>
<td>PSY 3366 Motivation and Achievement (3 semester hours)</td>
<td>Examines theories and research on achievement and achievement motivation. Topics include methods of assessing school achievement, theories of achievement motivation, socio-cultural and situational influences. Also explores classroom applications. Prerequisite: CLDP/PSY CLDP 3339 or PSY 3339. (Same as CLDP 3366) (3-0) Y</td>
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<td>2012-2013</td>
<td>psy3490 011137 psy3490.8</td>
<td>PSY 3490 Accelerated Quantitative Methods (4 semester hours)</td>
<td>An honors-level survey of statistical methods in psychology. Presents measurement techniques, basic research designs, and statistical analyses developed in terms of the general linear model. Draws upon examples primarily from cognitive and social psychology to illustrate methods in behavioral research. Prerequisite: Grade (Grade of B+ or better in MATH 1306, 1306 or MATH 1314 or higher, higher) or instructor consent required. (4-0) R</td>
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<td>2012-2013</td>
<td>psy4188 013952 psy4188.2</td>
<td>PSY 4188 Dean's Scholars' Seminar (1 semester hour)</td>
<td>A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester. (Same as CLDP 4488, 4188 and CGS 4488, 4188 and NSC 4488, 4188 and SPAU 4188) (1-0) Y</td>
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<td>2012-2013</td>
<td>psy4344 011172 psy4344.7</td>
<td>PSY 4344 Child Psychopathology (3 semester hours)</td>
<td>Present various views of clinical issues in childhood from sociological, anthropological, and psychological perspectives. Historical views of children are examined in terms of the evolution of current perspectives on childhood psychopathology. Prerequisite: CLDP/PSY (CLDP 3310 or CLDP/PSY PSY 3310) or (CLDP 3339 or CLDP/PSY PSY 3339) or (CLDP 4334 or PSY 4334) or equivalent. (Same as CLDP 4444) (3-0) Y</td>
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<td>2012-2013</td>
<td>psy4359 011185 psy4359.4</td>
<td>PSY 4359 Cognitive Neuroscience (3 semester hours)</td>
<td>Examines how modern cognitive neuroscientists explore the neural underpinnings of perception, memory, attention, language and emotion. Investigates how the brain-bases of these functions are uncovered by ingenious observations of clinical populations (including brain-damaged and schizophrenic patients), animal and human electrophysiological techniques, and powerful new functional neuroimaging tools. Prerequisite: PSY 2301. (Same as NSC CGS 4359 and CGS NSC 4359) (3-0) Y</td>
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<td>2012-2013</td>
<td>psy4364 011190 psy4364.6</td>
<td>PSY 4364 Attention and Memory (3 semester hours)</td>
<td>Factors influencing the capacity to pick up, organize, and remember complex information. Prerequisite: CGS/PSY CGS 3361 or PSY 3361 or instructor consent required. (Same as CGS 4364) (3-0) R</td>
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<td>2012-2013</td>
<td>psy4375 011201 psy4375.8</td>
<td>PSY 4375 Honors Seminar (3 semester hours) A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a research question(s), and 3) a faculty sponsor and second reader. This course is required for students seeking BBS School Honors (see Honors Program Manual for more information). Permission of Director of the Honors Program required. Offered only in spring semester. (Same as CLDP 4375, 4375 and CGS 4375, 4375 and NSC 4375, 4375 and SPAU 4375) (3-0) Y</td>
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<td>2012-2013</td>
<td>psy4378 013150 psy4378.4</td>
<td>PSY 4378 Advanced Conflict Resolution: Family Mediation (3 semester hours) Advanced course covers the mediation of complex disputes using the joint session as well as caucus methods. Collaborative and transformative modes of mediation are introduced. Course topics include family law, family dynamics, child development, family violence, practice considerations and skill sets required for successful family mediation. Role plays involving topics such as child custody, support, spousal maintenance and property division, are conducted. Successful completion of course qualifies students as family mediators under Texas law. <strong>Prerequisite or co-requisite:</strong> PSY 4377. (3-0) Y</td>
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<td>2012-2013</td>
<td>psy4385 013966 psy4385.2</td>
<td>PSY 4385 Neuropsychology (3 semester hours) This course is a comprehensive introduction of the relationship between brain and behavior. Topics include the foundations of neuropsychology, the brain's organization and functional systems, and neuropsychological perspectives of memory, attention, language, emotion, and spatial functions, and their related disorders. Prerequisite: NSC 3361 (Same as CGS 4385/NSC 4385 and NSC 4385) (3-0) T</td>
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<tr>
<td>2012-2013</td>
<td>psy4386 013968 psy4386.2</td>
<td>PSY 4386 Adult Development and Aging (3 semester hours) This course is designed to provide an overview of theories, methods, and research on the psychological, social, and biological aspects of adult development and aging. A selection of topics to be covered includes lifespan developmental theories, research methodology, cognitive aging, compensation and successful aging, personality development, health, coping, social-emotional development, and to understand the nature and multiple influences of development throughout the adult lifespan. Prerequisite: PSY 2301 (Same as CGS 4386 and NSC 4386/SPAU 4386/CGS 4386 and SPAU 4386) (3-0) T</td>
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<td>2012-2013</td>
<td>psy4394 011208 psy4394.8</td>
<td>PSY 4394 Internship in Psychology (3 semester hours) Students earn course credit for field experience in an applied setting. Requires working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to students in good academic standing with a GPA of at least 2.500 who have reached junior or senior standing (more than 53 hours). Apply for placements on the BBS website. Graded Credit/No Credit only. (Same as CGS 4394, 4394 and CLDP 4394, 4394 and NSC 4394 and SPAU 4396) (3-0) S</td>
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Undergraduate Catalog 2013 - Course Change Requests

Page 33 Submitted to CEP 11-29-12
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<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
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<tr>
<td>PSY 4395</td>
<td>3</td>
<td>Co-op Fieldwork (3 semester hours) Students earn course credit for field experience in an approved business or government setting. Requires working at least 8 hours per week. Students will keep a journal of their workplace experience, maintain contact with the instructor, and prepare a written report that focuses on the accomplishments and insights gained through their co-op experience. Open to students in good academic standing with a GPA of at least 2.500. Credit will not be awarded retroactively. Apply for placements through the Career Center office. May be repeated for credit (6 hours maximum). Graded Credit/No Credit only. (Same as CLDP/CGS CLDP 4395 and CGS 4395)</td>
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<tr>
<td>PSY 4V90</td>
<td>1-6</td>
<td>Special Topics in Psychology (1-6 semester hours) May be repeated for credit as topics vary (9 hours maximum).</td>
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<tr>
<td>SPAU 1100</td>
<td>1</td>
<td>First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Credit/No Credit. Corequisite: UNIV 1010.</td>
</tr>
<tr>
<td>SPAU 3340</td>
<td>3</td>
<td>Articulation Disorders (3 semester hours) Etiology, symptomatology, evaluation, and treatment of articulation disorders. Pre-Prerequisite or co-requisite: SPAU 3343.</td>
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<tr>
<td>SPAU 3341</td>
<td>3</td>
<td>Audiology (3 semester hours) Clinical application and interpretation in audiology. Emphasis on instrumentation and calibration considerations for air and bone conduction test, speech audiometry, cerumen management, infection control, and basic masking principles. Pre-Prerequisites or corequisites: SPAU 3304 and 3344, SPAU 3344 or instructor consent required.</td>
</tr>
<tr>
<td>SPAU 4188</td>
<td>1</td>
<td>Dean's Scholars' Seminar (1 semester hour) A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester. (Same as CLDP 4188 and CGS 4188, 4188 and NSC 4188, 4188 and PSY 4188)</td>
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<td>SPAU 4308</td>
<td>3</td>
<td>Language Disorders in Children (3 semester hours) Language impairment in children, including etiology, characteristics, evaluation, and treatment procedures, with special emphasis on factors that interfere with normal development of language skills. Prerequisite: CLDP/SPAU CLDP 3303 or SPAU 3303 or instructor consent required. (Same as CLDP 4308)</td>
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<td>Course Code</td>
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<td>SPAU 4325 3342</td>
<td>Exceptional Children (3 semester hours)</td>
<td>Examines the characteristics of exceptional children and their education, including children with disabilities (learning, emotional/behavioral, communication and physical) as well as those who are gifted. The causes and assessment of exceptionality are examined, along with educational and social policy considerations.</td>
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<tr>
<td>SPAU 4342</td>
<td>Assessment Procedures in Speech-Language Pathology (3 semester hours)</td>
<td>Principles and procedures in the diagnosis of communication disorders in preschool- and school-aged children and adults. Included will be a blend of philosophical issues with practical clinical methodology. Emphasis will be on application of diagnostic information to rehabilitation planning and techniques. Professional report writing skills included.</td>
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<tr>
<td>SPAU 4366</td>
<td>Clinical Report Writing (3 semester hours)</td>
<td>Organization of the therapeutic process and the accompanying recordkeeping. Students will be taught the foundations of professional and technical writing that accompany each step of the therapeutic process as well as the basic rules for grammar and punctuation necessary for acceptable writing. Included in the course will be the writing requirements necessary for their practicum experiences. To accomplish this goal, students will be required to write and will receive feedback throughout the semester.</td>
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<tr>
<td>SPAU 4375</td>
<td>Honors Seminar (3 semester hours)</td>
<td>A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a research question(s), and 3) a faculty sponsor and second reader. This course is required for students seeking BBS School Honors (see Honors Program Manual for more information). Permission of Director of the Honors Program required. Offered only in spring semester.</td>
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<tr>
<td>SPAU 4386</td>
<td>Adult Development and Aging (3 semester hours)</td>
<td>This course is designed to provide an overview of theories, methods, and research on the psychological, social, and biological aspects of adult development and aging. A selection of topics to be covered includes lifespan developmental theories, research methodology, cognitive aging, compensation and successful aging, personality development, health, coping, social-emotional development, and to understand the nature and multiple influences of development throughout the adult lifespan.</td>
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<tr>
<td>SPAU 4394</td>
<td>Multicultural Aspects of Communication Disorders (3 semester hours)</td>
<td>Service delivery issues in culturally and linguistically diverse populations with the goal of developing sensitivity to the special needs of multiculturalism in schools and in the clinical practice of Speech-Language Pathology. Therapeutic management of foreign dialect, language differences, and the effects of cultural diversity upon learning. Needs of multicultural populations within the public schools learning will also be addressed.</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<th>Year</th>
<th>Code</th>
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<tr>
<td>2012-2013</td>
<td>spau439</td>
<td>SPAU 4396 Internship (3 semester hours) Students earn course credit for</td>
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<td>Open to students in</td>
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<td>field experience in an applied setting. Requires working at least 8 hours</td>
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<td>per week at an approved community agency or business of the student's</td>
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<td>with a GPA of at least</td>
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<td>choice. Students keep daily job diaries, attend one class meeting per</td>
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<td>month, and write brief papers relative to their experiences. Open to</td>
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<td>students in good academic standing with a GPA of at least 2.500 who have</td>
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<td>reached junior or senior standing (more than 53 hours). Apply for</td>
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<td>2008-2013</td>
<td>crim3309 003350 crim3309 .2</td>
<td>CRIM 3309 Media and Crime (3 semester hours) Examines the media’s image of crime and the criminal justice system. An emphasis is placed on how various types of media construct or perceive criminal activities, how the media influences public policy and shapes perceptions of crime as a social problem. Topics include crime news, films and television dramas depicting crime and criminals, the media as a cause, consequence and cure for crime and news-making criminology. (3-0) R</td>
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<td>2008-2013</td>
<td>crim3312 003352 crim3312 .2</td>
<td>CRIM 3312 Drugs and Crime (3 semester hours) Provides students with a survey of legislation that has been attempted to combat the use of drugs, the relationship between drug use/abuse and crime, and the public policy problem surrounding the control of drugs. Topics include a historical analysis of the laws passed to control drugs, the relationship between drugs and crime, and a policy analysis of the alternative means available to deal with the drugs/crime problem. (3-0) R</td>
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<td>2008-2013</td>
<td>crim3319 003356 crim3319 .2</td>
<td>CRIM 3319 Comparative Justice Systems (3 semester hours) Survey of the differing policies, practices, and procedures of crime and justice across nationally, cross-nationally. Special emphasis will be devoted to U.S. / Mexico comparisons, while additional emphasis will be placed on such comparisons as U.S. / Canada and U.S. / England. (3-0) R</td>
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<td>2012-2013</td>
<td>crim3323 012916 crim3323 .3</td>
<td>CRIM 3323 Violence and Gun Control (3 semester hours) The primary purpose of this course is the examination of facts surrounding one of the most heated issues of our times: the relationship between guns, violence and gun control. The course provides a comprehensive criminological view of the topic rather than a political or legal one. Students will learn about evaluating evidence, the &quot;stricter gun law&quot; debate, and flaws in arguments on both sides of the issue as well as tricks used by advocates to persuade people to agree with their point of view. (3-0) R</td>
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<td>2011-2013</td>
<td>crim3324 003359 crim3324 .4</td>
<td>CRIM 3324 Gender, Crime, and Justice (3 semester hours) Analysis of the role of gender in crime and in the justice system. The emphasis is on gender differences in the commission of crime and the types of crimes committed, criminal justice processing, and the employment of women in the criminal justice professions. (3-0) T</td>
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<td>2008-2013</td>
<td>crim3325 003360 crim3325 .3</td>
<td>CRIM 3325 Victimology (3 semester hours) Analyzes the major perspectives on victimization. The emphasis is on patterns of victimization, the role of victims in the generation of crime, and the experience of victims in the criminal justice system. Special attention will be devoted to: sources of data – particularly the National Crime Victimization Survey, trends, variations by demography and offense type and ways in which those variations may affect how criminal justice officials respond to particular types of offenses. (3-0) R</td>
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<td>2012-2013</td>
<td>crim4311</td>
<td>CRIM 4311 Crime and Justice Policy</td>
<td>CRIM 3302 or CRIM 3303</td>
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<td>econ3315</td>
<td>ECON 3315 Economics of Sports Economics</td>
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<td>econ3337</td>
<td>ECON 3337 Economics of Poverty and Inequality</td>
<td>ECON 2302</td>
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<td>econ4348</td>
<td>ECON 4348 Business and Technology</td>
<td>ECON 2302 or instructor consent required</td>
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<td>2013-2013</td>
<td>ipec4396</td>
<td>IPEC 4396 Topics in International Political Economy</td>
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<td>2011-2013</td>
<td>isss4v86</td>
<td>ISSS 4V86 Special Interdisciplinary Topics in the Social Sciences</td>
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<td>isss4v96</td>
<td>ISSS 4V96 CV Honors Project</td>
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<td>2013-2013</td>
<td>isss4v97</td>
<td>ISSS 4V97 Independent Study in Interdisciplinary Studies</td>
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<tr>
<td>PA 3378</td>
<td>Public Finance and Economics (3 semester hours)</td>
<td>This course focuses on the application of economic theories to understand the role of government. Students will learn how to use the tools of microeconomics to interpret the impacts of government policies. Topics include the role of tax, public expenditure policies, public goods, externalities, social security, and regulation. (3-0) Y</td>
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<tr>
<td>PA 3379</td>
<td>Diversity in the Public Sector (3 semester hours)</td>
<td>This course will focus on diversity beyond just race/ethnicity and gender, and examine dimensions of sexual orientation, religion, skill level, physical ability, communication styles, and multi-generations in the workplace. Understanding diversity and learning how to manage its complexity is the key focus of this class. Students will examine the importance of multiple cultures in public organizations in work teams and discuss the challenges that come with multiculturalism. Social interactions that contribute to the understanding of difference groups in diverse settings are examined. (3-0) Y</td>
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<tr>
<td>PA 3380</td>
<td>Organizations and Management in the Public Sector (3 semester hours)</td>
<td>This course covers the major topics, issues, and contributions in the literature on organizations and management, with emphasis on applications to government and nonprofit organizations. Class readings draw from leading scholars in a variety of disciplinary traditions in order to shed light on the historical development of the literature. Additionally, the course material will review some of the contemporary approaches to the study of organizations. (3-0) Y</td>
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<tr>
<td>PA 4355</td>
<td>Nonprofit Organizations (3 semester hours)</td>
<td>This course will address the basic concepts of the often-overlooked trillion dollar nonprofit sector (also known as the Third Sector) that includes education, research, health care, art, religion, social services, advocacy, legal services, international assistance, foundations and mutual benefit organizations. This comprehensive course will provide a thorough introduction and understanding to the sector, such as the history of nonprofit organizations in America, qualifications for charitable groups, and international comparisons. It will also address voluntary sector dynamics such as board and volunteer administration and management. Topics may vary. (3-0) Y</td>
<td>3-0</td>
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<tr>
<td>PA 4370</td>
<td>Leadership (3 semester hours)</td>
<td>Explores the gamut of leadership theories and modern views of requisites for success in positions of leadership. Students will take from this course knowledge of leadership theories and practical knowledge for applying leadership principles in any organizational setting. (3-0) Y</td>
<td>3-0</td>
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</tr>
<tr>
<td>PA 4386</td>
<td>Social Policy in Modern Societies (3 semester hours)</td>
<td>Examines the controversies and research concerning the development of welfare states and public social provision. Particular emphasis is placed on the US public social spending system, in historical and comparative perspective. Explanations of developments in social policies and an assessment of their applicability to the American welfare state and those of other societies are considered. (Same as SOC 4386) (3-0) R</td>
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<td>R</td>
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<tr>
<td>PA 4V97</td>
<td>Independent Study in Public Administration (1-9 semester hours)</td>
<td>Independent study under a faculty member's direction. May be repeated for credit. Credit (9 hours maximum). Instructor consent required. ([1-9]-0) S</td>
<td>1-9</td>
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### Undergraduate Catalog 2013 - Course Change Requests

<table>
<thead>
<tr>
<th>Code</th>
<th>Detail</th>
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</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>PA 4V8 Internship (1-6 semester hours) May <strong>repeat</strong> be repeated for credit (6 hours maximum). Instructor consent required. This course can only be taken credit/no credit. Credit/No Credit. ([1-6]-0) S</td>
<td></td>
<td>vtt017000 2012-11-1 3 15:11:46</td>
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<tr>
<td>2012-2013</td>
<td>PSCI 3362 The American Political Institutions (3 semester hours) This course examines the constitutional foundations and historical development of the congress, Congress, the presidency, the executive, and the courts. Attention will be paid to both the interactions of these institutions, research methodologies employed in examining these institutions, and the internal workings of each. Prerequisites: GOVT 2301 and GOVT 2302 or instructor consent required. (3-0) Y</td>
<td></td>
<td>vtt017000 2012-11-1 3 15:15:01</td>
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<tr>
<td>2011-2013</td>
<td>PSCI 4349 The Politics of the Bureaucratic Process (3 semester hours) This course analyzes the role of administrative agencies in democratic policy making. Discusses the internal, procedural determinants of policy decision making as well as the interactions between administrative agencies and other branches of government. Topics may include the development of the contemporary administrative state, administrative rule making, and control of administrative processes by Congress, the president, and the judiciary. judiciary. (3-0) R</td>
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<td>vtt017000 2012-11-1 3 15:15:27</td>
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<tr>
<td>2012-2013</td>
<td>PSCI 4V8 Internship (1-6 semester hours) May be repeated for credit (6 hours maximum). Instructor consent required. This course can only be taken credit/no credit. Credit/No Credit. ([1-6]-0) S</td>
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<tr>
<td>2012-2013</td>
<td>PSCI 4V76 Archer Center Washington Internship (3-6 semester hours) This course is part of the Archer Program and is restricted to Archer Fellows. May be repeated for credit. credit (6 hours maximum). Prerequisite: Permission of Director of Archer Program required. ([3-6]-0) R</td>
<td></td>
<td>vtt017000 2012-11-1 6 11:46:07</td>
</tr>
<tr>
<td>2012-2013</td>
<td>SOC 3337 Media &amp; and Politics (3 semester hours) This course examines how American media, in a variety of forms, direct political debate, influence decision-making and agenda-setting, and facilitate the flow of political news and information in the United States. (3-0) R</td>
<td></td>
<td>vtt017000 2012-11-1 3 15:20:54</td>
</tr>
<tr>
<td>2012-2013</td>
<td>SOC 3339 Media &amp; and Society (3 semester hours) This course examines the role of the mass media in contemporary society. The course will take an integrated approach to studying mass media of various types and explore different dimensions of the media process as well as different types of media. (3-0) R</td>
<td></td>
<td>vtt017000 2012-11-1 3 15:21:13</td>
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<tr>
<td>2010-2013</td>
<td>SOC 3341 Internet &amp; and Society (3 semester hours) This course examines the ways that the Internet technologies are affecting our everyday life, culture, institutions, groups, and identity, dealing with issues about the representation, identity, production, consumption and regulation of the Internet. (3-0) R</td>
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<td>vtt017000 2012-11-1 3 15:21:33</td>
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<tr>
<td>2012-2013</td>
<td>SOC 3346 Sociology of Sport (3 semester hours) Analyzes sport and its place in the culture of contemporary societies. Focus Focuses on how sport and sport experiences are related to social development, social relations and major spheres of social life such as the economy, education and religion. (3-0) R</td>
<td></td>
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<tr>
<td>2012-2013</td>
<td>soc4337 013197 soc4337.3</td>
<td>SOC 4337 Immigrants and Immigration in U.S. Society (3 semester hours)</td>
<td>The course examines the assimilation into U.S. society and its main public social institutions of immigrants arriving after 1965 with a focus on the two largest groups: Mexicans and Asians, including as well as immigrants from the Middle East. The course considers the effects of the economy and immigration law and policy on assimilation. Other topics include the impact of these 'newest' immigrants on the racial and ethnic as well as cultural diversification of the U.S. population, the second generation, and the future of immigrants and immigration in U.S. society. (3-0) R</td>
</tr>
<tr>
<td>2011-2013</td>
<td>soc4371 011599 soc4371.6</td>
<td>SOC 4371 Mental Health and Illness (3 semester hours)</td>
<td>Explores the diverse, disturbing, disruptive, and disabling phenomena of mental disorders. Topics to be covered include the classification of mental disorders, the etiology and epidemiology of mental illnesses, and the history of societal responses to mentally ill, including public policies. (3-0) R</td>
</tr>
<tr>
<td>2013-2013</td>
<td>soc4386</td>
<td>SOC 4386 Social Policy in Modern Societies (3 semester hours)</td>
<td>Examines the controversies and research concerning the development of welfare states and public social provision. Particular emphasis is placed on the U.S. public social spending system, in historical and comparative perspective. Explanations of developments in social policies and an assessment of their applicability to the American welfare state and those of other societies are considered. (Same as PA 4386) (3-0) R</td>
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<tr>
<td>2008-2013</td>
<td>socs3v96 011705 socs3v96.7</td>
<td>SOCS 3V96 Selected Topics in the Social Sciences (1-3 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit (9 hours maximum). ([1-3]-0) R</td>
</tr>
<tr>
<td>2012-2013</td>
<td>crim4305 003366 crim4305.6</td>
<td>CRIM 4305 Social Control and Criminal Sanctions (3 semester hours)</td>
<td>Examines various means by which society attempts to control the deviant and criminal conduct of its members. Social control encompasses both formal criminal sanctions and informal mechanisms and a variety of institutions and social processes that are designed to deter inappropriate conduct if possible and/or punish and reform such conduct when it does occur. Moreover, social control has evolved considerably over time and various social control philosophies and techniques have been prevalent in one time frame but not in others. Prerequisite: CRIM 3302 or CRIM 3303. (3-0) R</td>
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<tr>
<td>Year</td>
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<td>Course Details</td>
<td>Status</td>
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<tr>
<td>2012-13</td>
<td>isss4301</td>
<td><strong>ISSS 4301 Political Economy of Latin America (3 semester hours)</strong> This course focuses upon the political economy of the Republic of Panama. Panama is a very diverse country, from the modern, cosmopolitan City of Panama, with its 50-story skyscrapers, to sparsely populated vast regions in the Province of Darien. The importance of Panama to international political economy is of high magnitude to the &quot;funnel for world commerce,&quot; the Panama Canal. Panama has existed as an independent country since 1903 when the U.S. aided political interests in Panama that wanted independence from Colombia, which would not grant concessions desired by the U.S. if it constructed the Canal. Run by the Panamanian government following the Torrijos-Carter treaties of 1977 that specified that by December 31, 1999, the Canal and lands comprising the Panama Canal Zone, home to U.S. military bases and civilian employees of the U.S. Panama Canal Company, would revert to Panamanian control. (3-0). R</td>
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<tr>
<td>2011-13</td>
<td>pa3335</td>
<td><strong>PA 3335 Organizational Behavior (3 semester hours)</strong> Power, conflict, consensus, and other dynamic behaviors within and between public organizations, and between organizations and their constituents. (2-0). Y</td>
<td>remove review pending</td>
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<tr>
<td>2011-13</td>
<td>pa4312</td>
<td><strong>PA 4312 Organizations (3 semester hours)</strong> Study of the structures and dynamics of organizations. Examines problems of motivation, leadership, morale, networks, communications, hierarchy, control, and technology. (3-0). Y</td>
<td>remove review pending</td>
</tr>
</tbody>
</table>
### BMEN 1208 Introduction to Biomedical Engineering (2 semester hours)

Project-based instruction. The purpose of this course is to give students a general understanding of the broad range of applications specific to the biomedical engineering profession. Course exercises include team-oriented competitions, lectures by various external biomedical engineering experts, and introductory materials associated with the discipline. Perform a competitive team design project. Prerequisite: ECS 1200. Corequisites: PHYS 2325/2125 2325 and MATH PHYS 2125 and (MATH 2419 or MATH 2414). (1-1) Y

### BMEN 2310 Static Equilibrium and Rigid Body Dynamics (3 semester hours)

Lecture course. Course material includes static equilibrium of particles, trusses and machines. Friction equivalent systems, particle dynamics in one, two and three dimensions, work, energy, angular momentum and moment of inertia, and dynamics of rigid bodies. Prerequisites or corequisites: ENGR 2300, 2300 and MATH 2420, and (PHYS 2326 and PHYS 2326/2126. (3-0) Y

### BMEN 2V99 Topics in Biomedical Engineering (1-4 semester hours)

May be repeated as topics vary (9 hours maximum). (1-4)-0) R

### BMEN 3130 Engineering Physiology Laboratory (1 semester hour)

Laboratory course. Corequisite: BMEN 3330; Prerequisite: RHET 1302. (0-1) Y

### BMEN 3301 Introduction to Biomechanics (3 semester hours)

Mechanical properties of biological materials. The molecular basis for macroscopically measured quantities. Molecular mechanics (e.g. protein folding). Cellular mechanics of passive and active processes (e.g. cytoskeletal mechanics, cell migration). Simulation and numerical solution of dynamical equations arising in biomechanics. Corequisite: BMEN 3101. Prerequisites: BMEN 1208 and 2310; Prerequisite or corequisite: BMEN 2340, 1208. (3-0) Y

### BMEN 3315 Thermodynamics and Physical Chemistry in Biomedical Engineering (3 semester hours)

An introduction to the fundamentals of thermodynamics and physical chemistry. Molecules and chemical bonds, chemical kinetics and reaction equilibria. Topics also include molecular transitions, nonequilibrium processes, self assembly, and interface thermodynamics. Prerequisites: BMEN 1208 and (CHEM 1312 and CHEM 1312/CHEM 1112, MATH 2420 1112) and BMEN 1208. MATH 2420. (3-0) Y
<p>| Code     | Title                                                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Credit Hours | Prerequisites                                      | Corequisites | Notes          | Author          | Date          | Time          |
|----------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------------|--------------|----------------|----------------|----------------|----------------|---------------|
| BMEN 3320 | BMEN 3320 Electrical and Electronic Circuits in Biomedical Engineering | (3 semester hours) Introduction to analysis methods and network theorems used to describe operation of electric circuits. Electrical quantities, linear circuit elements, circuit principles, signal waveforms, transient and steady state circuit behavior, diode and transistor circuits, operational amplifiers, digital logic devices. Time domain and Laplace transform methods for analysis of electric circuits. Modeling, analysis and simulation of circuits. Corequisite: BMEN 3120. Prerequisites: PHYS 2326/2126 and MATH 2420, 2420 and (PHYS 2326 and PHYS 2126). (3-0) Y | 3-0          | BMEN 3120, PHYS 2326/2126 and MATH 2420, 2420 | BMEN 3320, 3120 | mxv06200 0     | 2012-11-2 8 10:26:47 |
| BMEN 3330 | BMEN 3330 Engineering Physiology of the Human Body                     | (3 semester hours) An introduction to the physiology of the human body for engineers. This course will cover the various levels of structural organization of the body, from molecular, cellular and tissue/organ organization to the whole body anatomy and maintenance. The role of biological principles and phenomena will be highlighted in engineering terms. Corequisite: BMEN 3130. Prerequisites: BMEN 3120, PHYS 2312 and BIOL 2112 and BIOL 2312/2312/2312, and BMEN 1208 and BMEN 3315. (3-0) Y | 3-0          | BMEN 3130, PHYS 2312 | BMEN 3330, 3130 | ntafos         | 2012-11-2 6 19:34:24 |
| BMEN 3350 | BMEN 3350 Biomedical Component and System Design                       | (3 semester hours) Fundamental knowledge behind design of biomedical systems. Design and implementation of biomedical signal processing. Modeling and simulation for biomedical systems. Circuit and system design method for implantable devices. Software and hardware infrastructure for biomedical applications. Computer-aided techniques for analyzing sampled data. Corequisite: BMEN 3310. Prerequisites: BMEN 3301, 3301 and BMEN 3310. (3-0) Y | 3-0          | BMEN 3301, 3301 | BMEN 3310      | mxv06200 0     | 2012-11-2 8 10:27:17 |
| BMEN 4310 | BMEN 4310 Feedback Systems in Biomedical Engineering                  | (3 semester hours) Notions of inputs, outputs, and states. Linearity versus nonlinearity. Deterministic versus stochastic systems. Top down versus bottom up modeling. Sensitivity and reduction of sensitivity via feedback. Introduction to stability. Feedback for stabilization and disturbance rejection. Numerical simulation and controller design via computational approaches. Corequisite: BMEN 4310. 4110; Prerequisites: ENGR 2200, 2300 and MATH 2420. (3-0) Y | 3-0          | ENGR 2300, 2300 | BMEN 4310      | mxv06200 0     | 2012-11-2 8 10:43:04 |
| BMEN 4320 | BMEN 4320 Intermediate Electrical Systems                              | (3 semester hours) Principles of circuit and system analysis methods used in the design and analysis of biomedical instrumentation. Circuit solution methods. Filter design methods. Special emphasis is placed on circuits commonly employed in biomedical devices, such as amplifiers and filtering networks used in electrocardiograph systems, construction and characterization of simple transducers and signal conditioning equipment for measuring biomedical parameters such as force, displacement, pressure, flow and biopotentials. Prerequisites: BMEN 3320/3420, 3320 and BMEN 3120. (3-0) Y | 3-0          | BMEN 3320/3420, 3320 | BMEN 3120      | ntafos         | 2012-11-2 6 19:38:42 |
| BMEN 4350 | BMEN 4350 Applied Sensor Technology                                    | (3 semester hours) Introduction to the basic principles and design issues of biomedical sensors and instrumentation, including: the physical principles of biomedical sensors, analysis of biomedical instrumentation systems, and the application-specific biomedical sensor and instrumentation design. Topics include: basic concepts of sensors and instrumentation, membrane biophysics, action potentials, biopotential electrodes. Prerequisites: (BMEN 3320 and BMEN 3320/3420 3120) and (BMEN 3330 and BMEN 3330/3130. 3130). (3-0) Y | 3-0          | BMEN 3320, BMEN 3320/3420, 3320 | BMEN 3330, 3310 | ntafos         | 2012-11-2 6 19:39:53 |</p>
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<tr>
<td>2012-2013</td>
<td>bmen438</td>
<td><strong>BMEN 4388 Senior Design Project I (3 semester hours)</strong> First of two sequential semesters devoted to a team project that engages students in the full engineering design process. The goal of senior design projects is to prepare the student to run/participate in engineering projects related to an appropriate industry. Thus, all project teams are to follow standard industrial practices and methods. Teams must carry the engineering project to completion, examining real world and multiple design constraints, following applicable industrial and business standards. Such constraints may include but are not limited to: economic, environmental, industrial standards, team time/resource management and cross-disciplinary/departmental result integration. Students are required to work in teams that include collaborative design interaction. Additionally, cross-disciplinary/departmental teams are encouraged but not required. In Senior Design I, project proposals will be written, reviewed and approved. Initial designs will be completed and corresponding constraints will be determined. All students will participate in a public oral and poster presentation following departmental approved guidelines at a departmental approved time and location. Teams will also submit a written end of semester progress report and documented team communication (complete sets of weekly reports and/or log books) following guidelines approved by the faculty. <strong>Students must have completed ECS 3390</strong>. Prerequisites: BMEN 3315 and the following prerequisite sequence: BMEN 3315, BMEN 3320, 3320 and BMEN 3330, 3330 and BMEN 3350, 3350 and ECS 3390. (3-0) Y</td>
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<td>2012-2013</td>
<td>ce1337</td>
<td><strong>CE 1337 (COSC 1337) Computer Science I (3 semester hours)</strong> Introduction to object-oriented software analysis, design, and development. Classes and objects. Object composition and polymorphism. Sorting, searching, recursion. Strings using core classes. Inheritance and interfaces. Graphical User Interfaces. Includes a comprehensive programming project. Prerequisite: CS 1336 with a grade of C or better or equivalent. (Same as CS/TE CS 1337 and TE 1337) (3-0) S</td>
<td>edit review pending</td>
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<td>2012-2013</td>
<td>ce2305</td>
<td><strong>CE 2305 (MATH 2305) Discrete Mathematics for Computing I (3 semester hours)</strong> Principles of counting. Logic and proof methods, including induction. Basic recurrence relations. Basics of algorithm complexity. Sets, relations, functions. Elementary graph theory. Elementary number theory. Students cannot get credit for both CE 2305 and CS/TE 3307. (CE 3307 or TE 3307). Prerequisite: MATH 1326 or MATH 2413 or MATH 2417. (Same as CS/TE CS 2305 and TE 2305) (3-0) S</td>
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<tr>
<td>2012-2013</td>
<td>ce2336</td>
<td><strong>CE 2336 (COSC 2336) Computer Science II (3 semester hours)</strong> Exceptions and number formatting. File input/output using Stream classes. Implementation of primitive data structures, including linked lists (all types), stacks, queues, and binary trees. Advanced data manipulation using core classes. Introduction to multi-threading, multimedia, and networking. Includes a comprehensive programming project. Prerequisite: CE/CS/TE CE 1337 or CS 1337 or TE 1337. Prerequisite or corequisite: CE/CS/TE CE 2305 or CS 2305 or TE 2305. (Same as CS/TE CS 2336 and TE 2336) (3-0) S</td>
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<td>2012-2013</td>
<td>ce3101</td>
<td><strong>CE 3101 Electrical Network Analysis Laboratory (1 semester hour)</strong> Laboratory to accompany CE 3301. Design, assembly and testing of linear electrical networks and systems. Use of computers to control electrical equipment and acquire data. Prerequisites: CE/EE/TE (CE 1202 or EE 1202 or TE 1202) and RHET 1302. Corequisite: CE 3301. (Same as EE/TE EE 3101 and TE 3101) (0-1) S</td>
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<tr>
<td>2011-2013</td>
<td>ce3102</td>
<td>Signals and Systems Laboratory (1 semester hour)</td>
<td>Laboratory based on MATLAB and LabVIEW to provide implementation experience on topics covered in CE 3302. Laboratory experiments cover linear time-invariant systems, convolution, Fourier series, continuous Fourier transform, sampling, discrete Fourier transform, analog and digital filtering. Each lab is followed by a design application. Corequisite: CE 3302. Prerequisite: RHET 1302. (Same as EE/EE CE 3102 and TE 3102)</td>
<td>0-1 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3110</td>
<td>Electronic Devices Laboratory (1 semester hour)</td>
<td>Laboratory to accompany CE 3310. Experimental determination and illustration of properties of carriers in semiconductors including carrier drift, carrier diffusion; p-n junctions including forward and reverse bias effects and transient effects; bipolar transistors including the Ebers-Moll model and secondary effects; field effect transistors including biasing effects, MOS capacitance and threshold voltage. Corequisite: CE/EE CE 3311 or EE 3311. Prerequisite: RHET 1302. (Same as EE 3110)</td>
<td>0-1 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3111</td>
<td>Electronic Circuits Laboratory (1 semester hour)</td>
<td>Design, assembly and testing of electronic circuits that use diodes, transistors and operational amplifiers in configurations typically encountered in practical applications. Corequisite: CE/EE CE 3311 or EE 3311. Prerequisite: RHET 1302. (Same as EE 3111)</td>
<td>0-1 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3120</td>
<td>Digital Circuits Laboratory (1 semester hour)</td>
<td>Design, assembly, and testing of logic circuits. Use of programmable logic devices and simple CAD tools. Corequisite: CE/EE CE 3310 or EE 3310. Prerequisite: RHET 1302. (Same as EE 3120)</td>
<td>0-1 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3301</td>
<td>Electrical Network Analysis (3 semester hours)</td>
<td>Analysis and design of RC, RL, and RLC electrical networks. Sinusoidal steady state analysis of passive networks using phasor representation; mesh and nodal analyses. Introduction to the concept of impulse response and frequency analysis using the Laplace transform. Prerequisites: MATH 2420 and PHYS 2326. Corequisite: CE 3101. (Same as EE/TE EE 3301 and TE 3301)</td>
<td>3-0 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3302</td>
<td>Signals and Systems (3 semester hours)</td>
<td>Introduces the fundamentals of continuous and discrete-time signal processing. Linear system analysis including convolution and impulse response, Fourier series, Fourier transform and applications, discrete-time signal analysis, sampling and z-transform. Prerequisite: ENGR 3300. Corequisite: CE 3102. (Same as EE/TE EE 3302 and TE 3302)</td>
<td>3-0 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3303</td>
<td>Electronic Devices (3 semester hours)</td>
<td>Theory and application of solid state electronic devices. Physical principles of carrier motion in semiconductors leading to operating principles and circuit models for diodes, bipolar transistors, and field effect transistors. Introduction to integrated circuits. Prerequisite: CE/EE/TE CE 3301 or EE 3301 or TE 3301. Corequisite: CE/EE CE 3110 or EE 3110. (Same as EE 3310)</td>
<td>3-0 S</td>
</tr>
<tr>
<td>2012-2013</td>
<td>ce3311</td>
<td>Electronic Circuits (3 semester hours)</td>
<td>Large-signal and small-signal characteristics of diodes, BJT and MOSFET transistors. Analysis of circuits containing diodes. Analysis of the DC and small-signal characteristics of single-stage BJT and MOSFET amplifiers. Analysis of circuits with an operational amplifier as a black box. Introduction of high-frequency models of BJT and MOSFET transistors and methods to analyze amplifier frequency response. Prerequisite: CE/EE CE 3310 or EE 3310. Corequisite: CE/EE CE 3111 or EE 3111. (Same as EE 3311)</td>
<td>3-0 S</td>
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<tr>
<td>Year</td>
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<tr>
<td>2011-2013</td>
<td>ce3320</td>
<td>CE 3320 Digital Circuits (3 semester hours)</td>
<td>Design and analysis of combinational logic circuits using SSI basic logic gates and other building blocks like multiplexers and ROMs. Design and analysis of latches and MSI flip-flops. Design and analysis of synchronous state machines. State minimization and introduction to state assignment. Design of arithmetic circuits: datapath components: adders, multipliers and shifters, multipliers, registers, shifters, and counters. Electrical properties of logic gates. Students cannot receive credit for both CS 4341 and CE/EE CE 3320 or EE 3320. Prerequisite: CE/EE CE 2310 or EE 3320. Corequisite: CE/EE CE 3120. (Same as EE 3320) (3-0) S</td>
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<tr>
<td>2012-2013</td>
<td>ce3345</td>
<td>CE 3345 Data Structures and Introduction to Algorithmic Analysis (3 semester hours) Analysis of algorithms including time complexity and Big-O notation. Analysis of stacks, queues, and trees, including B-trees. Heaps, hashing, and advanced sorting techniques. Disjoint sets and graphs. Course emphasizes design and implementation. Students that completed CE/TE CE 3346 or TE 3346 cannot receive credit for this course. Prerequisites: CE/CS/TE (CE 2305 or CS 2305 or TE 2305) and CE/CS/TE 2336. Pre- (CE 2336 or CS 2336 or TE 2336). Prerequisite or corequisite: CS/SE CS 3341 or SE 3341 or ENGR 3341. (Same as CS/SE/TE CS 3345 and SE 3345 and TE 3345) (3-0) S</td>
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<td>2012-2013</td>
<td>ce3354</td>
<td>CE 3354 Software Engineering (3 semester hours) Introduction to software life cycle models. Software requirements engineering, formal specification and validation. Techniques for software design and testing. Cost estimation models. Issues in software quality assurance and software maintenance. Prerequisites: CE/CS/TE (CE 2336 or CS 3333, CE 2336 or TE 2336 or CS 3333), and CE/CS/TE (CE 2305 or CS 2305 or TE 2305 or equivalent. Pre-equivalent). Prerequisite or corequisite: ECS 3390. (Same as CS/SE CS 3354 and SE 3354) (3-0) S</td>
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<td>2012-2013</td>
<td>ce4304</td>
<td>CE 4304 Computer Architecture (3 semester hours) Introduction to computer organization and design, including the following topics: CPU performance analysis. Instruction set design, illustrated by the MIPS instruction set architecture. Systems-level view of computer arithmetic. Design of the datapath and control for a simple processor. Pipelining. Hierarchical memory. I/O systems. I/O performance analysis. Multiprocessing. Students cannot receive credit for both CS/SE/TE (CS 3340 or SE 3340 or TE 3340) and CE/EE 4304, (CE 4304 or EE 4304). Prerequisite: CE/EE CE 3320 or EE 3320. (Same as EE 4304) (3-0) S</td>
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<td>2012-2013</td>
<td>ce4337</td>
<td>CE 4337 Organization of Programming Languages (3 semester hours) Principles of design and implementation of contemporary programming languages. Formal description including specification of syntax and semantics of programming languages. Language definition structures including binding, scoping, data types, control structures, parameter passing, abstraction mechanism, and run-time considerations. Design issues of imperative languages, object-oriented languages, functional languages and logic languages. Design, implement, and debug programs in various programming language paradigms. Prerequisites: CE/CS/TE (CE 2336 or CS 3333, CE/CS/TE 2305, 2336 or TE 2336 or CS 3333) and (CE 2305 or CS 2305 or TE 2305) and CS/SE/TE (CS 3340 or SE 3340 or CE/EE 4304. TE 3340 or CE 4304 or EE 4304). (Same as CS 4337) (3-0) S</td>
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### CE 4348 Operating Systems Concepts (3 semester hours)
An introduction to fundamental concepts in operating systems: their design, implementation, and usage. Topics include process management, main memory management, virtual memory, I/O and device drivers, file systems, secondary storage management, and an introduction to critical sections and deadlocks. Prerequisites: CS/SE/TE (CS 3340 or equivalent), CE/CS/SE/TE 3345, SE 3340 or TE 3340 or equivalent), and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and a working knowledge of C and UNIX. (Same as CS/SE/TE CS 4348 and SE 4348 and TE 4348) (3-0) S

### CE 4370 Embedded Microprocessor Systems (3 semester hours)
An introduction to microprocessors and their uses. Features commonly found in a CPU are discussed, such as: The Program Counter, Stack, Status Register, General Purpose Registers, ALU, Instruction Set and peripheral devices. Memory (SRAM, DRAM, EPROM, EEPROM) and Memory Mapped IO Peripheral Devices. Assembly language is used to create the binary machine code necessary to program a Microprocessor system. The special features of microprocessors: the stack, interrupts, input ports, output ports and display. Prerequisites: CE/EE 3311, CE/EE 3320, (CE 3311 or EE 3311) and (CE 3320 or EE 3320). Corequisite: CE/EE 4304 or EE 4304. (3-1) Y

### CE 4372 Contemporary Systems Design (3 semester hours)
Design and analysis based system level design concepts, develop working projects using traditional and emerging technologies. Emphasis on specifying requirements, tracking projects and building test and validation strategies. Prerequisites: CE/EE 3320, CE/CS/SE/TE (CE 3320 or EE 3320) and (CE 3345 or CS 3345 or SE 3345 or TE 3345) and CE/CS/SE 3354. (CE 3354 or CS 3354 or SE 3354). (3-0) Y

### CE 4388 Senior Design Project I (3 semester hours)
First of two sequential semesters devoted to a team project that engages students in the full engineering design process. The goal of senior design projects is to prepare the student to run/participate in engineering projects related to an appropriate industry. Thus, all project teams are to follow standard industrial practices and methods. Teams must carry the engineering project to completion, examining real world and multiple design constraints, following applicable industrial and business standards. Such constraints may include but are not limited to: economic, environmental, industrial standards, team time/resource management and cross-disciplinary/departmental result integration. Students are required to work in teams that include collaborative design interaction. Additionally, cross-disciplinary teams are encouraged but not required. In Senior Design I, project proposals will be written, reviewed and approved. Initial designs will be completed and corresponding constraints will be determined. All students will participate in a public oral and poster presentation following departmental approved guidelines at a departmental approved time and location. Teams will also submit a written end of semester progress report and documented team communication (complete sets of weekly reports and/or log books) following guidelines approved by the faculty. Students must have completed ECS 3390 and one of the following prerequisite sequences: CE/EE 3311, CE/EE 3320, CE/CS/SE/TE 3345, and CE/CS/SE 3354, ((CE 3311 or ENGR 3300, CE/EE/TE 3302, CE/EE 3311, EE 3311), and CE/EE (CE 3320 or EE 3320), and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and (CE 3354 or CS 3354 or ENGR 3354)), or ((ENGR 3300 and (CE 3302 or EE 3302 or TE 3302), and (CE 3311 or EE 3311), and (CE 3320 or EE 3320)), or ((ENGR 3300, CE/EE/TE 3302, and CE/CS/SE/TE 3345; pre or corequisite: EE/TE 3360), (CE 3302 or EE 3302 or TE 3302), and (CE 3345 or CS 3345 or SE 3345 or TE 3345)), prerequisite or corequisite: EE 3350 or TE 3350. (Same as EE/TE EE 4388 and TE 4388) (3-0) S
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<th>Course Code</th>
<th>Title</th>
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<th>Prerequisites</th>
<th>Notes</th>
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<tr>
<td>CE 4389</td>
<td>Senior Design Project II</td>
<td>Continuation of the Senior Design project begun in the previous semester. In Senior Design II, projects based on approved project proposals will be completed. All limitations of the design will be determined and addressed. All students will participate in a public oral presentation following faculty-approved guidelines at a faculty-approved time and location. Teams will also submit a written final report and documented team communication (complete sets of weekly reports and/or log books) following faculty-approved guidelines. Prerequisite: CE/EE/TE CE 4388 or EE 4388 or TE 4388. (Same as EE/TE EE 4389 and TE 4389) (3-0) S</td>
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<tr>
<td>CE 4390</td>
<td>Computer Networks</td>
<td>The design and analysis of computer networks. Topics include the ISO reference model, transmission media, medium-access protocols, LANs, data link protocols, routing, congestion control, internetworking, and connection management. Students cannot get credit for both CE/CS/TE (CE 4390 or CS 4390 or TE 4390) and EE 4390. Prerequisite: CE/CS/TE CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent. (Same as CS/TE CS 4390 and TE 4390) (3-0) S</td>
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<tr>
<td>CS 1335</td>
<td>Computer Science I for Non-majors</td>
<td>Introduction to object-oriented software analysis, design, and development. Classes and objects. Object composition and polymorphism. Sorting and searching. Strings using core classes. Inheritance and interfaces. Graphical User Interfaces. This class cannot be used to fulfill degree requirements for majors in the School of Engineering and Computer Science. Computer Science and Engineering majors may NOT take this course. Students who have taken CE/CS/TE CE 1337 or CS 1337 or TE 1337 cannot receive credit for this course. Prerequisite: CS 1336 with a grade of C or better or equivalent. (3-0) S</td>
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<tr>
<td>CS 1336</td>
<td>Programming Fundamentals</td>
<td>Introduction to computers. Primitive data types, variable declarations, variable scope, and primitive operations. Control statements. Methods/functions. Arrays, and strings using primitive data arrays. Output formatting. Debugging techniques. Designed for students with no prior computer programming experience. This class cannot be used to fulfill degree requirements for majors in the School of Engineering and Computer Science. Corequisite: CS 1136. Note that a grade of C or better is required in order to register for CS 1335 or CE/CS/TE CE 1337 or CS 1337 or TE 1337. (3-0) S</td>
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<tr>
<td>CS 1337</td>
<td>Computer Science I</td>
<td>Introduction to object-oriented software analysis, design, and development. Classes and objects. Object composition and polymorphism. Sorting, searching, recursion. Strings using core classes. Inheritance and interfaces. Graphical User Interfaces. Includes a comprehensive programming project. Prerequisite: CS 1336 with a grade of C or better or equivalent. (Same as CE/TE CE 1337 and TE 1337) (3-0) S</td>
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<tr>
<td>CS 2305</td>
<td>Discrete Mathematics for Computing I</td>
<td>Principles of counting. Logic and proof methods, including induction. Basic recurrence relations. Basics of algorithm complexity. Sets, relations, functions. Elementary graph theory. Elementary number theory. Students cannot get credit for both CS 2305 and CE/TE CE 3307 or TE 3307. Prerequisite: MATH 1326 or MATH 2413 or MATH 2417. (Same as CE/TE CE 2305 and TE 2305) (3-0) S</td>
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<tr>
<td>CS 2335</td>
<td>Computer Science II for Non-majors</td>
<td>Exceptions and number formatting. File input/output using Stream classes. Implementation of primitive data structures, including linked lists, stacks, queues, and binary trees. Advanced data manipulation using core classes. This class cannot be used to fulfill degree requirements for majors in the School of Engineering and Computer Science. Students who have taken CE/CS/TE CE 2336 or CS 2336 or TE 2336 cannot receive credit for this course. Prerequisite: CS 1335 or CE/CS/TE CE 1337 or CS 1337 or TE 1337.</td>
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<td>2012-2013</td>
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<tr>
<td>CS 2336</td>
<td>Computer Science II (COSC 2336)</td>
<td>Exceptions and number formatting. File input/output using Stream classes. Implementation of primitive data structures, including linked lists (all types), stacks, queues, and binary trees. Advanced data manipulation using core classes. Introduction to multi-threading, multimedia, and networking. Includes a comprehensive programming project. Prerequisite: CE/CS/TE CE 1337 or CS 1337 or TE 1337. Prerequisite or corequisite: CE/CS/TE CE 2305 or CS 2305 or TE 2305. (Same as CE/TE CE 2336 and TE 2336)</td>
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<td>2012-2013</td>
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<tr>
<td>CS 3149</td>
<td>Competitive Learning in Computer Science</td>
<td>In this course, students will work together in small teams to solve graduated problems, similar to those used in programming contests around the world. Approaches to categorizing problems and selecting appropriate data structures and algorithms will be covered, along with types of algorithms for solving problems (brute force, greedy, divide and conquer, dynamic programming). Students will do problem solving in a competitive environment against the clock. May be repeated for credit (3 hours maximum). Prerequisites: CE/CS/TE CE 2336 or CS 2336 or TE 2336 and CS 3305.</td>
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<td>2012-2013</td>
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<tr>
<td>CS 3305</td>
<td>Discrete Mathematics for Computing II</td>
<td>Advanced counting methods; recurrence relations, divide and conquer algorithms, principle of inclusion and exclusion. Partial orders and lattices, Algorithmic complexity. Graph theory. Strings and languages. Number theory. Elements of modern algebra. Students cannot receive credit for both CS 3305 and CE/TE CE 3307 or TE 3307. Prerequisite: CE/CS/TE 2305. MATH (CE 2305 or CS 2305 or TE 2305), and (MATH 2414 or MATH 2419).</td>
<td>(3-0) S</td>
<td>2012-2013</td>
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<tr>
<td>CS 3333</td>
<td>Data Structures</td>
<td>Programming with basic data structures (arrays, stacks, queues, lists, and trees) and their associated algorithms. Various sorting and searching techniques. Fundamental graph algorithms. This course covers much of the same material as CS 3345 without requiring the analysis of algorithms. Computer Science majors may NOT take this course. This course may not be taken for degree credit by students who have completed CE/CS/TE CE 2336 or CS 2336 or TE 2336. Prerequisite: CS 1335 or CE/CS/TE CE 1337 or CS 1337 or TE 1337 or CS 3335 or equivalent programming experience.</td>
<td>(3-0) Y</td>
<td>2012-2013</td>
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<tr>
<td>CS 3335</td>
<td>C and C++</td>
<td>Numerous programming projects in both C and C++. All fundamentals of C, with special emphasis on use of pointers. Use of C++ extensions to create and extend (by inheritance) abstract data types. The use/advantages of virtual functions (dynamic polymorphism). Prerequisite: CS 2335 or CE/CS/TE CE 2336 or CS 2336 or TE 2336 or equivalent.</td>
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<tr>
<td>CS 3340</td>
<td>Computer Architecture</td>
<td>(3 semester hours) This course introduces the concepts of computer architecture by going through multiple levels of abstraction, and the numbering systems and their basic computations. It focuses on the instruction-set architecture of the MIPS machine, including MIPS assembly programming, translation between MIPS and C, and between MIPS and machine code. General topics include performance calculation, processor datapath, pipelining, and memory hierarchy. Students who have already completed CS 2310 or equivalent cannot receive credit for this course. Students cannot receive credit for both CS/SE/TE (CS 3340 or SE 3340 or TE 3340) and CE/EE 4304. Prerequisite: CE/CS/TE (CE 4304 or EE 4304). Prerequisites: (CE 1337 or CS 1337 or TE 1337 or equivalent) and CS 2305. (Same as SE/TE SE 3340 or TE 3340)</td>
<td>(CE 2305 or CS 2305 or TE 2305). Pre- or corequisite: ECS 3390. (Same as SE/TE SE 3345 and SE 3345 and TE 3345)</td>
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<td>CS 3341</td>
<td>Probability and Statistics in Computer Science and Software Engineering</td>
<td>(3 semester hours) Axiomatic probability theory, independence, conditional probability. Discrete and continuous random variables, special distributions of importance to CS/SE and expectation. Simulation of random variables and Monte Carlo methods. Central limit theorem. Basic statistical inference, parameter estimation, hypothesis testing, and linear regression. Introduction to stochastic processes. Illustrative examples and simulation exercises from queuing, reliability, and other CS/SE applications. Students cannot get credit for both CS/SE CS 3341 and ENGR 3341. Prerequisites: MATH (MATH 1326 or MATH 2414 or MATH 2419, 2419), and CE/CS/TE 2305. (CE 2305 or CS 2305 or TE 2305). (Same as SE 3341 or STAT 3341)</td>
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<td>CS 3345</td>
<td>Data Structures and Introduction to Algorithmic Analysis</td>
<td>(3 semester hours) Analysis of algorithms including time complexity and Big-O notation. Analysis of stacks, queues, and trees, including B-trees. Heaps, hashing, and advanced sorting techniques. Disjoint sets and graphs. Course emphasizes design and implementation. Students that completed CE/TE CE 3346 or TE 3346 cannot receive credit for this course. Prerequisites: CE/CS/TE (CE 2305 or CS 2305 or TE 2305) and CE/CS/TE 2336. Prerequisite or corequisite: CE/CS/TE CS 3341 or SE 3341 or ENGR 3341. (Same as SE/TE SE 3345 and SE 3345 and TE 3345)</td>
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<tr>
<td>CS 3354</td>
<td>Software Engineering</td>
<td>(3 semester hours) Introduction to software life cycle models. Software requirements engineering, formal specification and validation. Techniques for software design and testing. Cost estimation models. Issues in software quality assurance and software maintenance. Prerequisites: CE/CS/TE (CE 2333 or CS 3333, 2336 or TE 2336 or CS 3333), and CE/CS/TE (CE 2305 or CS 2305 or TE 2305 or equivalent). Prerequisite or corequisite: ECS 3390. (Same as CE/SE CE 3354 and SE 3354)</td>
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<td>CS 3376</td>
<td>C/C++ Programming in a UNIX Environment</td>
<td>(3 semester hours) Advanced programming techniques utilizing procedural and object oriented programming in a UNIX environment. Topics include file input and output, implementation of strings, stacks, queues, lists, and trees, and dynamic memory allocation/management. Design and implementation of a comprehensive programming project is required. Prerequisite: CE/CS/TE CE 2336 or CS 2336 or TE 2336 or equivalent. (Same as SE 3376)</td>
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<td>CS 4141</td>
<td>Digital Systems Laboratory</td>
<td>Laboratory to accompany CS 4341. The purpose of this laboratory is to give students an intuitive understanding of digital circuits and systems. Laboratory exercises include construction of simple digital logic circuits using prototyping kits and board-level assembly of a personal computer. Students who have already completed CS 2110 cannot receive credit for this course. Corequisite: CS/TE CS 4341 or TE 4341. (Same as TE 4141) (0-2) S</td>
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<td>CS 4315</td>
<td>Intelligent Systems Design</td>
<td>Mathematical tools for the design and evaluation of artificially intelligent deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include: (1) Markov Random Field probability representations, and (2) asymptotic mathematical statistical theory for: parameter estimation, model selection, and hypothesis testing. Prerequisite: CS/CGS (CS 4314 or CGS 4314) or instructor consent required. (Same as CGS 4315) (3-0) T</td>
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<tr>
<td>CS 4332</td>
<td>Introduction to Programming Video Games</td>
<td>Video game programming concepts. Programming with game engine. 2D and 3D computer graphics techniques and data structures. Computer animation, physics-based methods and collision detection. GPU and shader programming. Artificial intelligence for video games. Networking and multiplayer. Prerequisite: CE/CS/SE/TE CE 3345 or CS 3345 or SE 3345 or TE 3345. (3-0) Y</td>
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<tr>
<td>CS 4334</td>
<td>Numerical Analysis</td>
<td>Solution of linear equations, roots of polynomial equations, interpolation and approximation, numerical differentiation and integration, solution of ordinary differential equations, computer arithmetic, and error analysis. Students cannot receive credit for both CS/MATH CS 4334 and ENGR 4334. Prerequisites: CE/CS/TE 1337, MATH 2418, (CE 1337 or CS 1337 or TE 1337) and (MATH 2418 and MATH 2451). (Same as MATH 4334) (3-0) Y</td>
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<tr>
<td>CS 4336</td>
<td>Advanced Java</td>
<td>Advanced Java programming techniques integrating the technologies of advanced swing GUI components, JavaBeans, Java Servlets and Server Pages, XML, Security, Java Database Connectivity, Remote Method Invocation, and Software applications for Wireless Devices. Students will have the opportunity to work on their own E-Business Solutions. Prerequisite: CE/CS/TE CE 2336 or CS 2336 or TE 2336 or equivalent. (3-0) T</td>
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<tr>
<td>CS 4337</td>
<td>Organization of Programming Languages</td>
<td>Principles of design and implementation of contemporary programming languages. Formal description including specification of syntax and semantics of programming languages. Language definition structures including binding, scoping, data types, control structures, parameter passing, abstraction mechanism, and run-time considerations. Design issues of imperative languages, object-oriented languages, functional languages and logic languages. Design, implement, and debug programs in various programming language paradigms. Prerequisites: CE/CS/TE (CE 2336 or CS 3333, CE/CS/TE 2306, 2336 or TE 2336 or CS 3333) and CS/SE/TE (CE 2305 or CS 2305 or TE 2305) and (CS 3340 or SE 3340 or EE/CE 4304, TE 3340 or CE 4304 or EE 4304). (Same as CE 4337) (3-0) S</td>
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<tr>
<td>cs4341.3</td>
<td>CS 4341 Digital Logic and Computer Design</td>
<td>Boolean algebra and logic circuits; synchronous sequential circuits; gate level design of ALUSU, registers, and memory unit; register transfer operations; design of data path and control unit for a small computer; Input-Output interface. Students cannot receive credit for both CS/TE CS 4341 or TE 4341 and CE/EE CE 3320 or EE 3320. Prerequisites: CE/EE (CE 2310 or CE/SE/TE 2310) or (CS 3340 or SE 3340 or TE 3340) and PHYS 2326. Corequisite: CS/TE CS 4141 or TE 4141. (Same as TE 4341)</td>
<td>(3-0) S</td>
<td>edit review pending saf091000 2012-11-2 7 15:07:00</td>
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<tr>
<td>cs4347.8</td>
<td>CS 4347 Database Systems</td>
<td>This course emphasizes the concepts and structures necessary for the design and implementation of database management systems. Topics include data models, data normalization, data description languages, query facilities, file organization, index organization, file security, data integrity, and reliability. Prerequisite: CE/CS/SE/TE 3345 or CS 3345 or SE 3345 or TE 3345. (Same as SE 4347)</td>
<td>(3-0) Y</td>
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<tr>
<td>cs4348.8</td>
<td>CS 4348 Operating Systems Concepts</td>
<td>An introduction to fundamental concepts in operating systems: their design, implementation, and usage. Topics include process management, main memory management, virtual memory, I/O and device drivers, file systems, secondary storage management, and an introduction to critical sections and deadlocks. Prerequisites: CS/SE/TE (CS 3340 or equivalent, CE/CS/SE/TE 3345, SE 3340 or TE 3340 or equivalent), and (CE 3345 or CS 3345 SE 3345 or TE 3345), and a working knowledge of C and UNIX. (Same as CE/SE/TE 4348 and SE 4348 and TE 4348)</td>
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<td>cs4349.9</td>
<td>CS 4349 Advanced Algorithm Design and Analysis</td>
<td>Asymptotic analysis, recurrences, and graph algorithms. Algorithm design techniques such as greedy method, dynamic programming, and divide-and-conquer. Issues from computational complexity. Course emphasizes a theoretical approach. Prerequisites: CS 3305, CE/CS/SE/TE 3345, and (CE 3345 or CS 3345 or SE 3345 or TE 3345)</td>
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<td>edit review pending saf091000 2012-11-2 7 15:13:53</td>
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<td>cs4353.3</td>
<td>CS 4353 Human Computer Interactions II</td>
<td>Detailed exploration of human-computer interaction (HCI) through readings in journal articles and research reports. Practical experience in methodology typically used in the design of usable systems. Prerequisite: CS/CGS (CS 4352 or CGS 4352) or instructor consent required. (Same as CGS 4353)</td>
<td>(3-0) T</td>
<td>edit review pending mxv06200 0 2012-11-2 2 14:43:36</td>
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<tr>
<td>cs4361.8</td>
<td>CS 4361 Computer Graphics</td>
<td>Review of graphic display architecture and graphic input devices. Two- and three-dimensional transformations, matrix formulations, and concatenation. Clipping and windowing. Data structures for graphics systems, segmented display files, rings, etc. Hidden line and surface elimination. Shading. Graphics packages and applications. Prerequisites: MATH 2418, CE/CS/TE 3336, and CE/CS/SE/TE (CE 2336 or CS 2336 or TE 2336), and (CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent).</td>
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<tr>
<td>cs4365.7</td>
<td>CS 4365 Artificial Intelligence</td>
<td>Basic concepts and techniques that enable computers to perform intelligent tasks. Examples are taken from areas such as natural language understanding, computer vision, machine learning, search strategies and control, logic, and theorem proving. Prerequisite: CE/CS/SE/TE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent.</td>
<td>(3-0) Y</td>
<td>edit review pending saf091000 2012-11-2 7 15:16:42</td>
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<tr>
<td>CS 4375</td>
<td>Introduction to Machine Learning (3 semester hours)</td>
<td>Algorithms for creating computer programs that can improve their performance through learning. Topics include: cross-validation, decision trees, neural nets, statistical tests, Bayesian learning, computational learning theory, instance-based learning, reinforcement learning, bagging, boosting, support vector machines, Hidden Markov Models, clustering, and semi-supervised and unsupervised learning techniques. Prerequisites: CS/SE (CS 3341 or SE 3341) and CE/CS/SE/TE (CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent).</td>
<td>(3-0) Y</td>
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<tr>
<td>CS 4376</td>
<td>Object-Oriented Programming Systems (3 semester hours)</td>
<td>In-depth study of the features/advantages of object-oriented approach to problem solving. Special emphasis on issues of object-oriented analysis, design, implementation, and testing. Review of basic concepts of object-oriented technology (abstraction, inheritance, and polymorphism). Object-oriented programming languages, databases, and productivity tools. Prerequisite: CS/SE CS 4376 or CS 2336 or TE 4336 or equivalent.</td>
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<tr>
<td>CS 4386</td>
<td>Compiler Design (3 semester hours)</td>
<td>Basic phases of a compiler and their design principles. Topics include lexical analysis, basic parsing techniques such as LR(K) and LL(K) grammars. Prerequisite: CE/CS/SE/TE CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent.</td>
<td>(3-0) Y</td>
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<tr>
<td>CS 4389</td>
<td>Data and Applications Security (3 semester hours)</td>
<td>Data as a critical resource. Threats to data and applications security including access control violations, integrity violations, unauthorized intrusions and sabotage; techniques to enforce security. Prerequisite: CS/SE CS 4347 or SE 4347.</td>
<td>(3-0) Y</td>
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<tr>
<td>CS 4390</td>
<td>Computer Networks (3 semester hours)</td>
<td>The design and analysis of computer networks. Topics include the ISO reference model, transmission media, medium-access protocols, LANs, data link protocols, routing, congestion control, internetworking, and connection management. Students cannot get credit for both CE/CS/TE (CE 4390 or CS 4390 or TE 4390) and EE 4390. Prerequisite: CE/CS/SE/TE CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent.</td>
<td>(3-0) S</td>
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<tr>
<td>CS 4391</td>
<td>Introduction to Computer Vision (3 semester hours)</td>
<td>Techniques for manipulating and extracting information from digital images and video. Topics include color representations, analysis and processing based on image histograms, geometric transformations, convolutions, image blurring and sharpening, extraction of edges, matching, image and video motion. Prerequisites: CE/CS/SE/TE CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent.</td>
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<tr>
<td>CS 4392</td>
<td>Computer Animation (3 semester hours)</td>
<td>Introduction to traditional animation. Kinematics of motion. Key framing. Coordinate systems and transformations (review), Euler angles and Quaternions, Catmull Rom and B-Splines, Advanced Key framing, articulated figures (forward kinematics), human and animal modeling (soft tissue, skin, etc.). Facial animation (parametric). Physically based modeling (rigid, collision detection). Physically based modeling (deformable). Behavioral and heuristic models. Algorithmic animation. Optimization techniques. Animation languages and systems. Motion capture and real time control. Virtual reality and animation. Rendering and temporal aliasing. 2D and 3D morphing. 3D modeling. Prerequisites: MATH 2418 and CE/CS/SE/TE (CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent).</td>
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<tr>
<td>cs4393</td>
<td>CS 4393 Computer and Network Security</td>
<td>The study of security and vulnerabilities in computer and network systems. Common attacking techniques such as buffer overflow, viruses, worms, etc. Security in existing systems such as UNIX, Windows, and JVM. Fundamental access control and information flow concepts. Symmetric Ciphers such as DES and AES. Public-key encryption techniques and related number theory. Message authentication, hash functions, and digital signatures. Authentication applications, IP security and Web security. Prerequisite: CE/CS/SE/TE CE 4348 or CS 4348 or SE 4348 or TE 4348 or equivalent.</td>
<td>CE/CS/SE/TE CE 4348 or CS 4348 or SE 4348 or TE 4348 or equivalent.</td>
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<tr>
<td>cs4394</td>
<td>CS 4394 Implementation of Modern Operating Systems</td>
<td>This course focuses on developing systems implementation skills through a set of projects. Each project will explore one fundamental component of operating systems such as process scheduling, memory management, device drivers, file systems, and network communication management. The projects are expected to involve kernel-level programming. Prerequisites: CE/CS/SE/TE (CE 4348 or CS 4348 or SE 4348 or TE 4348) and CS 3335, or equivalent programming experience.</td>
<td>CE/CS/SE/TE (CE 4348 or CS 4348 or SE 4348 or TE 4348) and CS 3335, or equivalent programming experience.</td>
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<tr>
<td>cs4395</td>
<td>CS 4395 Human Language Technologies</td>
<td>Introduction to human language technologies (HLT), the study of natural languages from a computational perspective. Topics include computational models of syntax and semantics, natural language applications (such as machine translation, speech processing, information retrieval, and information extraction), and general machine-learning techniques commonly used in state-of-the-art HLT research. Prerequisite: CS/SE (CS 3341 or SE 3341, CE/CS/SE/TE equivalent) and (CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent).</td>
<td>CS/SE (CS 3341 or SE 3341, CE/CS/SE/TE equivalent) and (CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent).</td>
<td>3-0</td>
</tr>
<tr>
<td>cs4397</td>
<td>CS 4397 Embedded Computer Systems</td>
<td>Introduction to embedded computer applications and concepts. Real-time operating systems and resource management. Real-time scheduling and communication. Senior data acquisition, processing and fusion. Error handling, fault tolerance, and graceful degradation. System performance analysis and optimization techniques. Includes a project to develop and analyze a small embedded computer application. Prerequisite: CE/CS/SE/TE CE 4348 or CS 4348 or SE 4348 or TE 4348 or equivalent.</td>
<td>CE/CS/SE/TE CE 4348 or CS 4348 or SE 4348 or TE 4348 or equivalent.</td>
<td>3-0</td>
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<tr>
<td>cs4398</td>
<td>CS 4398 Digital Forensics</td>
<td>Creating and preserving digital evidence, data recovery and evidence collection algorithms, evidence construction and reconstruction, methods for certifying evidence, storing evidence, data acquisition, forensic analysis algorithms, image files, network forensics, logging methods to trace back attacks and digital trails, e-mail investigations. Prerequisites: CE/CS/SE/TE (CE 4348 or CS 4348 or SE 4348 or TE 4348) and CS 3990 or equivalent.</td>
<td>CE/CS/SE/TE (CE 4348 or CS 4348 or SE 4348 or TE 4348) and CS 3990 or equivalent.</td>
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### CS 4485 Computer Science Project (4 semester hours)

This course is intended to complement theory and to provide an in-depth, hands-on experience in all aspects of a software development project. Students will work in teams on projects of interest to industry and will be involved in specifying the problem and its solution, designing and analyzing the solution, developing the software architecture, along with implementation and testing plans. The deliverables will include reports that document these steps as well as a final project report, including the challenges they faced, and a user manual of the developed system. Students will explore security issues of their project and its potential impact on society. Teams will also make presentations as well as demonstrate their software. Additionally, this course will cover topics related to computer science profession including ethics and professional responsibility, entrepreneurship, leadership, and project management.

**Prerequisites:** CE/CS/SE/TE 3345, CE/CS/SE (CE 3345 or CS 3345 or SE 3345 or TE 3345), and (CE 3354 or CS 3354 or SE 3354 or TE 3354 or equivalent), and at least three CS 43XX classes.

(4-0) S

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### EE 3101 Electrical Network Analysis Laboratory (1 semester hour)

Laboratory to accompany EE 3301. Design, assembly and testing of linear electrical networks and systems. Use of computers to control electrical equipment and acquire data. Prerequisites: CE/EE/TE (CE 1202 or EE 1202 or TE 1202) and RHET 1302. Corequisite: EE 3301. (Same as CE/EE CE 3101 and TE 3101) (0-1) S

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### EE 3102 Signals and Systems Laboratory (1 semester hour)

Laboratory based on MATLAB and LabVIEW to provide implementation experience on topics covered in EE 3302. Laboratory experiments cover linear time-invariant systems, convolution, Fourier series, continuous Fourier transform, sampling, discrete Fourier transform, analog and digital filtering. Each lab is followed by a design application. Corequisite: EE 3302. Prerequisite: RHET 1302. (Same as CE/EE CE 3102 and TE 3102) (0-1) S

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### EE 3110 Electronic Devices Laboratory (1 semester hour)

Laboratory to accompany EE 3310. Experimental determination and illustration of properties of carriers in semiconductors including carrier drift, carrier diffusion; p-n junctions including forward and reverse bias effects and transient effects; bipolar transistors including the Ebers-Moll model and secondary effects; field effect transistors including biasing effects, MOS capacitance and threshold voltage. Corequisite: CE/EE CE 3310 or EE 3310. Prerequisite: RHET 1302. (Same as CE 3110) (0-1) S

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### EE 3111 Electronic Circuits Laboratory (1 semester hour)

Laboratory to accompany EE 3311. Design, assembly and testing of electronic circuits that use diodes, transistors and operational amplifiers in configurations typically encountered in practical applications. Corequisite: CE/EE CE 3311 or EE 3311. Prerequisite: RHET 1302. (Same as CE 3111) (0-1) S

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### EE 3120 Digital Circuits Laboratory (1 semester hour)

Laboratory to accompany EE 3320. Design, assembly, and testing of logic circuits. Use of programmable logic devices and simple CAD tools. Corequisite: CE/EE CE 3320 or EE 3320. Prerequisite: RHET 1302. (Same as CE 3120) (0-1) S
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<tr>
<td>ee3150</td>
<td>EE 3150 Communications Systems Laboratory</td>
<td>(1 semester hour) Laboratory to accompany EE 3350. Fundamental elements of communications systems hardware; use of spectrum analyzers and other measurement instruments typically encountered in communication systems; design of active filters in communications systems; analog frequency and amplitude modulators and demodulators; data communication systems. <strong>Corequisite:</strong> EE 3350. Prerequisite: (CE 3301 or EE 3301 or TE 3301) and RHET 1302. (Same as TE 3150) (0-1) S</td>
<td>Co-requisite: Corequisite: EE 3350.</td>
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<tr>
<td>ee3301</td>
<td>EE 3301 Electrical Network Analysis</td>
<td>(3 semester hours) Analysis and design of RC, RL, and RLC electrical networks. Sinusoidal steady state analysis of passive networks using phasor representation; mesh and nodal analyses. Introduction to the concept of impulse response and frequency analysis using the Laplace transform. Prerequisites: MATH 2420 and PHYS 2326. Corequisite: EE 3101. (Same as CE/EE CE 3301 and TE 3301) (3-0) S</td>
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<tr>
<td>ee3302</td>
<td>EE 3302 Signals and Systems</td>
<td>(3 semester hours) Introduces the fundamentals of continuous and discrete-time signal processing. Linear system analysis including convolution and impulse response, Fourier series, Fourier transform and applications, discrete-time signal analysis, sampling and z-transform. Prerequisite: ENGR 3300. Corequisite: EE 3102. (Same as CE/TE CE 3302 and TE 3302) (3-0) S</td>
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<tr>
<td>ee3310</td>
<td>EE 3310 Electronic Devices</td>
<td>(3 semester hours) Theory and application of solid state electronic devices. Physical principles of carrier motion in semiconductors leading to operating principles and circuit models for diodes, bipolar transistors, and field effect transistors. Introduction to integrated circuits. Prerequisite: CE/EE/TE CE 3301 or EE 3301 or TE 3301. Corequisite: CE/EE CE 3310 or EE 3110. (Same as CE 3310) (3-0) S</td>
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<tr>
<td>ee3311</td>
<td>EE 3311 Electronic Circuits</td>
<td>(3 semester hours) Large-signal and small-signal characteristics of diodes, BJT and MOSFET transistors. Analysis of circuits containing diodes. Analysis of the DC and small-signal characteristics of single-stage BJT and MOSFET amplifiers. Analysis of circuits with an operational amplifier as a black box. Introduction of high-frequency models of BJT and MOSFET transistors and methods to analyze amplifier frequency response. Prerequisite: CE/EE CE 3311 or EE 3111. (Same as CE 3311) (3-0) S</td>
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<tr>
<td>ee3320</td>
<td>EE 3320 Digital Circuits</td>
<td>(3 semester hours) Boolean logic. Design and analysis of combinational logic circuits using SSI basic logic gates and other building blocks like multiplexers and ROMs. Design and MSL analysis of latches and flip-flops. Design and analysis of synchronous state machines. State minimization and introduction to state assignment. Design of arithmetic circuits: datapath components: adders, multipliers and shifters, multipliers, registers, shifters, and counters. Electrical properties of logic gates. Students cannot receive credit for both CS 4341 and CE/EE CE 3320 or EE 3320. Prerequisite: CE/EE CE 2310 or EE 2310. Corequisite: EE 3120. (Same as CE 3320) (3-0) S</td>
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### EE 3350 Communications Systems (3 semester hours)
Fundamentals of communications systems. Review of probability theory and Fourier transforms. Filtering and noise. Modulation and demodulation techniques, including amplitude, phase, and pulse code. Time division multiplexing. This class may be offered as either regular or honors sections (H).

**Prerequisites:** ENGR 3300, CE/EE/TE 3302, 3300 and (CE 3301 or EE 3301 or TE 3301) and (CE 3302 or EE 3302 or TE 3302) and ENGR 3341. Corequisite: EE/TE EE 3150 or TE 3150. (Same as TE 3350) (3-0) S

**Prerequisites:** ENGR 3300, CE/EE/TE 3302, 3300 and (CE 3301 or EE 3301 or TE 3301) and (CE 3302 or EE 3302 or TE 3302) and ENGR 3341. Corequisite: EE/TE EE 3150 or TE 3150. (Same as TE 3350) (3-0) S

### EE 4301 Electromagnetic Engineering I (3 semester hours)
Introduction to the general characteristics of wave propagation. Physical interpretation of Maxwell's equations. Propagation of plane electromagnetic waves and energy. Transmission lines. Antenna fundamentals. Prerequisites: PHYS 2326, 2326 and ENGR 3300 and CE/EE/TE 3301. (CE 3301 or EE 3301 or TE 3301). (3-0) S

### EE 4304 Computer Architecture (3 semester hours)
Introduction to computer organization and design, including the following topics: CPU performance analysis. Instruction set design, illustrated by the MIPS instruction set architecture. Systems-level view of computer arithmetic. Design of the datapath and control for a simple processor. Pipelining. Hierarchical memory. I/O systems. I/O performance analysis. Multiprocessing. Students cannot receive credit for both CS/SE/TE (CS 3340 or SE 3340 or TE 3340) and CE/EE 4304. (CE 4304 or EE 4304). Prerequisite: CE/EE 3320 or EE 3320. (Same as CE 4304) (3-0) S

### EE 4310 Systems and Controls (3 semester hours)

### EE 4325 Introduction to VLSI Design (3 semester hours)
Introduction to CMOS digital IC design using semi-custom and full-custom design techniques with an emphasis on techniques for rapid prototyping and use of various VLSI design tools. FPGA's, standard cell and full-custom design styles. Introduction to a wide variety of CAD tools. Prerequisite: CE/EE 3320 or EE 3320 (or, for CS majors, CS 4341). (3-0) T

### EE 4330 Integrated Circuit Technology (3 semester hours)
Principles of design and fabrication of integrated circuits. Bipolar and MOS technologies. Passive and active component performance, fabrication techniques including epitaxial growth, photolithography, oxidation, diffusion, ion-implantation, thin and thick film components. Design and layout of integrated devices. Relations between layout and fabrication technique. Prerequisite: CE/EE CE 3320 or EE 3320 (or, for CS majors, CS 4341). (3-0) T

### EE 4340 Analog Integrated Circuit Analysis and Design (3 semester hours)
Analogue integrated circuits and systems. Analysis and design of linear amplifiers, including operational, high-frequency, broad-band and feedback amplifiers. Use of monolithic silicon systems. Prerequisite: CE/EE CE 3311 or EE 3311. (3-0) T

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*Undergraduate Catalog 2013 - Course Change Requests*

*Submitted to CEP 11-29-12*
<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
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<th>Description</th>
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<td>ee4341</td>
<td>Digital Integrated Circuit Analysis and Design</td>
<td>3</td>
<td>Digital integrated circuits. Large signal model for bipolar and MOS transistors. MOS inverters and gates. Propagation delay and noise margin. Dynamic logic concepts. Bipolar transistor inverters and gates, regenerative logic circuits, memories. Prerequisites: CE/EE 3311, CE/EE 3320. (CE 3311 or EE 3311), and (CE 3320 or EE 3320). (3-0) T</td>
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<tr>
<td>ee4360</td>
<td>Digital Communications</td>
<td>3</td>
<td>Information, digital transmission, channel capacity, delta modulation, and differential pulse code modulation are discussed. Principles of coding and digital modulation techniques such as Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Continuous Phase Frequency Shift Keying (CPFSK) are introduced. M-ary signaling such as Quadrature amplitude and phase shift keying, and M-ary PSK and FSK are also discussed. Prerequisite: EE/TE EE 3350 or TE 3350. (Same as TE 4360) (3-0) T</td>
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<td>ee4361</td>
<td>Introduction to Digital Signal Processing</td>
<td>3</td>
<td>An introduction to the analysis and design of discrete linear systems, and to the processing of digital signals. Topics include time and frequency domain approaches to discrete signals and systems, the Discrete Fourier Transform and its computation, and the design of digital filters. Prerequisite: CE/EE/TE CE 3302 or EE 3302 or TE 3302. (Same as TE 4361) (3-0) T</td>
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<td>ee4365</td>
<td>Introduction to Wireless Communication</td>
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<td>Introduction to the basic system concepts of cellular telephony. Mobile standards, mobile system architecture, design, performance and operation. Voice digitization and modulation techniques; PCS technologies. Prerequisite: EE/TE EE 3350 or TE 3350. (Same as TE 4365) (3-0) Y</td>
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<tr>
<td>ee4367</td>
<td>Telecommunication Networks</td>
<td>3</td>
<td>Trunking and queuing, switching technologies: voice, data, video, circuit switching and packet switching, transmission technologies and protocols, transmission media - copper, fiber, microwave, satellite, protocols - bipolar formats, digital hierarchy, optical hierarchy, synchronization, advanced switching protocols and architectures; frame relay, ATM, HDTV, SONET. Prerequisite or Corequisite: EE/TE EE 3350 or TE 3350. (Same as TE 4367) (3-0) Y</td>
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<td>RF Circuit Design Principles</td>
<td>3</td>
<td>Principles of high-frequency design, transmission lines, the Smith chart, impedance matching using both lumped and distributed components, and simple amplifier design. Prerequisites: CE/EE (CE 3310 or EE 3310) and EE 4301. (3-0) Y</td>
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### EE 4388 Senior Design Project I (3 semester hours)
First of two sequential semesters devoted to a team project that engages students in the full engineering design process. The goal of senior design projects is to prepare the student to run/participate in engineering projects related to an appropriate industry. Thus, all project teams are to follow standard industrial practices and methods. Teams must carry the engineering project to completion, examining real world and multiple design constraints, following applicable industrial and business standards. Such constraints may include but are not limited to: economic, environmental, industrial standards, team time/resource management and cross-disciplinary/departmental result integration. Students are required to work in teams that include collaborative design interaction. Additionally, cross-disciplinary teams are encouraged but not required. In Senior Design I, project proposals will be written, reviewed and approved. Initial designs will be completed and corresponding constraints will be determined. All students will participate in a public oral and poster presentation following departmental approved guidelines at a departmental approved time and location. Teams will also submit a written end of semester progress report and documented team communication (complete sets of weekly reports and/or log books) following guidelines approved by the faculty. Students must have completed ECS 3390 and one of the following prerequisite sequences:

- CE/EE 3311, CE/EE/TE 3320, CE/CS/SE/TE 3345
- CE 3302 or EE 3320, and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and CE/CS/SE 3354
- CE/EE 3311 and CE/EE/TE 3320

Prerequisite: ECS 3390 and one of the following prerequisite sequences:

- CE/CS 3390 or EE 3390 or TE 3390. (Same as CE/TE 4388 and TE 4388) (3-0) S

### EE 4389 Senior Design Project II (3 semester hours)
Continuation of the Senior Design project begun in the previous semester. In Senior Design II, projects based on approved project proposals will be completed. All limitations of the design will be determined and addressed. All students will participate in a public oral presentation following faculty-approved guidelines at a faculty-approved time and location. Teams will also submit a written final report and documented team communication (complete sets of weekly reports and/or log books) following faculty-approved guidelines. Prerequisite: CE/EE/TE CE 4388 or EE 4388 or TE 4388. (Same as CE/TE CE 4389 and TE 4389) (3-0) S

### EE 4390 Computer Networks (3 semester hours)
An introduction to packet-based computer and data communication networks, including the OSI model, Internet, TCP/IP, ATM, Ethernet, Frame Relay, and Local Area Networks. Enterprise network design procedures are introduced in conjunction with IP routing, VPN, MPLS and VOIP. Students cannot receive credit for both CE/CS/TE (CE 4390 or CS 4390 or TE 4390) and EE 4390. Pre-Prerequisite: CE/EE/TE EE 3350 or TE 3350. (3-0) S

### EE 4391 Technology of Plasma (3 semester hours)
Plasmas are critical to making the best electronic devices. This class will be an introduction to the technology required to make and use these plasmas. Topics include: high-vacuum technology (gas properties, pumps, pressure gauges, flow-meters, gas composition analysis) and plasma technology (etch, deposition, and lamps). Prerequisites: ENGR 3300 and CE/EE 3310; (CE 3310 or EE 3310). Recommended: ENGR 3341. (Same as NANO 4391) (3-0) Y
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<tr>
<td>ee4392</td>
<td>EE 4392 Introduction to Optical Systems</td>
<td>Operating principles of optical communications systems and fiber optic communication technology. Lightwave fundamentals, characteristics of integrated optic waveguides and optical fibers, attenuation and dispersion, operating principles of optical sources, detectors and optical amplifiers, optical transmitters and receivers, modulation techniques, effect of noise in optical systems, system design fundamentals, network topologies. Prerequisites: CE/EE/TE 3302, (CE 3302 or EE 3302 or TE 3302), and EE 4301 and CE/EE 3340. (CE 3310 or EE 3310).</td>
<td>(3-0) T</td>
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<tr>
<td>engr3341</td>
<td>ENGR 3341 Probability Theory and Statistics</td>
<td>Axioms of probability, conditional probability, Bayes theorem, random variables, probability density/mass function (pdf/pmf), cumulative distribution function, expected value, functions of random variables, joint, conditional and marginal pdfs/pmf for multiple random variables, moments, central limit theorem, elementary statistics, empirical distribution correlation. Students cannot get credit for both CS/SE CS 3341 or SE 3341 and ENGR 3341. Prerequisite: MATH 2414 or MATH 2419. Recommended co-requisite: MATH 2420.</td>
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<tr>
<td>engr4334</td>
<td>ENGR 4334 Numerical Methods in Engineering</td>
<td>Computer arithmetic and error analysis. Solution of linear equations, roots of polynomial equations, interpolation and approximation, numerical differentiation and integration, solution of ordinary differential equations. Emphasis on engineering applications and numerical software. Students cannot get credit for both CS/MATH CS 4334 or MATH 4334 and ENGR 4334. Prerequisites: ENGR 2300, ENGR 3300, and knowledge of a high level programming language.</td>
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<tr>
<td>nano4391</td>
<td>NANO 4391 Technology of Plasma</td>
<td>Plasmas are critical to making the best electronic devices. This class will be an introduction to the technology required to make and use these plasmas. Topics include: high-vacuum technology (gas properties, pumps, pressure gauges, flowmeters, gas composition analysis) and plasma technology (etch, deposition, and lamps). Prerequisites: ENGR 3300 and CE/EE 3340. (CE 3310 or EE 3310). Recommended: ENGR 3341. (Same as EE 4391)</td>
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<tr>
<td>se3306</td>
<td>SE 3306 Mathematical Foundations of Software Engineering</td>
<td>Boolean logic, first-order logic, models of first-order logic. Introduction to program verification, applications in software engineering. Completeness Theorem. Regular expressions, regular sets, finite-state machines, and applications in software engineering. Graph Theory, graph algorithms. Statecharts, Petri Nets and their role in software engineering. Prerequisite: CE/CS/TE CE 2305 or CS 2305 or TE 2305 or equivalent.</td>
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<td>se3340</td>
<td>SE 3340 Computer Architecture</td>
<td>This course introduces the concepts of computer architecture by going through multiple levels of abstraction, and the numbering systems and their basic computations. It focuses on the instruction-set architecture of the MIPS machine, including MIPS assembly programming, translation between MIPS and C, and between MIPS and machine code. General topics include performance calculation, processor datapath, pipelining, and memory hierarchy. Students who have already completed CS 2310 or equivalent cannot receive credit for this course. Students cannot receive credit for both CS/SE/TE (CS 3340 or SE 3340 or TE 3340) and CE/EE 4304. Prerequisites: CE/CS/TE (CE 4304 or EE 4304). Prerequisites: (CE 1337 or CS 1337 or equivalent. TE 1337 or equivalent) and CS 2305. (Same as CS/TE 3340)</td>
<td>(3-0) S</td>
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<td>2011-2013</td>
<td>se3341 011353 se3341.8</td>
<td>SE 3341 Probability and Statistics in Computer Science and Software Engineering</td>
<td>(3 semester hours) Axiomatic probability theory, independence, conditional probability. Discrete and continuous random variables, special distributions of importance to CS/SE, and expectation. Simulation of random variables and Monte Carlo methods. Central limit theorem. Basic statistical inference, parameter estimation, hypothesis testing, and linear regression. Introduction to stochastic processes. Illustrative examples and simulation exercises from queuing, reliability, and other CS/SE applications. Students cannot get credit for both CS/SE 3341 and ENGR 3341. Prerequisites: MATH (MATH 1326 or MATH 2414 or MATH 2419, 2419), and CE/CS/TE 2305. (CE 2305 or CS 2305 or TE 2305). (Same as CS 3341 or STAT 3341)</td>
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<td>2012-2013</td>
<td>se3345 011354 se3345.6</td>
<td>SE 3345 Data Structures and Introduction to Algorithmic Analysis</td>
<td>(3 semester hours) Analysis of algorithms including time complexity and Big-O notation. Analysis of stacks, queues, and trees, including B-trees. Heaps, hashing, and advanced sorting techniques. Disjoint sets and graphs. Course emphasizes design and implementation. Students that completed CE/TE 3346 or TE 3346 cannot receive credit for this course. Prerequisites: CE/CS/TE (CE 2305 or CS 2305 or TE 2305) and CE/CS/TE 2336. Pre-</td>
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<td>(CE 2305 or CS 2305 or TE 2305). Pre- or corequisite: CE/CS/TE 3341 or SE 3341 or ENGR 3341. (Same as CE/CS/TE 3345 and CS 3345 and TE 3345) (3-0) S</td>
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<td>2012-2013</td>
<td>se3354 011355 se3354.6</td>
<td>SE 3354 Software Engineering</td>
<td>(3 semester hours) Introduction to software life cycle models. Software requirements engineering, formal specification and validation. Techniques for software design and testing. Cost estimation models. Issues in software quality assurance and software maintenance. Prerequisites: CE/CS/TE (CE 2305 or CS 3333, 2336 or TE 2336 or CS 3333), and CE/CS/TE (CE 2305 or CS 2305 or TE 2305 or equivalent. Pre- equivalent). Prerequisite or corequisite: ECS 3390. (Same as CE/CS CE 3354 and CS 3354)</td>
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<td>2012-2013</td>
<td>se3376 012838 se3376.5</td>
<td>SE 3376 C/C++ Programming in a UNIX Environment</td>
<td>(3 semester hours) Advanced programming techniques utilizing procedural and object oriented programming in a UNIX environment. Topics include file input and output, implementation of strings, stacks, queues, lists, and trees, and dynamic memory allocation/management. Design and implementation of a comprehensive programming project is required. Prerequisite: CE/CS/TE 2336 or CS 2336 or equivalent. Pre-</td>
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<td>CE/CS/TE 2336 or CS 2336 TE 2336 or equivalent. (Same as CS 3376)</td>
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<td>2011-2013</td>
<td>se4347 011361 se4347.4</td>
<td>SE 4347 Database Systems</td>
<td>(3 semester hours) This course emphasizes the concepts and structures necessary for the design and implementation of database management systems. Topics include data models, data normalization, data description languages, query facilities, file organization, index organization, file security, data integrity, and reliability. Prerequisite: CE/CS/SE/TE CSE 3345 or CS 3345 or SE 3345 or TE 3345. (Same as CS 4347)</td>
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<td>2012-2013</td>
<td>se4348 011362 se4348.5</td>
<td>SE 4348 Operating Systems Concepts</td>
<td>(3 semester hours) An introduction to fundamental concepts in operating systems: their design, implementation, and usage. Topics include process management, main memory management, virtual memory, I/O and device drivers, file systems, secondary storage management, and an introduction to critical sections and deadlocks. Prerequisites: CE/CS/TE (CS 3340 or equivalent, CE/CS/SE/TE 3345, SE 3340 or TE 3340 or equivalent), and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and a working knowledge of C and UNIX. (Same as CE/CS/TE 4348 and CS 4348 and TE 4348)</td>
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<td>CE/CS/TE (CS 3340 or equivalent, CE/CS/SE/TE 3345, SE 3340 or TE 3340 or equivalent), and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and a working knowledge of C and UNIX. (Same as CE/CS/TE 4348 and CS 4348 and TE 4348) (3-0) S</td>
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<td>se4351.5</td>
<td>SE 4351 Requirements Engineering (3 semester hours)</td>
<td>Introduction to system and software requirements engineering. The requirements engineering process, including requirements elicitation, specification, and validation. Essential words and types of requirements. Structural, informational, and behavioral requirements. Non-functional requirements. Scenario analysis. Conventional, object-oriented and goal-oriented methodologies. Prerequisites: SE 3306, CE/CS/SE and (CE 3354 or CS 3354 or SE 3354) or instructor consent required. (3-0)</td>
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<td>se4352.5</td>
<td>SE 4352 Software Architecture and Design (3 semester hours)</td>
<td>Introduction to software design with emphasis on architectural design. Models of software architecture. Architecture styles and patterns, including explicit, event-driven, client-server, and middleware architectures. Decomposition and composition of architectural components and interactions. Use of non-functional requirements for tradeoff analysis. Component based software development, deployment and management. Prerequisites: SE 3306, CE/CS/SE and (CE 3354 or CS 3354 or SE 3354) or instructor consent required. (3-0)</td>
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<td>se4367.5</td>
<td>SE 4367 Software Testing, Verification, Validation and Quality Assurance (3 semester hours)</td>
<td>Methods for evaluating software for correctness and reliability, including code inspections, program proofs and testing methodologies. Formal and informal proofs of correctness. Code inspections and their role in software verification. Unit and system testing techniques, testing tools and limitations of testing. Statistical testing, reliability models. Prerequisites: SE 3306, CE/CS/SE and (CE 3354 or CS 3354 or SE 3354) or instructor consent required. (3-0)</td>
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<td>se4376.5</td>
<td>SE 4376 Object-Oriented Programming Systems (3 semester hours)</td>
<td>In-depth study of the features/advantages of object-oriented approach to problem solving. Special emphasis on issues of object-oriented analysis, design, implementation, and testing. Review of basic concepts of object-oriented technology (abstraction, inheritance, and polymorphism). Object-oriented programming languages, databases, and productivity tools. Prerequisite: CE/CS/TE CE 2336 or CS 2336 or TE 2336 or equivalent. (Same as CS 4376)</td>
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<td>se4381.5</td>
<td>SE 4381 Software Project Planning and Management (3 semester hours)</td>
<td>Planning and managing of software development projects. Software process models, ISO 9000, SEI's Capability Maturity Model, continuous process improvement. Planning, scheduling, tracking, cost estimation, risk management, configuration management. Prerequisite: CE/CS/SE CE 3354 or CS 3354 or SE 3354. (3-0)</td>
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<td>te1337.2</td>
<td>TE 1337 (COSC 1337) Computer Science I (3 semester hours)</td>
<td>Introduction to object-oriented software analysis, design, and development. Classes and objects. Object composition and polymorphism. Sorting, searching, recursion. Strings using core classes. Inheritance and interfaces. Graphical User Interfaces. Includes a comprehensive programming project. Prerequisite: CS 1336 with a grade of C or better or equivalent. (Same as CE/CS/TE CE 1337 and CS 1337)</td>
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<td>te2305.4</td>
<td>TE 2305 (MATH 2305) Discrete Mathematics for Computing I (3 semester hours)</td>
<td>Principles of counting. Logic and proof methods, including induction. Basic recurrence relations. Basics of algorithm complexity. Sets, relations, functions. Elementary graph theory. Elementary number theory. Students cannot get credit for both TE 2305 and CE/CS/TE CE 3307 or TE 3307. Prerequisite: MATH 1326 or MATH 2413 or MATH 2417. (Same as CE/CS/CE 2305 and CS 2305)</td>
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<td>TE 2336</td>
<td>Computer Science II</td>
<td>Exceptions and number formatting. File input/output using Stream classes. Implementation of primitive data structures, including linked lists (all types), stacks, queues, and binary trees. Advanced data manipulation using core classes. Introduction to multi-threading, multimedia, and networking. Includes a comprehensive programming project. Prerequisite: CE/CS/TE CE 1337 or CS 1337 or TE 1337. Prerequisite or corequisite: CE/CS/TE CE 2305 or CS 2305 or TE 2305. (Same as CE/CS CE 2336 and CS 2336)</td>
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<td>TE 3101</td>
<td>Electrical Network Analysis Laboratory</td>
<td>Laboratory to accompany TE 3301. Design, assembly and testing of linear electrical networks and systems. Use of computers to control electrical equipment and acquire data. Prerequisites: CE/EE/TE CE 1202 or EE 1202 or TE 1202) and RHET 1302. Corequisite: TE 3301. (Same as CE/EE CE 3101 and EE 3101)</td>
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<td>TE 3102</td>
<td>Signals and Systems Laboratory</td>
<td>Laboratory based on MATLAB and LabVIEW to provide implementation experience on topics covered in TE 3302. Laboratory experiments cover linear time-invariant systems, convolution, Fourier series, continuous Fourier transform, sampling, discrete Fourier transform, analog and digital filtering. Each lab is followed by a design application. Corequisite: TE 3302. Prerequisite: RHET 1302. (Same as CE/EE CE 3102 and EE 3102)</td>
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<td>TE 3150</td>
<td>Communications Systems Laboratory</td>
<td>Laboratory to accompany TE 3350. Fundamental elements of communications systems hardware; use of spectrum analyzers and other measurement instruments typically encountered in communication systems; design of active filters in communications systems; analog frequency and amplitude modulators and demodulators; data communication systems. Corequisite: TE 3350. Prerequisite: (CE 3301 or EE 3301 or TE 3301) and RHET 1302. (Same as EE 3150)</td>
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<td>TE 3301</td>
<td>Electrical Network Analysis</td>
<td>Analysis and design of RC, RL, and RLC electrical networks. Sinusoidal steady state analysis of passive networks using phasor representation; mesh and nodal analyses. Introduction to the concept of impulse response and frequency analysis using the Laplace transform. Prerequisites: MATH 2420 and PHYS 2326. Corequisite: TE 3101. (Same as CE/EE CE 3301 and EE 3301)</td>
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<td>TE 3302</td>
<td>Signals and Systems</td>
<td>Introduces the fundamentals of continuous and discrete-time signal processing. Linear system analysis including convolution and impulse response, Fourier series, Fourier transform and applications, discrete-time signal analysis, sampling and z-transform. Prerequisite: ENGR 3300. Corequisite: TE 3102. (Same as CE/EE CE 3302 and EE 3302)</td>
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<td>TE 3340</td>
<td>Computer Architecture</td>
<td>(3 semester hours) This course introduces the concepts of computer architecture by going through multiple levels of abstraction, and the numbering systems and their basic computations. It focuses on the instruction-set architecture of the MIPS machine, including MIPS assembly programming, translation between MIPS and C, and between MIPS and machine code. General topics include performance calculation, processor datapath, pipelining, and memory hierarchy. Students who have already completed CS 2310 or equivalent cannot receive credit for this course. Students cannot receive credit for both CS/SE/TE (CS 3340 or SE 3340 or TE 3340) and CE/EE 4304. Prerequisite: CE/CS/TE (CE 4304 or EE 4304). Prerequisites: (CE 1337 or CS 1337 or equivalent) TE 1337 or equivalent) and CS 2305. (Same as CS/SE/TE 3340) CS 3340 or SE 3340</td>
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<td>TE 3345</td>
<td>Data Structures and Introduction to Algorithmic Analysis</td>
<td>(3 semester hours) Analysis of algorithms including time complexity and Big-O notation. Analysis of stacks, queues, and trees, including B-trees. Heaps, hashing, and advanced sorting techniques. Disjoint sets and graphs. Course emphasizes design and implementation. Students that completed CE/TE CE 3346 or TE 3346 cannot receive credit for this course. Prerequisites: CE/CS/TE (CE 2305 or CS 2305 or TE 2305) and CE/CS/TE 3336. Pre- (CE 2336 or CS 2336 or TE 2336). Prerequisite or corequisite: CS/SE (CS 3341 or SE 3341) or ENGR 3341. (Same as CE/CS/SE CE 3345 and CS 3345 and SE 3345)</td>
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<td>TE 3350</td>
<td>Communications Systems</td>
<td>(3 semester hours) Fundamentals of communications systems. Review of probability theory and Fourier transforms. Filtering and noise. Modulation and demodulation techniques, including amplitude, phase, and pulse code. Time division multiplexing. This class may be offered as either regular or honors sections (H). Prerequisites: ENGR 3300, CE/EE/TE 3302, 3300 and (CE 3301 or EE 3301 or TE 3301) and (CE 3302 or EE 3302 or TE 3302) and ENGR 3341. Corequisite: EE/TE EE 3150 or TE 3150. (Same as EE 3350)</td>
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<td>TE 4141</td>
<td>Digital Systems Laboratory</td>
<td>(1 semester hour) Laboratory to accompany TE 4341. The purpose of this laboratory is to give students an intuitive understanding of digital circuits and systems. Laboratory exercises include construction of simple digital logic circuits using prototyping kits and board-level assembly of a personal computer. Students who have already completed CS 2110 cannot receive credit for this course. Corequisite: CS/TE CS 4341 or TE 4341. (Same as CS 4141)</td>
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<td>TE 4341</td>
<td>Digital Logic and Computer Design</td>
<td>(3 semester hours) Boolean algebra and logic circuits; synchronous sequential circuits; gate level design of ALUSU, registers, and memory unit; register transfer operations; design of data path and control unit for a small computer; Input-Output interface. Students cannot receive credit for both CS/TE (CS 4341 or TE 4341) and CE/EE 3320. (CE 3320 or EE 3320). Prerequisites: CE/EE (CE 2310 or CS/SE/TE EE 2310) or (CS 3340 or SE 3340 or TE 3340) and PHYS 2326. Corequisite: CS/TE 4441 (CS 4141 or TE 4141). (Same as CS 4341)</td>
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<td>TE 4348</td>
<td>Operating Systems Concepts</td>
<td>(3 semester hours) An introduction to fundamental concepts in operating systems: their design, implementation, and usage. Topics include process management, main memory management, virtual memory, I/O and device drivers, file systems, secondary storage management, and an introduction to critical sections and deadlocks. Prerequisites: CS/SE/TE (CS 3340 or equivalent, CE/CS/SE/TE 3345, SE 3340 or TE 3340 or equivalent), and (CE 3345 or CS 3345 or SE 3345 or TE 3345), and a working knowledge of C and UNIX. (Same as CE/CS/SE CE 4348 and CS 4348 and SE 4348)</td>
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<td>te4360</td>
<td>TE 4360 Digital Communications (3 semester hours)</td>
<td>Information, digital transmission, channel capacity, delta modulation, and differential pulse code modulation are discussed. Principles of coding and digital modulation techniques such as Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Continuous Phase Frequency Shift Keying (CPFSK) are introduced. M-ary signaling such as Quadrature amplitude and phase shift keying, and M-ary PSK and FSK are also discussed. Prerequisite: EE/TE 3350 or TE 3350. (Same as EE 4360)</td>
<td>(EE/TE 3350 or EE 3350) or TE 3350. (Same as EE 4360)</td>
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<td>te4361</td>
<td>TE 4361 Introduction to Digital Signal Processing (3 semester hours)</td>
<td>Introduction to the analysis and design of discrete linear systems, and to the processing of digital signals. Topics include time and frequency domain approaches to discrete signals and systems, the Discrete Fourier Transform and its computation, and the design of digital filters. Prerequisite: CE/EE/TE 3302 or EE 3302 or TE 3302. (Same as EE 4361)</td>
<td>(EE/TE 3350 or EE 3350) or TE 3350. (Same as EE 4361)</td>
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<td>te4365</td>
<td>TE 4365 Introduction to Wireless Communication (3 semester hours)</td>
<td>Introduction to the basic system concepts of cellular telephony. Mobile standards, mobile system architecture, design, performance and operation. Voice digitization and modulation techniques: PCS technologies. Prerequisite: EE/TE 3350 or TE 3350. (Same as EE 4365)</td>
<td>(EE/TE 3350 or EE 3350) or TE 3350. (Same as EE 4365)</td>
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<td>te4367</td>
<td>TE 4367 Telecommunication Networks (3 semester hours)</td>
<td>Trunking and queuing, switching technologies: voice, data, video, circuit switching and packet switching, transmission technologies and protocols, transmission media - copper, fiber, microwave, satellite, protocols - bipolar formats, digital hierarchy, optical hierarchy, synchronization, advanced switching protocols and architectures; frame relay, ATM, HDTV, SONET. Prerequisite or Corequisite: EE/TE 3350 or TE 3350. (Same as EE 4367)</td>
<td>(EE/TE 3350 or EE 3350) or TE 3350. (Same as EE 4367)</td>
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<td>te4388</td>
<td>TE 4388 Senior Design Project I (3 semester hours)</td>
<td>First of two sequential semesters devoted to a team project that engages students in the full engineering design process. The goal of senior design projects is to prepare the student to run/participate in engineering projects related to an appropriate industry. Thus, all project teams are to follow standard industrial practices and methods. Teams must carry the engineering project to completion, examining real world and multiple design constraints, following applicable industrial and business standards. Such constraints may include but are not limited to: economic, environmental, industrial standards, team time/resource management and cross-disciplinary/departmental result integration. Students are required to work in teams that include collaborative design interaction. Additionally, cross-disciplinary teams are encouraged but not required. In Senior Design I, project proposals will be written, reviewed and approved. Initial designs will be completed and corresponding constraints will be determined. All students will participate in a public oral and poster presentation following departmental approved guidelines at a departmental approved time and location. Teams will also submit a written end of semester progress report and documented team communication (complete sets of weekly reports and/or log books) following guidelines approved by the faculty. Students must have completed ECS 3390 and one of the following prerequisite sequences: [(CE/EE 3311, CE/EE 3320, CE/CS/SE/TE 3345, (CE 3311 or EE 3311), and (CE 3320 or EE 3320), and CE/CS/SE 3354), (CE 3345 or (ENGR CS 3345 or SE 3345 or TE 3345), and (CE 3354 or CS 3354 or SE 3354)), or ((ENGR 3300, CE/EE/TE 3302, CE/EE 3311, and CE/EE 3320), (CE 3302 or EE 3302 or (ENGR TE 3302), and (CE 3311 or EE 3311), and (CE 3320 or EE 3320)), or ((ENGR 3300, CE/EE/TE 3302, and CE/CS/SE/TE 3345; or (CE 3302 or EE 3302 or TE 3302), and (CE 3345 or CS 3345 or SE 3345 or TE 3345)); prerequisite or corequisite: EE/TE 3350]. (EE 3350 or TE 3350. (Same as CE/EE 4388 and EE 4388)</td>
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### TE 4389 Senior Design Project II (3 semester hours)
Continuation of the Senior Design project begun in the previous semester. In Senior Design II, projects based on approved project proposals will be completed. All limitations of the design will be determined and addressed. All students will participate in a public oral presentation following faculty-approved guidelines at a faculty-approved time and location. Teams will also submit a written final report and documented team communication (complete sets of weekly reports and/or log books) following faculty-approved guidelines. Prerequisite: CE/EE/TE CE 4388 or EE 4388 or TE 4388. (Same as CE/EE CE 4389 and EE 4389) (3-0) S

### TE 4390 Computer Networks (3 semester hours)
The design and analysis of computer networks. Topics include the ISO reference model, transmission media, medium-access protocols, LANs, data link protocols, routing, congestion control, internetworking, and connection management. Students cannot get credit for both CE/CS/TE (CE 4390 or CS 4390 or TE 4390) and EE 4390. Prerequisite: CE/CS/SE/TE CE 3345 or CS 3345 or SE 3345 or TE 3345 or equivalent. (Same as CE/CS CE 4390 and CS 4390) (3-0) S
### Undergraduate Catalog 2013 - Course Change Requests

#### School of Interdisciplinary Studies

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<td>2000-2013</td>
<td>ams3302 000412 ams3302.3</td>
<td>AMS 3302 American Cultures (3 semester hours) Study of contemporary American cultures. <strong>Examines The course examines</strong> institutions, culture regions, and the interaction between mainstream American culture and various subcultures. (3-0) Y</td>
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<td>2000-2013</td>
<td>ams3326 000435 ams3326.5</td>
<td>AMS 3326 The U.S. in the 21st Century (3 semester hours) An exploration of 21st-century <strong>scenarios for the U.S. by studying the trends in realities of the 1990s. U.S., including economic crisis and sociocultural changes.</strong> The course <strong>also</strong> examines the future roles of the U.S. in the world community. (3-0) T</td>
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<td>2004-2013</td>
<td>ams4304 000449 ams4304.2</td>
<td>AMS 4304 Communication in America (3 semester hours) <strong>Examines This course examines</strong> the basic verbal and non-verbal elements affecting communication in American society. Perspectives to be addressed include communication across cultures, gender differences in communication, interpersonal communication styles, and communication in peer groups, families, and work contexts. In addition, the effects of technology on communication and its impact on individuals and society will be explored. (3-0) T</td>
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<td>2010-2013</td>
<td>ams4360 000454 ams4360.3</td>
<td>AMS 4360 Rebels and Reformers: Women and Alcohol in America (3 semester hours) <strong>Examines This course examines</strong> women's historical role as crusaders against alcohol and identifies how the role of reformer was gendered. Identifies the genesis of the disease concept of alcoholism and how it was applied to women and men in different ways. <strong>Examines This course also examines</strong> gendered ideas about male and female drinking and how they are represented in popular culture, literature, and film. (Same as GST 4360) (3-0) T</td>
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<td>2012-2013</td>
<td>bis1100 013862 bis1100.2</td>
<td>BIS 1100 Interdisciplinary Studies Freshman Seminar (1 semester hour) This course is designed to introduce students to the programs offered through the School of Interdisciplinary Studies and to assist students adjust to university life. <strong>Corequisite:</strong> UNIV 1010. (1-0) Y</td>
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<td>2010-2013</td>
<td>gst4360 012869 gst4360.2</td>
<td>GST 4360 Rebels and Reformers: Women and Alcohol in America (3 semester hours) <strong>Examines This course examines</strong> women's historical role as crusaders against alcohol and identifies how the role of reformer was gendered. Identifies the genesis of the disease concept of alcoholism and how it was applied to men and women in different ways. <strong>Examines This course also examines</strong> gendered ideas about male and female drinking and how they are represented in popular culture, literature, and film. (Same as AMS 4360) (3-0) T</td>
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<td>2012-2013</td>
<td>hlth1100 012710 hlth1100.3</td>
<td>HLTH 1100 Career Explorations for the Health Professions (1 semester hour) Centered on guest speakers, this one hour course aims to develop a holistic approach for healthcare and to explore the realities of various health professions. Students will investigate many options for present and next-generation health careers, and learn what courses and activities will open doors to their areas of interest. Appropriate for any level student. <strong>Students must Instructor's permission is required to register for this course through the Health Professions Advising Center.</strong> (1-0) Y</td>
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### HLTH 3300 Pre-Health Professional Development (3 semester hours)
This course will introduce students to the concept of professionalism within a healthcare context including issues of appropriate personal attributes and expectations, ethical decision making, interpersonal communication, and self-appraisal. It will also have an overview of the history of medicine in the U.S., and examination of current issues in healthcare and discussions about personal enrichment through research, clinical activities, and study abroad experiences. Must be at least a sophomore. **Students must have Instructor’s permission is required to register for this course through the Health Professions Advising Center.**

| 2012-2013 | hlt4v01 012873 hlt4v01.4 | HLTH 4V01 Health Professions Independent Study (1-6 semester hours) Independent study under a faculty member’s direction. May be repeated for credit (6 hours maximum). **Consent of the Health Professions Advising Center’s consent required.** (1-6-0) R |
| 2012-2013 | hlt4v04 012874 hlt4v04.6 | HLTH 4V04 4304 Health Professions Internship (1-6) (3 semester hours) The internship provides students with exposure to a professional healthcare environment, interaction with a variety of disciplines, application of theory to practice and the opportunity to clarify career goals. The learning experience is faculty supervised and requires journal documentation and a research paper. The internship must be approved by the instructor before commencing the internship. **Instructor's permission is required to register for the class.** May be repeated for credit (6 hours maximum). (1-6-0) S |
| 2013-2013 | isis3309 2 | ISIS 3309 Dental Anthropology (3 semester hours) An introduction to the wealth of knowledge that can be ascertained through analysis of the dentition of archaeological and modern populations. (3-0) Y |
| 2013-2013 | isis3350 3 | ISIS 3350 World Archaeology (3 semester hours) A look at archaeology from a global perspective. This course will include theory, methods, and analytical techniques used to reconstruct past cultures. (3-0) Y |
| 2013-2013 | isisv70 5 | ISIS 3V70 Teaching Internship (1-3 semester hours) Students work individually with faculty members in preparing and presenting course materials and tutoring students. Instructor and Associate Dean’s consent required. Taken on a credit/no credit basis. Can be repeated (6 maximum hours). Must have completed the relevant course with a grade of at least B and have a UT Dallas GPA of at least 3.000. (1-3-0) S |

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### HLTH 2100 Directed Readings in Healthcare (1 semester hour)
Directed reading course covering topics in healthcare, healthcare-related settings and biomedical research. Students will be exposed to a variety of topics relevant to healthcare and preparation for careers in the health professions. Sophomores only. **Permission of the Health Professions Advising Center required.**

| 2010-2013 | hlt2100 012870 hlt2100.2 | HLTH 2100 Directed Readings in Healthcare (1 semester hour) Directed reading course covering topics in healthcare, healthcare-related settings and biomedical research. Students will be exposed to a variety of topics relevant to healthcare and preparation for careers in the health professions. Sophomores only. **Permission of the Health Professions Advising Center required.** May be repeated for credit as topics vary (2 hours maximum). (1-0) Y |
### Undergraduate Catalog 2013 - Course Change Requests

| 2011-2013 | hlth4000 013650 hlth4000 .2 | -- request to remove this course from catalog -- **HLTH 4000 Health Professions Evaluation (HPE) Process (0 semester hours)** Coverage of all aspects of the admissions process to medical, dental or optometry schools. Topics include self-assessment, application preparation, deadlines relevant to the application process, personal statement writing, interviewing skills, submitting letters of recommendation and other details regarding applying to professional school. Offered in spring and summer sessions only for students applying to professional schools in the summer. Students must register through the Health Professions Advising Center. (0-0) Y | remove review pending | cbg13003 0 2012-11-1 5 14:22:11 |

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<td>2012-2013</td>
<td>acct2301 000061 acct2301 .5</td>
<td>ACCT 2301 (ACCT 2301) Introductory Financial Accounting (3 semester hours) An introduction to business financial reporting designed to create an awareness of the accounting concepts and principles for preparing the three basic financial statements: the income statement, balance sheet, and statement of cash flows. The course is designed to benefit all business students who will be future users of accounting information. Students must earn a grade of C or better to progress to ACCT 2302. (3-0) S</td>
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<td>2012-2013</td>
<td>acct3320 000074 acct3320 .4</td>
<td>ACCT 3320 Financial Information Management (3 semester hours) This course is a study of the corporate financial reporting process and the use of financial statements by investors and analysts. Students use financial reports prepared by publicly-traded companies to study how financial statements and other information is prepared, communicated and used by managers, investors and other decision-makers. <strong>Accounting majors may not use the course as an accounting elective.</strong> Prerequisite: ACCT 2301. (3-0) S</td>
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<td>2012-2013</td>
<td>acct3322 000076 acct3322 .4</td>
<td>ACCT 3322 Integrated Accounting Information Systems (3 semester hours) Employs SAP software or similar enterprise systems software to illustrate the fundamental concepts of integrated information systems. Prerequisites: ACCT 2301, 2301 and ACCT 2302, 2302 and (MATH 1326 or MATH 2414 or MATH 2419), and (MATH 2333 or MATH 2418 or MATH 2415 or CS 2305 or OPRE 3333). (3-0) Y</td>
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<td>2012-2013</td>
<td>acct3331 000077 acct3331 .10</td>
<td>ACCT 3331 Intermediate Financial Accounting I (3 semester hours) A study of external financial reporting, including measuring and reporting of cash, receivables, inventories, investments, property, plant and equipment, and intangibles. <strong>Financial statement presentation issues are analyzed to gain an appreciation for the impact of generally accepted accounting principles on business decisions.</strong> for financial reporting are analyzed. Prerequisites: (MATH 1326 or MATH 2414 or MATH 2419), and (MATH 2333 or MATH 2418 or MATH 2415 or CS 2305 or OPRE 3333) and ACCT (ACCT 2301 with a minimum grade of C, C), and ACCT (ACCT 2302 with a minimum grade of C, C). (3-0) S</td>
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<td>2012-2013</td>
<td>acct3341 000081 acct3341 .9</td>
<td>ACCT 3341 Cost Management Systems (3 semester hours) A study of business management’s internal accounting information needs as they pertain to cost control and containment. Emphasis is on the processes of business planning, controlling, and decision making. Topics include cost behavior, cost allocation, budgeting, and performance measurement. Prerequisites: (MATH 1326 or MATH 2414 or MATH 2419), and (MATH 2333 or MATH 2418 or MATH 2415 or CS 2305 or OPRE 3333) and (ACCT 2301 with a minimum grade of C, C), and ACCT (ACCT 2302 with a minimum grade of C, C). (3-0) Y</td>
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<td>2012-2013</td>
<td>acct3350 013786 acct3350 .2</td>
<td>ACCT 3350 Fundamentals of Taxation (3 semester hours) Introduction to the role of taxes in today’s society and their impact on individuals and business entities; emphasis on federal income taxation. Prerequisites: BLAW 2301, 2301 and ACCT (ACCT 2301 with a minimum grade of C, C), and ACCT (ACCT 2302 with a minimum grade of C, C). (3-0) S</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<tr>
<td>acct4300.014013 acct4300.3</td>
<td>ACCT 4300 Database Fundamentals (3 semester hours) Introduces the basic concepts for the design and development of relational databases and database management. Topics include entity-relationship data model, logical database design, data administration, Structured Query Language, and database management issues, such as concurrency control, data security, and integrity. A database management system software package is used to implement working database systems. <strong>Neither</strong> ACCT 4300 and MIS 4300 can be used to satisfy degree requirements. <strong>Requirements for BS MIS majors.</strong> Prerequisites: ACCT 2301, ACCT 2302, MIS 3300 and (MATH 1325 or MATH 2413 or MATH 2417). (Same as MIS 4300) (3-0) Y</td>
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<td>acct4334.000092 acct4334.6</td>
<td>ACCT 4334 Auditing (3 semester hours) Basic concepts, philosophy, standards, procedures, and practices of auditing are presented. Topics include generally accepted auditing standards, the changing role of the independent auditor in society, professional conduct and ethics, auditor's reporting responsibilities, risk assessment, internal control, fraud, evidential matter, and the computer in auditing in the global economy. <strong>Evidence matter.</strong> Prerequisite: ACCT 3331 with a minimum grade of C. (3-0) Y</td>
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<td>acct4336.000094 acct4336.4</td>
<td>ACCT 4336 Financial Statement Analysis (3 semester hours) Financial statements are analyzed from the user's prospective. Broad concepts are illustrated with applications to different companies. Topics include comparative analysis, earnings management and ethics in financial reporting. Prerequisite: ACCT 3331 with a minimum grade of C. (3-0) Y</td>
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<td>acct4342.000096 acct4342.11</td>
<td>ACCT 4342 Analysis and Design of Accounting Systems (3 semester hours) Students are introduced to accounting system analysis and design tools and methods. The course emphasizes business processes, accounting transaction flows, internal control and accounting information systems as part of enterprise systems. <strong>Prerequisite:</strong> ACCT 3332. <strong>Prerequisites:</strong> (ACCT 3331 with a minimum grade of C) and <strong>Corequisite:</strong> (Prerequisite or corequisite: ACCT 3332). (Same as MIS 4342) (3-0) S</td>
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<td>acct4365.013977 acct4365.2</td>
<td>ACCT 4365 Real Estate Accounting, Taxation and Legal Concepts (3 semester hours) This course provides a study review of accounting, tax and legal issues affecting the real estate industry. Material includes special rules used by owners and developers of real estate. <strong>May not be used to satisfy degree requirements for majors in accounting.</strong> Prerequisite: ACCT 2301, 3320 or ACCT 3331. (Same as REAL 4365) (3-0) R</td>
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<td>acct4380.000101 acct4380.5</td>
<td>ACCT 4380 Internship in Accounting (3 semester hours) This course provides students with an opportunity to expand and apply their skills in accounting in a professional setting. The accounting student will be required to apply knowledge obtained at the University in an actual job situation. <strong>Credit/No Credit.</strong> (3-0) Y</td>
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<td>ba1100.013788 ba1100.2</td>
<td>BA 1100 Business Basics (1 semester hour) This course is an introduction to the study of business, with exposure to each of the business disciplines. Students will be introduced to the functional areas of business, learn about social entrepreneurship, begin to plan their business careers, and present a simple business plan. Required for all freshman Naveen Jindal School of Management majors; open to all non-School of Management majors. <strong>Corequisite:</strong> Corequisite: UNIV 1010. (1-0) S</td>
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<td>ba4010.014126 ba4010.3</td>
<td>BA 4010 <strong>SIFE ENACTUS</strong> Participation (0 semester hours) This course is designed for students participating in <strong>Students in Free Enterprise Enactus</strong> for zero course credit. Students in <strong>SIFE Enactus</strong> partner with business and education leaders to take lessons learned in the classroom out to local communities in need of assistance. Instructor consent required. May be repeated. (3 attempts maximum). <strong>Graded Credit/No Credit.</strong> (0-1) S</td>
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<td>ba4199</td>
<td>BA 4199 Senior Honors in Business Administration (1 semester hour)</td>
<td>For students conducting independent research for honors theses or projects.</td>
<td>Prerequisite: BA 4299. Corequisite: BA 4299. (1-0) S</td>
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<td>ba4v10</td>
<td>BA 4V10 SIFE ENACTUS Service (1-3 semester hours)</td>
<td>This course is designed for students participating in Enactus. Students in Free Enterprise, Students in SIFE Enactus partner with business and education leaders to take lessons learned in the classroom out to local communities in need of assistance. Working with the community, the students develop quality community outreach programs that focus on one or more of eight core areas: (1) market economics, (2) entrepreneurship, (3) financial literacy, (4) success skills, (5) environmental sustainability, (6) business ethics, (7) female empowerment, and (8) support of the military. These projects will be developed and applied with the intent of creating a better business or educational situation for the community. The target group for these projects will be aspiring entrepreneurs, struggling business owners, low-income families, and school children. Instructor consent required. May be repeated for credit (3 hours maximum). Graded Credit/No Credit. (1-3-0) S</td>
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<td>ba4v90</td>
<td>BA 4V90 Management Internship (1-3 semester hours)</td>
<td>This course is designed to further develop a student's business knowledge through appropriate developmental work experiences in a real business environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum). Credit/No Credit. (1-3-0) S</td>
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<td>bcom210</td>
<td>BCOM 2101 Basic Business Communication</td>
<td>This course will provide an introduction to business writing and speaking with a particular emphasis on grammar, sentence structure, thought formation, and presentation skills. Class activities will emphasize communication in real-world business situations and enable students to begin developing their ability to write and speak effectively in the workplace. (1-0) S</td>
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<td>bcom332</td>
<td>BCOM 3320 Business Communication, Communication, Practices, and Culture: Spain and Latin America (3 semester hours)</td>
<td>This course prepares students to maneuver the business environment in Spain and Latin America with a focus on technical communications, business practices, and the culture of business. Basic language skills are necessary to be able to more fully appreciate the business nuances involved in international business. Prerequisites: SPAN 1311 and SPAN 1312 or equivalent. (3-0) Y</td>
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<td>bcom332</td>
<td>BCOM 3321 Business Communication, Communication, Practices, and Culture: China (3 semester hours)</td>
<td>This course prepares students to maneuver the business environment in China with a focus on technical communications, business practices, and the culture of business. Basic language skills are necessary to be able to more fully appreciate the business nuances involved in international business. Prerequisites: CHIN 1311 and CHIN 1312 or equivalent. (3-0) Y</td>
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<td>2012-2013</td>
<td>bcom332 2</td>
<td>BCOM 3322 Business Communications, Communication, Practices, and Culture: Japan (3 semester hours)</td>
<td>This course prepares students to maneuver the business environment in Japan with a focus on technical communications, business practices, and the culture of business. Basic language skills are necessary to be able to more fully appreciate the business nuances involved in international business. Prerequisites: JAPN 1311 and JAPN 1312 or equivalent. (3-0) Y</td>
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<td>2012-2013</td>
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<td>BCOM 3323 Business Communications, Communication, Practices, and Culture: Germany (3 semester hours)</td>
<td>This course prepares students to maneuver the business environment in Germany with a focus on technical communications, business practices, and the culture of business. Basic language skills are necessary to be able to more fully appreciate the business nuances involved in international business. Prerequisites: GERM 1311 and GERM 1312 or equivalent. (3-0) Y</td>
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<td>2012-2013</td>
<td>bcom435 0</td>
<td>BCOM 4350 Advanced Business Communications Communication (3 Semester hours)</td>
<td>This course will expand communications intelligence builds on BCOM 3311 by helping students work towards mastery of three advanced critical communication competencies: business speaking, professional use of social media/technology in the workplace, in/for work, and the development of a professional online presence. This project based course Students will result gain experience engaging in the full complement many different kinds of oral communication skills for business, both individually and confidence that will enrich the student's work and position in the workforce. teams. Prerequisites: ACCT/BCOM BCOM 3311 and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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<td>2013-2013</td>
<td>blaw4310</td>
<td>BLAW 4310 Current Issues in Business and Law (3 semester hours)</td>
<td>This class will explore current business and legal issues. Topics covered will likely include employment issues, government regulation, social media and copyright, marketing, ethical business decision making, negligence, Constitutional issues, and many others. Prerequisite: BLAW 2301. (3-0) Y</td>
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<tr>
<td>2012-2013</td>
<td>bps4305 0</td>
<td>BPS 4305 Strategic Management (3 semester hours)</td>
<td>Capstone-level course requiring integration of all fields of business. Students will draw on their broadened awareness of various environmental influences (social and political) to solve business problems. Management alternatives will be examined with an ethical perspective relating policy trends to the strategic planning mode. Prerequisites: (BCOM 3311 or ACCT 3311), and FIN 3320, 3320 and MIS 3300, 3300 and OPRE 3310, 3310 and OBHR 3310, 3310 and MKT 3300 3300 and (STAT 3360 or OPRE 3360). (3-0) S</td>
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<td>2012-2013</td>
<td>bps4307 0</td>
<td>BPS 4307 Corporations, Politics and Society (3 semester hours)</td>
<td>Overview of the corporation as a political participant in the American political system. Topics include corporate political action committees, business lobbying, grassroots programs, Federal Election Campaign Act, and labor involvement. Prerequisite: BCOM 3311 or ACCT 3311. (3-0) Y</td>
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### ENTP 3301 Entrepreneurship (3 semester hours)
Explores all aspects of entrepreneurship and the process of creating new ventures. Topics include innovation and entrepreneurship and the roles of both in the domestic and international economies, opportunity recognition and evaluation, feasibility analysis and validation of assumptions, customer identification, value propositions, business models, market entry strategies, bootstrapping, venture finance, and legal considerations. Student teams will develop a business concept, prepare a preliminary business plan and prepare and present an investor overview presentation. **Prerequisite:** ACCT 2301. Sophomore standing. (3-0) Y

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<td>entp3301</td>
<td>ENTP 3301</td>
<td>ENTP 3301 Entrepreneurship (3 semester hours) Explores all aspects of entrepreneurship and the process of creating new ventures. Topics include innovation and entrepreneurship and the roles of both in the domestic and international economies, opportunity recognition and evaluation, feasibility analysis and validation of assumptions, customer identification, value propositions, business models, market entry strategies, bootstrapping, venture finance, and legal considerations. Student teams will develop a business concept, prepare a preliminary business plan and prepare and present an investor overview presentation. <strong>Prerequisite:</strong> ACCT 2301. Sophomore standing. (3-0) Y</td>
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### ENTP 3320 The Entrepreneurial Experience Start-up Launch I (3 semester hours)
Provides an opportunity for a student or a student team to continue the development of a business concept developed in ENTP 3301 or selected as and proceed toward the launch of a finalist in business. The course will follow a structured and defined methodology for the UT Dallas Business Idea Competition. Teams will be assigned. Teams will enter into an agreement with the assigned faculty mentor with respect to resources, milestones, and deliverables and will be provided with access to a concept, approved prior to registration in the course. Participant business ideas can come from many sources, including concepts or ideas developed in other entrepreneurship courses or during the Business Idea Competition. Additional resources including office and space or laboratory facilities of the UT Dallas Venture Development Center, and additional resources Center may be applied for. Additionally, as required upon concepts are refined, student teams may modify or pivot their approach during the achievement of mutually agreed milestones. Semester with faculty support. Students will enroll and complete the course either individually or as a venture team. Prerequisite: ENTP 3301 and approval of the supervising faculty. Instructor consent required. (3-0) Y

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<th>Description</th>
<th>Prerequisites</th>
<th>Credits</th>
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<tbody>
<tr>
<td>entp3320</td>
<td>ENTP 3320</td>
<td>ENTP 3320 The Entrepreneurial Experience Start-up Launch I (3 semester hours) Provides an opportunity for a student or a student team to continue the development of a business concept developed in ENTP 3301 or selected as and proceed toward the launch of a finalist in business. The course will follow a structured and defined methodology for the UT Dallas Business Idea Competition. Teams will be assigned. Teams will enter into an agreement with the assigned faculty mentor with respect to resources, milestones, and deliverables and will be provided with access to a concept, approved prior to registration in the course. Participant business ideas can come from many sources, including concepts or ideas developed in other entrepreneurship courses or during the Business Idea Competition. Additional resources including office and space or laboratory facilities of the UT Dallas Venture Development Center, and additional resources Center may be applied for. Additionally, as required upon concepts are refined, student teams may modify or pivot their approach during the achievement of mutually agreed milestones. Semester with faculty support. Students will enroll and complete the course either individually or as a venture team. Prerequisite: ENTP 3301 and approval of the supervising faculty. Instructor consent required. (3-0) Y</td>
<td>Instructor consent required.</td>
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### ENTP 3321 Start-up Launch II (3 semester hours)
Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y

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<th>Description</th>
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<th>Credits</th>
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<td>entp3321</td>
<td>ENTP 3321</td>
<td>ENTP 3321 Start-up Launch II (3 semester hours) Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y</td>
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### ENTP 3322 Start-up Launch III (3 semester hours)
Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y

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<th>Course Name</th>
<th>Description</th>
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<th>Credits</th>
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<td>entp3322</td>
<td>ENTP 3322</td>
<td>ENTP 3322 Start-up Launch III (3 semester hours) Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y</td>
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### ENTP 3323 Start-up Launch IV (3 semester hours)
Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y

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<th>Course Name</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Credits</th>
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<td>entp3323</td>
<td>ENTP 3323</td>
<td>ENTP 3323 Start-up Launch IV (3 semester hours) Faculty mentored development of a business concept initiated in ENTP 3320. Prerequisite: Instructor consent required. (3-0) Y</td>
<td>Instructor consent required.</td>
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</tbody>
</table>
### ENTP 3360 Entrepreneurial Finance (3 semester hours)
Explores the process of raising capital and managing financial resources in entrepreneurial ventures. Focus on forecasting cash flows, cash flow management, capital budgeting, valuation, capital structure and the various financing methods and mechanisms available to entrepreneurs (bootstrapping, angel investors, venture capitalists, IPOs) seeking to raise capital for a new venture. Prerequisite: FIN 3320. (Same as FIN 3360) (3-0) Y

### ENTP 4311 Entrepreneurial Strategy & Business Models (3 semester hours)
Students will learn to assess and conduct in-depth analyses of potential business opportunities, with an emphasis on entrepreneurial business strategies, innovative business models and the determinants of new venture success in high tech and other business environments. Alternative strategies and approaches for market entry and the growth of a new venture will be explored in both domestic and international environments. The application of these frameworks, tools and techniques will be illustrated with case studies and a project focused on evaluating an existing or new venture and making recommendations to its management. Prerequisites: ENTP (ENTP 3301 or instructor consent required) and at least sophomore standing. (3-0) Y

### ENTP 4320 Small Business & New Venture Management (3 semester hours)
An integrative course designed to help students develop the skills and knowledge required to successfully establish and manage a small business. The course addresses the major problem areas faced by smaller companies, including understanding and developing culture, development of systems and processes to monitor and run the business, legal issues in launching and growing the business, building and maintaining customer relationships, promotional planning, team building, conflict resolution, personnel and compensation issues, and developing development of exit strategies. The course will also include modules on how to set up a business, address special issues in unique to managing a family business, business and franchising. Prerequisites: ENTP 3301 or instructor consent required. (3-0) Y

### ENTP 4350 Corporate Entrepreneurship (3 semester hours)
This course seeks to equip student with the skills required to develop new ideas and create viable new businesses within the context of an established organization. The course will address the development of an internal culture of innovation, processes for reviewing ideas and for developing business concepts, strategic analysis, and positioning for competitive advantage. The course will address both domestic and international corporate entrepreneurship. Prerequisites: ENTP (ENTP 3301 or instructor consent required, required), and at least junior standing. (3-0) Y

### ENTP 4V90 Innovation and Entrepreneurship Internship (1-3 semester hours)
This internship course must be directly related to your concentration or minor in innovation and entrepreneurship. Students gain experience and improve skills through appropriate work assignments in a real business environment. Student must identify and submit specific business learning objectives at the beginning of the semester. At the end of the semester, students prepare a presentation describing their work experience and work output. Consent of the JSOM Internship Coordinator and the Innovation and Entrepreneurship Program is required. Credit/No Credit. ([1-3]-0) Y
### Undergraduate Catalog 2013 - Course Change Requests

<table>
<thead>
<tr>
<th>Year</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisite or corequisite</th>
<th>Status</th>
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<tr>
<td>2012-2013</td>
<td>fin3305</td>
<td>FIN 3305 Real Estate Principles (3 semester hours)</td>
<td>Survey of various aspects of the real estate business and economics, including</td>
<td>Marketing, finance, taxation, investment, development, law, appraising, and valuation. (Same as REAL 3305)</td>
<td>(3-0) S</td>
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<tr>
<td>2012-2013</td>
<td>fin3320</td>
<td>FIN 3320 Business Finance (3 semester hours)</td>
<td>Introduction to financial decision making and the valuation of business enterprises, with a</td>
<td>particularly focus on the use of discounted cash flow techniques in the selection of capital investment projects. Additional topics include financial planning, exchange rates, risk and return trade-offs in financial markets, financing decisions and dividend policy.</td>
<td>Pre-/Co-requisite: STAT 3360 or OPRE 3360. Prerequisite or corequisite: (STAT 3360 or OPRE 3360) and Prerequisites: (ACCT 2301 and ACCT 2304, ACCT 2302, MATH 1326, 2302 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333), and MIS 3300.</td>
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<tr>
<td>2012-2013</td>
<td>fin3330</td>
<td>FIN 3330 Personal Financial Planning (3 semester hours)</td>
<td>Application of principles of financial management to lifetime consumption and retirement</td>
<td>planning, with an emphasis on the integration of savings and investment decisions with life insurance programs and estate planning. Topics include the role of property, health, life insurance; tax-deferred investment vehicles, as well as fixed income and equity investment alternatives such as mutual funds. Open only to students majoring in either finance or accounting.</td>
<td>Prerequisites: ACCT 2301, MATH 1326, 2301 and MATH 1326 and (MATH 2333 or OPRE 3333, 3333), and STAT (STAT 3360 or OPRE 3360, 3360).</td>
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<td>2012-2013</td>
<td>fin3340</td>
<td>FIN 3340 Regulation of Business and Financial Markets (3 semester hours)</td>
<td>Examines the legal and regulatory environment of business and financial markets.</td>
<td>Comparisons between the impact of laws and their original intent are considered, as well as their ethical dimensions. Co/Prerequisites:</td>
<td>Prerequisite or corequisite: FIN 3320.</td>
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<td>2012-2013</td>
<td>fin3350</td>
<td>FIN 3350 Financial Markets and Institutions (3 semester hours)</td>
<td>Examines the operation of financial markets and financial intermediaries, along with their role in providing financing to the public and private sectors.</td>
<td>Topics covered include the banking system, markets for short-term securities, financial derivatives, and market for foreign exchange.</td>
<td>Co/prerequisites: Prerequisite or corequisite: FIN 3320.</td>
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<td>2012-2013</td>
<td>fin3360</td>
<td>FIN 3360 Entrepreneurial Finance (3 semester hours)</td>
<td>Explores the process of raising capital and managing capital financial resources in entrepreneurial ventures. Focus on forecasting cash flows, cash flow management, capital budgeting, valuation, capital structure and the various financing methods and mechanisms available to entrepreneurs (bootstrapping, angel investors, venture capitalists, IPOs) seeking to raise capital for a new venture.</td>
<td>Prerequisite: FIN 3320.</td>
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<td>2012-2013</td>
<td>fin3365</td>
<td>FIN 3365 Real Estate Finance and Advanced Principles (3 semester hours)</td>
<td>Survey of the institutions in real estate finance and factors affecting the flow of funds; investment analysis and procedures involved in real estate financing.</td>
<td>Prerequisite: FIN 3320.</td>
<td>(Same as REAL 3365)</td>
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<td>fin3390</td>
<td>FIN 3390 Introduction to Financial Modeling (3 semester hours)</td>
<td>Develops the ability to use quantitative methods and software (particularly spreadsheet) for financial decision making. Prerequisites: MATH (MATH 2333 or OPRE 3333, STAT 3333) and ((STAT 3360 or OPRE 3360 3360) with a C or better, better), and FIN (FIN 3320 with a C C+ or better. better).</td>
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<td>fin4300</td>
<td>FIN 4300 Investment Management (3 semester hours)</td>
<td>Examines a wide range of issues concerning management of investments and so provides an understanding of the role of modern financial theory in pricing financial assets and managing portfolios. Prerequisite: FIN 3390 3320 with a C or better. better and (prerequisite or corequisite: FIN 3390).</td>
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<tr>
<td>fin4310</td>
<td>FIN 4310 Applied Corporate Intermediate Business Finance (3 semester hours)</td>
<td>Integrates Builds on FIN 3320 to develop additional topics in business financial decision making. It integrates a variety of advanced topics in corporate financial decision making in examining the development of the financial strategy of the firm. Emphasis will be placed on the valuation of the firm and the impact of developing a firm's financial markets on corporate investment and financing decisions, strategy. Prerequisite: FIN 3390 3320 with a C C+ or better. better and (prerequisite or corequisite: FIN 3390).</td>
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<td>fin4321</td>
<td>FIN 4321 Real Estate Law and Contracts (3 semester hours) Study of the legal principles governing real estate transactions. Topics include contract law, estates in land, forms of ownership, deeds, mortgages, title insurance, agency and homestead. Prerequisite or corequisite: REAL 3305 or FIN 3305. (Same as REAL 4321)</td>
<td>(3-0) Y</td>
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<td>fin4328</td>
<td>FIN 4328 Real Estate Law and Contracts (3 semester hours) This capstone real estate course provides the theory and methods of residential and income property valuation and appraisal. Topics include the three major approaches to appraising real estate, regression analysis, real estate market analysis, highest and best use analysis and capitalization techniques. Income property valuation techniques are emphasized. Several cases and problems are presented and solved. Prerequisite: ((REAL 3305 or FIN 3305) or (REAL 3365 or FIN 3365)) and FIN 3320. (Same as REAL 4328)</td>
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<td>fin4335</td>
<td>FIN 4335 Financial Aspects of Retirement and Employee Benefits (3 semester hours)</td>
<td>This course focuses on business and individual retirement plans, planning strategies to meet individual and client goals as well as retirement distribution strategies. Students will evaluate employer and non-employer benefit plans and use a combination of financial planning software to create retirement plans. Prerequisite: FIN 3330. (3-0) Y</td>
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<td>fin4340</td>
<td>FIN 4340 Options and Futures Markets (3 semester hours) Examines valuation of derivative securities, such as options and futures contracts, and the use of these instruments in managing business and financial risks. Topics include pricing of futures contracts, swaps, and options, and use of derivative instruments in hedging, portfolio insurance, and exotic options. Prerequisite: FIN 4300 or (FIN 4310 with a C or better. better).</td>
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<td>fin4345</td>
<td>FIN 4345 Financial Information and Trading (3 semester hours) This course examines the sources and uses of financial information in valuing and trading securities, as well as the structure of trading in security markets. Prerequisite: FIN 3390 with a C or better.</td>
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<td>2012-13</td>
<td>fin4350</td>
<td>FIN 4350 Cases in Personal Financial Planning (3 semester hours)</td>
<td>This course provides practical experience in the development of skills</td>
<td>Necessary to help individuals, families, and business owners reach financial planning goals. Topic areas include investment planning, insurance planning and uses case studies to refine risk management, income tax planning, estate planning, retirement planning, and employee benefits planning. Students are required to study different personal financial planning issues and present them orally. Prerequisite or corequisite: FIN 4370 or instructor consent required. (3-0) R</td>
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<td>2012-13</td>
<td>fin4360</td>
<td>FIN 4360 Cases in Financial Management (3 semester hours)</td>
<td>This course uses case studies to study different financial management issues.</td>
<td>Prerequisite or corequisite: FIN 4310 or instructor consent required. (3-0) R</td>
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<td>2012-13</td>
<td>fin4380</td>
<td>FIN 4380 Practicum in Investment Domestic Fund Management (3 semester hours)</td>
<td>For students involved in the practice of investment management for the university. This course requires faculty consent and may be repeated for credit up to a maximum of 6 hours. (6 hours maximum). Prerequisite: FIN 4300 with a B or better (3-3) R</td>
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<tr>
<td>2013-13</td>
<td>fin4390</td>
<td>FIN 4390 Seminar Series in Finance (3 semester hours)</td>
<td>Examination of selected financial topics. Requires approval of the instructor. May be repeated for credit as topics vary (6 hours maximum). (3-0) R</td>
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<tr>
<td>2012-13</td>
<td>fin4v80</td>
<td>FIN 4V80 Practicum in Financial Management Finance (1-3 semester hours)</td>
<td>For students engaged in the practice of financial analysis or management. This course requires faculty sponsor and an employer sponsor. Performance will be assessed based on both sponsoring faculty and employer evaluations. This course is offered on a credit/no credit basis and may be repeated for credit up to a maximum of 3 hours. (3 hours maximum). Credit/No Credit. ((1-3)-0) R</td>
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<tr>
<td>2011-13</td>
<td>hmg4321</td>
<td>HMG 4321 Introduction to Healthcare Information Systems (3 semester hours)</td>
<td>Examines key processes in healthcare organizations and how information systems support the delivery of healthcare services. The course also deals with issues surrounding the selection, implementation, and use of electronic medical records (EMR) and provides opportunities to work hands-on with EMR software. Prerequisites: HMG 4301 and MIS 3300. (Same as MIS 4320) (3-0) Y</td>
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<td>2013-13</td>
<td>hmg4331</td>
<td>HMG 4331 Marketing in Healthcare Organizations (3 semester hours)</td>
<td>An overview of marketing &amp; business planning principles oriented to settings such as hospitals and outpatient clinics. Traditional marketing models are related to the healthcare industry as students are familiarized with concepts critical to understanding business development for healthcare professionals, including: industry data, market analysis, relevant stakeholders and patient flow through the continuum of care. Prerequisites: HMG 4301 and MKT 3300. (3-0) Y</td>
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### HMGT 4341 Human Resources Management in Healthcare Organizations (3 semester hours)
An introduction to the employee life cycle in healthcare organizations, including: recruitment, candidate selection, credentialing, record retention, performance management, staff retention, disciplinary action and termination. Students will explore topics pertinent to the management and development of staff and will be familiarized with federal legislation commonly encountered in human resources, including: NLRA, OSHA, EEOA, ERISA and FLSA.

**Prerequisites:** HMGT 4301 and OBHR 3310. (3-0) Y

### HMGT 4351 Management, Design and Optimization of Healthcare Processes (3 semester hours)
An interactive, experiential course in which students will utilize hands-on, practice-oriented opportunities to learn how to design, manage and optimize healthcare processes. Advanced analytical techniques for healthcare process optimization will also be discussed. (3-0) Y

### HMGT 4V90 Management Internship (1-3 semester hours)
This course is designed to further develop a student's business knowledge through appropriate developmental work experiences in a real business environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum). Credit/No Credit. ([1-3]-0) S

### IMS 3V92 Regional Management Area Studies: Western Europe (1-3 semester hours)
This course familiarizes students with the historical, social, economic, and political background of nations in Europe. Students will learn about the business environment of the area and participate in seminars on firms that operate in and have an economic impact in the area. Prerequisite: IMS 3310. May be repeated for credit (3 hours maximum). ([1-3]-0) R

### IMS 3V95 Regional Management Area Studies: North America (1-3 semester hours)
This course familiarizes students with the historical, social, economic, and political background of nations in North America. Students will learn about the business environment of the area and participate in seminars on firms that operate in and have an economic impact in the area. Prerequisite: IMS 3310. May be repeated for credit (3 hours maximum). ([1-3]-0) R

### IMS 3V96 Regional Management Area Studies: Eastern Europe (1-3 semester hours)
This course familiarizes students with the historical, social, economic, and political background of nations in Eastern Europe. Students will learn about the business environment of the area and participate in seminars on firms that operate in and have an economic impact in the area. Prerequisite: IMS 3310. May be repeated for credit (3 hours maximum). ([1-3]-0) R

### IMS 4310 Export Market Development (3 semester hours)
Survey of factors affecting export markets. Examination of free trade versus strategic trade; trade protectionism; role and influence of the WTO; impact of regional trade agreements (e.g. NAFTA, EU); supply chain management, logistics and distribution challenges; and trade finance.

**Prerequisite**
Prerequisites: IMS 3310 and BLAW 4301. (3-0) Y
<p>| 2012-2013 | ims4332 013877 ims4332. 2 | IMS 4332 International Negotiation (3 semester hours) This course explores the theories, processes and practical techniques of negotiations in situations where partners to the negotiation come from different national cultures, political, legal and economic systems. Topics include the basics of international negotiations, cultural influences on negotiations, culture-specific strategies and tactics used in the negotiation process, and qualities that an international negotiator must possess. Practical skills are developed through the use of simulations and exercises. Prerequisites: OBHR 4352 and IMS 4330. (3-0) Y | edit review pending mxv0620 00 2012-11-2 3 10:29:02 |
| 2012-2013 | ims4334 013878 ims4334. 2 | IMS 4334 International Leadership (3 semester hours) Addresses the challenge of leading organizations in a dynamic global environment. Overall goal is to not only question one's assumptions about leadership, but also enhance skills and acquire new content knowledge. Topics include visionary and transformational leadership; empowerment; leveraging and combining resources; designing organizations; and ethics. Prerequisites: OBHR 4350 and IMS 4330. (3-0) Y | edit review pending mxv0620 00 2012-11-2 3 10:45:01 |
| 2012-2013 | ims4373 013879 ims4373. 2 | IMS 4373 Global Strategy (3 semester hours) Study of the challenges that multinational firms face, including managing across national borders, managing international strategic alliances, managing headquarters-subsidiary relationships, and developing global capabilities. Prerequisites: (IMS 3310 and IMS 4320, 4320 and FIN 3380 and BLAW 4301). (3-0) Y | edit review pending cbg13003 0 2012-11-2 0 14:39:17 |
| 2012-2013 | ims4v90 013987 ims4v90. 3 | IMS 4V90 Management Internship (1-3 semester hours) This course is designed to further develop a student's business knowledge through appropriate developmental work experiences in a real business environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum). Credit/No Credit. ([1-3]-0) S | edit review pending mxv0620 00 2012-11-2 3 10:28:21 |
| 2012-2013 | mis4300 014014 mis4300. 3 | MIS 4300 Database Fundamentals (3 semester hours) Introduces the basic concepts for the design and development of relational databases and database management. Topics include entity-relationship data model, logical database design, data administration, Structured Query Language, and database management issues, such as concurrency control, data security, and integrity. A database management system software package is used to implement working database systems. Neither ACCT 4300 and MIS 4300 cannot both be used to satisfy degree requirements, requirements for BS MIS majors. Prerequisites: ACCT 2301, ACCT 2302, MIS 3300 and (MATH 1325 or MATH 2413 or MATH 2417). (Same as ACCT 4300) (3-0) Y | edit review pending mxv0620 00 2012-11-2 3 10:58:23 |
| 2013-2013 | mis4301 mis4301. 2 | MIS 4301 Database Systems (3 semester hours) Introduces the basic concepts of relational databases. The emphasis is on relational database structure and the use of relational databases for query retrievals and report generation. Structured Query Language (SQL) will be covered extensively. Applications of databases for accounting, finance, marketing, and other areas of business will be discussed. Cannot be used to satisfy the requirements of BS in MIS degree. Prerequisites: (ACCT 2301 and ACCT 2302 and MIS 3300) and (MATH 1325 or MATH 2413 or MATH 2417). (3-0) Y | edit review pending mxv0620 00 2012-11-2 3 11:00:24 |</p>
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<tr>
<td>MIS 4310 013885 mis4310.5</td>
<td>MIS 4310 Programming in Java (3 semester hours) Business application development using Java. Topics include the fundamentals of Java programming, applets programming for web-based systems, and object-oriented programming concepts. Prerequisites: MIS 3300, MATH 1326, (MIS 3300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>MIS 4312 013887 mis4312.2</td>
<td>MIS 4312 Mobile Web Application Development (3 semester hours) Provides an introduction to mobile web application development. A mobile web application is developed using a combination of CSS, HTML, HTML5, JavaScript, and PHP. Emphasis is given to hands on application of course material through development of a web application prototype under conditions simulating a business environment. Prior programming knowledge is highly recommended. (3-0) Y</td>
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<tr>
<td>MIS 4320 013887 mis4320.3</td>
<td>MIS 4320 Introduction to Healthcare Information Systems (3 semester hours) Examines key processes in healthcare organizations and how information systems support the delivery of healthcare services. The course also deals with issues surrounding the selection, implementation, and use of electronic medical records (EMR) and provides opportunities to work hands-on with EMR software. Prerequisites: HMGT 4301 and MIS 3300. (Same as HMGT 4321) (3-0) Y</td>
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<td>MIS 4330 013888 mis4330.9</td>
<td>MIS 4330 Systems Analysis and Design (3 semester hours) An overview of systems development methodologies will be presented. In addition to concepts in systems analysis and design, the students will be exposed to concepts in project management, and information gathering techniques. Projects focusing on the use of CASE tools will also be an integral part of the course. Prerequisites: (MIS 4310 or MIS 4311 or MIS 4312), MIS 4300, MATH 1326, 4312 and (MIS 4300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>MIS 4340 013889 mis4340.6</td>
<td>MIS 4340 Enterprise Resource Planning (3 semester hours) This course provides an understanding of the practical use of enterprise resource planning systems in modern business. The course provides an understanding of integrated business processes in ERP systems, project management approaches, ERP development methodologies, and ERP architectures. ERP concepts are reinforced with hands on transaction experience in the SAP ERP system. Topics associated with creating an information systems implementation proposal for an executive team are discussed. Prerequisites: MIS 3300, MATH 1326, (MIS 3300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<tr>
<td>MIS 4342 013787 mis4342.4</td>
<td>MIS 4342 Analysis and Design of Accounting Systems (3 semester hours) Students are introduced to accounting system analysis and design tools and methods. The course emphasizes business processes, accounting transaction flows, internal control and accounting information systems as part of enterprise systems. Prerequisite: ACCT Prerequisites: (ACCT 3331 with a minimum grade of C) and Co-Requisite (Prerequisite or corequisite: ACCT 3332, 3332). (Same as ACCT 4342) (3-0) S</td>
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<td>Year</td>
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<td>2012-2013</td>
<td>mis4350</td>
<td>MIS 4350 Introduction to Business Intelligence and Data Mining</td>
<td>3</td>
<td>This course will introduce various data mining techniques to extract business intelligence from firms' business data for various applications, including association, classification, and customer relationship management (CRM), personalization, online recommendation systems and web mining. Students will also be exposed to various business intelligence software such as XLMiner, SAS Enterprise Miner or SQL Server 2008 (depending on availability).</td>
<td>MIS 4300, MATH 1326, (MIS 4300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) T</td>
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<td>2012-2013</td>
<td>mis4351</td>
<td>MIS 4351 Enterprise Data Warehouses</td>
<td>3</td>
<td>Data warehouses enable firms to effectively consolidate, arrange and analyze vast amounts of data. This course will explore the theory and practice of data warehouses for enterprises. The course will examine the components of an enterprise data warehouse, model the relational database required for an enterprise data warehouse, extract, cleanse, consolidate, and transform heterogeneous data into a single enterprise data warehouse, and run queries using a data warehouse. The course currently uses SAP BW and Business Objects as the tools for hands-on experience.</td>
<td>MIS 4300, MATH 1326, (MIS 4300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4352</td>
<td>MIS 4352 Introduction to Web Analytics</td>
<td>3</td>
<td>The course focuses on collection and use of web data such as web traffic and visitor information to design web sites that will enable firms to acquire, convert, and retain customers. Online advertising such as paid search and web analytics tools will also be included.</td>
<td>MIS 4300, MATH 1326, (MIS 4300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4360</td>
<td>MIS 4360 Network and Information Security</td>
<td>3</td>
<td>With the advances in information technology, security of information assets has become a keenly debated issue for organizations. While much focus has been paid to technical aspects of the problem, managing information security requires more than technology. Effective information security management demands a clear understanding of technical as well as socio-organizational aspects of the problem. The purpose of this course is to prepare business decision makers who recognize the threats and vulnerabilities present in current information systems and who know how to design and develop secure systems.</td>
<td>MIS 4300, MATH 1326, Prerequisites: (MIS 3300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4361</td>
<td>MIS 4361 Business Data Communications</td>
<td>3</td>
<td>The course will focus on currently observed industry trends, including the digital convergence of voice, video and data, enterprise wide connectivity, distributed computing environments, and the massive demand for Internet-based open systems.</td>
<td>MIS 4300, MATH 1326, (MIS 3300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4370</td>
<td>MIS 4370 Information Systems Management</td>
<td>3</td>
<td>Management of the information technology within an organization is a critical activity. Students will be introduced to issues relating to IT investment, management of IT, and using IT for competitive advantage.</td>
<td>MIS 4300, MATH 1326, (MIS 3300 and MATH 1326) and (MATH 2333 or OPRE 3333, 3333 or MATH 2418 or MATH 2415 or CS 2305). (3-0) Y</td>
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<td>Year</td>
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<td>Course Name</td>
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<td>2013</td>
<td>mis4390, 2</td>
<td>MIS 4390 Information Systems Capstone (3 semester hours) Project-based capstone course. Student groups apply management information systems principles and techniques to analyze, design and test information systems. They also analyze organizational impacts associated with acquiring, designing, developing and delivering information systems solutions. As a designated communication-enhanced course, MIS 4390 also focuses on the refinement of students' business communications skills and their use of writing as a critical-thinking and learning tool. Prerequisite: MIS 4330.</td>
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<td>2012</td>
<td>mis4v90, 2</td>
<td>MIS 4V90 MIS Internship (1-3 semester hours) This course is designed to further develop a student's MIS knowledge through appropriate developmental work experiences in a real MIS environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum). Credit/No Credit.</td>
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<tr>
<td>2012</td>
<td>mkt3330, 2</td>
<td>MKT 3330 Personal Sales and Sales Management Introduction to Professional Selling (3 semester hours) C3 Certified. This course covers professional selling practices and philosophies, and provides philosophies at an introduction to the basic activities of sales management: training and recruitment, performance evaluation, sales force compensation, budgeting, time and territory management. introductory level. Personal selling skills including developing and qualifying prospects, creating a sales presentation, closing techniques and servicing the sale, sales will be covered. covered for business to business sales. Sales ethics, account relationship management and aspects of motivating a sales force basic professional networking will also be included. Prerequisites: MKT 3300 and (MATH 1326 or MATH 2414 or MATH 2419).</td>
<td>(3-0) Y</td>
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<td>2012</td>
<td>mkt4321, 3</td>
<td>MKT 4321 Marketing Strategy (3 semester hours) This course provides an overview of how strategy is developed in marketing. This course emphasizes the integration of knowledge from previous marketing courses and related disciplines. Topics include planning and development of policies, implementation and evaluation of the entire marketing strategy. Case analyses are employed to also understand how to monitor and respond to competition. Prerequisites: MKT 3300 and (MATH 1326 or MATH 2414 or MATH 2419).</td>
<td>(3-0) Y</td>
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<td>2012</td>
<td>mkt4322, 2</td>
<td>MKT 4322 Price Management (3 semester hours) The course teaches students how to set and manage price for products and services based on an understanding of costs, competition, price elasticity, and consumer perceptions based on price. The study also establishes the links between positioning / segmentation and pricing. Students will learn to use break even analysis, to compute price elasticity, and to evaluate price-quality trade-offs. They will also learn how to manage price in response to competitor's price changes. Prerequisites: MKT 3300 and (STAT 3360 or OPRE 3360).</td>
<td>(3-0) Y</td>
<td>edit review pending</td>
<td>cbg13003 0 2012-11-2 0 16:09:19</td>
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### MKT 4330 Direct Digital and Social Media Internet Marketing (3 semester hours)

The course provides an introduction to using direct marketing in the digital and social media environment as well as traditional direct response media such as print, DRTV and others. The course has special emphasis on the use of different Internet platforms in direct marketing such as email, paid search and social media (YouTube, Linkedin, Facebook, Twitter). Students will learn how online databases can be accessed for direct marketing purposes. Students will learn how to create and manage a paid search advertising campaign using Google AdWords. Students will have hands on practice through several labs that will cover: importing and exporting data, merging and purging (duplicate) records; using YouTube; creating and running a Google Ads campaign. The measurability and accountability of direct marketing is stressed including Excel based direct marketing math such as return on promotion calculations. Prerequisite: MKT 3300. (3-0) Y

### MKT 4331 Sales Customer Relationship Management (3 semester hours)

This course covers the methods and metrics, including the tools and software, that are used to manage existing customers and prospects for new customers using specialized CRM software. Focus is on customer relationship management strategy for the purpose of strategic sales account management and prospecting. Prerequisites: MKT 3300, 3300 and MIS 3300 and MKT 3330. (3-0) Y

### MKT 4332 Advanced Personal Selling Skills (3 semester hours)

The course covers advanced personal selling skills, practices and programs. Emphasis will be placed on sales, presentations, demonstrations, advanced sales techniques, advanced communication and relationship-building skills. Various corporate sales strategies for both consumer and business sales will be explored. This course is intended to prepare students for competitive sales situations and competitions and is primarily intended for students interested in sales careers. Prerequisites: MKT 3300, 3300 and MKT 3330 and (BCOM 3311 or ACCT 3311), BCOM 3311. (3-0) Y

### MKT 4334 Social Media Marketing (3 semester hours)

This course teaches special considerations in social media market research, consumer behavior and segmentation as well as how to develop a sound social media strategy (content curation) and content management (Hootsuite, Wordpress). The course will also familiarize students with best practices, case studies and tactical considerations using current popular platforms such as Facebook, Google Plus, Instagram, Pinterest, Twitter, Wordpress, YouTube and others. The metrics of social media will also be covered using both the tools provided by these platforms as well as by third party tools such as Netbase, Tweetstats, etc. Prerequisite: MKT 3300. (3-0) Y

### MKT 4350 Advertising (3 semester hours)

This course examines the principles and practices of advertising, public relations and promotions. Topics include: the role of the ad agency; the advertising plan based on marketing, research, and consumer behavior; integrated marketing communications; communication goals and measurement, advertising, budgeting, advertising buying, media planning, media scheduling, and art, copy, creativity and production of ads in different media. We also discuss social, ethical and legal issues in advertising. Prerequisites: MKT 3300 and MKT 3320. (3-0) Y
# Undergraduate Catalog 2013 - Course Change Requests

<p>| 2012-2013 | mkt4380 013918 mkt4380.3 | MKT 4380 Capstone Course in Marketing (3 semester hours) C3 Certified. Students (in teams) are expected to make marketing decisions and compete with other teams to achieve superior performance in terms of market share, profitability and stock price. The course will use marketing simulation to teach practical decision making. Students will make decisions regarding new product specifications, price, production, sales force and advertising as in a real life situation. This course integrates the strategic and the tactical aspects of marketing. Prerequisites: MKT 3320, 3320 and MKT 3330, 3330 and MKT 3340, 3340 and MIS 3300 and FIN 3320. (3-0) Y | edit review pending mxv0620 00 2012-11-2 3 13:12:43 |
| 2012-2013 | mkt4v90 013989 mkt4v90.2 | MKT 4V90 Marketing Internship (1-3 semester hours) This internship course must be directly related to your major in marketing. Students are expected to complete assignments satisfactorily during the semester and complete the online evaluation at the end of the semester. Information related to assignments or evaluation will be available in the course syllabi. Student must meet internship eligibility guidelines available from the internship coordinator. May be repeated for credit (6 hours maximum over 2 semesters). Credit/No Credit. ([1-3]-0) Y | edit review pending cbg13003 0 2012-11-2 0 16:19:55 |
| 2012-2013 | obhr3310 013921 obhr3310.3 | OBHR 3310 Organizational Behavior (3 semester hours) An integrated social science approach is taken to enable students to better understand their work environments and the issues that arise from the complex interplay among organizational members. This course explores theories and concepts derived from diverse fields such as psychology, sociology, economics, and anthropology. The topics include: motivation, attitudes, ethics, communication, leadership, teamwork, power, negotiation, and culture. Co/Prerequisite: (BCOM 3311 or ACCT 3311). Prerequisites: RHET 1302 and MATH 1325. (3-0) S | edit review pending mxv0620 00 2012-11-2 3 13:17:03 |
| 2013-2013 | obhr3311 obhr3311.2 | OBHR 3311 Principles of Management (3 semester hours) This course will introduce students to the connections between areas in management, emphasizing the role that organizational behavior plays in the functioning of the organization. Students will have the opportunity to learn and implement ideas through the use of exercises and case studies. The student will gain useful tools to identify problems in organizations, apply solutions and understand outcomes. Prerequisite: Junior or Senior standing. (3-0) S | edit review pending mxv0620 00 2012-11-2 3 13:17:36 |
| 2012-2013 | obhr3320 013922 obhr3320.2 | OBHR 3320 Groups and Teams (3 semester hours) This course focuses on how groups and teams can be used to maximize organizational success. Students will be introduced to theories and concepts that will allow them to analyze and manage groups in organizations. Topics will include building teams, managing teams, the opportunities and challenges of diversity in teams, managing conflict, and leadership. Practical experience will be developed through the use of exercises, case-studies, and the completion of a team project. Prerequisites: Prerequisite: OBHR 3300 and OBHR 3310, 3310 with a grade of C or better. (3-0) S T | edit review pending cbg13003 0 2012-11-2 0 16:25:20 |
| 2012-2013 | obhr3330 013923 obhr3330.2 | OBHR 3330 Introduction to Human Resource Management (3 semester hours) This course is an overview of human resource management. Students will learn theories and practices in many different &quot;core&quot; areas of human resource management including staffing, performance management, work and job design, training, compensation, and labor relations. The course also examines how the human resource function contributes to the company's business strategy and competitive advantage. Prerequisites: Prerequisite: OBHR 3300 and OBHR 3310, 3310 with a grade of C or better. (3-0) S T | edit review pending cbg13003 0 2012-11-2 0 16:26:12 |</p>
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<td>2013-2013</td>
<td>obhr4300</td>
<td>OBHR 4300 Management of Non-Profit Organizations (3 semester hours)</td>
<td>This course examines the role of non-profit organizations in today’s society and discusses the challenges of managing a non-profit both internally and externally concerning areas such as leadership, mission, program planning, budgeting, personnel, marketing, fundraising, volunteerism, and cross-sector collaboration. Prerequisite: Junior or Senior standing. (3-0) Y</td>
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<td>2012-2013</td>
<td>obhr4310</td>
<td>OBHR 4310 Business Ethics (3 semester hours)</td>
<td>This course examines ethical and socio-political issues and concepts that relate to management in a global business environment. Leaders increasingly need to be aware of potential threats and opportunities in their environments and many stem from value and cultural differences that most managers are not trained to resolve. Prerequisites: OBHR 3310 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) S</td>
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<td>2012-2013</td>
<td>obhr4331</td>
<td>OBHR 4331 Compensation and Benefits Administration (3 semester hours)</td>
<td>This course focuses on how managers can strategically utilize compensation to attract, retain, and motivate qualified employees. Students will gain an understanding of the multidisciplinary theories underlying pay system design and implementation. Attention will be given to principles underlying successful compensation systems, including internal alignment, external competitiveness, and pay-for-performance. Prerequisites: OBHR 3300, OBHR 3310 with a grade of C or better and OBHR 3320, 3330 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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<td>2012-2013</td>
<td>obhr4333</td>
<td>OBHR 4333 Performance Management (3 semester hours)</td>
<td>This course examines the continuous process of identifying measuring, and developing the performance of individuals and teams and aligning their performance with the strategic goals of the organization. Special attention will be placed on developing performance management systems for small and large, for-profit and not-for-profit, and domestic and global organizations, and in all industry segments. Prerequisites: OBHR 3310, 3310 with a grade of C or better and OBHR 3320, 3330, 4350 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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<td>2012-2013</td>
<td>obhr4334</td>
<td>OBHR 4334 Talent Acquisition and Management (3 semester hours)</td>
<td>This course focuses on the effective management of the flow of talent into and through organizations. It covers human resource planning, recruiting and selection, career transitions and other workforce movement. An important goal of the class will be to provide opportunities to develop hands-on skills that are relevant to effectively managing talent flow. Acquisition and development of human resources in organizations and career management for individuals. Some emphasis on using data systems to perform human resource planning, job analysis, recruitment, selection, training, socialization, career development, and withdrawal from work. Prerequisites: OBHR 3340, 3310 with a grade of C or better and OBHR 3330 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y T</td>
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<td>2012-2013</td>
<td>obhr4350</td>
<td>OBHR 4350 Introduction to Leading and Managing (3 semester hours)</td>
<td>This course will deal with theories and techniques of leadership and management. The course will start with a general overview of major theories on leadership and management. The main focus of this course is on the relationship between individual action and group and organizational performance. Prerequisites: OBHR 3310 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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| 2012-2013 | obrh4352  
013929  
obhr4352 .2 | OBHR 4352 Negotiation and Dispute Resolution (3 semester hours) This course explores the theories, processes and practical techniques of negotiation so that students can successfully negotiate and resolve disputes in a variety of situations including interpersonal and group settings. Emphasis is placed on understanding influence and conflict resolution strategies; identifying interests, issues, and positions of the parties involved; analyzing co-negotiators, their negotiation styles, and the negotiation situations; and managing the dynamics associated with most negotiations. Practical skills are developed through the use of simulations and exercises. Prerequisites: OBHR 3310 Junior or Senior standing and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y | edit review pending | cbg13003  
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16:33:32 |
|---|---|---|---|---|
| 2012-2013 | obrh4354  
013930  
obhr4354 .4 | OBHR 4354 Leading Organizational Change (3 semester hours) This course will emphasize practical skills required to be an effective change agent. Theories and techniques of planned and transformative organizational change will be discussed, along with topics that include change agent entry in change projects, negotiating role expectations, contracting, diagnostic interviewing and needs assessment, overcoming resistance to change, large group intervention processes, and cross-cultural differences in leadership expectations. Prerequisites: OBHR 3300 and Prerequisite: OBHR 3310 with a grade of C or better. (3-0) Y | edit review pending | mxv0620  
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13:30:25 |
| 2012-2013 | obrh4356  
013931  
obhr4356 .3 | OBHR 4356 Power and Influence in Organizations (3 semester hours) This course will examine the role that power plays in organizations and the ways in which influence can be developed and used to increase individual power. Focus will be placed on how individuals can increase their power from anywhere within the organization. Topics will include functions of power, sources of power, assessing power in organizations, and personal influence strategies and tactics. Prerequisites: OBHR 3300 and Prerequisite: OBHR 3310 with a grade of C or better. (3-0) Y | edit review pending | mxv0620  
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| 2012-2013 | obrh4358  
013932  
obhr4358 .3 | OBHR 4358 Transformational Leadership, Ethics, and Social Responsibility in Practice (3 semester hours) This is a hands-on course to help students understand how transformational leaders can change the people around him/her to create productive societies with sustainable institutions and practices. This course starts with an introduction to transformational leadership concepts and basic ideas from both western and eastern moral philosophical traditions. Armed with a good understanding of these leadership and ethical concepts students will be given opportunities to work on a real project with one of the not-for-profit charitable organizations in the DFW area. This will not only help them practice what they have learned in the classroom setting but also help the community and practice transformational leadership behavior. Prerequisite: Prerequisites: OBHR 3310 and OBHR 4300 and OBHR 4350 with grades of C or better. (3-0) Y | edit review pending | mxv0620  
0  
2012-11-2  
3  
13:29:30 |
| 2012-2013 | obrh4360  
013933  
obhr4360 .3 | OBHR 4360 Applied Advanced Organizational Behavior and Leadership (3 semester hours) Focus is on the successes and failures of enterprises and the people who run them. We examine the essential elements of leadership in businesses that either lead to sustainable competitive advantage or take the company into crisis and decline. Prerequisites: OBHR 3340, 3310 with a grade of C or better and OBHR 4350 with a grade of C or better and (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y | edit review pending | mxv0620  
0  
2012-11-2  
3  
13:32:03 |
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<tr>
<td>OBHR 4V90</td>
<td>Management Internship (1-3 semester hours)</td>
<td>This course is designed to further develop a student's business knowledge through appropriate developmental work experiences in a real business environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum). Credit/No Credit. ([1-3]-0) S</td>
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<tr>
<td>OPRE 3310</td>
<td>Operations Management (3 semester hours)</td>
<td>Applications of operations research methods to production problems. Production processes in the business firm with emphasis on forecasting, production planning, and production control techniques. Prerequisites: Prerequisites: (MATH 1326 or MATH 2414 or MATH 2419) and (MATH 2333 or MATH 2418 or CS 2305 or OPRE 3333). Co/Prerequisite: STAT 3333 and Prerequisite or corequisite: (STAT 3360 or OPRE 3360). (3-0) Y</td>
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<td>OPRE 3320</td>
<td>Introduction to Supply Chain Management (3 semester hours)</td>
<td>Introduction to the key players and challenges in a supply chain (SC). Type of facilities, inventory and transportation options, options and the role of information in running SCs are supply chain is discussed. The objectives of different players in SCS are laid out and contrasted with each other. This motivates the discussion of integration/coordination of the players, a central theme in SC management. Operations and tradeoffs in service supply chains (i.e., air/sea lines, health care, hotels, and restaurants) are examined. Prerequisites: OPRE 3310 and STAT 3360 or OPRE 3360. (3-0) Y</td>
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<tr>
<td>OPRE 3330</td>
<td>Introduction to Project Management (3 semester hours)</td>
<td>The objective of this course is to provide students with the tools and techniques needed to initiate and manage a project effectively. The course will enhance the ability of participants students to respond to the challenges of large-scale projects so that they can be more effective as project managers. We study in detail up-to-date The course also examines the modern project management concepts, models, and techniques useful for the evaluation. Prerequisites: OPRE 3310 and STAT 3360 or OPRE 3360. reviews case studies so students can develop practical skills necessary to be successful in the field. (3-0) Y</td>
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<tr>
<td>OPRE 3333</td>
<td>Quantitative Business Analysis (3 semester hours)</td>
<td>Provides students with the analytical tools necessary for making better management decisions. Students are introduced to mathematical techniques used to make different types of business decisions. Prerequisite: MATH 1325 or MATH 2413 or MATH 2417. Credit cannot be received for both courses, OPRE 3333 or MATH 2333. (3-0) S</td>
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<tr>
<td>OPRE 3360</td>
<td>Managerial Methods in Decision Making Under Uncertainty (3 semester hours)</td>
<td>Introduces the concept of probability and statistics to managerial decision making. Concepts will be developed in lecture and exercises using software packages. Topics include: summarizing and presenting data, probability theory, sampling, estimation, confidence intervals, hypothesis testing, regression, and ANOVA. Emphasis will be given to modeling and solving business problems in Finance, Marketing, Accounting, and Operations Management. Credit cannot be received for both courses, OPRE 3360 and or STAT 3360 cannot both be used to fulfill degree requirements. Prerequisite: MIS 3300 and 3360. Prerequisite: (MATH 1326 or MATH 2414 or MATH 2419). (3-0) Y</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<tr>
<th>Year</th>
<th>Course Code</th>
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<th>Description</th>
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<tr>
<td>2012-2013</td>
<td>opre4310 013940 opre4310.2</td>
<td>OPRE 4310 Lean and Six Sigma Processes (3 semester hours)</td>
<td>3</td>
<td>Topics covered include concepts and theory of quality control in manufacturing and service operations, analysis of product design and process capability, and statistical process control. In this course, students will develop a broad understanding of Lean and Six Sigma principles and practice, and acquire knowledge about Lean and Six Sigma initiatives in manufacturing/service operations.</td>
<td>OPRE 3310 and STAT 3360 or OPRE 3360, 3310.</td>
<td>(3-0) Y</td>
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<tr>
<td>2012-2013</td>
<td>opre4320 013941 opre4320.3</td>
<td>OPRE 4320 Integrated SCM Information Systems (3 semester hours)</td>
<td>3</td>
<td>An introduction to the concept of an integrated supply chain management system such as SAP's Enterprise Resource Planning System. Students will: 1) learn the elements of an ERP application, 2) understand the concepts of end-to-end supply chain management, 3) define the basic master data needed to create a supply chain plan, 4) forecast demand using several statistical methods, 5) plan inventories using MRP and re-order point techniques, 6) execute the supply chain plan through the production process, 7) view the completed inventories after production.</td>
<td>OPRE 3300, OPRE 3310 3300 and (MATH 1326 or MATH 2414 or MATH 2419), OPRE 3310.</td>
<td>(3-0) Y</td>
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<tr>
<td>2012-2013</td>
<td>opre4330 013942 opre4330.3</td>
<td>OPRE 4330 Logistics and Inventory Management (3 semester hours)</td>
<td>3</td>
<td>This course introduces and explains the logistics concepts and systems as well as the related components and managing the inventory in supply chain systems. It also covers the planning, designing and the techniques for managing the distribution of products and services.</td>
<td>Prerequisites: Prerequisite: OPRE 3310 and (MATH 1326 or MATH 2414 or MATH 2419).</td>
<td>(3-0) Y</td>
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<td>2012-2013</td>
<td>opre4350 013944 opre4350.4</td>
<td>OPRE 4350 Global Outsourcing Services (3 semester hours)</td>
<td>3</td>
<td>This course is an introduction to outsourcing of services. Students will learn how organizations initiate, engage and manage their global outsourcing of businesses or IT functions and services. The course covers topics related to the outsourcing lifecycle, selective vs. total outsourcing processes, strategies, models and related business implications.</td>
<td>OPRE 3320 and IMS Prerequisite: 3310.</td>
<td>(3-0) Y R</td>
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<tr>
<td>2012-2013</td>
<td>opre4v90 013996 opre4v90.3</td>
<td>OPRE 4V90 Management Internship (1-3 semester hours)</td>
<td>1-3</td>
<td>This course is designed to further develop a student's business knowledge through appropriate developmental work experiences in a real business environment. Students are required to identify and submit specific business learning objectives (goals) at the beginning of the semester. At the end of the semester students must prepare an oral presentation, reflecting on the knowledge gained in the work experience. Student performance is evaluated by the work supervisor. May be repeated for credit (6 hours maximum).</td>
<td>Credit/No Credit.</td>
<td>([1-3]-0) S</td>
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<td>2012-2013</td>
<td>real3305 013948 real3305.2</td>
<td>REAL 3305 Real Estate Principles (3 semester hours)</td>
<td>3</td>
<td>Survey of various aspects of the real estate business and economics, including marketing, finance, taxation, investment, development, law, appraisal, etc. appraisal and valuation.</td>
<td>Same as FIN 3305) (3-0)</td>
<td>S</td>
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<td>2012-2013</td>
<td>real3365 013856 real3365.2</td>
<td>REAL 3365 Real Estate Finance and Advanced Principles (3 semester hours)</td>
<td>3</td>
<td>Survey of the institutions in real estate finance and factors affecting the flow of funds; investment analysis and procedures involved in real estate financing.</td>
<td>FIN 3320. (Same as FIN 3365)</td>
<td>(3-0) Y S</td>
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Page 90  Submitted to CEP 11-29-12
### REAL 4321 Real Estate Law and Contracts (3 semester hours)
Study of the legal principles governing real estate transactions. Topics include contract law, estates in land, forms of ownership, deeds, mortgages, title insurance, agency and homestead. Prerequisite or corequisite: (REAL 3305 or FIN 3305). (Same as FIN 4321) (3-0) Y

| 2013-2013 | real4321 | REAL 4321 Real Estate Law and Contracts (3 semester hours) Study of the legal principles governing real estate transactions. Topics include contract law, estates in land, forms of ownership, deeds, mortgages, title insurance, agency and homestead. Prerequisite or corequisite: (REAL 3305 or FIN 3305). (Same as FIN 4321) (3-0) Y | edit review pending | mxv0620 | 00 | 2012-11-2 | 3 | 09:56:31 |

### REAL 4328 Real Estate Valuation (3 semester hours)
This capstone real estate course provides the theory and methods of residential and income property valuation and appraisal. Topics include the three major approaches to appraising real estate, regression analysis, real estate market analysis, highest and best use analysis and capitalization techniques. Income property valuation techniques are emphasized. Several cases and problems are presented and solved. Prerequisites: ((REAL 3305 or FIN 3305) or (REAL 3365 or FIN 3365)); and FIN 3320. (Same as FIN 4328) (3-0) Y

| 2013-2013 | real4328 | REAL 4328 Real Estate Valuation (3 semester hours) This capstone real estate course provides the theory and methods of residential and income property valuation and appraisal. Topics include the three major approaches to appraising real estate, regression analysis, real estate market analysis, highest and best use analysis and capitalization techniques. Income property valuation techniques are emphasized. Several cases and problems are presented and solved. Prerequisites: ((REAL 3305 or FIN 3305) or (REAL 3365 or FIN 3365)); and FIN 3320. (Same as FIN 4328) (3-0) Y | edit review pending | mxv0620 | 00 | 2012-11-2 | 3 | 09:58:20 |

### REAL 4365 Real Estate Accounting, Taxation and Legal Concepts (3 semester hours)
This course provides a study review of accounting, tax and legal issues affecting the real estate industry. Material includes special rules used by owners and developers of real estate. May not be used to satisfy degree requirements for majors in accounting. Prerequisite: ACCT 2301. (Same as ACCT 4365) (3-0) R

| 2013-2013 | real4365 | REAL 4365 Real Estate Accounting, Taxation and Legal Concepts (3 semester hours) This course provides a study review of accounting, tax and legal issues affecting the real estate industry. Material includes special rules used by owners and developers of real estate. May not be used to satisfy degree requirements for majors in accounting. Prerequisite: ACCT 2301. (Same as ACCT 4365) (3-0) R | edit review pending | cbg13003 | 0 | 2012-11-2 | 0 | 13:09:46 |

### REAL 4V80 Internship in Real Estate (1-3 semester hours)
This course provides students with an opportunity to expand and apply their skills in a professional setting. Students must identify and submit specific business learning objectives at the beginning of the semester. This course requires faculty sponsor approval, a written report upon completion and employer evaluation. In addition, this course is offered on a credit/no credit basis, but it can be repeated for credit up to a maximum of 3 hours. ([1-3]-0) R

| 2013-2013 | real4v80 | REAL 4V80 Internship in Real Estate (1-3 semester hours) This course provides students with an opportunity to expand and apply their skills in a professional setting. Students must identify and submit specific business learning objectives at the beginning of the semester. This course requires faculty sponsor approval, a written report upon completion and employer evaluation. In addition, this course is offered on a credit/no credit basis, but it can be repeated for credit up to a maximum of 3 hours. ([1-3]-0) R | edit review pending | cbg13003 | 0 | 2012-11-2 | 0 | 13:10:42 |

### ACCT 3351 Individual Taxation (3 semester hours)
An introduction to federal taxation principles and concepts for individual income. Prerequisites: BLAW 2301, and ACCT 2301 with a minimum grade of C, and ACCT 2302 with a minimum grade of C. (3-0) Y

| 2012-2013 | acct3351 | -- request to remove this course from catalog -- ACCT 3351 Individual Taxation (3 semester hours) An introduction to federal taxation principles and concepts for individual income. Prerequisites: BLAW 2301, and ACCT 2301 with a minimum grade of C, and ACCT 2302 with a minimum grade of C. (3-0) Y | remove review pending | cbg13003 | 0 | 2012-11-20 | 11:09:59 |

### FIN 4V91 Seminar Series in Finance (1-3 semester hours)
This course examines selected topics and theories in finance. This course requires instructor consent and may be repeated for credit as topics vary up to a maximum of 6 hours. ([1-3]-0) R

| 2012-2013 | fin4v91 | -- request to remove this course from catalog -- FIN 4V91 Seminar Series in Finance (1-3 semester hours) This course examines selected topics and theories in finance. This course requires instructor consent and may be repeated for credit as topics vary up to a maximum of 6 hours. ([1-3]-0) R | remove review pending | mxv0620 | 00 | 2012-11-23 | 08:03:22 |

### MIS 4311 Programming in Visual Basic (3 semester hours)
Introduction to basic programming concepts for business application development using Visual Basic. Topics include basic computation, flow of control, data structures, classes and objects as well as integration with databases and web applications. Prerequisites: MIS 3300, MATH 1326, and MATH 2333 or OPRE 3333. (3-0) Y

<p>| 2012-2013 | mis4311 | -- request to remove this course from catalog -- MIS 4311 Programming in Visual Basic (3 semester hours) Introduction to basic programming concepts for business application development using Visual Basic. Topics include basic computation, flow of control, data structures, classes and objects as well as integration with databases and web applications. Prerequisites: MIS 3300, MATH 1326, and MATH 2333 or OPRE 3333. (3-0) Y | remove review pending | cbg13003 | 0 | 2012-11-20 | 15:28:25 |</p>
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<tr>
<td>2012-2013</td>
<td>mis4341 013890 mis4341.2</td>
<td>MIS 4341 ERP for Small and Medium Enterprises (3 semester hours)</td>
<td>This course focuses on developing integrated information systems for small and medium enterprises (SMEs). The emphasis is on unique challenges faced by SMEs not only in developing their own integrated information systems but also in integrating their systems with their larger partner firms. Hands-on experience using SAP's Business ByDesign for implementing customer relationship management, purchase, production, logistics, human resources, and accounting solutions. Students will have the opportunity to obtain SAP Business ByDesign certification. Prerequisite: MIS 3300, MATH 1326, and MATH 2333 or OPRE 3333. (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4353 013894 mis4353.3</td>
<td>MIS 4353 Electronic Commerce (3 semester hours)</td>
<td>As an increasing number of business transactions take place using an electronic medium, there is a need for business managers to understand how these new technologies transform the way companies and individuals are doing business. This course offers a general background on electronic commerce and its impact on business. Topics include the evolution of information systems, economics of electronic transactions, Internet marketing, and issues related to virtual organizations. Prerequisites: MIS 3300, MATH 1326, and MATH 2333 or OPRE 3333. (3-0) Y</td>
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<td>2012-2013</td>
<td>mis4380 013898 mis4380.2</td>
<td>MIS 4380 Systems Development Project (3 semester hours)</td>
<td>Students are required to perform analysis, design, and implementation of a real-life project within an organization. Students work in teams using the concepts taught in the earlier classes on systems development. Prerequisites: MIS 4310 or MIS 4311 or MIS 4312 and MIS 4330. (3-0) Y</td>
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<td>obhr3300 013920 obhr3300.2</td>
<td>OBHR 3300 Principles of Management (3 semester hours)</td>
<td>This course will introduce students to the connections between areas in management, emphasizing the role that organizational behavior plays in the functioning of the organization. Students will have the opportunity to learn and implement ideas through the use of exercises and case studies. The student will gain useful tools to identify problems in organizations, apply solutions and understand outcomes. Prerequisite: (BCOM 3311 or ACCT 3311). (3-0) Y</td>
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<td>2012-2013</td>
<td>acts4302 012853 acts4302.4</td>
<td>ACTS 4302 Principles of Actuarial Models: Financial Economics (3 semester hours) This 3 semester hour course develops the student's knowledge of the theoretical basis of certain actuarial models and the application of those models to insurance and other financial risks. The topics discussed include interest rate models, rational valuation of derivative securities, mathematical and probabilistic foundation of risk management. This class covers parts of CAS exam 3F and SOA exam MFE. Prerequisites: STAT 4351 and STAT 4382. Prerequisite or corequisite: FIN 4300 or instructor consent required. (3-0) T</td>
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<td>2012-2013</td>
<td>acts4304 012854 acts4304.4</td>
<td>ACTS 4304 Construction and Evaluation of Actuarial Models (3 semester hours) Introduction to useful frequency and severity models beyond those covered in Principles of Actuarial Models. Discussion of the steps involved in the modeling process and how to carry out these steps in solving business problems. At the end of the course the students should be able to: 1) analyze data from an application in a business context; 2) determine a suitable model including parameter values; and 3) provide measures of confidence for decisions based upon the model. This class also provides an introduction to a variety of tools for the calibration and evaluation of the models. This class covers parts of CAS Exam 4/SOA Exam C. Prerequisites: ACTS 4301 and ACTS 4302; Prerequisite: STAT 4352 or instructor consent required. (3-0) T</td>
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<td>2012-2013</td>
<td>acts4308 012856 acts4308.4</td>
<td>ACTS 4308 Actuarial Financial Mathematics (3 semester hours) The purpose of this 3 semester hour course is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting, and valuing contingent cash flows. The students will also be given an introduction to financial instruments, including derivatives, and the concept of no-arbitrage as it relates to financial mathematics. This class covers topics of Exam 2/FM. Prerequisite: STAT 4351 Prerequisites: (MATH 2451 and MIS 3300), or instructor consent required. (3-0) R</td>
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<td>2012-2013</td>
<td>biol3361 001807 biol3361.4</td>
<td>BIOL 3361 Biochemistry I (3 semester hours) Structures and chemical properties of amino acids; protein purification and characterization; protein structure and thermodynamics of polypeptide chain folding; catalytic mechanisms, kinetics and regulation of enzymes; energetics of biochemical reactions; generation and storage of metabolic energy associated with carbohydrates; oxidative phosphorylation and electron transport mechanisms; photosynthesis. Prerequisites: CHEM 2323 and CHEM 2325 (Organic Chemistry I and II), 2225. Corequisite: BIOL 3161. (Same as CHEM 3361) (3-0) S</td>
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Edit review pending mxv0620 00 2012-10-31 10:33:17

Edit review pending mxv0620 00 2012-10-31 17:01:26
### Undergraduate Catalog 2013 - Course Change Requests

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<tr>
<td>2012-2013</td>
<td>biol3362</td>
<td>BIOL 3362 Biochemistry II (3 semester hours)</td>
<td>Breakdown and synthesis of lipids; membrane structure and function; nitrogen metabolism and fixation; nucleotide metabolism; structure and properties of nucleic acids; sequencing and genetic engineering; replication, transcription, and translation; chromosome structure; hormone action; biochemical basis of certain pathological processes. Prerequisite: BIOL/CHEM (BIOL 3361 or CHEM 3361) or its equivalent, or instructor consent required. Corequisite: BIOL 3162. (Same as CHEM 3362) (3-0) S</td>
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<tr>
<td>2012-2013</td>
<td>chem2323</td>
<td>CHEM 2323 (CHEM 2323) Introductory Organic Chemistry I (3 semester hours)</td>
<td>The covalent bond. Organic chemistry: aliphatic and aromatic compounds; covalent inorganic and organometallic compounds; a survey of the organic functional groups and their typical reactions; stereochemistry. The first course in organic chemistry. Satisfies the basic organic chemistry lecture requirements for pre-health profession students. Prerequisite: CHEM 1312 or CHEM 1316. Corequisite: CHEM 2123. (Same as CHEM 2323) (3-0) S</td>
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<tr>
<td>2012-2013</td>
<td>chem3321</td>
<td>CHEM 3321 Physical Chemistry I (3 semester hours)</td>
<td>Fundamental properties of macroscopic biophysical chemical systems are introduced and described in quantitative terms. A core of topics in thermodynamics, molecular motion, kinetics, molecular distributions and statistical thermodynamics is supplemented with topics germane to students taking physical chemistry with biophysical applications. Prerequisites: CHEM 2325 and (MATH 2415 or MATH 2451, 2451) or instructor consent required. (CHEM 3361 is recommended). (3-0) Y</td>
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<td>2012-2013</td>
<td>chem3322</td>
<td>CHEM 3322 Physical Chemistry II (3 semester hours)</td>
<td>Fundamental microscopic properties of matter and radiation are discussed. A core of topics including quantum chemistry, atomic and molecular structure and spectroscopy, non-bonded interactions, and computational chemistry is supplemented with topics germane to students taking physical chemistry with biophysical applications. Prerequisites: CHEM 3321 and (MATH 2415 or MATH 2451, 2451) or instructor consent required. (3-0) Y</td>
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<td>2012-2013</td>
<td>chem3341</td>
<td>CHEM 3341 Inorganic Chemistry I (3 semester hours)</td>
<td>Survey of inorganic chemistry with emphasis on the modern concepts and theories of inorganic chemistry including electronic and geometric structure of inorganic compounds. Topics address contemporary physical and descriptive inorganic chemistry. Prerequisites: CHEM (CHEM 2323 and CHEM 2325 2325) or equivalent. (3-0) Y</td>
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<tr>
<td>2012-2013</td>
<td>chem3361</td>
<td>CHEM 3361 Biochemistry I (3 semester hours)</td>
<td>Structures and chemical properties of amino acids; protein purification and characterization; protein structure and thermodynamics of polypeptide chain folding; catalytic mechanisms, kinetics and regulation of enzymes; energetics of biochemical reactions; generation and storage of metabolic energy associated with carbohydrates; oxidative phosphorylation and electron transport mechanisms; photosynthesis. Prerequisites: CHEM 2323 and CHEM 2325 (Organic Chemistry I and II). 2325. Corequisite: BIOL 3161. (Same as BIOL 3361) (3-0) S</td>
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<td>mxv0620 00 2012-10-31 16:53:52</td>
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### CHEM 3471 Advanced Chemical Synthesis Laboratory (4 semester hours)
Careful handling practices and controlled variation of reaction parameters to obtain high yield syntheses. Use of standard separation techniques and spectrophotometric methods to identify reaction products and assess their purity. Prerequisite: CHEM (CHEM 2125 and CHEM 3472 2401) or instructor consent required. (1-7) Y

### CHEM 3V92 Undergraduate Research in Biochemistry (2-6 semester hours)
Students will pursue an independent project under the supervision of a member of the Chemistry, Biology, or U.T. UT Southwestern faculty. May be repeated for credit (9 hours maximum). Prerequisite: Instructor consent required. ([2-6]-0) S

### CHEM 4355 Computational Modeling (3 semester hours)
This course will introduce students to computational modeling approaches commonly used to tackle chemical and biophysical problems. Prerequisites: CHEM (CHEM 3321 and MATH 2451 2451) or instructor consent required. (3-0) Y

### CHEM 4381 Environmental Green Chemistry & Green Fuels (3 semester hours)
This course encompasses the study of the sources, reactions, transport, effects, and fates of chemical species in water, soil, and air environments and the effects of technology thereon. Prerequisite: CHEM 2325 or instructor consent required. (3-0) T

### CHEM 4473 Physical Measurements Laboratory (4 semester hours)
Modules may include topics in physical chemistry and biophysics such as bio-nanotechnology, calorimetry, centrifugation, computational methods, computer-instrument interfaces, electrochemistry, electronics, kinetics, literature skills, property of matter, spectroscopy, and statistical methods. Prerequisites: CHEM 3472 (CHEM 3321 and CHEM 3321 3472) or instructor consent required. (1-7) Y

### GEOS 2306 Geodesy and Geospatial Analysis (3 semester hours)
Introduction to the basic concepts of geodetic datums (horizontal and vertical), coordinate systems, and map projections. Applications in the Earth Sciences will be discussed to reinforce concepts. (Same as GISC 2302) (3-0) Y

### GEOS 2V08 Special Topics in Geology or Geophysics I (1-4 semester hours)
Subject matter will vary from semester to semester. Instructor consent required. May be repeated for credit as topics vary (9 hours maximum). ([1-4]-0) R

### GEOS 3300 Field Geology I (Summer Field Camp I) (3 semester hours)
A three-week, early summer field based course designed to provide practical introductory field geological experience. Course emphasizes mapping in sedimentary and igneous terrains and will also cover techniques for mapping geomorphic features. Reports on each project in professional form are required. Prerequisites: GEOS 4402, 1103 and GEOS 4404, 1104 and GEOS 4303, 1303 and GEOS 1304, and GEOS 2406. NOTE: A field trip fee, which covers the cost of food, lodging, and transportation, is charged for this course. Students are responsible for any other personal expenses related to camp. (3-0) Y
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<tr>
<th>Year</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
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</thead>
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<tr>
<td>2007-2013</td>
<td>geos3401</td>
<td>GEOS 3401 Oceanography (4 semester hours) Fundamentals of oceanography, with discussions on the effects of the oceans and people on the Earth’s climate and biological communities. Topics include the formation of ocean currents, waves and tides, the greenhouse effect, El Niño, marine pollution, the exploitation of marine resources, wetlands preservation, coral reefs, life in the deep sea, and other marine ecological systems. Laboratory course. <strong>Credit cannot be received for only one of both courses, GEOS 3401 or ISNS 3367 The Oceans.</strong></td>
<td>4</td>
<td>GEOS 1103, 1104, 1303, 1304 and GEOS 2409.</td>
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<td>2012-2013</td>
<td>geos3421</td>
<td>GEOS 3421 Stratigraphy and Sedimentology (4 semester hours) Principles and evolution of modern stratigraphic nomenclature; concepts of space and time in the rock record and methods of stratigraphic correlation; factors controlling stratigraphic architecture of sedimentary basins; integrated stratigraphic techniques. Origin, transportation, and deposition of carbonate and siliciclastic sediments; weathering, textural analysis, and depositional environments. Laboratory course. Field trips. Prerequisites: GEOS 4403, 1103 and GEOS 4404, 1104 and GEOS 4303, 1303 and GEOS 4304, 1304 and GEOS 2409.</td>
<td>4</td>
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<td>2012-2013</td>
<td>geos3434</td>
<td>GEOS 3434 Paleobiology (4 semester hours) History of life as documented by the fossil record. Basic concepts of paleontology and biostratigraphy followed by a review of major fossil groups and major events in the evolution of life, speciation, mass extinction, evolution of communities and ecosystems through geologic time. Paleontological methods to paleoenvironmental reconstruction. Field trip. Prerequisites: GEOS 4403, 1103 and GEOS 4404, 1104 and GEOS 4303, 1303 and GEOS 4304, 1304 and GEOS 2409.</td>
<td>4</td>
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<td>2012-2013</td>
<td>geos3464</td>
<td>GEOS 3464 Igneous and Metamorphic Petrography (4 semester hours) Introduction to the petrographic microscope and its use for study of igneous and metamorphic minerals and rocks. Identification and classification of volcanic and plutonic igneous rocks and metamorphic rocks and their identification in thin sections. Introduction to igneous and metamorphic petrogenesis. Prerequisites: GEOS 4303, 1303 and GEOS 4403, 1103 and GEOS 4304, 1304 and GEOS 4104, 1104 and GEOS 2409.</td>
<td>4</td>
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<td>2012-2013</td>
<td>geos3470</td>
<td>GEOS 3470 Structural Geology (4 semester hours) Modern tectonic concepts, survey of major structural provinces, examination of material behavior, stress-strain concepts, failure criteria, soil mechanics, fault analysis, rheology, fold analysis and applications of structural concepts to neotectonics and environmental problems. Training in graphical techniques, use of stereographic projections, and geological map interpretation. Laboratory course. Field trip. Prerequisites: GEOS 4403, 1103 and GEOS 4404, 1104 and GEOS 4303, 1303 and GEOS 4304, 1304 and GEOS 2409 and GEOS 2406. Recommended prerequisites: PHYS 2325 and PHYS 2125.</td>
<td>4</td>
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<td>2012-2013</td>
<td>geos4300</td>
<td>GEOS 4300 Field Geology II (Summer Field Camp II) (3 semester hours) A three-week, early summer field based course designed to provide practical advanced field geological experience. Course emphasizes mapping in sedimentary, metamorphic, and igneous terrains and will also cover techniques used in imaging and analyzing geomorphic features. Reports on each project in professional form are required. Prerequisites: GEOS 3300, 3300 and GEOS 3421, 3421 and GEOS 3464, 3464 and GEOS 3470. NOTE: A field trip fee, which covers the cost of food, lodging, and transportation, is charged for this course. Students are responsible for all personal expenses related to camp.</td>
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<td>GEOS 3300, 3300 and GEOS 3421, 3421 and GEOS 3464, 3464 and GEOS 3470.</td>
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<td>geos4320</td>
<td>GEOS 4320 The Physics and Chemistry of the Solid Earth (3 semester hours)</td>
<td>The study of the structure and evolution of the Earth through petrology, geochemistry and geophysics. Plate tectonics will be emphasized as a framework for crust and mantle dynamics. The roles of gravity, thermal processes and the mechanical behavior of rocks are investigated. Tectonic settings of igneous and metamorphic rocks will be explored. Prerequisites: GEOS 4403, 1103 and GEOS 4404, 1104 and GEOS 1303, 1303 and GEOS 4304, 1304 and GEOS 2409, 2409 and GEOS 3464. Recommended prerequisites: PHYS 2125 and PHYS 2325. (3-0) Y</td>
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<td>geos4322</td>
<td>GEOS 4322 The Earth System (3 semester hours)</td>
<td>Planet Earth comprises a system of interacting spheres: atmosphere, hydrosphere, lithosphere and biosphere, all of which have played an important role in Earth processes and Earth history. This course examines these Earth systems and how their interactions over time have affected their evolving compositions, the evolution of life and Earth's climate. The short-term and long-term parts of the carbon cycle provide the underlying theme for the study of the Earth System. Prerequisites: GEOS 1103, 1103 and GEOS 4404, 1104 and GEOS 1303, 1303 and GEOS 4304, 1304 and GEOS 2409. (3-0) Y</td>
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<td>geos4369</td>
<td>GEOS 4369 Volcanic Successions (3 semester hours)</td>
<td>Terrestrial volcanism is considered from the perspective of volcanic processes, and the properties, products and deposits of volcanic eruptions, all in the context of definable facies models. The effects of subsequent sedimentological processes are also considered. Volcanic settings are explored in detail as they are related to their plate tectonic settings. Recognition of volcanically derived deposits are emphasized using the facies model concepts, and are considered with respect to their geological and economic significance. (3-0) T</td>
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<td>geos4430</td>
<td>GEOS 4430 Hydrogeology and Aqueous Geochemistry (4 semester hours)</td>
<td>An introduction to the principles of physical and chemical hydrogeology. Physical topics include the nature and quantification of the components of the hydrologic cycle, fundamentals of water supply and quality, overview of aquifer testing and environmental assessment. Chemical topics include behavior of low-temperature aqueous solutions, water-rock interaction and applications of chemistry to understand the Earth and its geochemical cycles. Prerequisites: GEOS 4403, 1103 and GEOS 4404, 1104 and GEOS 4303, 1303 and GEOS 4204, 1304 and GEOS 2409. Recommended prerequisites: CHEM 1311 and CHEM 1312. (4-0) Y</td>
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<td>geosv08</td>
<td>GEOS 4V08 Special Topics in Geology or Geophysics II (1-4 semester hours)</td>
<td>Subject matter will vary from semester to semester. Instructor consent required. May be repeated for credit as topics vary (9 hours maximum). ([(1-4)-0] R)</td>
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<td>math2420</td>
<td>MATH 2420 (MATH 2420) Differential Equations with Applications (4 semester hours)</td>
<td>Topics covered will be drawn from the following list: First order differential equations, system of linear differential equations, stability, series solutions, special functions, Sturm-Liouville problem, Laplace transforms and linear differential equations and applications in physical sciences and engineering using computers. Three lecture hours and two discussion hours a week; problem section required with MATH 2420, and will also be registered for exam section. Not all MATH/STAT courses may be counted toward various degree plans. Please consult your degree plan to determine the appropriate MATH/STAT course requirements. Prerequisite: A grade of at least a C- in either MATH 2415 or in MATH 2449, 2419, and a grade of at least a C- in MATH 2418 or equivalent. (3-2) S</td>
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<td>2012-13</td>
<td>math2451</td>
<td>MATH 2451 Multivariable Calculus with Applications (4 semester hours)</td>
<td>6</td>
<td>Vectors, matrices, vector functions, partial derivatives, divergence, curl, Laplacian, multiple integrals, line and surface integrals, Green's, Stokes', and Gauss' theorems, and applications in physical sciences and engineering. Topics drawn from implicit function theorem, differential forms and vector fields. Three lecture hours and two discussion hours per week; problem section required with MATH 2451. Not all MATH/STAT courses may be counted toward various degree plans. Please consult your degree plan to determine the appropriate MATH/STAT course requirements. Prerequisite: A grade of at least a C- in either MATH 2415 or in MATH 2419, and a grade of at least C- in MATH 2418 or equivalent. (3-2) S</td>
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<tr>
<td>2012-13</td>
<td>math2v90</td>
<td>MATH 2V90 Topics in Mathematics - Level 2 (1-6 semester hours) Special</td>
<td>5</td>
<td>topics in mathematics outside the normal course of offerings. May be repeated for credit as topics vary (9 hours maximum). Instructor consent required. ([1-6]-0) S</td>
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<td>2012-13</td>
<td>math3301</td>
<td>MATH 3301 Mathematics for Elementary and Middle School Teachers (3 semester hours) This course is intended to develop future teachers' depth of mathematical understanding by examining concepts in school mathematics from an advanced perspective. Topics include: numeration systems; arithmetic algorithms, prime factorization and other properties of the integers; proportional reasoning involving fractions and decimals; counting methods; and basic ideas of geometry and measurement. Problem solving is stressed. Cannot be used to satisfy: [1] undergraduate mathematics core requirement, [2] degree requirements by students in Mathematics, [3] the advanced electives, or [4] certification requirements in 8-12 mathematics. Prerequisite: MATH 1306 or MATH 1314 or equivalent. (3-0) S</td>
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<td>2012-13</td>
<td>math3303</td>
<td>MATH 3303 Introduction to Mathematical Modeling (3 semester hours) An introduction to construction, use, and analysis of empirical and analytical mathematical models. Emphasis on using appropriate technology with tools such as curve fitting, probability and simulation, difference and differential equations, and dimensional analysis. Cannot be used to satisfy mathematics requirements by students in Mathematics and cannot be used to satisfy the advanced electives. Prerequisites: MATH 2418 and a grade of at least a C- in either MATH 2415 or in MATH 2419. (3-0) Y</td>
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<td>2012-13</td>
<td>math3305</td>
<td>MATH 3305 Foundations of Measurement and Informal Geometry (3 semester hours) An analysis, from an advanced perspective, of the basic concepts and methods of geometry and measurement. Topics include visualization, geometric figures and their properties; transformations and symmetry; congruence and similarity; coordinate systems; measurement (especially length, area, and volume); and geometry as an axiomatic system. Emphasis on problem solving and logical reasoning. Cannot be used to satisfy: [1] undergraduate mathematics core requirement, [2] degree requirements by students in Mathematics, [3] the advanced electives, or [4] certification requirements in 8-12 mathematics. Prerequisite: Prerequisites: (MATH 2312 and MATH 2312, MATH 3301 3301) or equivalent. (3-0) Y</td>
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<td>MATH 3307</td>
<td>Mathematical Problem Solving for Teachers (3 semester hours) Development of the ability to solve mathematical problems and communicate their solutions through the study of strategies and heuristics. Practice in solving problems involving ideas from number theory, algebra, combinatorics and probability, etc. Communicating mathematics, logical reasoning, and connections between mathematical topics will be emphasized. Cannot be used to satisfy degree requirements by students in Mathematics or the advanced electives. Prerequisites: MATH 2312 and MATH (MATH 3305 or MATH 3321).</td>
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<td>MATH 3311</td>
<td>Abstract Algebra I (3 semester hours) Groups, rings, fields, vector spaces modules, linear transformations, and Galois theory. Prerequisite: A grade of at least a C- in either MATH 2415 or in MATH 2419, and a grade of at least C- in MATH 2418 or equivalent.</td>
<td>(3-0) S</td>
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<td>MATH 3380</td>
<td>Differential Geometry (3 semester hours) Curves and surfaces, multilinear algebra, alternating tensors, tangent vectors, tangent space, vector fields, differential forms; Curvature and torsion of curves, Riemannian metrics, curvature of surfaces, isometries, geodesics, Gauss map, First and Second Fundamental Forms, area on surfaces, Gauss-Bonnet Theorem, surfaces with constant negative curvature and elements of hyperbolic geometry. Prerequisites: MATH 2451, 2451 and MATH 2418, 2418 and MATH 2420. 2420 or equivalent courses.</td>
<td>(3-0) Y</td>
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<td>MATH 4333</td>
<td>Structure of Modern Geometry (3 semester hours) The course is designed to familiarize students with the geometrical concepts which relate to two and three dimensional geometry and the mathematical techniques used in the study of geometry. The emphasis is both on the development of understanding of the concepts and the ability to use the concepts in proving theorems. The course includes study of axiom systems, transformational geometry, and an introduction to non-Euclidean geometries, supplemented by other topics as determined by the instructor. Prerequisite: A grade of at least a C- in MATH 2418 or equivalent.</td>
<td>(3-0) Y</td>
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<td>MATH 4334</td>
<td>Numerical Analysis (3 semester hours) Solution of linear equations, roots of polynomial equations, interpolation and approximation, numerical differentiation and integration, solution of ordinary differential equations, equations, computer arithmetic, and error analysis. Students cannot receive credit for both CS/MATH MATH 4334 and ENGR 4334. Prerequisites: CE/CS/TE 3337, MATH 2418, (CE 1337 or CS 1337 or TE 1337) and (MATH 2418 and MATH 2451, 2451). (Same as CS 4334)</td>
<td>(3-0) Y</td>
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<td>NATS 1101</td>
<td>Natural Sciences &amp; Mathematics Freshman Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Natural Sciences and Mathematics (NS&amp;M). Students will learn about plans of study and career paths for majors in Biology, Chemistry, Physics, Mathematics, Geosciences, and Science and Mathematics Education. Basic study, problem solving and other skills needed to succeed as an NSM major will be covered. An overview of the connections within the disciplines of Natural Sciences &amp; Mathematics will be presented, as well as their relationship to engineering, medicine and health, and other fields. Required for all first time in college freshmen in NS&amp;M.</td>
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<td>NATS 1141</td>
<td>UTeach STEP 1 (1 semester hour)</td>
<td>1</td>
<td>A university grade point average of at least 2.750 and admission to the UTeach Dallas program by consent of the UTeach advisor.</td>
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<tr>
<td>NATS 1143</td>
<td>UTeach STEP 2 (1 semester hour)</td>
<td>1</td>
<td>A university grade point average of at least 2.750 and a grade of B- or better in NATS 4444 and/or 1141, and consent of the UTeach advisor.</td>
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<tr>
<td>NATS 3341</td>
<td>Knowing and Learning in Mathematics and Science (3 semester hours)</td>
<td>3</td>
<td>A university grade point average of at least 2.750, 3.000 a grade of B- or better in UTeach coursework, and consent of the UTeach advisor.</td>
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<td>NATS 3343</td>
<td>Classroom Interactions (3 semester hours)</td>
<td>3</td>
<td>A university grade point average of at least 2.750, credit or registration for NATS 3341, and a GPA of 3.000 or better in UTeach coursework, coursework, and consent of the UTeach advisor.</td>
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<td>NATS 4141</td>
<td>UTeach Student Teaching Seminar (1 semester hour)</td>
<td>Discussions include student teaching experiences, and contemporary critical issues in education. <strong>Time is also allocated for completion of the portfolio project.</strong> One class hour a week for one semester.</td>
<td>(NATS 3343 and NATS 3434, 4390 and NATS 4390, 4341), a UTD university grade point average of at least 2.750 and 2.750, a GPA of 3.000 or better in UTeach coursework, coursework, and consent of the UTeach advisor.</td>
<td>Corequisite: NATS 4694/4696 4694 or ED 4694/4696. NATS 4696. (1-0) S</td>
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<tr>
<td>NATS 4341</td>
<td>Project-Based Instruction (3 semester hours)</td>
<td><strong>Foundations Students explore topics including foundations</strong> of project-based, case-based, and problem-based learning environments; principles of project-based curriculum development in mathematics and science education; and, classroom management and organization of project-based learning classrooms are covered. <strong>Fieldwork usually includes 2 observation days and 3 teaching days.</strong> Three lecture hours a week for one semester with additional fieldwork hours to be arranged.</td>
<td>Prerequisite: <strong>A</strong> Prerequisites: NATS 3343, a university grade point average of at least 2.750 and 2.750, a GPA of 3.000 or better in UTeach coursework, coursework, and consent of the UTeach advisor.</td>
<td>Prerequisite or Corequisite: corequisite: NATS 3343. 4390. (3-0) Y</td>
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<td>NATS 4694</td>
<td>UTeach Student Apprentice Teaching, 8-12 Science and Mathematics (6 semester hours)</td>
<td>Closely supervised observation and teaching in a science or mathematics classroom for Grades 8-12. Experience includes carrying out the duties of a high school teacher and requires a minimum of four hours of fieldwork a day for 12 weeks. Students must apply for Student Apprentice Teaching the semester prior to enrollment.</td>
<td>Prerequisites: (NATS 4341 and NATS 4341, NATS 4390, 4390), a UTD university grade point average of at least 2.750 and 2.750, a GPA of 3.000 or better in UTeach coursework, coursework, and consent of the UTeach advisor.</td>
<td>Admission to student teaching. Must register in UTeach Dallas/Teacher the university’s teacher certification program by the Teacher Development Center. Corequisite: NATS 4141. Additional fee attached to course.</td>
<td>Corequisite: NATS 4141. (6-0) S</td>
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<tr>
<td>NATS 4696</td>
<td>UTeach Student Apprentice Teaching, 4-8 Science and Mathematics (6 semester hours)</td>
<td>Closely supervised observation and teaching in a science or mathematics classroom for Grades 4-8. Experience includes carrying out the duties of a middle grades teacher and requires a minimum of four hours of fieldwork a day for 12 weeks. Students must apply for Student Apprentice Teaching the semester prior to enrollment.</td>
<td>Prerequisites: (NATS 4341 and NATS 4341, NATS 4390, 4390), a UTD university grade point average of at least 2.750 and 2.750, a GPA of 3.000 or better in UTeach coursework, coursework, and consent of the UTeach advisor.</td>
<td>Admission to student teaching. Must register through UTeach Dallas/Teacher the university’s teacher certification program by the Teacher Development Center. Corequisite: NATS 4141. Additional fee attached to course.</td>
<td>Corequisite: NATS 4141. (6-0) S</td>
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<td>PHYS 2303</td>
<td>Contemporary Physics (3 semester hours)</td>
<td><strong>Topics include the fundamentals of geometric optics, interference, diffraction, special relativity, structure of the atom, nuclear physics, radioactivity, radioactivity, and elementary particles.</strong></td>
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<td>2012-2013</td>
<td>phys3125</td>
<td>PHYS 3125 Electronics Laboratory</td>
<td>(1 semester hour) Laboratory course to accompany PHYS 3325. Students will use common laboratory equipment to diagnose and troubleshoot breadboard circuits they build in lab. The lab exercises are closely tied to the topics covered weekly in PHYS 3325 lectures. The final lab of the semester is a design lab in which students design, build, and test a sequential logic circuit to solve a specific problem. Corequisite: PHYS 3325.</td>
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<td>2012-2013</td>
<td>phys3317</td>
<td>PHYS 3317 Physics of the Human Body</td>
<td>(3 semester hours) This course would be an introduction to basic biophysics of the human body. Topics include body motion and the forces which cause it, properties of the body like elasticity and how it affects things like muscles and bones, energy conservation of the body and how it affects metabolism, fluid flow and the circulatory system, waves and how they affect hearing and sight. Prerequisites: PHYS (PHYS 1301 or PHYS 2325 2325) and MATH 2413.</td>
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<tr>
<td>2012-2013</td>
<td>phys3330</td>
<td>PHYS 3330 Numerical Methods in Physics and Computational Techniques</td>
<td>(3 semester hours) The course covers concepts and computational techniques in numerical methods for solving physics problems. Topics typically include probability, statistics, data analysis, fits, numerical solutions, and interpretation of the experimental data. Prerequisites: MATH (MATH 2415 or MATH 2419 2419) and MATH 2418.</td>
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<tr>
<td>2012-2013</td>
<td>phys3380</td>
<td>PHYS 3380 Astronomy</td>
<td>(3 semester hours) An essentially descriptive course outlining the current views of the universe and the sources of data supporting those views. The solar system and its origin, stars, galaxies, pulsars, quasars, black holes, nebulae, and the evolution of the universe. Opportunity to use a UT Dallas telescope is provided. Prerequisite: PHYS 2326 or PHYS 2422.</td>
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<tr>
<td>2012-2013</td>
<td>phys3411</td>
<td>PHYS 3411 Theoretical Physics</td>
<td>(4 semester hours) Complex numbers; Vector spaces and linear operators; Line integrals; surface &amp; and volume integrals; Gradient, divergence &amp; and curl; vector integral theorems; Fourier series; Product solutions of PDEs. Co-requisite: Differential Equations (MATH Corequisite: MATH 2420 or equivalent). equivalent. Prerequisites: Linear Algebra (MATH 2418 or equivalent), Calculus of Several Variables and (MATH 2415) 2415 or Calculus II (MATH 2419), PHYS MATH 2419) and (PHYS 2326 or PHYS 2422, 2422).</td>
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<td>2011-2013</td>
<td>phys3416</td>
<td>PHYS 3416 Electricity and Magnetism</td>
<td>(4 semester hours) Coulomb's and Gaus' laws; potentials, methods for solving electric field distributions near conductors; potentials due to clusters of charges; polarization of dielectric materials; electric displacement. Magnetic fields in a vacuum and in matter; time varying electric and magnetic fields; Maxwell's equations; electromagnetic waves. Prerequisite: Either PHYS 3311 or PHYS 3411 or equivalent.</td>
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<tr>
<td>2012-2013</td>
<td>phys4301</td>
<td>PHYS 4301 Quantum Mechanics I</td>
<td>(3 semester hours) Fundamental concepts: the Stern Gerlach experiment; the Dirac formalism; kets; bras and operators; base kets and matrix representations. Measurements, observables and the uncertainty relations. Position, momentum, and translation. Wave functions in position and momentum space. Time evolution and Schrödinger's equation, Heisenberg picture. Orbital angular momentum, spin, and angular momentum addition. Applications include simple harmonic oscillator and the Hydrogen atom. Prerequisites: (PHYS 3311 or PHYS 3411 3411) and MATH 2418.</td>
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<tr>
<td>phys4302</td>
<td>PHYS 4302 Quantum Mechanics II (3 semester hours)</td>
<td>Fermions and bosons, perturbation theory, WKB approximation, scattering. Prerequisite: PHYS 4301. (3-0)</td>
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<tr>
<td>phys4311</td>
<td>PHYS 4311 Thermodynamics and Statistical Mechanics (3 semester hours)</td>
<td>Study of the elements of thermodynamics, kinetic theory, and statistical mechanics; the concepts of temperature, entropy, phase transitions, transport phenomena, partial partition functions, statistical ensembles; the Maxwell Boltzmann, Fermi-Dirac, and Bose-Einstein distributions; and the equipartition theorem. Applications of the theories will be considered. Prerequisites: PHYS 2326, PHYS 2326, and other. Corequisite: PHYS 3311 or PHYS 3411. Prerequisite: PHYS 2326 or PHYS 2422. (3-0)</td>
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<tr>
<td>phys4335</td>
<td>PHYS 4335 Remote Sensing of the Earth (3 semester hours)</td>
<td>This course covers the basic physical principles and applications of remote sensing of the earth system (air, land and sea), covering the types of platforms (satellites and aerial vehicles) and sensors used (UV/Visible, IR, Microwave, Radio). (3-0)</td>
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<tr>
<td>phys4371</td>
<td>PHYS 4371 Solid State Physics (3 semester hours)</td>
<td>This course provides a basic but detailed picture of important concepts in solid state physics. Material covered includes crystal structure, x-ray crystallography, reciprocal space, lattice vibrations, thermal properties of solids, free electron gas, Bloch functions, metals, insulators, semiconductors. The course concludes with a description of basic semiconductor devices. Prerequisite: PHYS 3416. (3-0)</td>
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<tr>
<td>phys4381</td>
<td>PHYS 4381 Space Science (3 semester hours)</td>
<td>A survey of the structure and dynamics of the atmospheres of planets, including ionospheres and magnetospheres, as influenced by the sun’s radiation and the solar wind. Topics include aurora and airglow, photochemistry, photochemistry, and atmospheric electricity. Prerequisite: PHYS 2422 or PHYS 2326 or equivalent. (3-0)</td>
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<tr>
<td>phys4395</td>
<td>PHYS 4395 Cosmology (3 semester hours)</td>
<td>The course is a simplified overview of contemporary cosmology including: cosmological principle; scale of distance and expansion law of the universe; redshift; Friedmann equations and cosmological models of the universe; cosmological probes and techniques; baryonic matter; dark matter; dark energy and cosmic acceleration. Prerequisites: PHYS (PHYS 3311 or PHYS 3411 3411) or ENGR (ENGR 3300 or MATH 2420 2420) and MATH 2415. (3-0)</td>
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<tr>
<td>phys4V10</td>
<td>PHYS 4V10 Special Topics in Physics (1-9 semester hours)</td>
<td>Subject matter will vary from semester to semester. May be repeated for credit as topics vary (9 hours maximum). Prerequisite: Instructor consent required. (1-9-0)</td>
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<tr>
<td>stat1342</td>
<td>STAT 1342 (MATH 1342) Statistical Decision Making (3 semester hours)</td>
<td>Principles of quantitative decision making: summarizing data, modeling uncertainty, loss functions, probability, conditional probability, random variables. Introduction to statistics: estimation, confidence intervals, hypothesis testing, regression. Introduction to statistical packages. Cannot be used to satisfy degree requirements for majors in the School of Engineering and Computer Science, or major requirements in the Schools of Management or Natural Sciences and Mathematics. Prerequisite: MATH 1306, 1306 or MATH 1314 or equivalent. (3-0)</td>
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### Undergraduate Catalog 2013 - Course Change Requests

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<tr>
<td>stat3341</td>
<td>STAT 3341 Probability and Statistics in Computer Science and Software Engineering</td>
<td>Probability and Statistics in Computer Science and Software Engineering (3 semester hours) Introduction to Axiomatic probability theory, independence, conditional probability. Discrete and continuous random variables, special distributions of importance to CS/SE, and expectation. Simulation of random variables and Monte Carlo methods. Central limit theorem. Basic statistical data analysis, with emphasis on applications in the sciences and engineering. Cannot be used by mathematical sciences majors in inference, parameter estimation, hypothesis testing, and linear regression. Introduction to stochastic processes. Illustrative examples and simulation exercises from queuing, reliability, and other CS/SE applications. Students cannot get credit for both STAT 3341 and ENGR 3341. Prerequisites: MATH 1326 or MATH 1472, 2414 or MATH 2419, and (CE 2305 or CS 2305 or TE 2305). (Same as CS 3341 or SE 3341) (3-0) (S)</td>
<td>3-0</td>
<td>MATH 1326 or MATH 1472, 2414 or MATH 2419, and (CE 2305 or CS 2305 or TE 2305)</td>
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<tr>
<td>acts4303</td>
<td>ACTS 4303 Principles of Actuarial Models: Life Contingencies II</td>
<td>Principles of Actuarial Models: Life Contingencies II (3 semester hours) The purpose of this class is to develop the student’s knowledge of the theoretical basis of life contingent actuarial models for multiple lives and the application of those models to insurance and other financial risks. Reserves, life contingencies for multiple lives, expenses and stochastic processes will be studied. This class covers parts of CAS Exam 3L and SOA Exam MLC. Prerequisite: ACTS 4301 or instructor consent required. (3-0)</td>
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<td>ACTS 4301 or instructor consent required</td>
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<td>chem2v95</td>
<td>CHEM 2V95 Individual Instruction in Chemistry</td>
<td>Individual Instruction in Chemistry (1-3 semester hours) Individual study under a faculty member's direction. May be repeated for credit as topics vary (9 hours maximum). Instructor consent required. (1-3-0)</td>
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<td>geos4606</td>
<td>GEOS 4606 Field Geology (Summer Field Camp)</td>
<td>Field Geology (Summer Field Camp) (6 semester hours) A four-week summer camp designed to provide both practical geological and geophysical experience. Geology students emphasize mapping in sedimentary, igneous, and metamorphic terrains. Geophysics students utilize seismic, potential field, and electrical methods to analyze a field area. Reports in professional form are required. Prerequisites: GEOS 1303, 1103, 1304, 1104, 2409 and GEOS 3470. NOTE: A field trip fee is charged for this course. Students are responsible for all personal expenses related to camp. (6-0)</td>
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<td></td>
<td>ISNS 3332 Future Energy Resources (3</td>
<td>Major energy consuming sectors: residential, industrial, transportation and electricity generating sectors. Present major energy resources: oil, gas, coal, hydroelectric, and nuclear. Energy mix used in consuming sectors. Imported energy. Domestic and world resources in conventional energies. Future energy resources: nuclear fission (conventional and breeder reactors), fusion reactors, technology and safety aspects, nuclear proliferation and terrorism, nuclear waste disposal, solar energy, solar heating and cooling. Non-conventional energy resources. Major problems of energy transportation. An energy mix for the future. Possible scenarios for a U.S. energy plan. Major fields of research and development. (3-0) Y</td>
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<td>2012-</td>
<td>ISNS 3333 Nuclear Safety and Terrorism (3</td>
<td>Practically all scientists, politicians, statesmen and other leaders of our society agree that the ultimate most tragic danger confronting our whole civilization is nuclear terrorism: the invisible terrorist with a shielded (invisible) nuclear weapon. The physical principles of nuclear weapons, access to them, possibility to smuggle them into the U.S., nuclear proliferation, the possibility of escalating a nuclear attack into full scale nuclear war, and the technical possibilities to reduce this terrible danger are discussed. (3-0) Y</td>
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<td>2004-</td>
<td>PHYS 3324 Scientific Computing (3</td>
<td>Introduction to modern programming languages like C++ and Fortran. Applications of programming for scientific analysis, manipulation, and graphical display. (2-0) R</td>
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<tr>
<td>2000-</td>
<td>PHYS 4324 Computer Interfacing and Data</td>
<td>Hardware and software techniques to utilize computers in data acquisition and control of physics experiments. Operation of digital input and output devices, analog to digital converters, digital to analog converters, and intercomputer communication. Hands-on operation of several devices. (3-0) T</td>
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<tr>
<td>2013</td>
<td>Acquisition (3 semester hours)</td>
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Academic Policies and Procedures

FERPA

The Family Educational Rights and Privacy Act (FERPA) is a federal law enacted in 1974 to protect the privacy of student education records. The law applies to those institutions that regularly receive federal funding from the Department of Education and is enforced by the Family Policy Compliance Office of the U.S. Department of Education.

FERPA forms for students can be found at http://www.utdallas.edu/student/registrar/forms (click on "FERPA packet").

Complaints of alleged violations may be addressed to

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue SW
Washington, D.C. 20202-5920

The UT Dallas FERPA violation link is located at http://www.utdallas.edu/legal/ferpa.

FERPA defines an eligible student as a student who has reached 18 years of age or is attending an institution of postsecondary education.

Students have four primary rights under FERPA:

- To inspect and review their education records
- To seek to amend those education records they believe to be inaccurate or misleading
- To have some control over the disclosure of information from those education records
- To file a complaint concerning alleged failures by an institution to comply with FERPA regulations within 180 days

More information regarding education records and the procedure for amending records can be found at http://www.utdallas.edu/student/registrar/faq.html#FERPA.

Directory or public information is information that is not generally considered harmful or an invasion of privacy if released. Directory information includes student's full name, local and permanent address, email address, phone numbers, date and place of birth, major field of study, dates of attendance, degrees/awards/honors received, most recent previous educational agency or institution attended, enrollment status.
(classification, under/grad, part/full-time), participation in officially recognized activities and sports, weight/height of members of athletic team, expected date of graduation and photographs.

Non-directory information is information that is not considered to be directory information, such as enrollment records, grades, schedules.

Student may choose to withhold release of directory information. A student may do so by completing the "Request for Confidentiality of Directory Information" form at http://www.utdallas.edu/student/registrar/forms (click on "FERPA packet").

More information regarding FERPA can be found at http://www2.ed.gov/policy/gen/guid/fpco/ferpa.

Test Scores (GMAT, GRE)

Standardized test scores must be official and reported directly by the Educational Testing Service (ETS) should be sent to The University of Texas at Dallas, Code 6897. The Graduate Management Admissions Test (GMAT) is required if applying to the School of Management and the Graduate Record Examination (GRE) revised General Test is required if applying to all other schools except the School of Arts and Humanities. Each degree program sets its own criteria for what constitutes a satisfactory score for degree-seeking admission see http://www.utdallas.edu/admissions/graduate/degrees/).

The information about the GRE and GMAT examinations given below was current at the time this catalog was published. Applicants should be advised that both examinations are undergoing changes in format and design.

Graduate Record Examination (GRE)

The GRE revised general test is offered on a year-round basis at regional testing centers in a computer-based testing (CBT) format.
Information on regional CBT testing may be obtained directly from Graduate Record Examination, Educational Testing Service, P.O. Box 6000; Princeton, NJ 08541-6000; by phone 1-610-771-7670 or 1-866-473-4373, via e-mail through its email form or direct email, gre-info@ets.org or on the World Wide Web at http://www.ets.org/gre. Applicants should specify by both institution and code that the test score be sent to The University of Texas at Dallas, Code 6897.
### CRIM 5381 Themes in Criminology (3 semester hours)
Topics vary from semester to semester. Prerequisite: Consult with an advisor to determine the appropriateness for one's degree plan and specialty areas of study. May be repeated for credit as topics vary (9 elective hours maximum). (3-0) R

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<td>2013-2013</td>
<td>add * crim5381 (r1) crim5381 .1</td>
<td>CRIM 5381 Themes in Criminology (3 semester hours) Topics vary from semester to semester. Prerequisite: Consult with an advisor to determine the appropriateness for one's degree plan and specialty areas of study. May be repeated for credit as topics vary (9 elective hours maximum). (3-0) R</td>
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### CRIM 6381 Issues in Criminology (3 semester hours)
Topics vary from semester to semester. May be repeated for credit as topics vary (9 elective hours maximum). Prerequisite: Consult with an advisor to determine the appropriateness for one's degree plan and specialty areas of study. (3-0) R

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<td>CRIM 6381 Issues in Criminology (3 semester hours) Topics vary from semester to semester. May be repeated for credit as topics vary (9 elective hours maximum). Prerequisite: Consult with an advisor to determine the appropriateness for one's degree plan and specialty areas of study. (3-0) R</td>
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### CRIM 6V01 Independent Study (1-9 semester hours)
Provides faculty supervision for student's individual study of a topic agreed upon by the student and the faculty supervisor. Student performance is assessed by instructor as pass/fail only. Prerequisite: Permission of instructor. May be repeated for elective credit (9 hours maximum). Can be applied for credit additionally at the discretion of the program on a case-by-case basis. ([1-9]-0) R

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<td>CRIM 6V01 Independent Study (1-9 semester hours) Provides faculty supervision for student's individual study of a topic agreed upon by the student and the faculty supervisor. Student performance is assessed by instructor as pass/fail only. Prerequisite: Permission of instructor. May be repeated for elective credit (9 hours maximum). Can be applied for credit additionally at the discretion of the program on a case-by-case basis. ([1-9]-0) R</td>
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### CRIM 6V97 Internship (1-6 semester hours)
Provides faculty supervision for a student's internship. Internships must be related to the student's course work. May be repeated for credit (6 hours maximum). Prerequisite: Permission of instructor required. ([1-6]-0) R

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<td>CRIM 6V97 Internship (1-6 semester hours) Provides faculty supervision for a student's internship. Internships must be related to the student's course work. May be repeated for credit (6 hours maximum). Prerequisite: Permission of instructor required. ([1-6]-0) R</td>
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<td>gisc5310 (r0)</td>
<td>GISC 5310 (GEOS 5310) Hydrogeology (3 semester hours)</td>
<td>Introduction to the principles and practice of ground- and surface- water hydrology. Study of the principles of occurrence and geologic controls of groundwater, physical flow and geochemistry of waters. Design and use of procedures for typical hydrologic investigations. (3-0) Y</td>
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<tr>
<td>2013-2013</td>
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<td>gisc5311 (r0)</td>
<td>GISC 5311 (GEOS 5311) Applied Groundwater Modeling (3 semester hours)</td>
<td>This course is designed to provide students with hands-on experience using the most commonly-applied groundwater flow and transport models (e.g. modflow/modpath, MT3D/RT3D, GMS). Practical application of the models and design of modeling studies is emphasized, modeling theory and mathematics is de-emphasized. (3-0) Y</td>
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<tr>
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<td>gisc5322 (r0)</td>
<td>GISC 5322 (GEOS 5322) GPS (Global Positioning System) Satellite Surveying Techniques (3 semester hours)</td>
<td>The theory and application of satellite positioning utilizing the Global Positioning System Code and phase methodology in field observations, data processing and analysis of Differential GPS, high accuracy static and other rapid measurements, in real time and with post-processing. (3-0) Y</td>
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### Additional changes made to graduate courses
#### 2013 Graduate Catalog

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<tr>
<td>gisc5324</td>
<td>2013-02-12</td>
<td>GISC 5324 (GEOS 5324) 3D Data Capture and Ground Lidar (3 semester hours)</td>
<td>The theory and applications of 3D data acquisition in the field for geosciences and non-geosciences studies. The basics and applications of field digital mapping with emphasis on RTK GPS, laser range finder, and terrestrial scanners (ground lidar). 3D digital photorealistic modeling with field photogrammetry and digital cameras. (3-0) T</td>
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<td>gisc5330</td>
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<td>GISC 5330 (GEOS 5330) Geospatial Applications in Earth Science (3 semester hours)</td>
<td>Application of geospatial techniques in solving earth science problems. Emphasis will be placed on the use of the Global Positioning System in survey and geodetic applications, airborne and ground-based LiDAR (Light Detection and Ranging), and digital acquisition and analysis techniques. Case histories will be considered and supplemented by hands-on exercises using a broad range of digital acquisition and analysis equipment and tools. (3-0) Y</td>
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<tr>
<td>gisc5395</td>
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<td>GISC 5395 (GEOS 5395) Satellite Geophysics and Applications (3 semester hours)</td>
<td>This course concerns both the theory and application of observing geophysical fields from space-borne platforms. The observation procedures including orbital mechanics are introduced and signal propagation, errors and uncertainties will be addressed. Concepts of current satellite missions such as radar and laser altimetry, space gravimetry and magnetometry, and synthetic aperture radar will be discussed. Applications of satellite geophysical observations in tectonics, geodynamics, ocean and ice surface monitoring, hydrology, and terrain modeling will be introduced through student projects and presentations. (3-0) Y</td>
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<td>gisc6301</td>
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<td>GISC 6301 Geospatial GIS Data Analysis Fundamentals (3 semester hours)</td>
<td>Focuses on data handling techniques and applying basic statistical methodology to spatial research questions. Concepts of statistical data analysis including descriptive statistics, exploratory methods, sampling theory, statistical inference and correlation analysis are reviewed from a Geo-Information Sciences perspective. Regression analysis and basic methods of spatial pattern analysis are introduced. A prior course in statistics (such as EPPS 3405) is strongly recommended. (3-2) Y</td>
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<tr>
<td>GISC 6325 (GEOS 5325)</td>
<td>Introduction to Remote Sensing Fundamentals (3 semester hours)</td>
<td>Application of airborne and satellite remote sensing for understanding the surface of the earth. Focus on interpretation of images obtained by passive and active imaging systems using electromagnetic radiation, especially visible, infra-red, and radar. Laboratory course. (2-3) Y</td>
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<td>GISC 6326</td>
<td>Geovisualization (3 semester hours)</td>
<td>Examines the theoretical concepts and practical applications of cartographic and geographic visualization. Topics covered in lectures include concepts for geographic data representation, symbolization and map design, and methods for geographic visualization and display. 3D visualization, cartographic animation, and web-based mapping may also be included. Lab sessions explore the implementation of cartographic and geographic visualization with industry standard GIS software. Prerequisite: GISC (GISC 6381 or GEOS 6381) or equivalent knowledge. (3-0) R</td>
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<td>GISC 6381 (GEOS 6381)</td>
<td>Geographic Information Systems Fundamentals (3 semester hours)</td>
<td>Examines the fundamentals of Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. (3-0) Y</td>
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<td>GISC 6382 (GEOS 6383)</td>
<td>Applied Geographic Information Systems (3 semester hours)</td>
<td>Further develops hands-on skills with industry-standard GIS software for application in a wide variety of areas including urban infrastructure management, marketing and location analysis, environmental management, geologic and geophysical analysis and the Economic, Political and Policy Sciences. Prerequisite: GISC (GISC 6381 or GEOS 6381) or equivalent with instructor's permission. (3-0) Y</td>
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**Additional changes made to graduate courses 2013 Graduate Catalog**

**Forwarded from CEP to Senate, 3-5-13**
### Additional changes made to graduate courses
#### 2013 Graduate Catalog

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<th>Year</th>
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<tr>
<td>2012-2013</td>
<td>GISC 6384</td>
<td>(GEOS 6384) Spatial Analysis and Modeling (3 semester hours)</td>
<td>Treatment of more advanced topics in the application of spatial analysis in a GIS environment. Topics covered include raster-based cartographic modeling, 3-D visualization, geostatistics and network analysis. Student will be acquainted with state-of-the-art software through hands-on laboratory experiences. Prerequisite: GISC 6381 or GEOS 6381. (3-0) Y</td>
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<td>2011-2013</td>
<td>GISC 6385</td>
<td>(GEOS 6385) GIS Theories, Models and Issues (3 semester hours)</td>
<td>Provides an understanding of the underlying theories, mathematical and geometric tools, and their computational implementations that establish GIS capabilities to handle and analyze geo-referenced information. Associated issues (such as uncertainty, spatial analysis and spatial data management) highlighted. Prerequisites: <em>GISC</em> (GISC 6381 or GEOS 6381) and <em>GISC 6382</em>, (GISC 6382 or GEOS 6383), or equivalent with instructor’s permission. (3-0) Y</td>
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<td>2011-2013</td>
<td>GISC 6387</td>
<td>(GEOS 6387) Geographic Information Systems Workshop (3 semester hours)</td>
<td>Provides a structured laboratory experience focused on the students' substantive area of interest. Each participant develops a project which should include aspects of database design and manipulation, spatial analysis, and cartographic production. Projects may be designed in coordination with a local government, utility, business, or other entity that uses GIS in its operations and research. Prerequisites: <em>GISC</em> (GISC 6381 or GEOS 6381) and <em>GISC 6382</em>, (GISC 6382 or GEOS 6383). (3-0) Y</td>
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<td>2011-2013</td>
<td>GISC 6388</td>
<td>GIS Application Software Development (3 semester hours)</td>
<td>Provides instruction and hands-on experience in specific techniques and languages for developing application systems based on GIS concepts. Students will learn to use current generation commercial software to design and implement an application. Prerequisites: <em>GISC</em> (GISC 6381 or GEOS 6381) and GISC 6317, or permission of instructor. (3-0) Y</td>
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<tr>
<td>2012-2013</td>
<td>edit</td>
<td>GISC 6389</td>
<td>Geospatial Information Sciences Master's Project Research (3 semester hours)</td>
<td>Requires completion of the GIS program, of a GIS Master's Project proposal. Under the supervision of an advisor. Students are also expected to conduct a team effort. Products must result in a research project. May be repeated in GISC 6387 or GISC 6386.</td>
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<td>GISC 7310</td>
<td>Regression Analysis with Spatial GIS Applications (3 semester hours)</td>
<td>The specification, interpretation and properties of the multiple linear regression model including spatial and aspatial regression diagnostics are examined. Extensions to the logistic and Poisson regression models and spatial heterogeneity are provided. Practical data analysis for large datasets is exercised by coupling statistical software with GIS environments.</td>
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<td>GISC 7360</td>
<td>GIS Pattern Analysis (3 semester hours)</td>
<td>Examines univariate and multivariate methods for point pattern analysis, geo-statistical surface interpolations, and spatial regression models. Underlying models and processes leading to spatially clustered and dispersed patterns are discussed. Course has particular relevance for local and global spatial analyses of crime, disease, or environmental patterns.</td>
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<td>GISC 7365</td>
<td>Remote Sensing Digital Image Processing (3 semester hours)</td>
<td>Introduction to remote sensing digital image processing techniques. Topics covered include principles of remote sensing and remote sensors, image visualization and statistics extraction, radiometric and geometric correction, image enhancement, image classification and change detection. Innovative image processing approaches will also be introduced. State-of-the-art commercial image processing software is used for labs and applications development.</td>
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Additional changes made to graduate courses 2013 Graduate Catalog
### GISC 7366 (GEOS 5329) Applied Remote Sensing (3 semester hours)
Focuses on the application of remote sensing techniques to solving real world urban and environmental problems in areas such as urban and suburban landscape, land use and land cover, transportation and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology studies. The current generation, industry standard software is used for labs and applications development. Prerequisite: GISC 6326/GEOS 5326, (GISC 6325 or GEOS 5325) or (GISC 7365 or GEOS 5326). (3-0) Y

### GISC 7367 (GEOS 7327) Remote Sensing Workshop (3 semester hours)
An independent project is designed and conducted by the student, after instructor approval. The project develops and demonstrates student's competence in using remote sensing techniques in a substantive application to his/her field of interest. Projects may be developed in coordination with a local government, utility, business, or other entity, which uses remote sensing in its operations and research. A formal presentation and a project report are required. Prerequisites: GISC 6381 and GISC 7365/GEOS 7365 or GEOS 5326. (3-0) Y

### GISC 7387 GI Sciences GIS Research Design (3 semester hours)
Examines issues relative to the conduct of effective and valid research in geospatial information sciences and related fields. (3-0) Y

### GISC 7389 GI Sciences GIS Ph.D. Research Project Qualifier (3 semester hours)
Requires completion, according to uniform guidelines established by the GI Sciences GIS program, of a GI Sciences GIS Research Project and proposal in preparation for its presentation to a committee of at least three GI Sciences GISC faculty. May be repeated once in the immediately following semester. May substitute for GISC 6389 GI Sciences Master's Project. Pass/Fail only. Prerequisite: completion of 24 hours of coursework in GI Sciences GIS Ph.D. program. (3-0) Y
# Additional changes made to graduate courses
## 2013 Graduate Catalog

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<th>Meta</th>
<th>Catalog Course Description</th>
<th>Req Status</th>
<th>Req Created NetID/Date</th>
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| 2013-2013 | add * | PA 8302 Proseminar in Public Affairs (3 semester hours)  
All first year doctoral students are required to take this workshop in their first year in the program. The course introduces students to a range of skills needed for graduate school and features research presentations by faculty, visiting scholars, and advanced students. Departmental consent required. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mxv062000 2013-01-31 09:53:00 |

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**Erik Jonsson School of Engineering and Computer Science**

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<td>BMEN 6388 (ENGR 6336, MECH 6313, SYSE 6324) Nonlinear Dynamics and Control Systems (3 semester hours) Introduction to analysis and control methods for nonlinear dynamical systems, with application to representative biological and engineering systems. Topics include local linearization and stability analysis, phase space analysis, bifurcation analysis, chaos and Differential geometric tools, feedback linearization. Prerequisites: BMEN 6385 Biomedical Signals &amp; Systems. linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: ENGR 6331 or MECH 6300 or SYSM 6307 or equivalent. (3-0) Y</td>
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<td>ENGR 6336</td>
<td>Nonlinear Systems (3 semester hours) Fundamental concepts and tools for the analysis of nonlinear systems, design of controllers and estimators for nonlinear systems. Prerequisite: EESC 6331 or MECH 6300 or SYSM 6307 or equivalent. (3-0) T</td>
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<td>2012-2013</td>
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<td>EESC 6331</td>
<td>Linear Systems (3 semester hours) State space methods of analysis and design of linear dynamical systems. Coordinate transformations, controllability and observability. Lyapunov stability analysis. Pole assignment, stabilizability, detectability. State estimation for deterministic models, observers. Introduction to the optimal linear quadratic regulator problem. Prerequisites: MECH 4310 or equivalents (3-0) Y</td>
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<td>ENGR 5375</td>
<td>Introduction to Robotics (3 semester hours) Fundamentals of robotics, rigid motions, homogeneous transformations, forward and inverse kinematics, velocity kinematics, motion planning, trajectory generation, sensing, vision, and control. Prerequisites: ENGR 2300, EE 3302 and EE 4310 or equivalent. (2-3) Y</td>
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<td>2013-2013</td>
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<td>ENGR 6331</td>
<td>Linear Systems (3 semester hours) State space methods of analysis and design for linear dynamical systems. Coordinate transformations and tools from advanced linear algebra. Controllability and observability. Lyapunov stability analysis. Pole assignment, stabilizability, detectability. State estimation for deterministic models, observers. Introduction to the optimal linear quadratic regulator problem. Prerequisites: ENGR 2300 and EE 4310 or MECH 4310 or equivalent. (3-0) Y Prerequisites: ENGR 2300 and EE 4310 or MECH 4310 or equivalent. (3-0)</td>
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<td>ENGR 6332 (MECH 6332)</td>
<td>Advanced Control (3 semester hours)</td>
<td>Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: ENGR 6331. (3-0) R</td>
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<td>2013–2013</td>
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<td>ENGR 6336 (BMEN 6388, MECH 6313, SYSE 6324)</td>
<td>Nonlinear Control Systems (3 semester hours)</td>
<td>Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: ENGR 6331 or MECH 6300 or SYSM 6307 or equivalent. (3-0) T</td>
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<td>2013–2013</td>
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<td>ENGR 7V90 Special Topics in Control Systems</td>
<td>(1-6 semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.)</td>
<td>([1-6]-0) R</td>
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<td>MECH 6313 (EEGR 6336) (BMEN 6388, ENGR 6336, SYSE 6324) Nonlinear Control Systems (3 semester hours)</td>
<td>Fundamental concepts and tools for the analysis of nonlinear systems, design of controllers and estimators for nonlinear systems. Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: ENGR 6331 or MECH 6300 or SYSM 6307 or equivalent. (3-0) T</td>
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<td>MECH 6323 (SYSE 6323) Robust Control Systems (3 semester hours)</td>
<td>Theory, methodology, and software tools for the analysis and design of model-based control systems with multiple actuators and multiple sensors. Control oriented model parameterizations and modeling errors. Definitions and criteria for robust stability and performance. Optimal synthesis of linear controllers. The loop shaping design method. Methods to simplify the control law. Control law discretization. Mechatronic design examples. Prerequisite: MECH 6300/EESC 6331/ SYSM 6307 (MECH 6300 or ENGR 6331 or SYSM 6307) or equivalent. (3-0) T</td>
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<td>MECH 6332 (EEGR (ENGR 6332) Advanced Control (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: MECH/EESC ENGR 6331. (3-0) R</td>
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<td>MECH 6V97 Research in Mechanical Engineering (1-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-9]-0) R</td>
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# Additional changes made to graduate courses

## 2013 Graduate Catalog

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<td>msen5355</td>
<td>MSEN 5355 (CHEM 5355) Analytical Techniques I (3 semester hours) Study of fundamental analytical techniques, including optical spectroscopic techniques, and energetic particle and x-ray methods including SEM, EDS, STM, AFM, AES, XPS, XRF, and SIMS, mass spectrometry, and microscopic and surface analysis methods. (3-0) Y</td>
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<td>msen6321</td>
<td>MSEN 6321 (EEMF 6321) Active Semiconductor Devices (3 semester hours) The physics of operation of active devices will be examined, including p-n junctions, bipolar junction transistors and field-effect transistors: MOSFETs, JFETs, and MESFETs. Special-purpose MOS devices including memories and imagers Active two-terminal devices and optoelectronic devices will be presented. Recommended co-requisite: EEMF MSEN 6320. (3-0) R</td>
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Forwarded from CEP to Senate, 3-5-13
### Additional changes made to graduate courses
#### 2013 Graduate Catalog

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<th>2013-2013</th>
<th>add * msen63 27 (r1) msen63 27.1</th>
<th>MSEN 6327 Semiconductor Device Characterization (3 semester hours) This course will describe the theoretical and practical considerations associated with the most common electrical and reliability characterization techniques used in the semiconductor industry. Prerequisite: (EE 6320 or MSEN 6320) or equivalent, or permission of instructor. (3-0) T</th>
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<td>MSEN 6339 Nanostructured Materials: Synthesis, Properties and Application (3 semester hours) Exploration of the synthesis, properties and applications of quantum dots, wells, rods, wires, particles and related nanostructures. The theoretical and experimental evidence for quantum-confinement effects, which are of considerable fundamental and applied interest, will be discussed. The manipulation of surface properties of nanostructures, their incorporation into bulk nanocomposites and their application to technological devices will be discussed. Pre/co-requisites: MSEN 6319 and MSEN 6324 and MSEN 5360 and MSEN 5310, or equivalent. (3-0) T</td>
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<td>2012-2013</td>
<td>add * syse632 3 (r0) syse632 3.3</td>
<td>SYSE 6323 (MECH 6323) Robust Control Systems (3 semester hours) Theory, methodology, and software tools for the analysis and design of model-based control systems with multiple actuators and multiple sensors. Control oriented model parameterizations and modeling errors. Definitions and criteria for robust stability and performance. Optimal synthesis of linear controllers. The loop shaping design method. Methods to simplify the control law. Control law discretization. Mechatronic design examples. <strong>Prerequisites:</strong> MECH 6300/EESC 6331/ SYSM 6307. Prerequisite: (MECH 6300 or ENGR 6331 or SYSM 6307) or equivalent. (3-0) T</td>
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<td>2013-2013</td>
<td>add * syse632 4 (r0) syse632 4.8</td>
<td>SYSE 6324 (BMEN 6388, EEGR ENGR 6336, MECH 6313) Nonlinear Control Systems (3 semester hours) Fundamental concepts and tools for the analysis of nonlinear systems, design of controllers and estimators for nonlinear systems. Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: EESC 6331/MECH 6300/SYSM 6307, ENGR 6331 or equivalent MECH 6300 or SYSM 6307 or equivalent. (3-0) T</td>
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Forwarded from CEP to Senate, 3-5-13
### Jindal School of Management

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<tr>
<td>2012-2013</td>
<td>remove * acct6300 (r0) acct6300.3</td>
<td>-- request to remove this course from catalog -- ACCT 6300 Accounting Internship (3 semester hours) This course provides students with an opportunity to expand and apply their skills in accounting in a professional setting. The accounting student will be required to apply knowledge obtained at the university in an actual job situation. This course is designed for students who are engaged in a supervised internship that meets all of the necessary requirements set forth by Texas State Board of Public Accounting. (3-0) S</td>
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<td>2013-2013</td>
<td>add * acct6350 (r0) acct6350.1</td>
<td>ACCT 6350 Fundamentals of Taxation I (3 semester hours) Introduction to the role of taxes in today’s society and their impact on individuals and business entities; emphasis on federal individual income taxation. Prerequisite: ACCT 6201 or equivalent. (3-0) S</td>
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<td>2013-2013</td>
<td>reinstate * acct6353 (r0) acct6353.4</td>
<td>ACCT 6353 Fundamentals of Taxation II (3 semester hours) Certain common and special Federal tax laws for individuals, partnerships, corporations, estates, trusts, and miscellaneous entities. Topics include income tax returns for partnerships and business corporations. Survey coverage of corporate tax issues, IRS audits, and exposure to partnerships, estate and gifts and international taxation. Prerequisite: ACCT 6350 or ACCT 6351 or ACCT 3350 or equivalent. (3-0) S</td>
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Additional changes made to graduate courses 2013 Graduate Catalog

Forwarded from CEP to Senate, 3-5-13
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<td>2011-2013</td>
<td>edit *</td>
<td>hmgt6325</td>
<td>HMGT 6325 (OPRE 6325) Healthcare Operations Management (3 semester hours)</td>
<td>Explores how effectively managing and continuously improving the end-to-end healthcare supply chain provides a competitive advantage. Topics include supply chain fundamentals, key players in the healthcare supply chain and their challenges, how the healthcare supply chain works, impact of technology on supply chain performance, and lean six sigma methodology. Simulations and case studies will reinforce the learning. (3-0) T</td>
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<td>2012-2013</td>
<td>edit *</td>
<td>ims8v99</td>
<td>IMS 8V99 Dissertation (1-9 semester hours) May be repeated for credit. Topics may vary. ([1-9]-0)</td>
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<td>2013-2013</td>
<td>reinstate *</td>
<td>mas6308</td>
<td>MAS 6308 Business Communication and Leadership (3 semester hours)</td>
<td>This course helps students improve their professional communication and leadership skills. Through readings, class discussion, group projects, presentations, and writing activities, students are placed in realistic work settings and challenged to see how effective communication and leadership behaviors are not only important for personal success but required by twenty-first century organizations. (3-0)</td>
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<td>MAS 8V99 Dissertation (1-9 semester hours) May be repeated for credit. Topics may vary. ([1-9]-0)</td>
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### Additional changes made to graduate courses

2013 Graduate Catalog

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<tr>
<td>MIS 6326</td>
<td>Data Management (3 semester hours) Database theory and tools used to manage accounting data and other information are introduced. Topics include relational database theories, Structured Query Language (SQL), database design and conceptual/semantic data modeling. A client/server database environment is developed with a selected SQL server and a database application development tool. MIS 6320 and MIS 6326 cannot both be used to satisfy degree requirements. <strong>Prerequisite: MS ITM Major or permission of instructor.</strong> (3-0) Y</td>
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<td>OB 6301</td>
<td>Organization (SYSM 6333) Organizational Behavior (3 semester hours) The study of human behavior in organizations. Emphasizes theoretical concepts and practical methods for understanding, analyzing, and predicting individual, group, and organizational behavior. Topics include work motivation, group dynamics, decision making, conflict and negotiation, leadership, power, and organizational culture. Ethical and international considerations are also addressed. (3-0) S</td>
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<td>OPRE 6250</td>
<td>Global Supply Chain Management (2 semester hours) Executive Education Course. This course addresses the design and management of global supply chain including international sourcing, integration of suppliers and distribution channels. <strong>Prerequisite: OPRE 6201 or OPRE 6302 or consent of instructor.</strong> (2-0) Y</td>
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<td>OPRE 6350</td>
<td>Global Supply Chain Management (3 semester hours) Executive Education Course. This course addresses the design and management of global supply chain including international sourcing, integration of suppliers and distribution channels. <strong>Prerequisite: OPRE 6201 or OPRE 6302 or consent of instructor.</strong> (3-0) Y</td>
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## Additional changes made to graduate courses
### 2013 Graduate Catalog

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<td>SYSM 6333 (OB 6301) Systems Organization Behavior (3 semester hours) The study of human behavior in organizations. Emphasizes theoretical concepts and practical methods for understanding, analyzing, and predicting individual, group, and organizational behavior. Topics include work motivation, group dynamics, decision making, conflict and negotiation, leadership, power, and organizational culture. Ethical and international considerations are also addressed. (3-0) S</td>
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### School of Natural Sciences and Mathematics

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## Additional changes made to graduate courses
### 2013 Graduate Catalog

| 2008-2013 | edit * geos5311 (r0) geos5311.4 | GEOS 5311 (GISC 5311) Applied Groundwater Modeling (3 semester hours) This course is designed to provide students with hands-on experience using the most commonly-applied groundwater flow and transport models (e.g. modflow/modpath, MT3D/RT3D, GMS). Practical application of the models and design of modeling studies is emphasized, modeling theory and mathematics is de-emphasized. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mxv062000 2013-02-11 16:40:58 |
| 2008-2013 | edit * geos5322 (r0) geos5322.4 | GEOS 5322 (GISC 5322) GPS (Global Positioning System) Satellite Surveying Techniques (3 semester hours) The theory and application of satellite positioning utilizing the Global Positioning System Code and phase methodology in field observations, data processing and analysis of Differential GPS, high accuracy static and other rapid measurements, in real time and with post-processing. (3-0) Y | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mxv062000 2013-02-11 16:48:10 |
| 2008-2013 | edit * geos5324 (r0) geos5324.5 | GEOS 5324 (GISC 5324) 3D Data Capture and Ground Lidar (3 semester hours) The theory and applications of 3D data acquisition in the field for geosciences and non-geosciences studies. The basics and applications of field digital mapping with emphasis on RTK GPS, laser range finder, and terrestrial scanners (ground lidar). 3D digital photorealistic modeling with field photogrammetry and digital cameras. (3-0) T | phase: edit edit: ongoing approve: notstarted process: notstarted publish: unpublished audit: | mxv062000 2013-02-11 16:53:08 |
**Additional changes made to graduate courses**

**2013 Graduate Catalog**

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<th>2012-2013</th>
<th>edit *</th>
<th>geos5325</th>
<th>GEOS 5325 (GISC 6325) Introduction to Remote Sensing Fundamentals (3 semester hours) Application of airborne and satellite remote sensing for understanding the surface of the earth. Focus on interpretation of images obtained by passive and active imaging systems using electromagnetic radiation, especially visible, infra-red, and radar. Laboratory course. (2-3) Y</th>
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<td>geos5326</td>
<td>GEOS 5326 (GISC 7365) Remote Sensing Digital Image Processing (3 semester hours) Introduction to remote sensing digital image processing techniques. Topics covered include principles of remote sensing and remote sensors, image visualization and statistics extraction, radiometric and geometric correction, image enhancement, image classification and change detection. Innovative image processing approaches will also be introduced. State-of-the-art commercial image processing software is used for labs and applications development. <strong>Prerequisite:</strong> GISC 6325. (3-0) Y</td>
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<td>geos5329</td>
<td>GEOS 5329 (GISC 7366) Applied Remote Sensing (3 semester hours) Focuses on the application of remote sensing techniques to solving real world urban and environmental problems in areas such as urban and suburban landscape, land use and land cover, transportation and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology studies. The current generation, industry standard software is used for labs and applications development. <strong>Prerequisite:</strong> GISC 6325/GEOS 5325, (GISC 6325 or GEOS 5325) or (GISC 7365 or GEOS 5326). (3-0) Y</td>
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<td>geos5330</td>
<td>GEOS 5330 (GISC 5330) Geospatial Applications in Earth Science (3 semester hours) Application of geospatial techniques in solving earth science problems. Emphasis will be placed on the use of the Global Positioning System in survey and geodetic applications, airborne and ground-based LiDAR (Light Detection and Ranging), and digital acquisition and analysis techniques. Case histories will be considered and supplemented by hands-on exercises using a broad range of digital acquisition and analysis equipment and tools. (3-0) Y</td>
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<td>geos5395</td>
<td>GEOS 5395 (GISC 5395) Satellite Geophysics and Applications (3 semester hours)</td>
<td>This course concerns both the theory and application of observing geophysical fields from space-borne platforms. The observation procedures including orbital mechanics are introduced and signal propagation, errors and uncertainties will be addressed. Concepts of current satellite missions such as radar and laser altimetry, space gravimetry and magnetometry, and synthetic aperture radar will be discussed. Applications of satellite geophysical observations in tectonics, geodynamics, ocean and ice surface monitoring, hydrology, and terrain modeling will be introduced through student projects and presentations. (3-0) Y</td>
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<td>2013-2013</td>
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<td>geos6381</td>
<td>GEOS 6381 (GISC 6381) Geographic Information Systems Fundamentals (3 semester hours)</td>
<td>Examines the fundamentals of Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. (3-0) Y (3-0) Y</td>
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<td>geos6383</td>
<td>GEOS 6383 (GISC 6382) Applied Geographic Information Systems (3 semester hours)</td>
<td>Further develops hands-on skills with industry-standard GIS software for application in a wide variety of areas including urban infrastructure management, marketing and location analysis, environmental management, geologic and geophysical analysis and the Economic, Political and Policy Sciences. Prerequisite: (GISC 6381 or GEOS 6381) or equivalent with instructor's permission. (3-0) Y</td>
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<td>geos6384</td>
<td>GEOS 6384 (GISC 6384) Spatial Analysis and Modeling (3 semester hours)</td>
<td>Treatment of more advanced topics in the application of spatial analysis in a GIS environment. Topics covered include raster-based cartographic modeling, 3-D visualization, geostatistics and network analysis. Student will be acquainted with state-of-the-art software through hands-on laboratory experiences. Prerequisite: GEOS 6381 or GISC 6381. (3-0) Y</td>
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<td>geos6385</td>
<td>GEOS 6385 (GISC 6385) GIS Theories, Models and Issues (3 semester hours)</td>
<td>Provides an understanding of the underlying theories, mathematical and geometric tools, and their computational implementations that establish GIS capabilities to handle and analyze geo-referenced information. Associated issues (such as uncertainty, spatial analysis and spatial data management) highlighted. Prerequisites: (GEOS 6381 or GISC 6381) and (GEOS 6383 or GISC 6382), or equivalent with instructor's permission. (3-0) Y</td>
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<td>2013-2013</td>
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<td>geos6387</td>
<td>GEOS 6387 (GISC 6387) Geographic Information Systems Workshop (3 semester hours)</td>
<td>Provides a structured laboratory experience focused on the students’ substantive area of interest. Each participant develops a project which should include aspects of database design and manipulation, spatial analysis, and cartographic production. Projects may be designed in coordination with a local government, utility, business, or other entity that uses GIS in its operations and research. Prerequisites: (GEOS 6381 or GISC 6381) and (GEOS 6383 or GISC 6382). (3-0) Y</td>
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<td>geos7327</td>
<td>GEOS 7327 (GISC 7367) Remote Sensing Workshop (3 semester hours)</td>
<td>An independent project is designed and conducted by the student, after instructor approval. The project develops and demonstrates student's competence in using remote sensing techniques in a substantive application to his/her field of interest. Projects may be developed in coordination with a local government, utility, business, or other entity, which uses remote sensing in operations and research. A formal presentation and a project report are required. Prerequisites: Prerequisite: GISC 6381 and GISC 7365/GEOS 7365 or GEOS 5326. (3-0) Y</td>
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<tr>
<td>ACTS 6301</td>
<td>Theory of Actuarial Models: Life Contingencies I</td>
<td>(3 semester hours) The purpose of this class is to develop the student’s knowledge of the theoretical basis of life contingent actuarial models and the application of those models to insurance and other financial risks. Life contingencies, survival models, life insurances, annuities and premiums will be studied. This class covers parts of CAS Exam 3L and SOA Exam MLC. Prerequisite: STAT 5351 or instructor consent required. (3-0) T</td>
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<td>ACTS 6302</td>
<td>Theory of Actuarial Models: Financial Economics</td>
<td>(3 semester hours) This 3 semester hour course develops the student’s knowledge of the theoretical basis of certain actuarial models and the application of those models to insurance and other financial risks. The topics discussed include interest rate models, rational valuation of derivative securities, mathematical and probabilistic foundation of risk management. This class covers parts of CAS Exam 3F and SOA exam MFE. Prerequisite: STAT 5351 or instructor consent required. (3-0) T</td>
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<td>ACTS 6303</td>
<td>Theory of Actuarial Models: Life Contingencies II</td>
<td>(3 semester hours) The purpose of this class is to develop the student’s knowledge of the theoretical basis of life contingent actuarial models for multiple lives and the application of those models to insurance and other financial risks. Reserves, life contingencies for multiple lives, expenses and stochastic processes will be studied. This class covers parts of CAS Exam 3L and SOA Exam MLC. This class covers parts of CAS Exam 3L and SOA Exam MLC. Prerequisite: ACTS 6301 or instructor consent required. (3-0) T</td>
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<td>ACTS 6304</td>
<td>Construction and Evaluation of Actuarial Models I</td>
<td>(3 semester hours) Introduction to useful frequency and severity models beyond those covered in Theory of Actuarial Models. Discussion of the steps involved in the modeling process and how to carry out these steps in solving business problems. At the end of the course the students should be able to: 1) analyze data from an application in a business context; 2) determine a suitable model including parameter values; and 3) provide measures of confidence for decisions based upon the model. This class also provides an introduction to a variety of tools for the calibration and evaluation of the models. This class covers parts of CAS Exam 4/SOA Exam C. Prerequisite: STAT 5351 or instructor consent required. (3-0) T</td>
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<td>Construction and Evaluation of Actuarial Models II</td>
<td>3 semester hours</td>
<td>Introduction to useful frequency and severity models beyond those covered in Principles of Actuarial Models. The topics discussed include parametric models, credibility and simulation. This class covers parts of CAS Exam 4/SOA Exam C. Prerequisite: STAT 6304 or instructor consent required. (3-0) T</td>
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<td>ACTS 6306</td>
<td>Advanced Actuarial Applications</td>
<td>3 semester hours</td>
<td>Special topics in actuarial science will be discussed. This class covers parts of CAS Exam 5 (Basic Techniques for Ratemaking and Estimating Claim Liabilities)/SOA Exam FAP (Fundamentals of Actuarial Practice). Prerequisite: Instructor consent required. (3-0) R</td>
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<td>ACTS 6308</td>
<td>Actuarial Financial Mathematics</td>
<td>3 semester hours</td>
<td>The purpose of this 3 semester hour course is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting, and valuing contingent cash flows. The students will also be given an introduction to financial instruments, including derivatives, and the concept of no-arbitrage as it relates to financial mathematics. This class covers topics of Exam 2/FM. Prerequisite: Instructor consent required. (3-0) R</td>
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The School of Arts and Humanities offers five graduate degree programs: Arts and Technology, Emerging Media and Communication, History, Humanities, and Latin American Studies.

**Graduate Program in Arts and Technology (M.A., M.F.A., Ph.D.)**

The interdisciplinary Graduate Program in Arts and Technology focuses on the creation, application, and implications of technologically sophisticated interactive communication. Students may focus on either Games and Interactive Narrative or Digital Arts and Design.

**Graduate Program in Emerging Media and Communications (M.A.)**

The interdisciplinary Graduate Program in Emerging Media and Communication focuses on ways in which digital technology is transforming the dissemination of information and art. The program enables students to analyze, employ and produce technologically mediated communication.

**Graduate Program in History (M.A.)**

The Graduate Program in History fosters advanced understanding of the processes by which interpretations of the past are made, disseminated and evaluated.

**Graduate Program in the Humanities (M.A., Ph.D.)**

The interdisciplinary Graduate Program in Humanities fosters integrated study and practice of the arts, literature, history, and philosophy. Combining the activities of established disciplines in the arts and humanities into one enterprise, the program enables students to take a broad view of human achievement in these areas.
Graduate Program in Latin American Studies (M.A.)

The interdisciplinary program in Latin American Studies allows students to acquire expertise in multiple aspects of Latin America. The curriculum connects literary, historical, cultural, and visual studies.

**DEGREES OFFERED**

- Master of Arts in Arts and Technology (36 hours **minimum**)
- Master of Fine Arts in Arts and Technology (54 hours **minimum**)
- Doctor of Philosophy in Arts and Technology (60 hours **minimum beyond the master’s degree**)
- Master of Arts in Emerging Media and Communication (33 hours **minimum**)
- Master of Arts in History (36 hours **minimum**)
- Master of Arts in Humanities (33 hours **minimum**)
- Master of Arts in Humanities Major in Aesthetic Studies (33 hours **minimum**)
- Master of Arts in Humanities Major in History of Ideas (33 hours **minimum**)
- Master of Arts in Humanities Major in Studies in Literature (33 hours **minimum**)
- Master of Arts in Latin American Studies (36 hours **minimum**)
- Doctor of Philosophy in Humanities (60 hours **minimum beyond the master’s degree**)
- Doctor of Philosophy in Humanities Major in Aesthetic Studies (60 hours **minimum beyond the master’s degree**)
- Doctor of Philosophy in Humanities Major in History of Ideas (60 hours **minimum beyond the master’s degree**)
Doctor of Philosophy in Humanities Major in Studies in Literature (60 hours
minimum beyond the master’s degree)
Certificate in Holocaust Studies (15 hours)
Graduate Programs in Arts & Humanities

http://www.utdallas.edu/ah/

Faculty


Associate Professors: Susan Briante, Frank DuFour, J. Michael Farmer, Midori Kitagawa, Shelley Lane, Patricia Michaelson, Venus O. Reese, Natalie Ring, Erin A. Smith, Dean Terry, Daniel Wickberg, Michael Wilson

Assistant Professors: Matt Bondurant, Matthew Brown, Monica Evans, Eric Farrar, Todd Fechter, Shari Goldberg, John Gooch, Charles Hatfield, Jessica Murphy, Cihan Muslu, Peter Park, David Parry, Monica Rankin, Mark Rosen, Eric Schlereth, Charissa Terranova, Marjorie Zielke

Senior Lecturers: Lisa Bell, Kelly P. Durbin, Maria Engen, Kathryn C. Evans, Dianne Goode, Michele Hanlon, Peter Ingrao, Janet Johnson, Thomas Lambert, Kathy Lingo, Mary Medrick, Greg L. Metz, Chris Ryan, Monica M. Saba, Jeffrey Schulze, Betty Wiesepape

Emeritus Professors: Joan Chandler, S. Michael Simpson, Gerald L. Soliday, Deborah Stott
Objectives

The School of Arts and Humanities is committed to interdisciplinary programs that investigate the linkages between the arts and the humanities by fusing critical with creative thinking, theoretical with practical endeavors. Rather than identifying fixed disciplinary areas, the program emphasizes the interrelationship of broad areas of interest.

Within the Graduate Program in Arts and Technology, most courses are offered under the rubric of Arts and Technology (ATEC), but the degree plan also includes courses in Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL).

Within the Graduate Program in Emerging Media and Communication, most courses are offered under the rubric of Emerging Media and Communication (EMAC), but the degree plan also includes courses in Arts and Technology (ATEC), Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL).

Within the Graduate Program in the Humanities, most courses are offered within the three main areas of concentration: Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL), and students seeking the M.A. or Ph.D. degrees in humanities must take courses in all three areas. The fourth area and other courses, including core courses required of all students, are offered under the rubric Humanities (HUMA).

Within the Graduate Program in History, most courses are offered within History (HIST) and History of Ideas (HUHI) but students may also take courses in Aesthetic Studies (HUAS) and Studies in Literature (HUSL).

Within the Graduate Program in Latin American Studies, required courses are offered within Latin American Studies (LATS) and elective courses are drawn from Aesthetic Studies (HUAS), History (HIST), History of Ideas (HUHI), and Studies in Literature (HUSL).

All our graduate programs are designed to provide students a flexible, interdisciplinary context within which to pursue a program of study built on...
connections among specific courses and the areas of concentration. Offerings include not only seminars stressing the interpretation and criticism of specific works and issues but also ensembles, studios, and workshops in which the activity of creation and/or performance becomes the primary means of learning.

**Facilities**

The School of Arts & Humanities provides specialized facilities for academic research and creative expression. The Jonsson Building contains technologically rich environments for studies in Rhetoric, Computer Graphics, Professional Communication, Musical Instrument Digital Interface, and Art & Technology. The Visual Arts Building houses a Media Room as well as studios for painting, photography, sculpture, and other arts. Performance venues for drama and music include the University Theatre and the Jonsson Performance Hall.

**Admission Requirements**

The University’s general admission requirements are discussed here.

Each application is considered on its individual merits. Normally students applying for admission to the Graduate Program in Arts and Technology should have a previous academic degree (B.A. or B.S., M.A. or M.F.A.) in an appropriate field (i.e., Art, Computer Science), a grade point average of 3.3 (especially in upper-division undergraduate and graduate work), and evidence of previous course work and/or expertise in the creative arts and digital technology.

Normally students applying for admission to the Graduate Program in Emerging Media and Communication should have a previous academic degree (B.A. or B.S.) in an appropriate field (i.e., Art, Computer Science, Communication), a grade point average of 3.3 (especially in upper-division undergraduate work), and evidence of previous course work and/or expertise in the creative arts, communications, and/or digital technology.
Normally students applying for admission to the Graduate Program in Humanities should have previous academic degrees (B.A. or M.A.) in arts and humanities fields and a grade point average of 3.3 (especially in upper-division undergraduate or graduate work).

Normally students applying for admission to the Graduate Program in History should have a previous degree (B.A. or B.S.) in history or related disciplines and a grade point average of 3.3 (especially in upper-division undergraduate work).

Normally students applying for admission to the Graduate Program in Latin American Studies should have a previous degree (B.A. or B.S.) in arts and humanities fields, demonstrated interest and experience in Latin American studies and a grade point average of 3.3 (especially in upper-division undergraduate work).

The School of Arts and Humanities does not require the Graduate Record Examination for admission to graduate programs.

**Full-time and Part-time Students**

Students can pursue the graduate degrees in humanities on a full- or part-time basis. Full-time students normally register for nine or more semester hours per term. The school takes care to accommodate part-time study by scheduling both day and night classes, thus allowing students flexibility in organizing individual schedules.

**Degree Requirements**

The University’s general degree requirements are discussed [here](#).

The approach to graduate education in the School of Arts and Humanities is flexible. Within the specific degree requirements listed below, each student plans a program of studies in consultation with an assigned faculty adviser.

Courses meeting degree requirements are normally chosen from the core
courses and the areas of concentration within the School of Arts and Humanities. To have courses taken outside the school applied to one of its degrees, students must seek prior approval from the School’s Associate Dean for Graduate Studies. They may also petition to have appropriate transfer courses applied to reduce the required number of hours for a degree at U.T. Dallas. The School’s Associate Dean for Graduate Studies may require students with background deficiencies in interdisciplinary work to take additional courses at the undergraduate or graduate level to remedy those deficiencies.

Active involvement in the process of artistic creation and performance is basic to the design of the Aesthetic Studies area of concentration. Therefore, students working in the Graduate Program in the Humanities at the M.A. level with an emphasis on Aesthetic Studies are required to take at least one ensemble/workshop, and those working toward a Ph.D. with an emphasis on this area are required to take at least one additional ensemble/workshop. Students undertaking creative projects for master’s portfolios or doctoral dissertations must demonstrate their competency as artists by including in their degree plans a minimum number of studios, ensembles, or workshops related to a proposed medium: two for the M.A. and four for the Ph.D.

**Research**

The research interests of the faculty reflect the interdisciplinary mission of the School. In addition to the research activities of individual faculty, six centers and institutes that promote interdisciplinary research are located within the School: The Center for Translation Studies; the Ackerman Center for Holocaust Studies; the Confucius Institute; the Institute for Interactive Arts and Engineering; the Center for the Interdisciplinary Study of Museums, and the Center for Values in Medicine, Science and Technology. Since the School combines the Humanities and the Arts, many faculty are engaged in the creation and performance of artistic works in music, drama, literature and the visual arts.
Graduate Program in Arts and Technology

Master of Arts (36 hours minimum)

The program leading to the M.A. in Arts and Technology is designed both for individuals engaged in professional practice wishing to enhance their knowledge and skills and for students intending to pursue a doctorate in a related field. It offers advanced studies in interactive media and computer-based arts that emphasize the fusion of creative with critical thinking and theory with practice. Students must complete thirty-six semester hours of course work and an advanced project.

Core Courses (6 hours)

ATEC 6300 Interdisciplinary Approaches to Arts and Technology
ATEC 6331 Aesthetics of Interactive Arts

Students are expected to complete these courses as early as possible in their degree plan.

Prescribed Electives (27 hours)

Twenty-seven hours chosen from the following courses:

ATEC 6332 Design Principles
ATEC 6333 Computational Design
ATEC 6334 Information Design for New Media
ATEC 6335 Research in Sound Design
ATEC 6341 Game Design
ATEC 6342 Game Studies
ATEC 6343 Interactive Environments
ATEC 6345 Game Production Lab
ATEC 6351 Digital Arts
ATEC 6352 Motion Capture
ATEC 6353 Visualization Research
ATEC 6354 Virtual Environments
ATEC 6355 Animation Production Lab
ATEC 6361 Creating Interactive Media
ATEC 6372 Approaches to Emerging Media and Communication
ATEC 6373 Emerging Media Studio I
ATEC 6374 Digital Textuality
ATEC 6375 Topics in Emerging & Cognitive Design
ATEC 6376 E-Business Environment Design
ATEC 6382 Special Topics in Interactive Media
ATEC 6383 Special Topics in Sound Design
ATEC 6384 Special Topics in Game Studies
ATEC 6385 Special Topics in Animation
ATEC 6389 Topics in Arts and Technology
HUAS 6313 The Business of the Arts
HUAS 6312 Art and Society
HUAS 6330 Studies in the Visual Arts
HUAS 6339 Painting/Digital Imaging/Video
HUAS 6375 Imagery and Iconography
HUAS 6391 Creativity: Visual Arts Workshop
HUAS 6392 Creativity: Image/Text Workshop
HUAS 6393 Creativity: Time-Based Arts Workshop
HUSL 6308 Studies in Literary Forms and Genres
HUSL 6370 Studies in Literature and Ideas

Final Project (3 hours)

ATEC 6V95 Advanced Project Workshop

Having completed at least 30 hours of course work, students will complete and present an advanced project in digital arts for evaluation by a master’s committee.

Master of Fine Arts (54 hours minimum)

The program leading to the M.F.A. in Arts and Technology is designed both for students wishing to teach arts-and-technology-related courses in colleges and universities and for those intending to engage in professional studio or design practice. While maintaining a commitment to interdisciplinary education fusing critical with creative thinking, this program places greater emphasis on the creation and application of computer-based arts and narrative. Students must complete fifty-four semester hours of course work and a substantial advanced project.

Core Courses (6 hours)
ATEC 6300 Interdisciplinary Approaches to Arts and Technology

ATEC 6331 Aesthetics of Interactive Arts

Students are expected to complete these courses as early as possible in their degree plan.

**Prescribed Electives (24 hours)**

Twenty-four hours chosen from the following courses:

- ATEC 6332 Design Principles
- ATEC 6333 Computational Design
- ATEC 6334 Information Design for New Media
- ATEC 6335 Research in Sound Design
- ATEC 6341 Game Design
- ATEC 6342 Game Studies
- ATEC 6343 Interactive Environments
- ATEC 6345 Game Production Lab
- ATEC 6351 Digital Arts
- ATEC 6352 Motion Capture
- ATEC 6353 Visualization Research
- ATEC 6354 **Virtual** Environments
- ATEC 6355 Animation Production Lab
- ATEC 6361 **Creating** Interactive Media
- ATEC 6372 Approaches to Emerging Media and Communication
- ATEC 6373 Emerging Media Studio I
ATEC 6374 Digital Textuality
ATEC 6375 Topics in Emerging & Cognitive Design
ATEC 6376 E-Business Environment Design

ATEC 6382 Special Topics in Interactive Media
ATEC 6383 Special Topics in Sound Design
ATEC 6384 Special Topics in Game Studies
ATEC 6385 Special Topics in Animation
ATEC 6389 Topics in Arts and Technology

HUAS 6312 Art and Society
HUAS 6313 The Business of the Arts
HUAS 6317 Art and Authorship

HUAS 6330 Studies in the Visual Arts
HUAS 6339 Painting/Digital Imaging/Video

HUAS 6352 Creating Television and Movie Scripts
HUAS 6373 Studies in Film, Television, and Digital Media
HUAS 6375 Imagery and Iconography
HUAS 6391 Creativity: Visual Arts Workshop
HUAS 6392 Creativity: Image/Text Workshop
HUAS 6393 Creativity: Time-Based Arts Workshop
HUAS 6354 Creating Short Fictions

HUAS 6308 Studies in Literary Forms and Genres
HUAS 6370 Studies in Literature and Ideas
Free Electives (9 hours)

Nine hours of electives in any organized courses.

Independent Study (9 hours)

Final Project (6 hours)

ATEC 6V95 Advanced Project Workshop

Having completed at least 45 hours of course work, students complete and present a substantial advanced project in digital arts for evaluation by a master’s committee.

Doctor of Philosophy (60 hours minimum beyond the master’s degree)

The program leading to the Ph.D. in Arts and Technology is designed both for students wishing to teach arts-and-technology-related courses in colleges and universities and those who wish to develop new artistic, cultural or commercial applications of digital technology/emerging media. This program emphasizes the fusion of creative with critical thinking and theory with practice. Students seeking a Ph.D. in Arts and Technology will normally complete a minimum of 60 semester hours (42 hours in course work and 18 hours in dissertation) beyond a master’s degree or its equivalent, pass doctoral field examinations, and complete and defend a dissertation.

Core Courses (9 hours)

ATEC 6300 Interdisciplinary Approaches to Arts and Technology
ATEC 6331 Aesthetics of Interactive Arts
ATEC 7331 Research Methodology in Arts and Technology

Students are expected to complete these courses as early as possible in their degree plan.

**Prescribed Electives (21 hours)**

Twenty-one hours chosen from the following courses:

ATEC 6341 Game Design
ATEC 6351 Digital Arts
ATEC 6361 Creating Interactive Media
ATEC 7340 Advanced Studies in Arts and Technology
ATEC 7V81 Advanced Project Workshop
ATEC 7V82 Advanced Projects in Interactive Media
ATEC 7620 Advanced Projects in Simulation and Game Design
ATEC 8305 Independent Research in Arts and Technology
HUAS 6375 Imagery and Iconography
HUHI 7387 Science and Technology in Western Culture
HUSL 6384 Digital and Visual Rhetorics

**Free Electives (12 hours)**

Twelve hours of electives in any organized 7000-8000 level courses offered by the Schools of Arts and Humanities, Engineering and Computer Science, Behavioral and Brain Sciences, Management, Economic, Political and Policy Sciences, Natural Science and Mathematics, or Interdisciplinary...
Studies.

**Doctoral Field Examinations**

After completing all these requirements, students proceed to the doctoral field examinations, a sequence consisting of three written sections and one oral section. The examining committee, composed of three regular members of the faculty, oversees definition and preparation of the three examination fields within guidelines established by the program. At least seven days before the exams themselves, the faculty members submit examination questions to the Arts and Humanities office, which schedules and administers the examination. The maximum time allowed for a student's completion of the examination sequence is 20 business days.

**Dissertation (18 hours minimum)**

Students are formally advanced to Ph.D. candidacy when they have successfully completed the qualifying examinations and received final approval for dissertation topics. A four-person supervising committee is formed, normally from the examining committee plus another regular faculty member proposed by the student, to oversee dissertation work.

Each candidate then writes a doctoral dissertation, which is supervised and defended according to general university regulations. Every student must register for a minimum of nine hours of dissertation credit in two successive semesters and must maintain continuous enrollment thereafter for at least three semester hours during consecutive long semesters until the degree is completed. Any exception to this requirement is granted only by petition to the school’s Associate Dean for Graduate Studies.
Graduate Program in Emerging Media and Communication

Master of Arts (33 hours minimum)

The program leading to the M.A. in Emerging Media and Communication focuses on ways in which network technologies are transforming the creation and dissemination of information and content. Providing an interdisciplinary education that connects theory with practice, the program combines the creation of digital content for multiple communication platforms with examination of cultural issues created by emerging technology. The program is intended for (a) professionals in fields such as journalism, design, public relations, and advertising that are powerfully affected by emerging communicative technologies, (b) graduates with degrees in computer science or related fields who wish to expand their occupational potential by gaining expertise in communication, (c) graduates of programs in the humanities, communication, and journalism who wish to expand their occupational potential by gaining expertise in emerging media, and (d) teachers in the humanities and other fields that will be profoundly affected by new modes of communication and information transfer. Students must complete 33 semester credit hours of course work and a capstone project.

Core Course (3 hours)

| EMAC 6300 Interdisciplinary Studies in Emerging Media and Communication |

Required Courses (15 hours)

EMAC 6342 Digital Culture
EMAC 6372 Approaches to Emerging Media and Communication
EMAC 6373 Emerging Media Studio I
EMAC 6374 Digital Textuality
HUHI 6323 Space, Time, and Culture

or HUHI 6351 History and Philosophy of Science and Technology

or HUSL 6355 Literature, Science, and Culture

Prescribed Electives (9 hours)

Nine hours chosen from the following courses:

ATEC 6331 Aesthetics of Interactive Arts
EMAC 6361 Creating Interactive Media
EMAC 6365 Journalism and the Digital Network
EMAC 6375 Research Methodologies in Emerging Media and Communication
EMAC 6383 Emerging Media Studio II
EMAC 6381 Special Topics in Emergent Communication
HUAS 6312 Art and Society
HUAS 6330 Studies in the Visual Arts
HUAS 6339 Painting/Digital Imaging/Video
HUAS 6354 Creating Short Fictions
HUAS 6355 Creating Nonfictions
HUAS 6373 Studies in Film, Television, and Digital Media
HUAS 6391 Creativity: Visual Arts Workshop
HUHI 6323 Space, Time, and Culture
HUHI 6327 Artist and Writer in Society
HUSL 6355 Literature, Science, and Culture

**Free Elective (3 hours)**

**Final Project (3 hours)**

EMAC 6V91 Advanced Project Workshop

Having completed at least 30 hours of coursework, students will complete and present an advanced multi-media project for evaluation by a master's committee.
Graduate Program in History

Master of Arts **(36 hours minimum)**

The program leading to the M.A. in History is designed both for individuals wishing to enhance their knowledge of and skills at the study of the past and for those intending to pursue a doctorate in a related field. Thus, students seeking the M.A. in History have two options, a "research" or a "professional" option. Students with plans for doctoral study should choose the research option.

Students in the research option must complete thirty-six semester hours of course work, demonstrate reading proficiency in an approved foreign language, and successfully complete a master's thesis.

**Core Course (3 hours)**

HIST 6301 Historiography

Students are expected to complete this course as early as possible in their programs.

**Electives in History (HIST) or History of Ideas (HUHI) (24 hours)**

Twenty-four hours chosen from graduate courses in HIST or HUHI, at least fifteen of which must be in HIST courses. Normally no more than six hours of independent study are applicable to the degree plan.

**Elective Course (3 hours)**

Three hours in any organized course outside of History (HIST) and History of Ideas (HUHI), but normally in the Humanities Graduate Program.
Thesis (6 hours)

HIST 6390 Master's Thesis

Having completed thirty hours of course work, students must write and present a thesis in history for evaluation by a master's committee.

Students in the professional option in History must complete thirty-six semester hours of course work, including HIST 6301 and normally all in organized HIST and HUHI courses. They are not required to complete a thesis or meet a foreign-language requirement, and they receive a terminal degree.
Graduate Program in the Humanities

Master of Arts *(33 hours minimum)*

The program leading to the M.A. in Humanities is designed both for individuals wishing to enhance their knowledge and skills and for students intending to pursue a doctorate in a humanistic field. Thus, students seeking an M.A. in Humanities have two options, a "research" or a "professional" option. Students with plans for doctoral study should choose the research option.

Students in the research option must complete thirty-three semester hours of course work, demonstrate reading proficiency in an approved foreign language, and successfully complete a portfolio.

**Core Course (3 hours)**

HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities.

Students are expected to complete this course *within their first two semesters of enrollment*.

**Elective Courses (30 hours)**

Thirty semester hours, of which at least twenty-seven hours are normally in organized courses. Eighteen of these hours are divided among organized courses in Aesthetic Studies (6 hours), History of Ideas (6 hours), and Studies in Literature (6 hours). The remaining hours must be taken in the student's major area of concentration (Aesthetic Studies, History of Ideas, or Studies in Literature), the exception being students pursuing a general Humanities degree. Normally no more than three hours of independent study are applicable to the degree plan. Independent studies do not count toward the 18 hour minimum in the major required for certification to teach at either a two or four year college/university. M.A. students are restricted
to courses numbered at the 5000- and 6000-level.

Foreign Language

The research M.A. degree requires demonstrated reading proficiency in an approved foreign language. Students can demonstrate proficiency by passing a translation examination in an approved language (e.g., Chinese, French, German, classical Greek, Italian, Latin, or Spanish). Intensive review courses (HUMA 6320-6323) and the advanced language workshops (HUMA 6330-6333), which students may take to prepare for the examination, do not count toward minimum course requirements for the degree. Any students wishing to satisfy the requirement with languages other than those listed above must secure the approval of the School's Associate Dean for Graduate Studies. Students must satisfy the M.A. language requirement before or as they submit their master's portfolio proposals to the Graduate Studies Committee.

Portfolio

Two substantial pieces of work (two research papers or a creative project plus a scholarly essay) originating in or completed for graduate courses are revised and presented in a portfolio for evaluation by a master's committee.

Students in the professional option in Humanities must complete thirty-three hours of coursework, all normally in organized courses and distributed as in the research option above. They are not required to complete a portfolio or meet a foreign language requirement, however, and they receive a terminal degree.

Doctor of Philosophy (60 hours minimum beyond the master’s degree)

Students seeking a Ph.D. in the Humanities will normally complete a
minimum of sixty semester hours beyond a master's degree or its equivalent, demonstrate advanced proficiency in a foreign language, pass doctoral field examinations, and complete and defend a dissertation. In addition to meeting the general university criteria for admission to graduate study, students earning an M.A. degree in the Humanities from UT Dallas must obtain the formal endorsement of their portfolio committees to proceed into the doctoral program. Students who have completed pertinent graduate work at other institutions (thirty hours of humanities courses, language training, and written work roughly equivalent to the portfolio here) may qualify for a Master of Arts equivalency upon admission to the graduate program. Students admitted with an M.A. equivalent must take HUMA 6300 within their first two semesters of enrollment.

Courses (42 hours)

Forty-two semester hours of which at least thirty-three are normally in organized courses. Eighteen of these hours are divided among organized courses in Aesthetic Studies (6 hours), History of Ideas (6 hours), and Studies in Literature (6 hours). The remaining hours may be in one or more of the three areas, and normally no more than nine hours of independent study are applicable to the degree. At least fifteen hours of doctoral coursework must be taken in organized courses numbered at the 7000-level.

Foreign Language

Students admitted to the Ph.D. program from universities other than UT Dallas must pass a translation examination in an approved foreign language (e.g., Chinese, French, German, classical Greek, Italian, Latin, or Spanish) during their first year in the Ph.D. program. Part-time students admitted from other universities, however, may have two calendar years to meet this initial requirement. All Ph.D. students must then demonstrate active use of the foreign language at an advanced level in two courses. For this purpose, they may undertake readings and research in regular organized courses, they may meet one half the requirement by taking the Art and Craft of Translation (HUSL 6380) once, or they may arrange to demonstrate active use of the language as part of an independent study.
Students wishing to satisfy the requirement with languages other than those listed above must secure the approval of the school’s Associate Dean for Graduate Studies.

Students must satisfy the Ph.D. foreign-language requirement prior to taking doctoral field examinations.

**Doctoral Field Examinations**

After completing all the above requirements, students proceed to the doctoral field examinations, a sequence consisting of three written sections and one oral section. The examining committee, composed of three regular members of the faculty, oversees definition and preparation of the three examination fields within guidelines established by the program. At least seven days before the exams themselves, the faculty members submit examination questions to the Arts and Humanities office, which schedules and administers the examination. The maximum time allowed for a student’s completion of the examination sequence is twenty business days.

**Dissertation (18 hours minimum)**

Students are formally advanced to Ph.D. candidacy when they have successfully completed the qualifying examinations and received final approval for dissertation topics. A student may submit a preliminary dissertation proposal for consideration during the oral section of the qualifying examination. In any case, after that examination, a four-person supervising committee is formed, normally from the examining committee plus another regular faculty member proposed by the student, to oversee dissertation work. The supervising committee must then approve a formal dissertation proposal before the student submits it to the Graduate Studies Committee for final approval.

Each candidate then writes a doctoral dissertation, which is supervised and defended according to general university regulation. Every student must register for a minimum of nine hours of dissertation credit in two successive semesters and must maintain continuous enrollment thereafter.
for at least three semester hours during consecutive long semesters until the degree is completed. Any exception to this requirement is granted only by petition to the school’s Associate Dean for Graduate Studies.

Certificate in Holocaust Studies

The Ackerman Center for Holocaust Studies

The Certificate in Holocaust Studies (Certificate) is offered to MA and PhD students in the School of Arts and Humanities (A & H) from The Ackerman Center for Holocaust Studies at UT Dallas.

Each student seeking a Certificate in Holocaust Studies must complete 15 graduate credit hours in organized classes chosen from the courses below.

Holocaust Certification Courses (15 hours)

I. Foundation Courses (6 hours):

HUHI 6338: The Holocaust

AND

HUSL 6378: Literature and the Holocaust

(As new courses are developed, students may substitute a required course with the permission of the Center’s Director.)

II. German history, philosophy, and literature (3 hours):

HUSL 6375: German Literature and Ideas 1870-1960

OR

HUSL 6376: Literature of Weimar Germany
(As new courses are developed, students may substitute a required course with the permission of the Center’s Director.)

III. Jewish Studies (6 hours):

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<th>HUSL 6374: Modern Jewish Literature across Cultures</th>
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AND

| HUHI 6336: Modernity, Culture, and the Jews |

(As new courses are developed, students may substitute a required course with the permission of the Center’s Director.)

Students with Existing Course Credit:

Students who have completed a minimum of 9 credit hours as of the date of application for the Holocaust Certificate may apply their hours toward the above requirements as long as those classes have been taken within the last 24 credit hours or 12 months of prior coursework. Students must be current in their requirements for graduation, and should be prepared to furnish the Center Advisor a completed, up-to-date advising form from their A & H Academic Advisor.

Certificate Registration:

Certificate registration forms are available online at [http://www.utdallas.edu/ah/ackerman/](http://www.utdallas.edu/ah/ackerman/). Please contact the Center office at 972-883-2100, or by email: holocauststudies@utdallas.edu if you have any questions. Please submit Certification enrollment forms to the Arts and Humanities Office located at JO 4.510.
Graduate Program in Latin American Studies

Master of Arts (36 hours minimum)

The program leading to the M.A. in Latin American Studies allows students to acquire expertise in multiple aspects of Latin America. Building on the unique interdisciplinary structure of the School of Arts and Humanities, the program has an integrated curriculum that connects literary, historical, cultural, and visual studies. Students seeking the M.A. in Latin American Studies have two options, a “research” or a “professional” option. Students with plans for doctoral study should choose the research option.

Students pursuing the research option must complete thirty-six semester hours of course work, demonstrate reading proficiency in an approved foreign language, complete an approved internship or study abroad, and successfully complete a capstone project. Normally no more than six hours of independent study are applicable to the degree plan.

Core Course (3 hours)

LATS 6300: Introduction to Latin American Studies

Students are expected to complete this course as early as possible in their program.

Prescribed Electives (15 hours)

Prescribed electives are selected from the following courses:

HIST 6360 Latin American History

HIST 6365 Mexican History
HUAS 6334 Iberian Culture and Music
HUHI 6315 Thought, Culture, and Society in Latin America
HUSL 6373 Topics in Latin American Literature
HUSL 6380 The Art and Craft of Translation
HUSL 6396 Spanish Language, Literature, and Culture

**Free Elective Courses (9 hours)**

These three courses may be selected from other courses related to Latin America and/or the students' area of concentration. Students may take approved courses on Latin America topics in the School of Economic, Political, and Policy Sciences and the School of Interdisciplinary Studies.

Free electives must be approved by the Associate Dean for Graduate Studies.

**Internship or Study Abroad (3 hours)**

Students will also complete a minimum of 3 semester credit hours in an approved study abroad immersion program or a comparable internship program established in partnership with UT Dallas and businesses and/or non-for-profit agencies in the Dallas-Fort Worth area.

LATS 6390 Internship in Latin American Studies

**Capstone Project (6 hours)**

LATS 6399 Capstone Project in Latin American Studies

Having completed thirty hours of course work, students must write and present a capstone project on a topic of their choice in Latin American Studies, either a research thesis or final project.
Students pursuing the professional option in Latin American Studies must complete thirty-six semester hours of course work, including LATS 6300 and 15 hours of prescribed electives, demonstrate reading proficiency in an approved foreign language, and complete an approved internship or study abroad. They are not required to complete a capstone project and they receive a terminal degree. Normally no more than six hours of independent study are applicable to the degree plan.
SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES

The School of Behavioral and Brain Sciences offers graduate preparation at the Masters and Doctoral levels designed to meet the needs of students with both research and professional objectives. With instruction and mentoring from internationally recognized faculty, the School’s programs emphasize multidisciplinary training coupled with opportunities for intensive research and clinical experiences. The School’s degree programs draw upon three clusters of expertise: Communication Sciences and Disorders, Cognition and Neuroscience, and Psychological Sciences. The Callier Center for Communication Disorders-Dallas and Callier-Richardson, large comprehensive clinical and research centers, the Center for BrainHealth, the Center for Vital Longevity, and the Center for Children and Families further enrich the training of students.

DEGREES OFFERED

- Master of Science in Applied Cognition and Neurosciences (36 hours minimum)
- Master of Science in Communication Disorders (48 hours minimum)
- Master of Science in Human Development and Early Childhood Disorders (45 hours minimum)
- Master of Science in Psychological Sciences (36 hours minimum)
- Doctor of Audiology (100 hours)
- Doctor of Philosophy in Cognition and Neuroscience (minimum beyond the baccalaureate degree)
- Doctor of Philosophy in Communication Sciences and Disorders (75 hours minimum beyond the baccalaureate degree)
Doctor of Philosophy in Psychological Sciences (75 hours minimum beyond the baccalaureate degree)
Master of Science Program in Applied Cognition and Neuroscience  
(36 hours minimum)

http://bbs.utdallas.edu/acn/

Faculty


**Associate Professors:** Lawrence J. Cauller (emeritus), Mandy Maguire, Bart Rypma, Lucien T. Thompson

**Assistant Professors:** Chandramallika Basak, Cindy de Frias, Francesca Filbey, *Kristen Kennedy,* Daniel Krawczyk, Sven Kroener, Christa McIntyre, Jon Plosksi, *Karen Rodrigue,* Noah Sasson, Gagan Wig

**Distinguished Scholar in Residence:** James Jerger

Objectives

The Master of Science in Applied Cognition and Neuroscience (ACN) program is an applied multidisciplinary program that incorporates and integrates methodologies from such diverse fields as psychology, neuroscience, computer science, and philosophy. The *neuroscience specialization area* enables students to focus on the brain from a variety of perspectives including systems, cellular, and molecular-level approaches with the objective of understanding the interactions of these systems and how they underlie the emergence and diversity of behavior.
The Cognition specialization area provides students with training in the area of experimental cognitive psychology, which exploits experimental psychology methods to develop and test information processing theories of human behavior, including perception, learning, memory, thinking, and language. The Cognition and Neuroscience specialization area provides a flexible multidisciplinary curriculum for studying the mind and brain that strategically incorporates features of both the Cognition specialization area and the Neuroscience specialization area. Students enrolling in the Cognition and Neuroscience specialization area learn to use behavioral research methods in conjunction with neuroscience research methods to investigate the neural foundations of cognitive processes. The Computational Modeling/Intelligent Systems specialization area provides advanced training applicable to mathematical and computer simulation models of the brain and behavior as well as the design, development, and evaluation of artificially intelligent systems. The Human Computer Interaction specialization area provides preparation for work in areas involving human computer interactions. These areas include usability engineering and user-experience design issues associated with the design, development, and evaluation of user-friendly human-computer interfaces. The Neurological Diagnosis and Monitoring specialization area provides advanced training for using functional brain imaging methodologies such as: EEG, SPECT, PET, and fMRI for both clinical and experimental investigations. It also provides training for career paths in the field of Intraoperative Neurophysiological Monitoring. Furthermore, all six specialization areas provide excellent preparation for doctoral work in the Cognition and Neuroscience area as well as medical school.

Career Opportunities

The Masters of Science in Applied Cognition and Neuroscience (ACN) provides advanced training opportunities in the areas of Neuroscience, Experimental Psychology, Artificial Intelligence, and Human-Computer-Interactions. In addition, the ACN program is a multidisciplinary program that should be of interest to business professionals, working full-time in a professional-level job who are interested in either a career change or continuing education. Many courses in the ACN program are offered...
periodically as evening courses that meet either once or twice a week. A few representative career opportunities in the Applied Cognition and Neuroscience Area are listed as follows.

Software development and engineering professionals interested in pursuing careers in the areas of usability engineering and user-experience (UX) design and development will greatly benefit from the Human-Computer Interactions specialization area. Usability engineering and user-experience design involve the evaluation and design of human-computer interfaces such as: website and software graphical user interfaces (GUls), smartphone interfaces, and voice-user interfaces (VUIs).

Psychological counselors and Education professionals (e.g., high school science teachers, adult literacy educators) will greatly benefit from the basic neuroscience and psychological science courses offered in the Cognition and Neuroscience specialization area.

Medical Health professionals (e.g., Electroneurodiagnostic Technologists, MRI Technicians, Radiologists) who are working in the area of brain imaging technology will find the Neurological Diagnosis and Monitoring specialization area relevant for improving their knowledge and understanding of functional brain imaging technologies such as: EEG, SPECT, PET, and fMRI.

Software development and engineering professionals interested in artificially intelligent systems should consider the Intelligent Systems specialization area. Mathematical algorithms are now widely embedded in a variety of systems for the purposes of providing "intelligent assistance" to the end-user. Examples of such systems include: web search engines, speech recognition systems, robotics, computer-vision systems, computer games, natural language understanding systems, bionic and prosthetic technology, data
Facilities

In addition to numerous individual faculty research labs, the Applied Cognition and Neuroscience Program utilizes several facilities which are shared among faculty and graduate students in the School of Behavioral and Brain Sciences. The Computational Systems Laboratory consists of a network of workstations which are used for computationally intensive models of perceptual, cognitive, and neural processes as well as high-volume data analyses. The Computational Systems Laboratory can be accessed remotely by graduate students and faculty members. The Neuroscience Laboratory facilities are located in Green Hall and the Administration Building at the Richardson campus as well. The Callier Center for Communication Disorders, located adjacent to the University of Texas Southwestern Medical School, provides access to brain imaging laboratories and speech, hearing, and language laboratories.

Admission Requirements

The University's general admission requirements are discussed here.

Admission to the Applied Cognition and Neuroscience Program is based on a review of the applicant's GPA, letters of recommendation, and narrative description of interests and career goals. Both GRE math and verbal scores are required to be considered for admission.

Students with strong academic records, who are in the process of completing their undergraduate degree at UTD, may be admitted as Fast-track Students. Fast-track students may accelerate completion of the degree requirements of the Master of Science Program in Applied Cognition and Neuroscience at UTD by completing up to 12 credits of specified fast-track graduate coursework at UTD as an undergraduate. Fast-track credit hours may be used to fulfill requirements for the student's
undergraduate UTD degree as well as satisfy course requirements for the masters’ degree in Applied Cognition and Neuroscience. Applications to the Graduate Program in Applied Cognition and Neuroscience can be submitted as soon as the student is an undergraduate at UTD with no more than 45 credit hours remaining.

Degree Requirements

The University’s general degree requirements are discussed here.

All students in the program are required to regularly review their degree plans with their program advisor. In all areas of specialization, students complete 6 hours of approved core courses, 6 hours of approved methods courses, 6 hours of approved advanced elective courses, 12 hours of coursework in an approved specialization area, and 6 hours of internship courses. A grade of "B" is the required passing grade for coursework used to fulfill the core course and methods course requirements of the degree. Internship coursework must be taken pass/fail.

Required Core Courses (6 hours)

Select two of the following core courses based upon choice of specialization area (6 hours).

ACN 6330 Cognitive Science

ACN 6395 Cognitive Psychology

ACN 6340 Cellular Neuroscience

ACN 6338 Functional Neuroanatomy

ACN 6346 Systems Neuroscience
ACN 6348 Neural Net Mathematics

Required Methods Courses (6 hours)

Select two methods courses based upon choice of specialization area (6 hours).

ACN 6312 Research Methods in Behavioral and Brain Sciences - Part I
ACN 6313 Research Methods in Behavioral and Brain Sciences - Part II
ACN 6316 Research Methods in Behavioral and Brain Sciences - Part III
ACN 5314 Computational Modeling Methods in Behavioral and Brain Sciences
ACN 6388 MATLAB for Brain Sciences
ACN 6322 Computational Modeling Methods for Language Understanding
ACN 6351 Quantitative Methods in Neuroscience
ACN 6347 Intelligent Systems Analysis
ACN 6349 Intelligent Systems Design
ACN 6373 Intraoperative Neurophysiological Monitoring I
ACN 6374 Intraoperative Neurophysiological Monitoring II

Area of Specialization (18 hours)

The following six specialization areas have been approved for the Applied Cognition and Neuroscience program. Alternative curriculum proposals may be submitted for consideration to the Applied Cognition and Neuroscience program head.
**Neuroscience Specialization Area**

All students selecting this specialization area should take at least two of the following three courses: ACN 6346 Systems Neuroscience, ACN 6338 Functional Neuroanatomy, and ACN 6340 Cellular Neuroscience in order to fulfill their core course requirements. Students selecting this specialization area are approved to select any four courses from the ACN program (i.e., courses with the prefix ACN) or the Cognition and Neuroscience Area of the Doctoral Programs in Psychological Sciences (i.e., courses with the prefix HCS).

**Cognition Specialization Area**

The core course requirement for this specialization area is satisfied by choosing: ACN 6330 Cognitive Science and ACN 6395 Cognitive Psychology. Research Methods I (ACN 6312) and Research Methods II (ACN 6313) are also strongly recommended for this specialization area. Students selecting this specialization area are approved to select any four courses from the ACN program (i.e., courses with the prefix ACN) or the Cognition and Neuroscience Area of the Doctoral Programs in Psychological Sciences (i.e., courses with the prefix HCS).

**Cognition and Neuroscience Specialization Area**

All students selecting this specialization area should take either: ACN6346 Systems Neuroscience or ACN 6338 Functional Neuroanatomy in order to fulfill one of their core course requirements. The remaining core course requirement will be satisfied by choosing either: ACN 6330 Cognitive Science or ACN 6395 Cognitive Psychology. Research Methods I (ACN 6312) and Research Methods II (ACN 6313) are also strongly recommended for this specialization area. Students selecting this specialization area are approved to select any four courses from the ACN program (i.e., courses with the prefix ACN) or the Cognition and Neuroscience Area of the Doctoral Programs in Psychological Sciences (i.e., courses with the prefix HCS).

**Human-Computer Interactions Specialization Area**
The core course requirement for this specialization area is satisfied by choosing: ACN 6330 Cognitive Science and ACN 6395 Cognitive Psychology. All students selecting this specialization area should take at least one of the following three courses: ACN 6341 Human Computer Interactions I, ACN 6342 Human Computer Interactions II, and ACN 6343 Human Computer Interactions Lab. Research Methods II (ACN 6313) is highly recommended as well. Students pursuing the usability-engineering track within the HCI specialization area should take two additional courses from the Cognition and Neuroscience Specialization Area course selections. Students pursuing the user experience design track within the HCI specialization area should take the coursework in the usability engineering track as well as: CS 5343 Algorithm Analysis & Data Structures and CS 6354 Advanced Software Engineering. Note that the prerequisites for CS 5343 are: CS 5303 Computer Science I (or equivalent) and CS 5333 Discrete Structures. Students specializing in the Human Computer Interactions area should also regularly review the Arts and Technology (ATEC) courses offered in the School of Arts and Humanities and discuss relevant course offerings with the ACN Program Head.

**Computational Modeling/Intelligent Systems Specialization Area**

Students pursuing the computer simulation modeling track should take four courses from the Cognition and Neuroscience Specialization Area which include at least one of the following courses: ACN 6388 MATLAB for Brain Science, ACN 7367 Speech Perception Laboratory, ACN 6322 Computational Modeling Methods for Language Understanding, and ACN 5314 Computational Modeling Methods in the Behavioral and Brain Sciences. Students pursuing the mathematical modeling track will satisfy the advanced elective requirement in this specialization area by taking the sequence: ACN 6346 Neural Net Mathematics, ACN 6347 Intelligent Systems Analysis, and ACN 6349 Intelligent Systems Design and one additional course from the Cognition and Neuroscience Specialization Area course selection. Note that STAT 5351 Probability and Statistics, linear algebra, multivariable calculus, and ACN 5314 Computational Modeling Methods in the Behavioral and Brain Sciences are recommended prerequisites for: ACN 6347, ACN 6348, and ACN 6349. The following
Computer Science and Electrical Engineering courses are pre-approved electives for students specializing in the Intelligent Systems area who have the appropriate prerequisite background in computer science and/or electrical engineering: CS 6320 Natural Language Processing, CS 6321 Discourse Processing, CS 6364 Artificial Intelligence, CS 6373 Intelligent Systems, CS 6375 Machine Learning, CS 6384 Computer Vision, EESC 6362 Introduction to Speech Processing, EESC 6363 Digital Image Processing, EESC 6364 Pattern Recognition, and EESC 6365 Adaptive Signal Processing.

**Neurological Diagnosis and Monitoring Specialization Area**

Students should choose ACN 6338 Functional Neuroanatomy and ACN 6346 Systems Neuroscience to fulfill the core course requirements. ACN 6373 Intraoperative Neurophysiological Monitoring I and ACN 6374 Intraoperative Neurophysiological Monitoring II should be taken to fulfill the methods requirement. Students should also choose at least 2 of the following courses as specialization area electives: ACN 6310 Fundamentals of Functional Brain Imaging, HCS 7315 Statistical Analysis of Brain Imaging Data, HCS 7329 Functional Brain Imaging Practica, ACN 6372 The Neuroscience of Pain, and ACN 7330 Advanced Functional Brain Imaging.

**Internships (6 hours)**

The internship requirement is satisfied by enrolling in 6 credit hours of ACN 7V71 Industry Internship, ACN 7V72 Research Internship, and/or HCS 8V80 Research in Behavioral and Brian Sciences. Students whose immediate post-graduate goals are graduate school and medical school should fulfill the Internship Requirement by taking six credit hours of HCS 8V80 in order to obtain research experience. Students not intending to pursue graduate or medical school training immediately after receiving their ACN masters degree should discuss internship opportunities with the Program Head during their second semester of enrollment in the ACN program.
Master of Science Program in Communication Disorders (48 hours minimum)

http://bbs.utdallas.edu/comd/

Faculty

Professors: Thomas Campbell, Sandra Chapman, Christine Dollaghan, Julia Evans, William F. Katz, Robert D. Stillman, Linda Thibodeau, Emily Tobey, Hanna Ulatowska, Anne van Kleeck

Associate Professor: Mandy Maguire, Pamela Rollins

Assistant Professor: Raul Rojas

Clinical Faculty: Michelle Aldridge, Suzanne Bonifert, Lucinda Dean, Diane Garst, Karen Kaplan, Helen Kenedi, Janice Lougeay, Felicity Sale

Objectives

The Master of Science program in Communication Disorders offers broad-based professional preparation in speech-language pathology within an environment which supports an active program of clinical services and research. Students are provided comprehensive exposure to clinical approaches in communication disorders and to the scientific foundations from which clinical approaches are derived. Practical experience is available in a variety of on- and off-campus clinical, educational, and medical settings.

The graduate program in Communication Disorders is accredited in speech-language pathology by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.
Facilities

The principal sites for the academic, clinical, and research activities of the Communication Disorders program are the UT Dallas Callier Center for Communication Disorders, adjacent to The University of Texas Southwestern Medical Center, and Callier-Richardson on the University’s main campus. These facilities, and others throughout the Metroplex, provide the educational, clinical, research, and medical environments essential for an interdisciplinary program in Communication Disorders.

Admission Requirements

The University’s general admission requirements are discussed here.

Admission to the Communication Disorders Program is based on a review of the applicant’s transcripts, GRE scores, letters of recommendation, and statement of purpose.

Degree Requirements

The University’s general degree requirements are discussed here.

The Master of Science program requires a minimum of 48 semester hours. Students completing the master’s degree meet the academic and clinical practicum requirements for the Certificate of Clinical Competence offered by the American Speech-Language-Hearing Association.

Students entering the master’s program with a bachelor’s degree in speech-language pathology are required to take the following courses: COMD 6221 Voice Disorders, COMD 6222 Stuttering, COMD 6320 Motor Speech Disorders, COMD 6377 Neurogenic Communication Disorders, COMD 7303 Dysphagia, and COMD 7378 Assessment and Intervention of Language Impairments in Preschool and School-Age Children. Students must also complete approved elective courses and practicum/internship totaling 48 credit hours. In addition to the required courses listed above, students must complete a minimum of three additional courses in the areas of language disorders in children and language disorders in adults.
Two courses must be completed in one area and one course in the other. Students enroll in Practicum (HCS 7380) or Internship (COMD 6630) each semester in order to earn the necessary clock hours for certification and licensure. In general, a maximum of 9 semester hours of Practicum/Internship may be counted toward the minimum 48 semester hours required for the degree. Exceptions to the above requirements must be approved by the program head.

**Combined Master/Doctoral Study**

Students who wish to earn a clinical master’s degree while pursuing doctoral study may apply for combined master's/doctoral study. Students approved to enroll in both master’s and doctoral courses pursue an individualized plan of study leading to both degrees.

**Comprehensive Examination**

All students seeking the master’s degree in Communication Disorders must pass a written comprehensive examination. A thesis is optional.

**Out-Of-Field Students**

Students entering the program who lack undergraduate preparation in speech-language pathology or audiology are required to take a specified 15 semester hours of preparatory courses. These courses may be taken at UT Dallas in conjunction with graduate coursework or may be taken at another university.
Master of Science Program in Human Development and Early Childhood Disorders (45 hours minimum)

http://bbs.utdallas.edu/hdecd/

Faculty

Professors: Bert S. Moore, Margaret Tresch Owen, John W. Santrock, Melanie J. Spence, Robert D. Stillman, Marion K. Underwood, Deborah Wiebe

Associate Professors: Shayla Holub, Mandy Maguire, Pamela Rollins, Candice Mills

Assistant Professors: Jackie Nelson, Noah Sasson

Clinical Faculty: Cherryl Bryant

Senior Lecturer: Toosje Van Beveren

Objectives

The Master of Science program in Human Development and Early Childhood Disorders is designed for students with professional interests in early child development and disorders. The curriculum offers a strong foundation in the normative path of physical, cognitive and social development with specialized training in diagnostic and intervention techniques needed to work with developmental disorders of early childhood. The program is designed for students interested in a career in the delivery of services to young children who show developmental delays and disorders and teaches students to work as part of a multi- or transdisciplinary team. It provides training to work with infants and young
children and their families in early childhood intervention programs, child life programs in hospitals, preschools, and medical/therapy clinics. Classroom training is combined with practical experience in a variety of clinical and educational settings, both on campus and in the community. Students graduating from the program qualify to work as Early Intervention Specialists and Developmental Specialists. Coursework also satisfies most of the competencies toward Child Life certification. Graduates with one additional year of work experience typically qualify for Level 2 Infant Mental Health Endorsement by the Texas Association for Infant Mental Health.

Facilities

The principal sites for the academic activities of the Human Development and Early Childhood Disorders program are located at UTD and the Callier Center for Communication Disorders on the main campus in Richardson and on the campus of the UT Southwestern Medical Center in Dallas. Facilities include research and observational laboratories, including settings dedicated to infant and child assessment. The Callier Center on both the main campus in Richardson and the medical center campus offer a number of educational and clinical programs serving young children, including the Preschool Language Development Program held at Callier-Richardson. Various community programs and settings throughout the Metroplex provide essential educational and clinical environments for training in Human Development and Early Childhood Disorders. Practicum and Internship placements both on campus and in the community provide supervised on-site and community based fieldwork experiences with young children with special needs and their families.

Admission Requirements

The University’s general admission requirements are discussed here.

The Human Development and Early Childhood Disorders program is designed for students with backgrounds in psychology, special education, early childhood education, social work, and communication disorders. Students from other disciplines are also encouraged to apply. Those from other fields are generally not required to take leveling courses.
Admission to the Human Development and Early Childhood Disorders program is based on a review of the applicant’s GPA, GRE scores, letters of recommendation, and narrative description of interests, relevant experiences, and career goals.

**Degree Requirements**

The University’s general degree requirements are discussed here.

The plan of study includes a set of required foundational courses, elective course options, and supervised practical experience in applied settings designed to prepare students to work with children and their families.

Students are advised that participation in off-campus practicum and internship requires a criminal background check. Students excluded from off-campus sites for any reason may be unable to complete all degree requirements.

The Master of Science program requires a minimum of 45 semester hours. Specific degree requirements follow.

**Required Core Courses (24 hours)**

HDCD 6319 The Developing Child: Infants and Toddlers
HDCD 6312 Atypical Development
HDCD 6315 Assessment Theory
HDCD 6316 Developmental Assessment
HDCD 6335 Intervention Paradigms
HDCD 6310 Parent Education
HDCD 6320 The Developing Child: Toddler and Preschool Years (Two to Five Years)
HDCD 6370 Intervention with Young Children
### Practicum (3 hours)

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HDCD 7V20</td>
<td>Practicum/Internship in Early Childhood Disorders</td>
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### Internship (6 hours)

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<th>Course Code</th>
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<tbody>
<tr>
<td>HDCD 7V20</td>
<td>Practicum/Internship in Early Childhood Disorders</td>
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### Electives (12 hours)

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<tr>
<td>HDCD 6325</td>
<td>Service Coordination of Community Resources</td>
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<tr>
<td>HDCD 6395</td>
<td>Medical and Biobehavioral Factors in Early Childhood Disorders</td>
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<tr>
<td>HDCD 6330</td>
<td>Families and Culture</td>
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<tr>
<td>HDCD 6385</td>
<td>Child Psychopathology</td>
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<tr>
<td>HDCD 6355</td>
<td>Family Outreach and Assessment</td>
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<tr>
<td>HDCD 6390</td>
<td>Infant Mental Health</td>
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<tr>
<td>HDCD 6V81</td>
<td>Special Topics in Human Development and Early Childhood Disorders</td>
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<tr>
<td>HDCD 6360</td>
<td>Behavior Management</td>
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<tr>
<td>HDCD 6365</td>
<td>(COMD 7336) Social Communication in Early Childhood Disorders</td>
</tr>
<tr>
<td>HCS 7382</td>
<td>Health Psychology</td>
</tr>
<tr>
<td>COMD 6307</td>
<td>Language Acquisition</td>
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<tr>
<td>COMD 7V62</td>
<td>Seminar in Autism</td>
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</tbody>
</table>

HDCD 7V98 Independent Study
HDCD 7V80 Independent Research
Master of Science Program in Psychological Sciences (36 hours minimum)

http://bbs.utdallas.edu/psycims/

Faculty


Associate Professors: Shayla C. Holub, Daniel Krawczyk, Candice M. Mills, Bart Rypma,

Assistant Professors: Robert Ackerman, Chandramalika Basak, Francesca Filbey, Cindy de Frias, Kristen Kennedy, Mandy J. Maguire, Christa McIntyre, Jinkyung Na, Karen Rodrigue, Noah Sasson, Jackie Nelson Taylor

Objectives

The Master of Science (M.S.) in Psychological Sciences program provides advanced training in psychological sciences. The program is designed for full-time student scholars who wish to expand their knowledge of psychology by engaging in advanced coursework, additional research training, and/or applied experience in psychological sciences. The program also offers students the opportunity to gain additional psychology training in preparation for applying to nationally prominent doctoral programs in Clinical and Experimental Psychology. This research-focused program requires students to work with a research mentor from the beginning and to be actively involved in at least one research laboratory throughout
training. Students also have the opportunity to gain additional applied experiences through the Internship Program in the School of Behavioral and Brain Sciences. The Master of Psychological Sciences degree does not provide clinical training or lead to licensure as a counselor or psychologist.

Facilities

The principal sites for the academic, applied, and research activities of the Masters Program in Psychological Sciences include faculty labs located on the Richardson Campus and the Callier Center for Communication Disorders. Students also will be exposed to research and applied experiences at vibrant centers within the School of Behavioral and Brain Sciences: the Center for Children and Families, the Callier Center for Communication Disorders, the Center for BrainHealth, the joint Center for Brain Imaging with UT Southwestern, and the Center for Vital Longevity. These centers provide access to brain imaging laboratories and speech, hearing, and language laboratories.

Admission Requirements

The University’s general admission requirements are discussed here.

The application deadline is February 15th each year. Applicants are selected once a year to begin the program in the fall semester.

Admission to the Master of Science Program in Psychological Sciences is based on a review of the applicant’s GPA, three letters of recommendation, and narrative description of interests and career goals. Both GRE math and verbal scores are required to be considered for admission.

Degree Requirements

The University’s general degree requirements are discussed here.

The M.S. in Psychological Sciences curriculum is designed to offer
opportunities for specialization in a chosen core field, breadth of training, selection of electives that serve students’ individual goals, and research experience. Each student will be assigned to a research mentor at the start of the program and will maintain involvement in a research laboratory throughout the two-year program. Students will also have the opportunity to gain applied experience by participating in the internship program offered by the School of Behavioral and Brain Sciences.

All students in the program are required to regularly review their degree plans with their research mentor. The program requires a minimum of 36 credit hours distributed as follows. Students are required to complete 6 credit hours of major field core courses (two selected from one of the following fields: Developmental, Cognitive, Social and Personality, Neuroscience), 6 credit hours of additional core courses (two courses from a different area than the major core), 6 credit hours of Research Methods (a two course sequence in statistics and research methods), 12 credit hours of approved advanced elective courses, and 6 credit hours of Independent Study/Research.

Students are encouraged to use the summer between the first and the second year to get applied internship experience. Students interested in summer applied internships can find placements through the currently existing School of Behavioral and Brain Sciences internship program for undergraduates.

Required Core Courses (18 hours)

Major Field Core Courses (12 SCH minimum). Students will declare a major in one of these areas and take two courses from the major area and two courses from a different area than the major core.

1. Developmental Psychology

   PSYC 6350 Social Development
   PSYC 6331 Cognitive Development
   PSYC 6368 Language Development
2. Cognition

PSYC 6330 Cognitive Science
PSYC 6395 Cognitive Psychology
PSYC 6333 Memory

3. Social/Personality Psychology

PSYC 6376 Social Psychology
PSYC 6327 Personality

4. Neuroscience

PSYC 6346 Systems Neuroscience
PSYC 638 Functional Neuroanatomy

Research Methods (6 SCH minimum)

Students will complete two 3-hour courses in research methods and design that are approved by the program head and faculty coordinator.

1. Research Methods I
   PSYC 6312 Research Methods in Behavioral and Brain Sciences – Part I

2. Research Methods II
   PSYC 6313 Research Methods in Behavioral and Brain Sciences – Part II

Advanced Electives (12 SCH minimum)

Students will elect 4 courses from masters and doctoral offerings. Any core course (listed above) may count as an advanced elective, though it cannot count both as a core course and as an elective.
As an elective course, interested students may participate in a Teaching Internship. Teaching internships will be arranged by the Program Head in consultation with the teaching faculty. Teaching internships will be for course credit and not for pay.

**Independent Study/Research (6 SCH)**

Students will complete a Research Project fulfill this requirement. The research requirement will be fulfilled by completion of a focused research project to be submitted and presented in poster format.
Doctor of Audiology Program (100 hours)

http://bbs.utdallas.edu/aud/

Faculty

Professors: Peter F. Assmann, Michael Kilgard, Aage R. Møller, Ross J. Roesser, Robert D. Stillman, Linda Thibodeau, Emily Tobey

Assistant Professor: Andrea Warner-Czyz

Clinical Associate Professors: Jackie Clark, Carol Cokely, Lee Wilson, Kenneth Pugh

Clinical Assistant Professor: Jeffrey Martin

Distinguished Scholar in Residence: James F. Jerger

Faculty Associates: Beth Bernthal, Jenifer Carlock, Jill Chen, Lisa Flores, Elizabeth Gill, Shawna Jackson, Shari Kwon, Amanda Labue, Elizabeth Mani, Holly Marvin, Lisa Richards, Cheryl Taylor, Sarah Tillman, Laura Veazey

Objectives

Doctor of Audiology (Au.D.): The AuD degree offers broad-based professional preparation in audiology within an environment supporting an active program of clinical services and research. Students receive comprehensive exposure to clinical methods and procedures across the scope of practice in audiology and to the scientific foundations from which clinical approaches are derived. Clinic rotations are provided at the Callier Center and medical and educational settings throughout the Dallas/Ft. Worth Metroplex.

Au.D./Ph.D. degree track: Students who are interested in combining clinical and research training may combine the Au.D. with the Ph.D. in Communication Sciences and Disorders. Students must apply separately to the Ph.D. program to be considered.

Facilities

The principal site for the academic, clinical, and research activities of the Doctor of Audiology program is the U.T. Dallas Callier Center for Communication Disorders, which is adjacent to The University of Texas Southwestern Medical Center. Courses and practicum are also offered at U.T. Dallas Callier Richardson on the Main Campus of the University. The U.T. Dallas Callier Advanced Hearing Research Center provides specialized clinical and research facilities for the program. In addition to the Callier outpatient clinics, the Callier Center houses the Dallas Cochlear Implant Program, the Dallas Regional Day School for the Deaf, Tinnitus and Hyperacusis Clinic, Auditory Processing Clinic, and Assistive Devices Center.

Admission Requirements

The University's general admission requirements are discussed here.
Admission to the Doctor of Audiology Program is based on a review of the applicant’s GPA, GRE scores, letters of recommendation, and narrative description of interest in audiology, research interests and career goals. The GRE score is included in the evaluation of the applicant’s record. There is no minimum cut-off scores for admission.

**Degree Requirements**

The University’s general degree requirements are discussed [here](#).

The Doctor of Audiology (Au.D.) degree requires 100 semester hours. Students completing the Au.D. degree meet the academic and clinical practicum requirements for the Certificate of Clinical Competence offered by the American Speech-Language-Hearing Association and Texas State licensure requirements for audiology. Specific degree requirements follow.

**Required Courses (100 hours)**

**Foundation (25 Semester Hours)**

- AUD 6120 Laboratory Procedures in Audiology and Hearing Science (taken 4 times)
- AUD 6303 Hearing Science
- AUD 6305 Anatomy and Physiology of Audition
- AUD 6306 Speech Science
- AUD 6310 Advanced Clinical Audiology
- AUD 6311 Diagnostic Audiology
- AUD 6316 Audiologic Rehabilitation for Adults
- AUD 6318 Pediatric Audiology

**Doctoral Core (29 Semester Hours)**

- AUD 6352 Medical Audiology
- AUD 7182 Issues in Mentoring and Counseling
- AUD 6113 Grand Rounds (taken 4 times)
- AUD 7324 Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments
- AUD 7326 Aural Habilitation of Children with Hearing Impairments
- AUD 7327 Evaluation and Fitting of Amplification Systems
- AUD 7338 Research in Audiology
- AUD 7339 Evidence-Based Practice in Communication Disorders
- AUD 7353 Clinical Electrophysiology

**Advanced (18 Semester Hours)**

- [ASSIGNABLE CREDIT](#)
AUD 7210 Professional Issues in Audiology
AUD 7228 Hearing Loss Prevention
AUD 7351 Physiologic Assessment of Vestibular System
  *Varies*  Doctoral Elective in AuD (taken 2 times 3 credit course)
AUD 7240 Auditory Processing Disorders

AUD 6314 Instrumentation

**Experiential (28 Semester Hours)**

AUD 7280 Doctoral Practicum in Audiology (taken 8 times)
AUD 8V80 Individual Research in Audiology
AUD 8V97 Doctoral Internship in Audiology (taken 3 times)

**Out-of-Field Students**

Students entering the program who lack undergraduate preparation in communication disorders or science are required to take a specified sequence of corequisite courses. Students may take these courses at The University of Texas at Dallas prior to the beginning of the program, or concurrently during AUD courses.

Students are advised that participation in clinical rotations mandates some personal expense. All students must obtain lab coats and professional liability insurance. Off campus clinical rotations and externship may have additional expenses such as a criminal background check, drug screening, TB screening, chicken pox titer, hepatitis vaccination, CPR certification, and fingerprinting. Students excluded from off-campus sites for any reason may be unable to complete all degree requirements.
Doctoral Programs in Cognition and Neuroscience, Communication Science and Disorders, Psychological Sciences

http://bbs.utdallas.edu/

Faculty


Associate Professors: Lawrence J. Cauller (emeritus), Shayla Holub, Daniel Krawczyk, Mandy Maguire, Candace Mills Robert Rennaker, Pamela Rollins, Bart Rypma, Lucien T. Thompson

Assistant Professors: Robert Ackerman, Chandramallika Basak, Cindy de Frias, Francesca M. Filbey, Kristen Kennedy, Sven Kroener, Christa McIntyre, Jinkyung Na, Jonathan E. Plosks, Karen Rodrigue, Raul Rojas, Noah Sasson, Jackie Nelson Taylor, Gagan Wig
Distinguished Scholar in Residence: James Jerger

Objectives

The School of Behavioral and Brain Sciences offers doctoral programs in Cognition and Neuroscience, Communication Sciences and Disorders, and Psychological Sciences. Each provides preparation in basic and applied aspects of behavioral and brain sciences. The faculty consists of specialists in developmental psychology, cognitive science, neuroscience, cognitive neuroscience, and communication sciences and disorders. Students may specialize in these areas or pursue study across areas as in the study of child language, aging, perception, and behavioral and neural plasticity. Core and specialized courses provide the foundation for advanced seminars and a wide spectrum of doctoral research in laboratories, schools, and clinics. Frequent colloquia and informal brown-bag seminars contribute to a stimulating environment for scholarly development.

Cognition and Neuroscience

The flexible, non-traditional doctoral program in Cognition and Neuroscience provides novel opportunities for multidisciplinary and cross-disciplinary studies in the areas of perception, memory, attention, and executive processing, cognitive neuroscience, cellular and systems neuroscience, cortical plasticity, and computational modeling of cognitive and neural processes. Close liaison with the UT Southwestern Medical School provides access to first-class neuroimaging technologies and research populations. Students pursuing research in this program have the option of developing, in consultation with their doctoral advisor, a unique training program tailored to their specific research interests.

Psychological Sciences

The doctoral program in Psychological Sciences provides opportunities for study within the context of a traditional experimental psychology curriculum. The program also offers strong interdisciplinary linkages to other areas within the School of Behavioral and Brain Sciences, including
cognitive neuroscience, behavioral neuroscience, and communication sciences and disorders. The primary goal of the program is to prepare research investigators for academic and applied settings either directly or indirectly related to the field of Experimental Psychology. Students work closely with one or more faculty members in a collegial mentoring relationship. Although all students complete a core curriculum comprised of coursework in areas such as Developmental Psychology, Cognition, and Social/Personality Psychology, the program allows students to individually tailor their studies in creative ways.

**Communication Sciences and Disorders**

The doctoral program in Communication Sciences and Disorders provides opportunities for graduate study and research in the areas of speech, language, and hearing science and in the disorders that affect speech, language, and hearing. Students have available a wealth of research opportunities in laboratories, clinics, and schools, both on-campus and in the community. Close liaison with the UT Southwestern Medical School provides patient access and numerous opportunities for research in medical settings. Coursework and research options within the doctoral programs in Psychological Sciences and Cognition and Neuroscience allow students to pursue interdisciplinary study in areas such as neuroimaging of language processes, child language, autism, neural plasticity and recovery, speech perception, auditory neuroscience and cognitive aging.

**Facilities**

The offices and research facilities of the School of Behavioral and Brain Sciences are located on the Richardson campus, and off-campus at the Callier Center for Communication Disorders-Dallas, the Center for BrainHealth, and the Center for Vital Longevity, which are adjacent to the campus of the UT Southwestern Medical Center at Dallas. Facilities on the Richardson campus include teaching and research laboratories for neuroscience, cognitive science, and facilities for the study of child development. The Center for Children and Families and Callier-Richardson provide a variety of clinical services to the community and
serve as a research sites for graduate students.

The Center for BrainHealth and the Center for Vital Longevity are the primary facilities for the study of cognitive neuroscience. The Center for BrainHealth includes research activities in the areas of aging, and neurogenic disorders in children and adults. The Callier Center-Dallas has its primary focus on speech, language, and hearing and includes research laboratories, clinical services, and classroom programs for preschool children. The Center for Vital Longevity includes research on how the body and mind can successfully age together and uses cutting-edge brain imaging technologies and advances in cognitive science to identify the “neural signature” of those at risk of not aging well and preventing problems before symptoms occur. Collaborative arrangements with the UT Southwestern Medical School expand student research opportunities including access to its clinical populations and neuroimaging facilities. The Center for Children and Families, housed in the School for Behavioral and Brain Sciences, offers an array of clinical and community outreach activities organized around three initiatives: parenting healthy families, strengthening interpersonal relationships and enhancing thinking and learning.

Admission Requirements

The University’s general admission requirements are discussed here.

Admission to a doctoral program is based on a review of the applicant’s transcripts, GRE scores, 3 letters of recommendation, and narrative description of research interests and career goals. In addition to academic requirements, the admissions committee weighs heavily the match between the applicant’s research interests and the research areas available to students in the school. For information about faculty research interests, see our web pages at bbs.utdallas.edu.

Applications for admission are due December 1. Students are accepted for the Fall semester only. Some courses in the graduate programs in Audiology, Applied Cognition and Neuroscience, Communication
Disorders, Human Development and Early Childhood Disorders, and Psychological Sciences complement doctoral coursework and, upon a student’s admission to the Ph.D. program, can be applied toward the degree. Students should consult with the doctoral program head to determine which graduate courses can be applied to the Ph.D.

Combining a Clinical Master’s (M.S.) or Doctorate (Au.D.) with the Ph.D.

Students seeking clinical certification from the American Speech-Language-Hearing Association in Speech-Language Pathology or Audiology, in addition to the Ph.D., may combine the masters program in Communication Disorders (speech-language pathology) or doctoral program in Audiology with the Ph.D. programs in Communication Sciences and Disorders, Cognition and Neuroscience, or Psychological Sciences. An individualized plan of study leads to both degrees. Students are separately admitted to each program and admission to one program does not assure admission to the other.

Degree Requirements

The University’s general degree requirements are discussed here.

Students seeking the Doctor of Philosophy degree must complete 75 graduate hours.

**DOCTOR OF PHILOSOPHY IN COGNITION AND NEUROSCIENCE (75 hours minimum beyond the baccalaureate degree)**

Doctoral Proseminar (6 semester hours)

HCS 6302 Issues in Behavioral and Brain Sciences – Part I
HCS 6303 Issues in Behavioral and Brain Sciences – Part II

Research Methods (6 semester hour minimum)

HCS 6312 Research Methods in Behavioral and Brain Science – Part I

HCS 6313 Research Methods in Behavioral and Brain Sciences - Part II

Cognition and Neuroscience Core Courses (6 semester hour minimum)

Students must take a minimum of one Cognition Core and one Neuroscience Core, choosing from those listed below.

1. Cognition

   HCS 6330 Cognitive Science
   HCS 6395 Cognitive Psychology

2. Neuroscience

   HCS 6346 Systems Neuroscience
   HCS 6388 Functional Neuroanatomy

Advanced Electives (9 semester hours minimum)
In addition to completing the 6 semester credit hour (SCH) core requirement, students take a minimum of 9 SCH of advanced electives. Any HCS course may count as an advanced elective. This includes core courses (see above), though no course can be counted both as a core and an advanced elective for any single student. Advanced electives are selected by students with the concurrence of their research advisors based on the students’ research foci. Depending on a student’s background and dissertation research, additional advanced electives beyond the 9 SCH minimum may be necessary.

**DOCTOR OF PHILOSOPHY COMMUNICATION SCIENCES AND DISORDERS (75 hours minimum beyond the baccalaureate degree)**

**Doctoral Proseminar (6 semester hours)**

- HCS 6302 Issues in Behavioral and Brain Sciences – Part I
- HCS 6303 Issues in Behavioral and Brain Sciences – Part II

**Research Methods (9 semester hour minimum)**

- HCS 6312 Research Methods in Behavioral and Brain Science - Part I
- HCS 6313 Research Methods in Behavioral and Brain Sciences - Part II
- Other Approved Advanced Research Methods course or Statistics course

**Core (6 semester hour minimum)** Students must complete a minimum of 6 semester credit hours of approved COMD or AUD prefixed courses. Courses meeting this requirement will vary depending on the student’s research interests. The requirement may be waived for students holding a graduate degree in the field of speech-language pathology or
audiology. Students lacking an adequate foundation in communication sciences may be required to complete more than the 6 SCH minimum of core coursework.

**Communication Sciences and Disorders (3 semester hour minimum)** All students must complete a minimum of 3 SCH of doctoral coursework offered through the Ph.D. program in Communication Sciences and Disorders.

**Supplemental Coursework (12 semester hour minimum)**
All students must complete an additional minimum of 12 SCH’s of doctoral level courses and seminars. Courses may be selected from doctoral level coursework offered through the Ph.D. programs in Communication Sciences and Disorders or, with advisor approval, from the doctoral coursework offered through the Ph.D. programs in Cognition and Neuroscience and Psychological Sciences.

**DOCTOR OF PHILOSOPHY IN PSYCHOLOGICAL SCIENCES (75 hours minimum beyond the baccalaureate degree)**

**Doctoral Proseminar (6 semester hours)**
- HCS 6302 Issues in Behavioral and Brain Sciences – Part I
- HCS 6303 Issues in Behavioral and Brain Sciences - Part II

**Research Methods (6 semester hour minimum)**
- HCS 6312 Research Methods in Behavioral and Brain Science - Part I
- HCS 6313 Research Methods in Behavioral and Brain Sciences - Part II
Psychological Science Core Courses (12 semester hour minimum). Students will declare a major in Developmental Psychology, Cognition, or Social/Personality Psychology. Students must take four core courses from those listed below. Two of these courses must be selected from the major area, and the four courses must be selected from at least two of the four areas listed.

1. Developmental Psychology
   - HCS 6350 Social Development
   - HCS 6331 Cognitive Development
   - HCS 6368 Language Development

2. Cognition
   - HCS 6395 Cognitive Psychology
   - HCS 6330 Cognitive Science
   - HCS 6333 Memory

3. Social/Personality Psychology
   - HCS 6376 Social Psychology
   - HCS 6327 Personality

4. Neuroscience
   - HCS 6346 Systems Neuroscience
   - HCS 6388 Functional Neuroanatomy
**Advanced Electives (9 semester hour minimum)**

After completing the 12 SCH core requirements, students will take an additional 9 SCH of advanced electives. Any core course (see above) may count as an advanced elective, though it cannot count both as a core course and as an elective. One of these 3-hour elective courses must be an advanced research methods course. Students will declare a major in Developmental Psychology, Cognition, or Social/Personality Development and will take a minimum of four courses (cores and electives) in the major area. Students may enroll in other advanced electives from the other doctoral course offerings available in the School, including courses in language and communication. Additional advanced electives are available each semester.

**ADDITIONAL REQUIREMENTS**

All students must complete the Qualifying Project/Qualifying Paper requirements of the Ph.D. degree sought. The successful defense of a written dissertation completes the requirements for the degree.
SCHOOL OF ECONOMIC, POLITICAL
AND POLICY SCIENCES

As we begin the 21st century, the School of Economic, Political and Policy Sciences is strategically positioned to offer leadership in addressing society’s most pressing concerns. Our mission is simple: develop scholars and practitioners who love to learn, individuals who can integrate knowledge and analyze sophisticated problems, and who are committed to advancing the search for truth and justice. Our domain is broad: risk management, economic performance, terrorism, voter behavior, health care, democratization, social inequality, international trade, and conflict resolution only hint at the wide variety of specific topics that must be addressed by informed social scientists. Our approach is comprehensive: strong disciplinary foundations, a dynamic interdisciplinary environment, and a striving to achieve a synthesis of theory-based knowledge and practical experience through internships, workshops, and seminars.

The School of Economic, Political and Policy Sciences awards master’s degrees in Applied Sociology, Criminology, Economics, Geospatial Information Sciences (jointly with the School of Natural Sciences and Mathematics), International Political Economy, Justice Administration and Leadership, Political Science, Public Affairs, Public Policy and Ph.D.’s in Criminology, Economics, Geospatial Information Sciences (jointly with the Erik Jonsson School of Engineering and Computer Science and the School of Natural Sciences and Mathematics), Political Science, Public Affairs, and Public Policy and Political Economy. Each degree program offers a rigorous foundation with enough flexibility to specialize and earn additional certification in city planning, crime and justice analysis, economic and demographic data analysis, evaluation research, geographic information systems, geospatial intelligence, homeland security, local government management, nonprofit management, and remote sensing. These certificate programs are available to degree-seeking as well as non-degree students seeking highly focused curricula that can benefit their
professional development. We invite you to explore our programs, scrutinize our faculty, examine our resources, and, then, to join us as we prepare to face our future.

**DEGREES OFFERED**

- Doctor of Philosophy in Criminology (75 hours **minimum beyond the baccalaureate degree**)
- Doctor of Philosophy in Economics (75 hours **minimum beyond the baccalaureate degree**)
- Doctor of Philosophy in Geospatial Information Sciences (75 hours **minimum beyond the baccalaureate degree**)
- Doctor of Philosophy in Political Science (75 hours **minimum beyond the baccalaureate degree**)
- Doctor of Philosophy in Public Affairs (90 hours **minimum beyond the baccalaureate degree**)
- Doctor of Philosophy in Public Policy and Political Economy (75 hours **minimum beyond the baccalaureate degree**)

- Master of Arts in Political Science (30 hours **minimum**)
- Master of Arts in Political Science - Constitutional Law Studies (30 hours **minimum**)
- Master of Arts in Political Science - Legislative Studies (30 hours **minimum**)

- Master of Science in Applied Sociology (36 hours **minimum**)
- Master of Science in Criminology (36 hours **minimum**)
- Master of Science in Criminology (Online) (36 hours **minimum**)


Master of Science in Economics (36 hours minimum)
Master of Science in Geospatial Information Sciences (30 hours minimum)
Master of Science in International Political Economy (36 hours minimum)

Executive Master of Science in Justice Administration and Leadership (30 hours minimum)

Master of Public Affairs (42 hours minimum)
Master of Public Policy (36 hours minimum)

Certificate in City Planning (15 hours)
Certificate in Economic and Demographic Data Analysis (15 hours)
Certificate in Evaluation Research (15 hours)
Certificate in Geographic Information Systems (15 hours)
Certificate in Geospatial Intelligence (15 hours)
Certificate in Local Government Management (15 hours)
Certificate in Non-Profit Management (15 hours)
Certificate in Remote Sensing (15 hours)

Deleted: Certificate in Homeland Security (15 hours)
Graduate Programs in Economic, Political And Policy Sciences

http://epps.utdallas.edu/

Faculty


Assistant Professors: Rodney Andrews, Jonas Bunte, Yongwan Chun, Nadine Connell, Monica Deza, Evgenia Gorina, James Harrington, Brandon Kinne, Asli Leblebicioglu, Young-joo Lee, Xin (Sherry) Li, Banks Miller, Clint Peinhardt, Meghna Sabharwal, Nicholas Vargas

Clinical Professors: Donald Arbuckle, Calvin Jamison, Elmer Polk

Clinical Associate Professors: Brian Beary, Douglas Dow

Clinical Assistant Professors: Timothy Bray, Rodolfo Hernandez
Guerrero

**Research Professors:** Tammy Leonard,

**Professors Emeritus:** Ronald Briggs, Irving J. Hoch

**Adjunct Associate Professors:** Ernan Haruvi (joint appointment with SOM)

**Senior Lecturers:** Teodoro Benavides, Karl Ho, Luba Ketsler, Irina Vakulenko, Yuki Watanabe (joint appointment with A&H)

**Objectives**

There is increasing awareness of the impact that rapid technological, economic and social change is having on society. The graduate programs in the School of Economic, Political and Policy Sciences are designed to prepare students for careers in the rapidly evolving public, private and non-profit sectors by developing expertise in areas such as policy analysis, economic decision making and public management. Our Ph.D. Programs are also designed to prepare students for careers in both teaching and research. Each graduate program is discussed in more detail below.

**Facilities**

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's [Computer Labs](#). The School has its own teaching laboratories. The University’s [Computer Labs](#) also provides personal computers and UNIX workstations for student use. Databases, a computerized geographic information system, and [Westlaw](#), a legal research system, are also available for student research. Doctoral students have opportunities to participate in research programs directed by members of the faculty. Further details are available below.

**Admission Requirements**
The University’s general admission requirements are discussed here.

All programs require applicants to have a baccalaureate degree from an accredited college or university, GRE or GMAT scores, transcripts and letters of recommendation. Specific additional requirements are discussed for each program in their respective sections below.

Prerequisites

The details for each program are discussed in their respective sections below. Students may be required to take courses to prepare them for coursework.

Research

The School of Economic, Political and Policy Sciences offers graduate degrees in twelve master’s programs and six Ph.D. programs. These programs represent a wide range of both disciplinary as well as interdisciplinary courses of student. Our master’s degree offerings include M.S. degrees in Applied Sociology, Criminology, Economics, Geospatial Information Sciences, International Political Economy, Master of Public Affairs and the Master of Public Policy degrees. The Ph.D. programs include programs of study in Criminology, Economics, Geospatial Information Sciences, Political Science, Public Affairs, Public Policy and Political Economy. The Economics and Political Science programs offer innovative courses of study in these disciplinary areas. The Ph.D. in Public Policy and Political Economy combines rigorous methodological training with a strong substantive focus in different policy areas. The School also offers non-degree certificate programs in City Planning, Crime and Justice Analysis, Economic and Demographic Data Analysis, Evaluation Research, Geographic Information Sciences, Local Government Management, and Non-profit Management.

Summary

The School of Economic, Political and Policy Sciences offers 12 masters programs and six Ph.D. programs. These programs and their credit hour
requirements are given below.

**Master’s Programs**

- M.A. in Political Science - Constitutional Law Studies (30 hours minimum)
- M.A. in Political Science in Legislative Studies (30 hours minimum)
- M.A. in Political Science (30 hours minimum)
- M.S. in Applied Sociology (36 hours minimum)
- M.S. in Criminology (36 hours minimum)
- M.S. in Criminology (Online) (36 hours minimum)
- M.S. in Economics (36 hours minimum)
- M.S. in Geospatial Information Sciences (30 hours minimum)
- M.S. in International Political Economy (36 hours minimum)
- Executive M.S. in Justice Administration and Leadership (30 hours minimum)

- Master of Public Affairs (42 hours minimum)
- Master of Public Policy (36 hours minimum)

**Ph.D. Programs**

- Criminology *(75 hours minimum beyond the baccalaureate degree)*
- Economics *(75 hours minimum beyond the baccalaureate degree)*
- Geospatial Information Sciences *(75 hours minimum beyond the baccalaureate degree)*
- Political Science *(75 hours minimum beyond the baccalaureate degree)*
Public Affairs  **(75 hours minimum beyond the baccalaureate degree)**

Public Policy and Political Economy **(75 hours minimum beyond the baccalaureate degree)**

All Ph.D. programs require at least 75 hours beyond the baccalaureate degree. Applicants should contact their respective program office to discuss possible transfer credit.

**Graduate Certificate Programs**

In addition to our degree programs, the School offers the following certificate programs for both degree and non-degree seeking students.

- City Planning
- Economic and Demographic Data Analysis
- Evaluation Research
- Geographic Information Systems (GIS)
- Geospatial Intelligence (Geolnt)
- Local Government Management
- Non-Profit Management
- Remote Sensing
Doctor of Philosophy in Criminology
(75 hours minimum beyond the baccalaureate degree)

http://epps.utdallas.edu/crim/

Faculty

Professors: Bruce Jacobs, James Marquart, Alex Piquero, Nicole Leeper Piquero, Robert W. Taylor, John L. Worrall

Associate Professors: Denise Paquette Boots, Tomislav Kovandzic, Robert Morris, Lynne Vieraitis

Assistant Professors: J.C. Barnes, Nadine Connell

Clinical Professor: Elmer Polk

Clinical Assistant Professors: Timothy Bray

Mission

The Mission of the Doctor of Philosophy in Criminology at the University of Texas at Dallas is threefold in nature, in order to:

1. Deliver high-quality education to a diverse body of graduate students regarding the etiology, control, and variation of law-breaking across space and time.

2. Serve local, regional, and national communities through professional development programs, public policy analyses, evaluation research, program and policy design, and a forum for new approaches to the study of crime.

3. Advance the understanding of criminology through a
multidisciplinary mix of theoretical and applied research.

Objectives
The doctoral program in Criminology is an interdisciplinary, research-oriented degree offered in conjunction with other graduate programs in the School of Economic, Political, and Policy Sciences at UT Dallas. The objective of the Ph.D. program is to provide students a coherent, yet intellectually challenging degree that adequately prepares them to conduct research among the many aspects of criminology and criminal justice, varying with individual interests and areas of specialty. Graduates of the Ph.D. program will be qualified to teach at the University level as professors. Graduates will also be competent to enter into analytic and administrative posts within the vast array of research and policy institutions, criminal justice organizations, and in the private sector.

Facilities
Students have access to the computing facilities in the School of Economic, Political and Policy Sciences (EPPS) in two computing laboratories which equipped with major social science software packages, including EViews, R, RATS, PASW, Stata, LexisNexis database, and Westlaw for student use. The University’s Computer Labs provides personal computers and UNIX Workstations. Data and reference materials are also available online via the library and UTD’s memberships in numerous organizations.

Graduate Assistantships
Criminology Program Funding is limited primarily to doctoral students, with limited opportunities others. Students should note their desire to be considered for graduate student funding as a teaching or research assistant in their letter of intent to the program at the time of application. For more specific information, please see our Criminology Graduate Program Handbook located on our website at http://epps.utdallas.edu/crim/.
Application and Admission Requirements

The PhD Program in Criminology seeks applicants from a baccalaureate or Masters in Criminology, Sociology, or a relevant discipline. A 3.2 GPA and a GRE score of 1000 are desirable, but students may be admitted at the program’s discretion. All transcripts must be submitted, along with three letters of recommendation (preferably academic) and a one-page essay describing their background, education, and professional objectives. For more information please see our Graduate Handbook on our website.

Degree Requirements

On admission to the Ph.D. in Criminology Program, a student must complete a 75 semester credit hours across three tiers of graduate coursework. Additionally, students must fulfill other requirements including comprehensive exams, and two writing requirements as follows:

- Coursework: 75 credit hours of graduate study (minus transferred or masters hours)
- Analytical Paper Writing Requirement
- Comprehensive Examination
- Doctoral Dissertation

A grade of "B-" or worse in any graduate class requires that the class be retaken with only one retake allowed per course. If the retake results in a final grade of "B-" or worse, the student will be dropped from the program. In addition, all students must meet the University’s minimum required GPA of 3.0 or higher. See our Criminology Graduate Program Handbook located on our website for more specific requirements.

Semester Credit Hour Requirements

Coursework Tiers and Credit Hours

Tier I

Required Criminology Core Classes: 15 hours
Electives: 15 hours (9 hours in Criminology/6 graduate hours taken in any other subject)

Writing Requirement for Analytical Paper: 6 hours

**Total Tier I Hours: 36**

**Tier II**

Required Criminology Core Classes: 12 hours

Required Additional EPPS Methods/Stats Classes: 6 hours

Criminology Electives: 6 hours

Open Electives (in Criminology or any other program/college): 6 hours

**Total Tier II Hours: 30**

**Tier III**

Dissertation/Three-Paper Option Research (minimum of 9 hours)

**Total Tier III Hours: 9**

**Total Program Hours: 75 total credit hours minimum beyond BA/BS**

27 Hours Core Criminology Courses

6 Hours Analytical Writing

6 Hours Additional EPPS Methods/Stats Classes

15 Hours Criminology Electives

12 Hours Open Electives (any program/college)

9 Hours Dissertation

75 Hours TOTAL
Core Courses

- EPPS 6310 Research Design I
- CRIM 6300 Proseminar in Criminology
- CRIM 6303 Etiology of Crime and Criminality
- CRIM 6307 Extent of Crime and Measurement
- CRIM 6311 Crime and Justice Policy
- EPPS 6313 Introduction to Quantitative Methods
  or EPPS 7313 Descriptive and Inferential Statistics
- EPPS 6316 Applied Regression
  or EPPS 7316 Regression and Multivariate Analysis
- CRIM 7300 Advances in Criminology Theory
- CRIM 7301 Seminar in Criminology Research and Analysis
- CRIM 6V98 Analytical Writing Research (6 hours)
  or CRIM 6V96 Master Thesis Research (6 hours)
- CRIM 8V99 Dissertation (18 hours)

Criminology Electives

- CRIM 6308 Victimology
- CRIM 6309 Communities and Crime
- CRIM 6310 Delinquency and Juvenile Justice
- CRIM 6313 Corrections
Sample of Additional Methods/Stats Classes

EPPS 6342 Research Design II
EPPS 6346 Qualitative Research Methods
EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences
EPPS 7318 Structural Equation and Multilevel
EPPS 7344 Categorical and Limited Dependent Variables
EPPS 7368 Spatial Epidemiology
EPPS 7370 Time Series Analysis
EPPS 7386 Survey Research
EPPS 7390 Bayesian Analysis for Social and Behavioral Sciences
Doctor of Philosophy in Economics
(75 hours minimum beyond the baccalaureate degree)

http://www.utdallas.edu/epps/eco/

Faculty

Professors: Daniel G. Arce M., Kurt J. Beron, James Murdoch, Todd Sandler, Donggyu Sul

Associate Professors: Nathan Berg, Susan Williams McElroy, Kevin Siqueira

Assistant Professors: Rodney Andrews, Monica Deza, Xin (Sherry) Li, Asli Leblebicioglu,

Mission

The mission of the Ph.D. in Economics is to provide a cutting-edge education in economic theory, the development of a rigorous toolkit of mathematical and econometric techniques, and in various research areas in economics. This education allows students to think critically about how to approach the analysis of economic problems and to contribute to the knowledge base of the discipline.

Admission Requirements

The University’s general admission requirements are discussed here.

Applicants will be judged and evaluated by the existing admission standards as set forth by the University in its Graduate Catalog. These standards include a bachelor’s degree from an accredited institution or its
equivalent, fluency in written and spoken English, a grade average of 3.25 or better in upper-division and graduate course work in economics and related courses, submission of official Graduate Record Examination (GRE) scores: GRE scores in the verbal and quantitative components of the exams should total to at least 1200. Students may also wish to consider submitting their score from the writing component of the GRE test as additional evidence of their writing skills. A score of at least 4.5 in analytical writing is considered desirable.

Standardized tests scores are only one of the factors taken into account in determining admission. Given the demands that will be placed on the student in his/her study of economics, a strong background in calculus, linear algebra, and mathematical statistics is highly desirable.

Students should submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant’s background, reasons for choosing UT at Dallas, prior educational experiences, and personal objectives.

**Prerequisites**

Students who lack the necessary background to start the program are advised to take courses at the School of Economic, Political and Policy Sciences to strengthen their preparation, but they will not receive credit towards their Ph.D. program. The following courses may be used to gain the prerequisite knowledge: (i) ECON 3310 Intermediate Microeconomic Theory; (ii) ECON 3311 Intermediate Macroeconomic Theory; (iii) ECON 4351 Mathematical Economics; (iv) EPPS 7316 Regression and Multivariate Analysis or ECON 4355 Econometrics; (v) EPPS 7313 Descriptive and Inferential Statistics or equivalent. It is also necessary to have had undergraduate courses in calculus and matrix or linear algebra. Additional math courses, such as differential equations, mathematical statistics and real analysis, are useful.

**Degree Requirements**

The University’s general degree requirements are discussed here.
Students seeking the Ph.D. in Economics must complete 75 graduate hours. In addition, they must (i) complete core courses with an average GPA of 3.00; (ii) pass comprehensive exams in micro- and macroeconomic theory and in econometrics (although the econometrics exam will be waived for students who complete each of the required econometrics courses with an average grade of A or better); (iii) submit an acceptable research paper by the beginning of the fourth year of study, (iv) be certified in two research areas within the science of Economics; and (v) submit an approved dissertation. The following paragraphs elaborate on these requirements.

Students are required to complete the following core courses:

- ECON 6301 Microeconomics Theory I
- ECON 7301 Microeconomics Theory II
- ECON 7303 Microeconomics Theory III
- ECON 6302 Macroeconomics Theory I
- ECON 7302 Macroeconomics Theory II
- ECON 6305 Mathematical Economics
- ECON 6311 Statistics for Economists
- ECON 6309 Econometrics I
- ECON 7309 Econometrics II

In addition, they are required to register for the following courses at the appropriate stages of their study:

- ECON 7V01 Literature Survey/Paper Seminar
- ECON 8V01 Dissertation Seminar

In order to assure that the student progresses satisfactorily, each student
is required to consult with the Director of Graduate Studies (DGS) of Economics Programs prior to registration in every semester.

For research area certification, the student must select the two research areas, preferably during the second year of study, and advise the DGS of the selection. The DGS will, in conjunction with the Economics Curriculum Committee, advise the student regarding the appropriate certification requirements. The general guidelines for certification consist of making a grade of B or better in three courses within each area.

The submission of an approved dissertation will complete the course of study for the Ph.D. degree in Economics. The procedure for approval of the dissertation is outlined in the UT Dallas Graduate Catalog.
http://www.utdallas.edu/dept/graddean/CAT2012/EPPS/PHD/phd_gis.htm

Doctor of Philosophy in Geospatial Information Sciences (75 hours minimum beyond the baccalaureate degree)

http://www.utdallas.edu/epps/geospatial-science/

This degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically in the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science, and is administered by the School of Economic, Political and Policy Sciences.

Faculty

Professors: Carlos Aiken (Geosciences), Brian J. L. Berry (Economic, Political and Policy Sciences), Denis J. Dean (Economic, Political and Policy Sciences), John Ferguson (Geosciences), Daniel Griffith (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Edwin Sha (Computer Science), Robert Stern (Geosciences)

Associate Professors: Alexander Braun (Geosciences), Tom Brikowski (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorf (Economic, Political and Policy Sciences), Weili Wu (Computer Science)

Assistant Professors: Yongwan Chun (Economic, Political and Policy Sciences)

Senior Lecturers: Bryan Chastain (Economic, Political and Policy Sciences), Irina Vakulenko (Economic, Political and Policy Sciences)
Powerful technologies have emerged in recent years to collect, store, manage, analyze, and communicate information regarding the features of the Earth's surface and to combine these with other types of environmental, social and economic information. These technologies, which include geographic information systems (GIS), the global positioning system (GPS), and remote sensing, are used in many ways, including the production of digital maps in vehicles, the management and maintenance of city infrastructure, agriculture and forestry, the policing of communities, and the conduct of modern warfare. The PhD in Geospatial Information Sciences aims to develop individuals capable of advancing this field by developing new knowledge or capabilities relevant to it.

The degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science. This unique structure reflects geospatial information science's origins as the confluence of multiple disciplines including geography, computer science, engineering, geology, and various social, policy and applied sciences. It is anticipated that many students will enter the program with a bachelor's or master's degree (and/or work experience) in an application area (such as public administration, geology, or economics) or in a technical specialization (such as engineering, computer science, or statistics). These students may choose to pursue research projects that advance existing geospatial information sciences practices within that application area. Alternatively, students may opt to pursue research that expands the technological or theoretical base of all the geospatial information sciences.

Mission and Objectives

The mission of the Doctor of Philosophy in Geographic Information Sciences program is to cultivate innovative researchers capable of advancing the frontiers of knowledge in the geospatial information sciences through improved theories, new technologies, innovative methodologies, sophisticated quantitative analyses, and integrative applications. Specifically, program graduates will:

- UT Dallas Doctoral graduates will find employment in research departments of public and private organizations and in major academic institutions.
• Demonstrate their knowledge of the fundamental theories and concepts underlying the geospatial sciences.
• Master the advanced methodologies and/or quantitative analyses used in at least one of three geospatial specialization areas: [a] computing and information management, [b] spatial analysis and modeling, or [c] remote sensing and satellite technologies.
• Produce innovative research that advances theory or methodology in the geospatial sciences.
• Participate at academic conferences, publish in peer-reviewed journals and find employment in research departments of public and private organizations and in major academic institutions.

Facilities

Students have access to state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and at the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University’s extensive instructional computing facilities, including those in the Eric Jonsson School of Engineering and Computer Science, are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All major industry-standard GIS and remote sensing software is available. The University is a member of the University Consortium for Geographic Information Science (UCGIS).

Admission Requirements

The University’s general admission requirements are discussed here.

The PhD program in Geospatial Information Sciences seeks applications from students with a baccalaureate, Master of Arts, Master of Science or professional masters-level degree in any field relevant to geospatial information science including, but not limited to, computer science, economics, engineering, geography, geology, management information systems, marketing, natural resource management, public affairs and public administration, statistics, and urban and regional planning. Applicants will be judged and evaluated by the existing admission
standards as set forth by the University in its Graduate Catalog and by the standards set forth here by the Geospatial Information Sciences program. A bachelor’s degree from an accredited institution or its equivalent and fluency in written and spoken English are required. A grade average of at least 3.25 in undergraduate and graduate course work, and a combined verbal and quantitative score of 1150 (old scale) or 300 (new scale) on the GRE are desirable. An analytical writing score of at least 4.5 in the GRE is considered desirable.

Applicants must submit transcripts from all higher education institutions attended, three letters of recommendation, and an essay outlining their background, education, and academic objectives as they specifically relate to a Ph.D. in Geospatial Information Sciences.

Prerequisites

The following pre-requisites/co-requisites will also be required for admission to the PhD program: (i) college mathematics through calculus, (ii) competence in at least one modern programming language equivalent to GISC 6317 Computer Programming for GIS, MIS 6323 Object Oriented Programming, or their equivalents, and (iii) at least one course in inferential statistics through to regression analysis equivalent to GISC 6301 GIS Data Analysis Fundamentals, EPPS 7313 Descriptive and Inferential Statistics, or GEOS 5306 Data Analysis for Geoscientists. Graduate courses taken at UT Dallas to meet these prerequisites may be counted as electives toward the 75 credit hours required of students entering the Ph.D. program directly from a B.A. or B.S. degree, but they shall not be considered substitutes for any other specified course.

Advising

Because of the cross-disciplinary nature of this doctoral program, to ensure adequate preparation and appropriate course sequencing, every doctoral student is required to consult with the student’s designated advisor and/or the GIS Doctoral Program Director prior to registration in every semester. Students generally will not have a faculty advisor when they first enter the Ph.D. program, but every student is required to select
(with consent of the potential advisor) an advisor from the advising faculty by the end of his/her first academic year.

Degree Requirements

The University’s general degree requirements are discussed here.

To receive the PhD in Geospatial Information Sciences, students must complete the Geospatial Science Core (15 SCH) to achieve a mastery of appropriate Geospatial Information Science technologies and theory, have a Geospatial Specialization Area (15 SCH), have a Specific Application area or Technical field (12 SCH), evidence research skills through successful completion and defense of a Ph. D. dissertation, and take related electives as necessary for a total of 75 semester credit hours. In addition, students must satisfy a set of exams and qualifiers. Other courses may be substituted for those listed below with the written permission in advance of the Director of the GIS Doctoral program.

Geospatial Science Core (15 SCH)

Students must earn a minimum grade point average (GPA) of 3.0 across the following five courses:

- GISC 6381 Geographic Information Systems Fundamentals
- GISC 6382 Applied Geographic Information Systems
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with GIS Applications

Geospatial Specialization Area
Students must select from one of the following, with a minimum of 15 SCH. Courses selected must include at least three at successively advanced levels.

I. Geospatial Computing and Information Management

- CS 6359 Object-Oriented Analysis and Design
- CS 6360 Database Design
- CS 6364 Artificial Intelligence
- CS 6366 Computer Graphics
- CS 6375 Machine Learning
- CS 6378 Advanced Operating Systems
- CS 6381 Combinatorics and Graph Algorithms
- CS 6384 Computer Vision
- GEOS 5303 Computing for Geoscientists
- GISC 6317 Computer Programming for GIS
- GISC 6388 GIS Application Software Development
- GISC 7363 Internet Mapping and Information Processing
- MIS 6326 Database Management

II. Spatial Analysis and Modeling

- ECON 6309 Econometrics I
ECON 7309 Econometrics II

EPPS 7318 Structural Equation and Multilevel Modeling

ECON 6316 Spatial Econometrics

GISC 7364 Demographic Analysis and Modeling

EPPS 7368 Spatial Epidemiology

GEOS 5306 Data Analysis for Geoscientists

GISC 6311 Statistics for Geospatial Science

GISC 7360 GIS Pattern Analysis

GISC 7361 Spatial Statistics

EPPS 7313 Descriptive and Inferential Statistics

EPPS 7316 Regression and Multivariate Analysis

III. Remote Sensing and Satellite Technologies

GISC 5322 (GEOS 5322) GPS (Global Positioning System) Surveying Techniques

GISC 5324 (GEOS 5324) 3D Data Capture and Ground Lidar

GISC 5330 (GEOS 5330) Geospatial Applications in Earth Science

GISC 5395 (GEOS 5395) Satellite Geophysics and Applications

GISC 6325 (GEOS 5325) Remote Sensing Fundamentals

GISC 7366 (GEOS 5329) Applied Remote Sensing

Comment [6]: Please check this course. ECON 6315, POEC 7370 and PSCI 6315 are now inactive since 2010. Did all 3 courses consolidate into a new course, EPPS 7370 Time Series Analysis?

Comment [7]: Cross-linked title for ECON 6311 is Statistics for Economists. Title for GISC 6311 is Statistics for Geospatial Science. Which one do you want to use?
GISC 7365 (GEOS 5326) Remote Sensing Digital Image Processing
GISC 7367 (GEOS 7327) Remote Sensing Workshop
EESC 6360 Digital Signal Processing I
EESC 6363 Digital Image Processing

IV. Customized Geospatial Specialization (15 SCH)

Identified by the student with approval in advance by the Director of the GIS Doctoral Program.

Application Area or Technical Field (12 SCH)

Twelve semester-credit hours of specialized course work in an application area or technical field relevant to GIScience. Normally, these will derive from the student’s Master’s degree. These hours may be transferred from another institution, or taken at UT Dallas in an existing master’s program area and may be applied toward a master’s degree in that area.

Application area examples: planning, public affairs, criminal justice, health and epidemiology, geoscience, forestry, hydrology, marketing, real estate, economics, civil engineering, etc.

Technical field examples: statistics, computer science, software engineering, management information systems, image analysis, operations research/location science, instrumentation.

Research and Dissertation (Variable SCHs)

All students must complete the following two classes as part of the research and dissertation requirement:
In addition, students must complete sufficient additional research and dissertation credit hours to bring the total number of SCHs they have earned within the UT Dallas doctoral program (or transferred into the UT Dallas doctoral program) to 75, the minimum required to earn a doctoral degree. Additional research and dissertation SCHs above and beyond those required to reach the 75 credit hour minimum may be required at the discretion of the student’s Ph.D. advisor. Additional research and dissertation SCHs can be earned through any of the following classes:

- **GISC 7387** Geographic Information Systems Workshop
- **GISC 6387** Geospatial Information Sciences Master’s Research
- **GISC 7367** (GEOS 7327) Remote Sensing Workshop
- **GISC 8V29** Research in GIS
- **EPPS 6310** Research Design I
- **EPPS 6342** Research Design II
- **GISC 8V99** or GEOS 8V99 or CS 8V99 Dissertation

**Other Related Electives (0 to 24 SCH)**

Students may choose up to 24 SCHs in related electives (from CS, GEOS, GISC, etc.) with consent of their advisor or the GIS Doctoral Program Director.

**Exams and Qualifiers**

**Qualifying Examination**

The GISC PhD Qualifier Examination is administered in May of a doctoral student’s first year, following the completion of the first academic year (i.e. Fall and Spring semester) by the student. This exam comprises four parts, each based upon one of the following...
core courses:

- GISC 6382 (GEOS 6383) Applied Geographic Information Systems
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with GIS Applications

A student must pass three of the four parts to pass the exam. If a student fails his/her exam, s/he may retake only the parts they failed in the subsequent August. If s/he does not pass a cumulative total of three parts after the August exam date, then s/he the Qualifier Examination, and is withdrawn from the GIS doctoral program.

**Defense of Proposal**

After completing the GIS Research Project class, doctoral students must successfully present and defend a dissertation proposal through an oral examination, according to uniform guidelines established by the GIS program.

**Grade Point Qualifier**

Doctoral students must have GPAs of at least 3.25, and preferably 3.5, in courses taken at UT Dallas at the time they register for GISC 7389 GIS Ph.D. Research Project, or they must petition the GIS faculty for an exemption for extenuating circumstances beyond the student’s control.

**Defense of Dissertation**

A dissertation must be prepared and defended successfully following the procedures established by the Dean of Graduate Studies.
may not be used in conjunction with certain other courses. Consult GIS Doctoral Program Director.
**Doctor of Philosophy in Political Science** *(75 hours minimum beyond the baccalaureate degree)*

http://www.utdallas.edu/epps/political-science/

**Faculty**

**Professors:** Thomas L. Brunell, Anthony M. Champagne, Harold D. Clarke, Euel Elliott, Edward J. Harpham, L. Douglas Kiel, Robert Lowry, Marianne C. Stewart

**Associate Professors:** Patrick T. Brandt, Michael Crespin, Jennifer S. Holmes, Linda Camp Keith, Gregory S. Thielemann

**Assistant Professors:** Brandon Kinne, Banks Miller, Clint Peinhardt

**Senior Lecturers:** Brian Bearry, Karl Ho

**Mission Statement**

The Doctor of Philosophy in Political Science provides a rigorous, disciplinary program with strong multidisciplinary links. The Program consists of innovative, state-of-the-science graduate education in political methodology and the fields of Comparative Politics and International Relations; Political Institutions and American Politics; and Law and Courts. In the first two years of the program, students acquire basic research skills and tools and work on research projects. Later, they have opportunities to develop their instructional and presentation skills, to participate in summer methodology programs, and to interact with highly regarded scholars and practitioners in their fields of study.

**Objectives**
Students will engage in critical and constructive thinking, effective communication to academic audiences, and rigorous design and execution of research projects.

Students will describe, classify, and analyze the causes and consequences of the unprecedented unfolding of democracy on a global scale, its successes and failures, and its opportunities and problems during an era of globalization and of ongoing subnational, national, and transnational conflicts and negotiations.

Students will describe, classify, and analyze the major theories, methods, and findings that are used to explain the participation of individuals in a variety of institutional settings in the United States and elsewhere, how public institutions can be designed to promote both collective goods and individual gains, and how changes in institutions have consequences for individuals and public policy.

Students will describe, classify, and analyze the major theories and empirical findings about the behavior of judges, interactions between the judiciary and other institutions, and the role of courts in the evolution of public policy and the definition and protection of human rights around the world.

Students will acquire the professional socialization necessary to teach and to conduct research in American, comparative, or international government and politics; democratization, globalization and international relations; governmental and political institutions and processes; and public administration, decision making, and risk management.

**Facilities**

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computer Labs. The School has three computing laboratories which house over 50
computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, S-Plus, SPSS, and Stata. Computerized geographic information system software (e.g. ARC-GIS), the LexisNexis Database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX workstations.

Many important data and reference materials are available online from professional associations or at U.T.Dallas via the Library’s and School’s memberships in the American Political Science Association, the European Consortium for Political Research (ECPR), the Inter-University Consortium for Political and Social Research (ICPSR), the Roper Center, the University Consortium for Geographic Information Science (UCGIS), and other organizations. The Library has a substantial number of political science journals and access to journals via loan from the University of Texas System.

Students have opportunities to participate in research programs directed by members of the faculty. As appropriate, some students may become involved in methodological development activities offered by the School’s membership in the ECPR, ICPSR, and UCGIS. In addition, some students may be eligible to participate in the professional development activities provided by faculty who co-edit the journal Electoral Studies.

To attract the best students, editorial, research and teaching assistantships are available. Prospective students interested in teaching assistantships should apply for admission to start in the Fall by February 15. Editorial assistantships are available through several of the professional journals supported by the University. Research assistantships may be available with individual faculty who have funding from external sources. Other assistantships are provided to work with faculty at the Center for Texas Politics or on instructional activities.

**Admission Requirements**

The University’s general admission requirements are discussed [here](#).

The Doctor of Philosophy in Political Science Program seeks applications
from individuals with a baccalaureate, Master of Arts, or Master of Science degree in Government and Politics, Political Science, Public Administration, Public Affairs or a relevant discipline. The degree must be from an accredited college or university. An undergraduate grade point average of at least 3.2 and a combined quantitative and verbal Graduate Record Examination (GRE) score of 310 are desirable for students who expect to progress satisfactorily towards graduation. An analytical writing score of at least 4.5 in the GRE is considered desirable. Applicants also may submit their score from the writing component of the GRE as additional evidence of their admission eligibility. Applicants should submit all transcripts, three letters of recommendation (preferably from individuals who can evaluate the applicant’s potential for graduate study and research), and a one-page essay describing educational and professional objectives. Grade point average, GRE score, and other information pertaining to the applicants’ educational background and professional goals are among the factors that are considered in determining direct admission. Applications are reviewed by the Political Science Program Committee in the School of Economic, Political and Policy Sciences.

Students who lack the necessary background to start the Program are advised to take courses that strengthen their preparation, but these courses do not receive credit towards the Ph.D. Program.

Undergraduate students who are interested in completing their undergraduate degrees while simultaneously taking graduate courses in the Political Science Ph.D. Program are expected to meet the School’s “fast-tracking” requirements.

**Degree Requirements**

The University’s general degree requirements are discussed here.

On admission to the Ph.D. in Political Science Program, the student earns a minimum of 75 semester credit hours of coursework and dissertation credit beyond the baccalaureate degree. Core hours include four courses in Political Science Methodology and Theory, and three proseminars in the Program fields. The three fields are Comparative Politics and International
Relations; Political Institutions and American Politics; and Law and Courts. Additional coursework includes four courses in the major field, two courses in the minor field, and three to six courses of freely chosen credit. Students may use these electives to complete an optional concentration in research methods. Prior to admission to doctoral candidacy and further work on the dissertation or practicum, the student must pass examinations in the subjects covered by the core and field courses. Students must receive a grade of B- or better in all core courses and must maintain at least a 3.0 grade point average to graduate.

On examination completion, the student proceeds to present a doctoral dissertation or practicum proposal. The proposal must be approved by his/her Advisory Committee not later than two consecutive semesters after examination completion. Upon Committee approval, the student does further work on the doctoral dissertation or practicum while enrolling continuously for credit in research seminars and in dissertation or practicum research. The dissertation has multiple chapters that consist of a clear statement of the research problem, the theoretical framework and research design, the methods of analysis and findings, and an appropriately developed conclusion. The practicum consists of three papers that may or may not be thematically related and are informed by the theories and methodology of the student’s major field. All three papers must be suitable for presentation at a major professional meeting and/or submission to a peer-reviewed professional journal.

**Semester Credit Hour Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Core Courses in Political Science Methodology and Theory</td>
<td>12</td>
</tr>
<tr>
<td>Field Proseminars</td>
<td>9</td>
</tr>
<tr>
<td>Courses in Major Field</td>
<td>12</td>
</tr>
<tr>
<td>Courses in Minor Field</td>
<td>6</td>
</tr>
<tr>
<td>Freely Chosen Elective Credit</td>
<td>9-18</td>
</tr>
<tr>
<td>Dissertation or Practicum Research</td>
<td>18-27</td>
</tr>
</tbody>
</table>
Total (Minimum) 75

Core Courses

- EPPS 7313 Descriptive and Inferential Statistics
- EPPS 7316 Regression and Multivariate Analysis
- PSCI 6300 Proseminar in Comparative Politics and International Relations
- PSCI 6311 Proseminar in Law and Courts
- PSCI 6347 Proseminar in Political Institutions and American Politics
- PSCI 6350 Logic, Methodology, and Scope of Political Science
- PSCI 6352 Empirical Democratic Theory

Students who lack the math background for EPPS 7313 and EPPS 7316 may need to do additional work before completing these requirements.

Comparative Politics and International Relations

- PSCI 6309 International Political Economy
- POEC 6319 Political Economy of MNCs
- PSCI 6316 International Organizations
- PSCI 6335 Institutions and Development
- PSCI 6337 Comparative Institutions
- PSCI 6357 Political Economy of Latin America
- PSCI 6362 Political Development
- PSCI 6363 Conflict and Development
- PSCI 6361 Political Violence and Terrorism
PSCI 7330 Contemporary International Security

**Political Institutions and American Politics**

- PSCI 6314 Policy Processes, Implementation and Evaluation
- PSCI 6324 Local and State Government and Politics
- PSCI 6330 Campaigns and Elections
- PSCI 6331 Executives, Legislatues and Public Policy
- PSCI 6333 Political and Civic Organizations
- PSCI 6337 Comparative Institutions
- PSCI 6323 Public Choice
- PSCI 6339 Election Law and Electoral Systems
- PSCI 6343 Law and the Policy Process
- PSCI 7350 Institutions and Citizen Behavior
- PSCI 7352 Choice and Decision Making

**Law and Courts**

- PSCI 6301 Constitutional Law
- PSCI 6305 Workshop in Constitutional Law Studies
- PSCI 6306 Human Rights and International Law
- PSCI 6342 Comparative Courts and Law
- PSCI 6339 Election Law and Electoral Systems
- PSCI 6343 Law and the Policy Process
Research Methods Concentration (optional)

Students can complete a concentration in research methods by taking three courses from the following list. Students must consult with the Director of Graduate Studies in advance to determine which courses fit best with their research interests.

- ECON 6306 Applied Econometrics
- ECON 6309 Econometrics I
- ECON 7309 Econometrics II
- ECON 6311 Statistics for Economists
- ECON 6316 Spatial Econometrics
- ECON 6320 Game Theory for the Social Sciences
- ECON 6380 Experimental Economics
- ECON 7315 Econometrics III
- ECON 7316 Game Theory
- EPPS 6310 Research Design I
- EPPS 6342 Research Design II
- EPPS 6346 Qualitative Research Methods
- EPPS 6352 Evaluation Research Methods in Economic, Political, and Policy Sciences
- EPPS 7304 Cost-Benefit Analysis
- EPPS 7318 Structural Equation and Multilevel
- EPPS 7344 Categorical and Limited Dependent Variables
- EPPS 7370 Time Series Analysis
- EPPS 7390 Bayesian Analysis for the Social and Behavioral Sciences
- GISC 6301 GIS Data Analysis Fundamentals
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>GISC 6317</td>
<td>Computer Programming for GIS</td>
</tr>
<tr>
<td>GISC 7310</td>
<td>Regression Analysis with GIS Applications</td>
</tr>
<tr>
<td>PSCI 6325</td>
<td>Decision Theory</td>
</tr>
<tr>
<td>PSCI 6353</td>
<td>Mathematical Models in Political and Social Science</td>
</tr>
<tr>
<td>PSCI 6364</td>
<td>Public Opinion and Survey Research</td>
</tr>
<tr>
<td>PSCI 7352</td>
<td>Choice and Decision Making</td>
</tr>
<tr>
<td>PSCI 7372</td>
<td>Game Theory for Political Scientists</td>
</tr>
</tbody>
</table>

Other courses as approved by the Director of Graduate Studies.
Doctor of Philosophy in Public Affairs (90 hours minimum beyond the baccalaureate degree)

http://www.utdallas.edu/epps/pa/phd/

Faculty

Professors: L. Douglas Kiel, Robert W. Taylor
Associate Professors: Paul Battaglio, Douglas Goodman, Sarah Maxwell, Sheryl Skaggs
Assistant Professors: Evgenia Gorina, James Harrington, Young-joo Lee, Meghna Sabharwal
Clinical Professors: Donald Arbuckle
Senior Lecturer: Teodoro Benavides

Mission

The mission of the Ph.D. in Public Affairs program is to prepare students for research-oriented careers in academia, policy analysis, and executive public/nonprofit management positions. The rigorous core curriculum provides advanced conceptual and theoretical training in the principal areas of public administration and management, including: public policy, intergovernmental relations, budget and finance, human capital and organizational theory. Students develop analytical competencies through a sequence of research methods courses, and technical knowledge in specific topics through a flexible elective sequence.

Objectives

Through a faculty-guided program of instruction, research and mentoring, students in the Public Affairs doctoral program develop a firm understanding of the broad intellectual tradition of public administration and related fields.

The guiding philosophy of the degree is that "public affairs" involves more than mere functional administration, policy implementation or quantitative policy analysis. Rather, doctoral education in public affairs requires an interface between the traditions of public management, public policy, and organizations with a practical appreciation for the challenges of maintaining and building institutions of governance and a civic culture in a complex, democratic society.

The Ph.D. in Public Affairs begins as a cohort program where entering students remain together through the completion of a core curriculum and the qualifying examination (QE), after which they are able to pursue one of several areas of concentration. The concentration allows students to take courses appropriate for their research interests.
This structure produces shared experiences and progress through the program that enrich student learning and research.

**Faculty Commitments**

The faculty of the Ph.D. program in Public Affairs is committed to assist students in meeting a set of clear and specific education- and research-related goals. The specific objectives for all graduates of the Ph.D. in Public Affairs program are to:

1. **Demonstrate Comprehensive and Deep Knowledge**: Students will demonstrate their knowledge in principal fields of public administration and management, including: public policy, intergovernmental relations, organization theory, budget and finance, and human capital.

2. **Understand and Apply Theories and Processes of Knowledge Acquisition**: Students will demonstrate familiarity with key theories in each of the principal fields of public administration and management, and will apply this theoretical knowledge in the development of research projects ranging from course assignments to their dissertation research projects.

3. **Produce Scholarly Manuscripts and Publications**: Students, as scholars, will have the ability to execute research projects that utilize state of the art methodologies to produce scholarly manuscripts that are worthy of publication in the journals of the field.

4. **Develop, Present, and Defend Complex Ideas**: Students will have the ability to develop, present, and defend both orally and in writing complex ideas based on in-depth scholarly research.

**Facilities**

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computer Labs. The School has two computing laboratories which house over 30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX workstations.

**Application, Admission and Assistantships**

**Application Deadlines**: Due to the cohort nature of the Ph.D. program in Public Affairs, admissions are limited to the fall semester only. The application deadline for students seeking funding through assistantships is March 31. Applications for international students must be received by May 1 and June 1 for all required documentation (transcripts, test scores, letters of recommendation, etc.). The application deadline for US Citizens and Residents is July 1 with all documentation (transcripts, test scores, letters of recommendation, etc.) due by July 15. These deadlines must be followed to ensure applications are given full consideration. The web-based application form can be...
Admission Requirements: The program typically admits only students who have completed a Master's degree in Public Affairs or Social Science from an accredited University. A graduate GPA of 3.0 or better is expected. Prospective students must complete the University's online graduate application and submit a narrative outlining 1) academic interests, 2) current or long-range interests in research, teaching or other professional objectives, 3) description of publications or other scholarly endeavors, and 3) listing of academic and professional organizations and fellowships, scholarships, or other honors received. The Graduate Record Examination (GRE) is also required of all applications with a minimum verbal score of 156 and quantitative score of 146. International students whose native language is not English are also required to submit the Test of English as a Second Language (TOEFL), unless they graduated from a four-year college or university in the United States or other English speaking country. Students should submit examination scores and transcripts from all colleges previously attended to UT Dallas Admission and Enrollment Services. Three letters of recommendation from individuals (employers, community leaders, teachers, etc.) who are able to judge a student's probable success in graduate school are required. The letters may be sent directly to the program office or uploaded online.

International applicants without Permanent Resident Visas must submit evidence of financial support (financial affidavit and original bank statement) before they can receive the I-20 or other required documents needed for visa application.

Teaching Assistantships: Prospective students interested in receiving assistantships must have submitted all application materials including a Teaching Assistant (TA) application form by March 31 of the year they intend to start the program. Applications for the assistantships may be obtained from the Public Affairs Program Office. Offers of teaching assistantships will be made by May 1 of the year of fall enrollment, although additional appointments may be made as new positions become available each semester.

It is expected that students can communicate effectively in both written and spoken English. State law and regulations of the Texas Higher Education Coordinating Board require that international students appointed as TA's be proficient in the use of the English language. An English Proficiency Interview conducted under the auspices of the office of the Dean of Graduate Studies will be used to screen for students requiring remedial help in the form of English as a Second Language (ESL) course. International students must satisfy the proficiency requirement upon appointment or pass the ESL course within two semesters to be eligible for consideration of continued appointment as a TA. Regardless of test scores, students must meet the language requirements of their programs.

Program Overview
The Ph.D. in Public Affairs requires the completion of at least 75 hours including a minimum of 45 hours of course work and 12 hours of dissertation work. Students may be allowed to transfer some of their graduate course work (a maximum of 18 hours) which can be applied to the 75 hours required. To qualify for transfer credit, the student must have completed the graduate course work within the past 24 months at an accredited college or university and earned a grade of B or better. Grades of B and courses completed through correspondence or extension are not eligible for transfer credit.

**Prerequisites**

Prior to enrolling in core classes for the Ph.D. program, students must have completed a master’s degree in public affairs/administration or related field and show evidence of completing a graduate level course within the past 24 months in statistics/quantitative methods and public policymaking/public institutions. A grade of B or better is expected in these course prerequisites.

**Qualifying Exam (QE)**

Students must pass the Qualifying Exam (QE) to continue in the Ph.D. program. If a student fails the exam he or she will be dismissed from the program.

Students must have a grade of B or better in each of the four exam-related courses to be eligible to sit for the exam. Students who do not meet this requirement may choose to leave the program or repeat a course to earn a better grade. Students are encouraged to review the University’s Retaking Courses Policy. Students retaking an exam related course are required to enroll in the course in the next semester it is offered. Students will not be permitted to enroll in courses outside the doctoral core curriculum until successful completion of the QE.

**Overview**

1. All Public Affairs (PA) Ph.D. cohort members entering the program in the fall must pass a QE taken after their first spring semester to continue in the program.
   a. The QE is based on four specified courses from the core curriculum. The exam comprises 3 sections: (1) general public affairs topics; (2) policy topics, and (3) research methods.
   b. The QE is a classroom proctored test. It includes three 4-hour sessions, which will take place over a two day period. The specific days and location of the sessions will be designated by the Department Head and announced at the start of the spring semester.
2. Exams will be read and graded by a committee of PA faculty. Each section will be read by a minimum of two readers and given a Pass or Fail grade.
3. A student who fails two or more sections of the QE will be dismissed from the program.
4. If a student fails one section, he or she will be given the opportunity to retake that section. The retake exam will be given within four weeks of the original exam, and will be graded as described above (see 2). If the student passes the retake exam he or she may continue in the program.
5. Only under extreme, documented circumstances will a student be allowed to reschedule the QE. If an emergency arises, the student must notify the Department Head within 12 hours of the scheduled exam and request to take a rescheduled exam. If approved, the exam will be rescheduled within 2 weeks of the original exam date.

**Required Courses and Dissertation (57 hours)**

The Program consists of course work in six core substantive knowledge areas central to public administration and management, including: public policy, intergovernmental relations and management, organizational theory, fiscal and budgetary theory, and human capital (18 hours).

Research methods provide analytical skills necessary to conduct doctoral level research beginning with Research Design, a regression course suitable for the student’s mathematical skill set (EPPS 6316 for algebra, EPPS 7316 for calculus), and a methods course appropriate for the student’s intended dissertation research (9 hours).

Building on the core curriculum, students have the flexibility to choose from one of four concentrations or develop their own customized concentration based on their area of interest (18 hours). Each concentration allows students the flexibility to select from existing EPPS course (6000 level or above; with program director approval).

To graduate, students are required to enroll for dissertation research credit (PA 8V99) with their appointed dissertation chairperson (12 hours minimum). To remain in good standing, students must remain enrolled in 8V99 while completing their dissertation.

**Program Course Work**

***Indicates the four (4) courses included in the required qualifying examination taken during summer immediately following the first two semesters of course work.

I. Public Affairs Core (18 hours)

1. PA 7314 Advanced Policy Process, Implementation and Evaluation***
2. PA 7320 Advanced Human Capital Research and Theory***
3. PA 7350 Advanced Organizational Theory and Behavior***
4. PA 7360 Advanced Fiscal and Budgetary Policy
5. PA 7381 Special Topics in Public Affairs
6. PA 8302 Proseminar in Public Affairs (this course includes a series of professional workshops which runs through a student's first year)

II. Research Methods (9 hours)

1. PA 7330 Research Design in Public Affairs***
2. EPPS 6316 Applied Regression OR EPPS 7316 Regression and Multivariate Analysis. Note: 6000 presumes algebra; 7000 level presumes calculus.
III. Concentration (18 hours)

**Concentration 1: Policy Analysis and Evaluation**

1. SOC 6340 Domestic Social Policy
2. PA 6345 Human Resource Management
3. PA 7305 Leadership and Change in Public and Nonprofit Organizations
4. PA 7318 Ethics, Culture and Public Responsibility
5. PA 7382 Seminar in Urban Policy
6. Approved elective (6000 level or above)

**Concentration 2: Personnel Policy**

1. PA 6345 Human Resource Management
2. PA 7305 Leadership and Change in Public and Nonprofit Organizations
3. PA 7318 Ethics, Culture and Public Responsibility
4. PA 7322 Negotiations for Effective Management
5. PA 7383 Diversity in the Public Sector
6. Approved elective (6000 level or above)

**Concentration 3: Nonprofit Management**

1. EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences
2. PA 6369 Grant Writing and Management
3. PA 6374 Financial Management for Nonprofit Organizations
4. PA 7305 Leadership and Change in Public and Nonprofit Organizations
5. PA 7375 Nonprofit Organizations: Theory and Practice
6. Approved elective (6000 level or above)

**Concentration 4: Urban Policy and Administration**

1. PA 6326 Decision Tools for Managers
2. SOC 6340 Domestic Social Policy
3. PA 6344 State/Local Government Management
4. EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences
5. PA 7382 Seminar in Urban Policy
6. Approved elective (6000 level or above)
Concentration 5: Customized and Directed Research (Choose 6 courses; **ALL courses must be pre-approved by program director**)

IV. Dissertation Research (minimum of 12 hours)

Dissertation: Students are encouraged to consult with the department head and/or doctoral program director about the selection of their dissertation chair.

Following a successful public proposal defense, students begin work on their dissertation research, and enroll in PA 8V99 Dissertation during each semester until the dissertation is completed and defended. The final dissertation defense is conducted when the student’s chair and committee agree that the dissertation is satisfactorily completed.

Program Policies

Required Grades for Qualifying Exam: To be eligible for the Qualifying Exam (QE), a student must have earned a grade of ‘B’ or better in each of the examination related courses (see classes previous listed with ***). Students not eligible to take the exam will be dismissed from the program.

Required Grade Point Average: The minimum acceptable University grade point average for graduation is 3.0 for **all** graduate courses taken in the student’s degree program at UT Dallas.

Time Limits: All requirements for the doctoral degree, including transfer credit, must be completed within one ten-year period. Students exceeding the time limit will not be eligible for their degrees and will be dismissed from the graduate program. An approved leave of absence will not alter the time limits placed on graduate degrees.

Continuous Enrollment: Unless on an approved leave of absence, a graduate student in a degree program must maintain continuous enrollment during the fall and spring (long session) semesters of each academic year. A graduate student who fails to register in any given long session will be permitted to re-enroll through his/her program office in any two subsequent semesters provided the student was in good academic standing at the time of last enrollment. Students absent more than three long semesters will be required to reapply to the doctoral program.

Reduced Enrollment during Last Semester: Students must be enrolled in at least one credit hour in the semester in which they graduate. Enrollment for one semester hour in the final semester is only allowed once.
Doctor of Philosophy in Public Policy and Political Economy (75 hours minimum beyond the baccalaureate degree)

http://epps.utdallas.edu/pppe

Faculty


Assistant Professors: Jonas Bunte, Brandon Kinne, Clint W. Peinhardt.

Mission Statement

The mission of the Ph.D. program in Public Policy and Political Economy is to prepare our students for professional positions in research, teaching, and practice in fields related to public policy and political economy, and in both academic and nonacademic settings. We prepare students through instruction in social science and public policy concepts, advanced methodological knowledge, applied social research techniques, and
professional communication skills. PPPE students and faculty are encouraged to promote an inclusive and diverse environment that is committed to continued scholarship and service.

Objectives

Students will demonstrate the ability to apply social science and public policy theories and concepts.

Students will develop competency in advanced methods of social science and public policy research and analysis.

Students will develop basic skills in professional communication appropriate to the public policy and political economy research and analysis.

Facilities

Students have access to the computing faculties in the School of Economic, Political and Policy Sciences and University’s Computer Labs. The School has two computing laboratories that have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A geographic information system, the LexisNexis database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library and the school’s memberships in numerous organizations.

Admission Requirements

The PhD. in Public Policy and Political Economy seeks applications from students with a baccalaureate degree from an accredited university or college. An undergraduate grade point average of at least 3.2, and a combined 1200 GRE (old scale) or 160 Verbal and 148 Quantitative (new scale), or equivalent score on the GMAT, are desirable. Students may also wish to consider submitting their score from the writing component of the
GRE test as additional evidence of their writing skills. Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant’s background, education, and professional objectives.

**Prerequisites**

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in economics, political science, sociology, calculus, statistics, and research design.

**Degree Requirements**

The PhD in Public Policy and Political Economy requires a minimum of 75 post-baccalaureate graduate credit hours. Full-time students can complete the degree in an average of 5 years.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, and earn a grade of at least 3.0 (B) for all core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receives two Cs will not be allowed to continue in the program.

Students must complete the following:

- 33 hours of core courses
- 12 hours of field courses (six hours in two fields of the student’s choice)
- 6 hours area of specialization (in one of the fields of the student’s choice)

**Development**

[International Conflict and Security](#)
[International Political Economy](#)
[Social Policy](#)

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A Methods Qualifying Examination in Quantitative Methods and Research Design

Matriculation to the dissertation phase

Successful completion of a dissertation

Successful completion of 75 credit hours including electives

The requirements are outlined in further detail below:

I. Core Requirements (33 hours)
Students complete a core sequence of courses as follows:

1. Six hours of coursework in Government and Public Policy:
   - POEC 6347 Proseminar in Political Institutions and American Politics
   - POEC 6329 Ethics, Culture, and Public Policy

2. Six hours of Theories of Political Economy
   - POEC 6312 Social Economic Theories or POEC 6301 Political-Economic Theories
   - POEC 6321 Economics for Public Policy or POEC 7327 Innovation Dynamics and Economic Change

3. Fifteen hours of Analytical Methods
   - Methods Core (Algebra-based or Calculus based)
     - Algebra-based series
     - EPPS 6313 Introduction to Quantitative Methods and EPPS 6316
Applied Regression

Calculus-based series

EPPS 7313 Descriptive and Inferential Statistics and EPPS 7316 Regression and Multivariate Analysis

Students are strongly encouraged to take the calculus-based sequence, which is better preparation for the methods qualifying exam and more advanced methods courses.

Students will also take at least three additional courses from a set of courses approved by the relevant graduate program committee. Students may obtain a list of those courses from the program office.

4. Six hours of Research Design

EPPS 6310 Research Design I
EPPS 6342 Research Design II

II. Field Courses (12 hours)

Students take a two course introductory sequence in two of the following five fields. The fields and required courses are as follows:

Development:

POEC 6354 Theories and Issues of Development (Required), and:

Select one of the following:

POEC 6335 Institutions and Development
POEC 6360 World Political Economy
POEC 6362 Political Development
POEC 6364 Development Economics
POEC 6368 Population and Development
POEC 6392 Practice of International Development

International Conflict and Security (Select two of the following):

POEC 6361 Political Violence and Terrorism
POEC 6369 National and International Security Strategies and Policies
PSCI 6300 Proseminar in Comparative Politics and International Relations

International Political Economy (Select two of the following):

PSCI 6300 Proseminar in Comparative Politics and International Relations
PSCI 6309 International Political Economy
PSCI 6316 International Organizations
POEC 6360 World Political Economy

Social Policy (Select two of the following):

POEC 6351 Domestic Social Policy
POEC 7341 Health Policy
Students may request that alternative courses be substituted in a particular field with the approval of the Program Head. Moreover, students may, in consultation with the Program Head, define a new field provided that appropriate coursework is available in a coherent research literature is identified. *Note: (1) Students may only count POEC 6360 World Political Economy as a field course for either Development or International Political Economy, not for both.

III. Area of Specialization (6 hours)

The student takes at least six hours of additional coursework in one of the field areas as defined above. The specific required courses are designated by the faculty associated with that area of concentration and may be obtained from the program office. The student completes a dissertation in one of the two fields (see above) and must successfully defend the dissertation before a duly constituted dissertation committee, in accordance with the requirements of the University and the UT System.

IV. Methods Qualifying Exam and Matriculation to the Dissertation Phase

To advance to the dissertation stage of the program, students are evaluated by the Program Committee based on a Methods Qualifying Examination (MQE).

The MQE will cover course material from EPPS 6313/EPPS 6316 and/or EPPS 7313/EPPS 7316, EPPS 6310 Research Design I and EPPS 6342 Research Design II. It is critical full-time students take EPPS 6313 or EPPS 7313 and EPPS 6310 the Fall semester of the first year and EPPS 6316 or EPPS 7316 and EPPS 6342 in Spring. The Exam is administered once a year in late April or May. Student performance will be evaluated as...
unsatisfactory, satisfactory or excellent. Those failing the exam will be given a second opportunity to pass, at the end of the summer. Those failing the MQE for the second time will not be allowed to continue in the program. Part-time students should seek to complete the required methods sequence by spring of their second year; courses noted above should be taken in the same basic sequence.

**IV. Dissertation Seminar**

Students must register for POEC 8398 Dissertation Seminar for a minimum of one semester after passing the MQE and workshop paper requirements. The aim of the Dissertation Seminar is to assist students in the formulation of a dissertation topic, and prepare a dissertation topic for submission to a dissertation Committee and defense of the proposal before the committee. The Dissertation Seminar can also be taken as an independent study course under the supervision of the student’s likely dissertation supervisor. Students seeking advising concerning a suitable dissertation topic or appropriate supervisor are encouraged to consult with the Program Head.

**VI. Electives**

Students take free electives in areas of interest to fulfill the 75-hour PhD requirement.

Ph.D. students should note that they are eligible to receive Master’s degrees offered by the School of Economic, Political and Policy Sciences while they matriculate toward the doctorate. These degrees include the Master of Public Policy and the MS in International Political Economy. Other EPPS masters degrees can be earned as well. Students interested in obtaining one of these degrees should consult the catalog requirements or the graduate advisor.
Master of Arts in Political Science (30 hours minimum)

Faculty


Associate Professors: Patrick Brandt, Michael Crespin, Jennifer S. Holmes, Linda Camp Keith, Gregory S. Thielemann

Assistant Professors: Brandon Kinne, Banks Miller, Clint Peinhardt

Senior Lecturers: Brian Bearry, Karl Ho

Mission Statement

The mission of the Master of Arts in Political Science (MAPS) degree is to offer advanced instruction in the social science literature and theories about politics, citizenship and governance. The program serves the interests and needs of talented students who can commit initially to a 30-hour program but may be attracted subsequently to the Ph.D. program, as well as those who can commit initially to the doctoral program but subsequently decide not to complete the program. The Master of Arts in Political Science further can satisfy the interests and talents of students who “fast-track” in the Political Science undergraduate program and who want an additional year of more rigorous, sharply focused graduate coursework in Political Science.

Objectives

Students in the Master of Arts in Political Science program will:
Demonstrate the ability to apply political science theories and concepts to the study of citizenship, governance and politics.

Develop a competency in one of the fields of Comparative Politics and International Relations; Political Institutions and American Politics; or Law and Courts.

Develop basic skills in professional communication appropriate to political science research and analysis.

Develop competency in analysis, evaluation, and research design relevant to political science research and analysis.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computer Labs. The School has two computing laboratories that have over 30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are available online from professional associations or at UTD via the Library’s and School’s memberships in the American Political Science Association, the European Consortium for Political Research, the Inter University Consortium for Political and Social Research, the Roper Center, and the University Consortium for Geographic Information Systems, and other organizations.

Admissions Requirement

The University’s general admission requirements are discussed here.

The Master of Arts in Political Science seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering
students have earned a 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 300 on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Applicants should also submit all transcripts, three letters of recommendation (preferably from individuals who can evaluate the applicant’s potential for graduate study), and a one-page essay outlining the applicant’s background, education, and professional objectives. Applications are reviewed by the Political Science Program Committee in the School of Economic, Political and Policy Sciences.

Undergraduate students who are interested in completing their undergraduate degrees while simultaneously taking graduate courses in the M.A. in Political Science program are expected to meet the School’s “fast-tracking” requirements.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the Economic, Political and Policy Sciences, statistics, and research design. In cases where undergraduate preparation is not adequate, students may be required to take additional course work before starting the master's program.

Transfer Policies

Students who have previous graduate work pertinent to the requirements of a master’s program may be given up to 6 hours of transfer credit, and the hours of coursework required for the degree will be reduced accordingly. Students desiring to transfer graduate courses thought to be equivalent to core courses may be required to demonstrate competency through examination. The award of such transfer credit must be consistent with the University’s “Transfer of Credit” policy.

Degree Requirements
The University’s general degree requirements are discussed here.

Students seeking a Master of Arts in Political Science must complete at least 30 semester credit hours of work in the program, must receive a grade of B- or better in all required courses, and must maintain at least a 3.0 grade point average to graduate.

The curriculum has two components:

1. Fifteen semester hours of required coursework
2. Fifteen semester hours of prescribed electives

**Required Courses (15 hours)**

All students should complete the core courses as soon as possible.

All of the following:

- EPPS 6313 Introduction to Quantitative Methods
- PSCI 6350 Logic, Methodology, and Scope of Political Science
- PSCI 6352 Empirical Democratic Theory

Two of the following:

- PSCI 6300 Proseminar in Comparative Politics and International Relations
- PSCI 6311 Proseminar in Law and Courts
- PSCI 6347 Proseminar in Political Institutions and American Politics

**Prescribed Electives (15 hours)**

a) Two additional courses at the 5000 or 6000 level in one of the following fields: Comparative Politics and International Relations; Political
Institutions and American Politics; or Law and Courts.

b) Three additional political science courses at the 5000 or 6000 level, or methodology courses such as applied regression (EPPS 6316) or other methods courses offered throughout the School, or up to three credits of optional thesis (independent study).
Master of Arts in Political Science – Constitutional Law Studies (30 hours minimum)

Faculty

**Professors:** Thomas Brunell, Anthony M. Champagne, Marianne C. Stewart, John Worrall

**Associate Professors:** Denise Paquette Boots, Patrick Brandt, Linda Camp Keith

**Assistant Professors:** Banks Miller

Mission Statement

The mission of the Master of Arts in Political Science - Constitutional Law Studies degree is to provide students with the reasoning and analytic skills necessary to understand the technical rules of law, legal practices and policies, and law more generally as a social phenomenon. It serves the interests and needs of students who want an intellectually rigorous legal education as preparation for law school, for more advanced graduate learning, or for law-related careers in teaching, journalism, government, policy-making, or the private sector.

Objectives

Students in the Master of Arts in Political Science - Constitutional Law Studies program will:

- Acquire detailed knowledge of the role of the judicial system in the evolution of public policy in the United States.
Acquire detailed knowledge of the roles played by practicing attorneys in the development and application of public law in the United States.

Demonstrate basic skills in legal research and writing.

Develop competency in the application of theories of the evolution of constitutional law to United States Supreme Court decisions.

Demonstrate the ability to conduct original research on law and courts using skills in legal research and writing, quantitative research or field research.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computer Labs. The School has two computing laboratories that have over 30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database and Westlaw are also available for student use. The University's Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are available online from professional associations or at UTD via the Library's and School's memberships in the American Political Science Association, the European Consortium for Political Research, the Inter University Consortium for Political and Social Research, the Roper Center, and the University Consortium for Geographic Information Systems, and other organizations.

The Center for American and International Law, an internationally known organization that provides professional development to lawyers, judges, and law enforcement officers, helps to administer the Capstone Seminar in Constitutional Law Studies in which leading lawyers and judges provide lectures on law and the legal process.
Admissions Requirement

The University’s general admission requirements are discussed here.

The Master of Arts in Political Science seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 300 on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Applicants should also submit all transcripts, three letters of recommendation (preferably from individuals who can evaluate the applicant’s potential for graduate study), and a one-page essay outlining the applicant's background, education, and professional objectives. Applications are reviewed by the Political Science Program Committee in the School of Economic, Political and Policy Sciences.

Undergraduate students who are interested in completing their undergraduate degrees while simultaneously taking graduate courses in the M.A. in Political Science - Constitutional Law Studies program are expected to meet the School's “fast-tracking” requirements.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the Economic, Political and Policy Sciences, statistics, and research design. In cases where undergraduate preparation is not adequate, students may be required to take additional course work before starting the master's program.

Transfer Policies

Students who have previous graduate work pertinent to the requirements of a master’s program may be given up to 6 hours of transfer credit, and the hours of coursework required for the degree will be reduced.
accordingly. Students desiring to transfer graduate courses thought to be equivalent to core courses may be required to demonstrate competency through examination. The award of such transfer credit must be consistent with the University's “Transfer of Credit” policy.

Degree Requirements

The University’s general degree requirements are discussed here.

Students seeking a Master of Arts in Political Science - Constitutional Law Studies must complete at least 30 semester credit hours of work in the program, must receive a grade of B- or better in all required courses, and must maintain at least a 3.0 grade point average to graduate.

The curriculum has two components:

(1) Eighteen semester hours of required coursework

(2) Twelve semester hours of prescribed electives

Required Courses (18 hours)

All students should complete the core courses as soon as possible.

One of the following:

EPPS 6313 Introduction to Quantitative Methods

PSCI 6350 Logic, Methodology, and Scope of Political Science

All of the following:

PSCI 5306 The American Legal System and the Practice of Law

PSCI 5307 Legal Reasoning and Writing
### PSCI 6301
Constitutional Law

### PSCI 6305
Workshop in Constitutional Law Studies

### PSCI 6343
Law and the Policy Process

**Prescribed Electives (12 hours)**

Four of the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CRIM 6311</td>
<td>Criminal Justice Policy</td>
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<td>CRIM 6317</td>
<td>Courts</td>
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<td>CRIM 6348</td>
<td>Drugs and Crime</td>
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<td>EPPS 6316</td>
<td>Applied Regression</td>
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<td>PA 6319</td>
<td>Topics in Public Affairs</td>
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<td>PSCI 5308</td>
<td>Immigration Law</td>
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<td>PSCI 6306</td>
<td>Human Rights and International Law</td>
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<td>PSCI 6311</td>
<td>Proseminar in Law and Courts</td>
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<td>PSCI 6331</td>
<td>Executives, Legislatures, and Public Policy</td>
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<td>PSCI 6339</td>
<td>Election Law and Electoral Systems</td>
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<tr>
<td>PSCI 7320</td>
<td>International Negotiations</td>
</tr>
</tbody>
</table>

Other courses as approved by the Director of Graduate Studies.
Master of Arts in Political Science – Legislative Studies (30 hours minimum)

Faculty

Professors: Thomas Brunell, Anthony M. Champagne Harold D. Clarke, Euel Elliott, Edward J. Harpham, Robert C. Lowry, Marianne C. Stewart

Associate Professors: Patrick Brandt, Michael Crespin, Linda Camp Keith, Gregory S. Thielemann

Mission Statement

The mission of the Master of Arts in Political Science - Legislative Studies degree is to offer pre-professional instruction for students interested in positions as legislative staff, political consultants, or other careers in professional politics. Students will receive instruction that moves beyond the standard coursework in American and Texas government and politics by advancing their knowledge of legislative processes and the role that legislatures play at the local, state, and national levels of government. Graduates will have the communication, research and project management skills that are necessary for undertaking policy or political analysis in legislative and/or public affairs offices of the state of Texas and elsewhere.

Objectives

Students in the Master of Arts in Political Science - Legislative Studies program will:
• Demonstrate knowledge of subnational political institutions and processes in the United States and their effects on politics and policy

• Demonstrate knowledge of normative issues in contemporary democracies involving representation, influence, and the balance of majority and minority interests and the ability to evaluate political institutions and processes in the United States.

• Demonstrate proficiency in skills required for at least one position in the practice of politics by successfully completing an internship.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computer Labs. The School has two computing laboratories that have over 30 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database and Westlaw are also available for student use. The University's Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are available online from professional associations or at UTD via the Library's and School's memberships in the American Political Science Association, the European Consortium for Political Research, the Inter University Consortium for Political and Social Research, the Roper Center, and the University Consortium for Geographic Information Systems, and other organizations.

Students also have access to the non-partisan Center for the Study of Texas Politics. The Center develops opportunities for North Texans to interact with Texas’ leading policy-makers while simultaneously enhancing the quality of instruction, research and service that exists in the School of Economic, Political and Policy Sciences.

Admissions Requirement
The University's general admission requirements are discussed here.

The Master of Arts in Political Science seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 300 on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Applicants should also submit all transcripts, three letters of recommendation (preferably from individuals who can evaluate the applicant’s potential for a career in professional politics), and a one-page essay outlining the applicant’s background, education, and professional objectives. Applications are reviewed by the Political Science Program Committee in the School of Economic, Political and Policy Sciences.

Undergraduate students who are interested in completing their undergraduate degrees while simultaneously taking graduate courses in the M.A. in Political Science - Legislative Studies program are expected to meet the School’s “fast-tracking” requirements.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the Economic, Political and Policy Sciences, statistics, and research design. In cases where undergraduate preparation is not adequate, students may be required to take additional course work before starting the master's program.

Transfer Policies

Students who have previous graduate work pertinent to the requirements of a master's program may be given up to 6 hours of transfer credit, and the hours of coursework required for the degree will be reduced accordingly. Students desiring to transfer graduate courses thought to be equivalent to core courses may be required to demonstrate competency through examination. The award of such transfer credit must be consistent
with the University’s “Transfer of Credit” policy.

## Degree Requirements

The University’s general degree requirements are discussed [here](#).

Students seeking a Master of Arts in Political Science - Legislative Studies must complete at least 30 semester credit hours of work in the program, must receive a grade of B- or better in all required classes, and must maintain at least a 3.0 grade point average to graduate.

<table>
<thead>
<tr>
<th>Required Courses (9 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPPS 6313</strong> Introduction to Quantitative Methods</td>
</tr>
<tr>
<td><strong>PSCI 6352</strong> Empirical Democratic Theory</td>
</tr>
</tbody>
</table>

One of the following:

| **PSCI 6347** Proseminar in Political Institutions and American Politics |
| **OR** |
| **PA 6313** Public Policymaking and Institutions |

Prescribed Electives (9 hours)

Three from the following list of courses:

| **PSCI 6314** Policy Processes, Implementation and Evaluation |
| **PSCI 6324** Local and State Government and Politics |
PSCI 6330  Campaigns and Elections
PSCI 6331  Executives, Legislatures and Public Policy
PSCI 6332  The U.S. Congress
PSCI 6333  Political and Civic Organizations
PSCI 6339  Election Law and Electoral Systems
PSCI 6341  Texas Legislative Process
PSCI 7350  Institutions and Citizen Behavior

PSCI 6364  Public Opinion and Survey Research
OR
EPPS 7386  Survey Research (cannot use both)

Free Electives (6 hours)

Two additional courses at the 5000-level or above offered by programs in the School of Economic, Political and Policy Sciences, subject to approval by the Director of Graduate Studies. These may include additional courses from the list above.

Internship (6 hours)

PSCI 6v42  Legislative Affairs Internship (6 hours total; can be spread over more than one semester) Internships can be done in Austin, TX or Washington, DC, or with another state or local government agency or political organization.
Master of Science in Applied Sociology (36 hours minimum)

http://epps.utdallas.edu/soc/

Faculty

Professors: Richard K. Scotch

Associate Professors: Bobby C. Alexander, Sheryl Skaggs

Assistant Professors: Nicholas Vargas

Senior Lecturer: Carol Cirulli Lanham

Objectives

With an emphasis on the acquisition of theoretical knowledge and social research skills, the MS degree in Applied Sociology is offered under two different options: (1) the thesis option, which is primarily designed for students continuing on for a Ph.D. in sociology or other social science program; (2) the non-thesis option, which is primarily designed to prepare students for careers in policy analysis, program development and evaluation, and quantitative and qualitative data analysis. As public, private and nonprofit organizations attempt to maximize their human and monetary resources, they often seek professionals with specialized skills to assess program demands and viability, evaluate program success, direct change and inform policy. Graduates of the MSAS program are trained to fill such roles and effectively apply their knowledge and skills in employment areas including healthcare, local, state and national
government, nonprofit social services, community activism, marketing research, human resources and business administration.

Although the MA in Applied Sociology is a terminal degree program, a number of our graduates have transitioned into UTD’s doctoral program in Public Policy and Political Economy, as well as external sociology doctoral programs throughout the country. Students planning to apply to a doctoral program are strongly encouraged to pursue the master’s thesis option. The program is open to full-time and part-time students, with many of our classes offered in the late afternoon and evenings. Students may enter the program in the fall, spring or summer semesters.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computing Labs. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A computerized geographic information system, the LexisNexis Database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library’s and the School’s memberships in numerous organizations.

Prerequisites

There are no required prerequisite courses in sociology for the Applied Sociology program, although prior coursework in social theory, research methods, and social statistics is desirable. Prospective students with concerns about their preparation for the Applied Sociology program are encouraged to consult with the program coordinator.

Grading Policy

To qualify for graduation, students must have earned a grade of B or better in each of the program’s core courses plus an aggregate grade point
average of 3.0 for all graduate courses taken in the student’s degree program at U.T. Dallas.

**Degree Requirements**

The University’s general degree requirements are discussed here.

Students may select the thesis or non-thesis option. The Master of Science (M.S.) in Applied Sociology has three components and requires the completion of 36 semester credit hours.

**Thesis Option**

**Course Requirements**

- 12 credit hours of core courses in Applied Sociology and EPPS*
- 12 credit hours of Applied Sociology guided electives
- 6 credit hours of Economic, Political and Policy Sciences (EPPS) electives
- 6 credit hours of thesis research

The Master’s Thesis is supervised by the student’s major professor and the thesis committee, chosen in consultation with the major professor. The thesis committee may include a faculty member from another program with the approval of the major professor. Students are advised to consult with the graduate program director in selecting a major professor and thesis committee members. Students must pass a publicly announced defense of the thesis before it is submitted to the Graduate School. A passing grade on the defense is required in order to graduate. The date for the thesis defense should be early enough for required revisions (if any) to be made prior to the Graduate School deadline for submission. The thesis must conform to all Graduate School requirements.

**Non-Thesis Option**
Course Requirements

12 credit hours of core courses in Applied Sociology and EPPS*

15 credit hours of Applied Sociology guided electives

9 credit hours of Economic, Political and Policy Sciences (EPPS) electives

*Students must maintain at least an overall grade point average of 3.0 to qualify for graduation.

The Master of Science (M.S.) in Applied Sociology (ASOC) requires the completion of 36 semester credit hours: 12 credit hours of core courses in Applied Sociology, 15 credit hours of Applied Sociology guided electives, and 9 credit hours of electives from any graduate program in the School of Economic, Political, and Policy Sciences (EPPS).

Core Courses in Applied Sociology and EPPS (12 hours):

EPPS 6313 Introduction to Quantitative Methods (usually offered in Fall)
EPPS 6346 Qualitative Research Methods (usually offered in Fall)
Or EPPS 6310 Research Design I (usually offered in Fall)

SOC 6312 Social-Economic Theories (usually offered in Spring)
SOC 6350 Social Stratification (usually offered in Fall)

Applied Sociology Guided Elective Courses (15 hours):
Any graduate-level courses with a SOC prefix outside of the core may be applied to this requirement. Students may apply other graduate social science courses related to Sociology, including an appropriate graduate-level internship, with the permission of the program coordinator.

**Social Science Electives (9 hours):**

Any 5000 or 6000 level courses in the School of Economic, Political and Policy Sciences may be applied to this requirement. Students are encouraged to consult with the program coordinator in order to select courses appropriate for their academic and professional career goals.

**Admission Requirements**

The Master of Science in Applied Sociology seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering students should have earned a 3.0 undergraduate grade point average (on a 4.0 scale) and optimally have a Graduate Records Examination (GRE) verbal score of 156 and a quantitative score of 146. Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining personal background, education, and professional objectives. UT-Dallas undergraduates in any major may apply to the ASOC fast track program, which involves taking up to 15 semester credit hours of graduate courses as an undergraduate that can subsequently be applied to the master’s degree requirements.

For further information about the Applied Sociology Program, contact Katie Doctor-Troup (kld015500@utdallas.edu, 972-883-4936), see our web page...
at http://www.utdallas.edu/epps/soc, or contact the program coordinator: Dr. Sheryl Skaggs (slskaggs@utdallas.edu, 972-883-4460).
Master of Science in Criminology **(36 hours minimum)**

http://epps.utdallas.edu/crim/

**Faculty**

**Professors:** Bruce Jacobs, James Marquart, Alex Piquero, Nicole Leeper Piquero, Robert W. Taylor, John L. Worrall

**Associate Professors:** Denise Paquette Boots, Tomislav Kovandzic, Robert Morris, Lynne Vieraitis

**Assistant Professors:** J.C. Barnes, Nadine Connell

**Clinical Professors:** Elmer Polk

**Clinical Assistant Professors:** Timothy Bray

**Mission**

The Mission of the Master of Science in Criminology program at the University of Texas at Dallas is threefold, to:

1. Deliver high-quality education to a diverse body of students regarding the etiology, control, and variation of law-breaking across space and time.

2. Serve local, regional, and national communities through professional development programs, public policy analyses and evaluation research, program and policy design, and as a forum for new ideas and approaches to the study of crime.

3. Advance the understanding of criminology through a multidisciplinary mix of theoretical and applied research, as well as to provide a forum for new ideas and approaches to the study of crime.
Objectives

The Master of Science in Criminology provides students with a coherent yet intellectually challenging degree that prepares them to conduct interdisciplinary research among the many aspects of criminology and criminal justice, varying with individual interests and areas of specialty. Graduates of the M.S. program will be competent to teach at the community college and at the University level as adjunct lecturers. Graduates will also be ready to enter into analytic and administrative posts within a vast array of research and policy institutions, criminal justice organizations, and in the private sector.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computer Labs. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A computerized geographic information system, the LexisNexis Database, and Westlaw are also available for student use. The University's Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library’s and School’s memberships in numerous organizations.

Application and Admission Requirements

The Master of Science in Criminology seeks applicants from a baccalaureate in Criminology, Sociology, or a relevant discipline. A 3.2 GPA and a GRE score of 1000 are desirable, but students may be admitted at the program’s discretion. All transcripts must be submitted, along with three letters of recommendation (preferably academic) and a one-page essay describing their background, education, and professional objectives. For more information please see our Graduate Handbook on our website.
Prerequisites

For the Master of Science in Criminology, students with an undergraduate degree in Criminology or a related field will have the necessary academic foundation to begin their graduate coursework (See the Graduate Program Handbook which is posted on the EPPS Website for more information on Prerequisites and Transfer Policies at http://epps.utdallas.edu/crim).

Program of Studies Policy

Each student admitted to a graduate program will have a specific program of studies agreed upon in consultation with the Graduate Studies Committee or graduate advisor for Criminology per the degree plan for the program. A complete Program of Studies Form will be filled in and approved prior to the student’s registration for his/her 19th semester credit hour to be counted toward a master’s degree.

Analytical Paper Writing Requirement (MS in Criminology)

All Doctoral track students must complete a writing requirement while enrolled in the MS Program. Student must take a minimum of six enrollment hours of CRIM 6V98, complete an analytical research paper and present their findings in a colloquium setting to be eligible for graduation with the MS.

Non-Writing Requirement for the MS in Criminology

MS students on a terminal track who do not wish to be considered for admission into a doctoral program have the option of taking 6 hours of any graduate classes as electives in lieu of the writing requirement.

Coursework and Credit Hours

15 Hours of required Criminology core classes:

CRIM 6300 Proseminar in Criminology
CRIM 6303 Etiology of Crime and Criminality
CRIM 6311 Crime and Justice Policy
EPPS 6310 Research Design I
EPPS 6313 Introduction to Quantitative Methods

PLUS 15 hours Electives:

9 hours in Elective Criminology graduate courses,
AND 6 hours in any program or school outside Criminology
AND:

6 hours of CRIM 6V9 Analytical Writing Research (for Ph.D. track students),

OR

6 hours of graduate-level course electives (for students wishing to terminate at MS)

Total Hours: 36
Master of Science in Criminology
(Online) (36 hours minimum)

http://epps.utdallas.edu/crim/

Faculty

Professors: Bruce Jacobs, Alex Piquero, Nicole Leeper Piquero, James Marquart, Robert W. Taylor, John L. Worrall

Associate Professors: Denise Paquette Boots, Tomislav Kovandzic, Robert Morris, Lynne Vieraitis

Assistant Professors: J.C. Barnes, Nadine Connell

Clinical Professors: Elmer Polk

Clinical Assistant Professors: Timothy Bray

Mission

The Mission of the Master of Science in Criminology program at the University of Texas at Dallas is threefold, to:

1. Deliver high-quality education to a diverse body of students regarding the etiology, control, and variation of law-breaking across space and time.

2. Serve local, regional, and national communities through professional development programs, public policy analyses and evaluation research, program and policy design, and as a forum for new ideas and approaches to the study of crime.

3. Advance the understanding of criminology through a multidisciplinary mix of theoretical and applied research, as well as to provide a forum for new ideas and approaches to the study of
Objectives

The Master of Science in Criminology (MS) provides students with a coherent yet intellectually challenging degree that prepares them to conduct interdisciplinary research among the many aspects of criminology and criminal justice, varying with individual interests and areas of specialty.

The fully online MS in Criminology offers students the convenience of completing coursework on their own schedules.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computer Labs. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A computerized geographic information system, the LexisNexis Database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library’s and School's memberships in numerous organizations.

Prerequisites

For the Master of Science in Criminology, students with an undergraduate degree in Criminology or a related field will have the necessary academic foundation to begin their graduate coursework (See the Graduate Program Handbook which is posted on the EPPS Website for more information on Prerequisites and Transfer Policies at http://epps.utdallas.edu/crim).

Program of Studies Policy

Each student admitted to a graduate program will have a specific program of studies agreed upon in consultation with the Graduate Studies Committee or graduate advisor for Criminology per the degree plan for the
program. A complete Program of Studies Form will be filed in and approved prior to the student’s registration for his/her 19th semester credit hour to be counted toward a master’s degree.

**Non-Writing Requirement for the MS in Criminology**

MS students on a terminal track who do not wish to be considered for admission into a doctoral program have the option of taking 6 hours of any graduate classes as electives in lieu of the writing requirement.

**Coursework and Credit Hours**

- **15 Hours of required Criminology Core Classes:**
  - CRIM 6300: Proseminar in Criminology
  - CRIM 6303: Etiology of Crime and Criminality
  - CRIM 6311: Crime and Justice Policy
  - EPPS 6310: Research Design I
  - EPPS 6313: Introduction to Quantitative Methods

- **PLUS 15 hours Electives:**
  - 15 hours in Elective Criminology graduate courses, including up to 6 hours in any program or school outside Criminology

- **AND:**
  - 6 hours of graduate electives (online, in any program or school) **OR** 6 hours of CRIM 8V01 (for independent study project directed by a faculty member)

**Total Hours: 36**
Master of Science in Economics (36 hours minimum)

http://www.utdallas.edu/epps/eco/

Faculty

Professors: Daniel G. Arce M., Kurt J. Beron, James Murdoch, Todd Sandler, Donggyu Sul

Associate Professors: Nathan Berg, Susan Williams McElroy, Kevin Siqueira

Assistant Professors: Rodney Andrews, Monica Deza, Xin (Sherry) Li, Asli Leblebicioglu

Mission

The mission of the Master of Science in Applied Economics is to provide excellent graduate-level education in economics, with an emphasis on the development of theoretical understanding of economic phenomena, quantitative skills that can be applied to economic problems, and critical thinking to understand how best to apply economic theory and quantitative skills to real-world problems. Graduates of the Economics program will have an educational background that is conducive to employment in banking or financial institutions, insurance, consulting, corporate strategic planning, real estate, journalism, management, marketing, labor arbitration, regulation, environmental and urban and regional planning and quantitative analysis. Graduates may also choose to undertake further studies in Ph.D. programs in Economics, Political Economy, and Political Science, as well as additional studies in business or law.

Admission Requirements
The University’s general admission requirements are discussed here.

The master’s program in Economics seeks applications from students with a baccalaureate degree from an accredited university of college. A 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 1200 on the Graduate Records Examination (GRE). Students may also wish to consider submitting their score from the writing component of the GRE test as additional evidence of their writing skills. Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant’s background, education and professional objectives.

Prerequisites

For the Master of Science in Economics, students with a Bachelor of Science in Economics and courses in calculus and matrix or linear algebra will have the necessary foundation in economics, statistics and mathematics. Students who lack this foundation should complete the following undergraduate courses at UT Dallas or their equivalents at another institution: ECON 3310 Intermediate Microeconomic Theory, ECON 3311 Intermediate Macroeconomic Theory, ECON 4351 Mathematical Economics, ECON 4355 Econometrics, and EPPS 3405 Introduction to Social Statistics with Lab, MATH 1325 Applied Calculus I, MATH 1326 Applied Calculus II, and MATH 2333 Matrices, Vectors, and Their Applications in order to begin the program.

Degree Requirements

The University’s general degree requirements are discussed here.

Students seeking a Master of Science in Economics degree must complete 36 semester credit hours of work in the program. The program has three components: 12 hours (four courses) of Required Core Courses (listed below), 9 hours of Economics Electives and 15 hours of Other Electives. Students must consult with the Director of Graduate Studies of the
Economics Program each semester in order to determine the approved Economics Electives and Other Electives each semester. Students must achieve at least a 3.0 grade point average in the required courses and an overall grade point average of 3.0 to graduate.

**Required Core Courses in Economics (12 hours):**

- ECON 5321 Microeconomic Theory for Applications
- ECON 5322 Macroeconomic Theory for Applications
- ECON 6305 Mathematical Economics
- ECON 6306 Applied Econometrics

Advising note: If the student intends to enter the Ph.D. program in Economics upon completion of the M.S., then he or she should consider taking ECON 6301 *Microeconomics Theory I* instead of ECON 5321 and ECON 6302 *Macroeconomics Theory I* instead of ECON 5322.

**Economics Electives Courses (9 credit hours):**

Approved ECON courses numbered 5000 and above.

**Other Electives Courses (15 credit hours):**

Approved ECON courses numbered 5000 and above or approved graduate courses from other programs.

Advising note: If the student intends to enter the Ph.D. program in Economics upon completion of the M.S. then he or she should consider taking ECON 7301 *Microeconomics Theory II* and ECON 7302 *Macroeconomic Theory II* as electives.
Master of Science in Geospatial Information Sciences *(30 hours minimum)*

http://www.utdallas.edu/epps/gis/

Faculty

**Professors:** Carlos Aiken (Geosciences), Brian J. L. Berry (Economic, Political and Policy Sciences), Denis J. Dean (Economic, Political and Policy Sciences), John Ferguson (Geosciences), Daniel Griffith (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Robert Stern (Geosciences)

**Associate Professors:** Alexander Braun (Geosciences), Tom Brikowski (Geosciences), Georgia Fotopoulos (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorff (Economic, Political and Policy Sciences)

**Assistant Professors:** Yongwan Chun (Economic, Political and Policy Sciences)

**Senior Lectures:** Bryan Chastain (Economic, Political and Policy Sciences), Irina Vakulenko (Economic, Political and Policy Sciences)

Students may choose between two tracks within the Master of Science in Geospatial Information Sciences program. Both tracks are offered jointly by the School of Economic, Political and Policy Sciences and the School of Natural Sciences and Mathematics. The first track is a professional program that focuses on the use of Geographic Information Systems (GIS) and associated technologies such as remote sensing and global positioning systems for acquiring, describing, managing, analyzing and communicating spatially-referenced information in order to provide...
decision support.

This track emphasizes coursework, and involves a GIS Master's Research class where a student needs to identify a faculty member as their Master's advisor, prepare a proposal for a professional GIS Master's project and conduct research under the supervision of the advisor. To obtain his/her Master's degree, a student must present the Master's project to the faculty and fellow students and successfully defend it. Students are expected to master the concepts underlying GIS, the skills for implementing GIS projects in public or private sector organizations, and the ability to use GIS in pure or applied research in substantive areas. Graduates can apply their skills in a variety of areas such as public administration and policy analysis; public safety, criminology, emergency preparedness management; environmental and resource management; urban, regional, social service and transportation planning and analysis; marketing, site selection, logistics and real estate; and resource exploration, including petroleum.

The second track of the Master's of Science in Geospatial Information Sciences program is a conventional program that offers a balance between coursework and research. A student needs to register for a Master's thesis class under a supervising advisor to conduct a research project, which will ultimately lead to a research-oriented master's thesis. To obtain his/her Master's degree, a student must present the Master's thesis to the faculty and fellow students and successfully defend it. This track is aimed at students who want to hone their research skills, and is the preferred route for students who may want to move to a doctoral program. Graduates in this track can apply their skills to the same areas as graduates from the first track, but also have the option of moving into research-oriented jobs, and maximizing their ability to move into doctoral programs.

Mission and Objectives

The mission of both tracks of the Master of Science in Geographic Information Sciences program is to provide students a rigorous understanding of the technologies, quantitative techniques, models and theories used to acquire and manage spatially referenced information,
analyze spatial processes, communicate spatial information, and provide spatial decision support. The second track has the additional mission of providing students with a thorough understanding of the scientific research method. UT Dallas graduates will have strong analytical and numerical skills, knowledge of empirical and quantitative research methodologies, and employ novel geographic information sciences technologies. They will use these capabilities to support public and private sector organizations, to address significant societal issues, and to enhance understanding of the human and natural environments. They will successfully compete at the highest level for jobs requiring geospatial skills and for entry into quality doctoral programs in relevant areas. More specifically, graduates of the program will:

• **Possess a thorough** knowledge of the technologies, quantitative techniques, models and theories used to acquire and manage spatially referenced information and to analyze spatial processes.
• **Have strong analytical and numerical skills, knowledge of empirical and quantitative research methodologies, and be able to employ these skills and methodologies in novel geographic information sciences applications.**
• **Be able to identify and apply appropriate geospatial methodologies to support public and private sector organizations, to address significant societal issues, and to enhance understanding of the human and natural environments.**
• **Successfully compete at the highest level for jobs requiring geospatial skills and for entry into quality doctoral programs in relevant areas.**

**Facilities**

Classes are offered through state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University’s extensive instructional computing facilities are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All industry-standard GIS and remote sensing software is available. The University is a member...
Admission Requirements

The University’s general admission requirements are discussed here.

For admission to the program, a baccalaureate degree from an accredited university or college is required and Graduate Record Examination (GRE) or Graduate Management Aptitude Test (GMAT) scores must be presented. A 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 295 (new scale) and 1000 (old scale) on the GRE, or equivalent score on the GMAT, are desirable. Students must also submit transcripts from all higher education institutions attended, three letters of recommendation, and a personal statement, approximately one page in length, outlining their background, education and professional objectives.

Prerequisites

Beginning students must have the equivalent of GISC 6381 Geographic Information Systems Fundamentals and GISC 6382 Applied Geographic Information Systems, or they must take these courses at UT Dallas in addition to the 30 credit hours required for the Master’s degree.

Degree Requirements

The University’s general degree requirements are discussed here.

To earn the Master of Science in Geospatial Information Sciences, students must complete a minimum of 30 semester credit hours of work beyond the prerequisites. Both tracks of the program involve the same requirement of 9 hours (three courses), core requirement of 9 hours, and prescribed electives for 9 hours. The two tracks differ in their research requirements. Students must achieve at least a 3.0 grade point average in the core requirement and an overall grade point average of 3.0 to graduate.
Base Requirement – Both Tracks (9 credit hours):

Statistics (1 or 2 courses):
- GISC 6301 GIS Data Analysis Fundamentals or
- GEOS 5306 Data Analysis for Geoscientists or
- GISC 6311 Statistics for Geospatial Science
- GISC 7310 Regression Analysis with GIS Applications.

Programming (1 or 2 courses):
- GEOS 5303 Computing for Geoscientists
- GISC 6317 Computer Programming for GIS
- GISC 6388 GIS Application Software Development
- GISC 7363 Internet Mapping and Information Processing

Core Requirement – Both Tracks (9 credit hours):

Students must earn a minimum grade point average (GPA) of 3.0 in at least three of the following courses:
- GISC 6325 (GEOS 5325) Remote Sensing Fundamentals
- GISC 6384 Spatial Analysis and Modeling
- GISC 6387 Geographic Information Systems Workshop
- GEOS 7327 (GISC 7367) Remote Sensing Workshop
Elective Courses (at least 9 credit hours from the following, not duplicated elsewhere)

- CS 6359 Object-Oriented Analysis and Design
- CS 6360 Database Design
- CS 6366 Computer Graphics
- CS 6384 Computer Vision
- EPPS 6316 Applied Regression
- EPPS 7368 Spatial Epidemiology
- GEOS 5301 Geology of the Metroplex
- GISC 5310 (GEOS 5310) Hydrogeology
- GISC 5311 (GEOS 5311) Applied Groundwater Modeling
- GISC 5322 (GEOS 5322) GPS (Global Positioning System) Satellite Surveying Techniques
- GISC 5324 (GEOS 5324) 3D Data Capture and Ground Lidar
- GISC 5330 (GEOS 5330) Geospatial Applications in Earth Science
- GISC 5395 (GEOS 5395) Satellite Geophysics and Applications
- GISC 6380 Spatial Concepts and Organization
- GISC 6383 Geographic Information Systems Management and Implementation
- GISC 6385 GIS Theories, Models, and Issues
- GISC 6388 GIS Application Software Development
- GISC 7310 Regression Analysis with GIS Applications
- GISC 7360 GIS Pattern Analysis
- GISC 7361 Spatial Statistics
GISC 7363 Internet Mapping and Information Processing
GISC 7364 Demographic Analysis and Modeling
GISC 7365 Remote Sensing Digital Image Processing
GISC 7366 Applied Remote Sensing
GISC 7387 GIS Research Design
GISC 8320 Seminar in Spatial Analysis
MIS 6308 Systems Analysis and Project Management
MIS 6324 Business Intelligence Software and Techniques
MIS 6326 Database Management
PA 6318 Information Systems in Policy Environments

Research Requirement – Project Track (3 hours):
GISC 6389 Geospatial Information Sciences Master’s Research
Successfully defend a professional GIS Master’s Project

Research Requirement – Thesis Track (3 hours):
GISC 6V98 Master’s Thesis
Successfully defend a GIS Master’s Research Thesis
Master of Science in International Political Economy *(36 hours minimum)*

http://www.utdallas.edu/epps/public-policy-and-political-economy/

**Faculty**

**Professors:** Sheila Amin de Gutiérrez de Piñeres, Brian J.L. Berry, Lloyd J. Dumas, Euel W. Elliott, Donald A. Hicks, Murray J. Leaf, Richard K. Scotch

**Associate Professors:** Patrick T. Brandt, Simon M. Fass, Jennifer S. Holmes, Linda Camp Keith, Dohyeong Kim

**Assistant Professors:** Jonas Bunte, Brandon Kinne, Clint W. Peinhardt

**Mission Statement**

The mission of the Master of Science in International Political Economy is to offer an experience in interdisciplinary education and policy research through activities in graduate education, scholarly and applied inquiry, and professional service. Today, more careers increasingly require international knowledge and skills that transcend the confines of traditional disciplinary training. We prepare students for careers in research, teaching, and practice in a variety of both academic and non-academic
public policy and political economy settings. The Master of Science in International Political Economy will develop students’ critical skill sets to meet the needs and demands of the international diplomatic and business sectors. These skills include critical thinking, knowledge of multiple cultures, and cultural contexts, rigorous research skills, and the ability to communicate effectively in an array of environments. Students will be prepared to advance careers in policy and data analysis, and administrative positions in government, the non-profit and private sectors.

Objectives

- Students will demonstrate the ability to apply social science and international political economy theories and concepts.
- Students will develop competency in advanced methods of social science and international political economy research and analysis.
- Students will develop basic skills in professional communication appropriate to international political economy research and analysis.
- Students will develop competency in analysis, evaluation, and research design relevant to social science and international political economy research and analysis.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's [Computer Labs](#). The School has two computing laboratories that have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database.
and Westlaw are also available for student use. The University's Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library and school's memberships in numerous organizations.

Admissions Requirement

The master's program in International Political Economy seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 1100 (old scale) or 156 Verbal and 146 Quantitative (new scale) on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant's background, education, and professional objectives.

Prerequisites

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the Economic, Political and Policy Sciences, statistics, and research design. Students are strongly encouraged to strengthen their foreign language skills.

Degree Requirements

The University's general degree requirements are discussed here.

Students seeking a Master of Science in International Political Economy must complete at least 36 semester credit hours of work in the program. The program has four components:
1. Eighteen semester hours of required coursework
2. Twelve semester hours of prescribed electives
3. Six hours of free electives.
4. Students must demonstrate a foreign language proficiency equivalent to two years of university-level study in one foreign language before graduation.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, including core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receives two Cs will no longer be allowed to continue in the program.

Required Courses (18 hours)

All students should complete the core courses as soon as possible.

Economic Theory Core (take one of the following):

- POEC 6321 Economics for Public Policy
- POEC 7327 Innovation Dynamics and Economic Change

Methods Core (Algebra-based or Calculus based)

Algebra-based series

- EPPS 6313 Introduction to Quantitative Methods
- & EPPS 6316 Applied Regression

Calculus-based series

- ECON 6306 Advanced Microeconomics
- POEC 6390 Innovation and Public Policy

Students must demonstrate a foreign language proficiency equivalent to two years of university-level study in one foreign language before graduation.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, including core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receive/or two Cs will no longer be allowed to continue in the program.

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- POEC 7327 Innovation Dynamics and Economic Change

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Algebra-based series

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Calculus-based series

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- POEC 6390 Innovation and Public Policy

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Algebra-based series

- EPPS 6313 Introduction to Quantitative Methods
- & EPPS 6316 Applied Regression

Calculus-based series

- ECON 6306 Advanced Microeconomics
- POEC 6390 Innovation and Public Policy

Students must demonstrate a foreign language proficiency equivalent to two years of university-level study in one foreign language before graduation.

Students must maintain a 3.0 cumulative GPA in their graduate courses in the degree program, including core courses. If placed on probation, students will have one semester to bring their cumulative grade point average to a 3.0 or greater. Any student who receive/or two Cs will no longer be allowed to continue in the program.
Or

**Calculus-based series**

EPPS 7313 Descriptive and Inferential Statistics  
& EPPS 7316 Regression and Multivariate Analysis

**One of the following:**

- POEC 6360 World Political Economy
- POEC 6366 International Economics
- PSCI 6309 International Political Economy

**One of the following:**

- POEC 6335 Institutions and Development
- POEC 6362 Political Development
- PSCI 6309 International Political Economy
- PSCI 6316 International Organizations

**One of the following:**

- POEC 7V76 Policy Research Workshop in Development Studies
- EPPS 6310 Research Design I
- EPPS 6352 Evaluation Research in the Economic, Political and Policy Sciences
Prescribed Electives

Students complete 12 hours of Prescribed Electives. These consist of:

1. An area concentration in which the student completes two courses (six hours) in history, advanced language, or area studies courses that address a single region, including Europe, Latin America, or the Middle East/Greater Asia.

2. A theme concentration in which the student completes two courses (six hours) in Development, International Business & Public Policy, or International Conflict & Security.

Courses in both the area concentrations and theme concentrations must have the approval of the Program Head. Internships and independent studies may count toward either area or theme concentrations, with the permission of the Program Head.

Elective Courses

Students also select an additional six hours of coursework. Students may select courses from those courses not selected under Required Courses.
Executive Master of Science in
Justice Administration and Leadership (30 minimum hours)

http://www.utdallas.edu/epps/

Faculty

Professors: Bruce A. Jacobs, James W. Marquart, Alex Piquero, Nicole Leeper Piquero, Robert W. Taylor, John Worrall
Associate Professors: J.C. Barnes, Denise Paquette Boots, Tomislav Kovandzic, Robert Morris, Sheryl Skaggs, Lynne Vieraitis
Assistant Professors: J.C. Barnes, Nadine Connell
Clinical Professor: Elmer Polk
Clinical Assistant Professors: Timothy Bray

Mission

The Mission of the Executive Master of Science in Justice Administration and Leadership program at the University of Texas at Dallas is to:

1. Deliver high-quality education to working professionals who in turn will examine the role of leadership within justice agencies and organizations.

2. Prepare students to evaluate and apply relevant research findings on leadership and administration to lead, influence and manage others in an increasingly diverse workforce and work environment.

3. Advance the understanding of the consequences of change within justice organizations, and lead and manage personnel in periods of organizational change.

4. Prepare students to apply relevant techniques of leadership, management, conflict resolution and negotiation when confronted with change and subsequent conflict in justice and related organizations.

Objectives

The Executive Master of Science in Justice Administration and Leadership (MS-JAL) is housed in the Department of Criminology and provides students with a coherent and intellectually challenging degree that prepares a new generation of leaders to manage and administer justice and other social service organizations. The program will deliver an innovative and integrated curriculum that connects such key components of leadership and administration in the justice setting as policy implementation and analysis, organizational behavior and change, planning and decision-making, and legal issues and conflict resolution to prepare students for supervisory and executive positions.
Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences (or EPPS), the University’s Computer Labs, and computing facilities in the School of Management (or SOM). EPPS has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A computerized geographic information system, the LexisNexis Database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library’s and School’s memberships in numerous organizations.

Graduate Assistantships

Graduate teaching and research assistantships will not be available.

Admissions Requirement

The University’s general admission requirements are discussed here.

The Executive Master of Science in Justice Administration and Leadership (MS-JAL) seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general entering students have earned a 3.0 undergraduate grade point average (on a 4.0 scale). Students should complete the following undergraduate courses at U.T. Dallas or their equivalents at another institution: CRIM 3302 Advanced Criminology, CRIM 3303 Advanced Criminal Justice, and CRIM 3304 Research Methods in Crime and Justice Studies. Prospective students with concerns about their preparation for the program are encouraged to consult with the program director.

Prerequisites

For the Executive Master of Science in Justice Administration and Leadership, students with a Bachelor’s degree in Criminal Justice, Criminology, Public Administration, and general business will have the necessary foundation for the master’s degree. Students who lack this foundation should complete the following undergraduate courses at U.T. Dallas or their equivalents at another institution: CRIM 3302 Advanced Criminology, CRIM 3303 Advanced Criminal Justice, and CRIM 3304 Research Methods in Crime and Justice Studies. Prospective students with concerns about their preparation for the program are encouraged to consult with the program director.

Degree Requirements

The University’s general degree requirements are discussed here.

Students seeking an Executive Master of Science in Justice Administration and Leadership degree must complete 30 semester credit hours of coursework in the program. The Core curriculum includes 15 hours in criminal justice policy and criminology, 9 hours in public administration and practice courses, 6 hours in legal aspects of administration and dispute resolution, and 3 hours of independent research acting as a capstone project to satisfy a writing requirement. Students must achieve at least an overall grade point average of 3.0 to graduate.
Core Courses

Criminology
CRIM 6311: Crime and Justice Policy
CRIM 6390: Administration of Justice Agencies
CRIM 6395: Contemporary Issues in Justice Administration
CRIM 6399: Capstone in Justice Administration
CRIM xxxx: Elective

Public Administration
PA 6316: Leadership in Public and Nonprofit Management
PA 6345: Human Resource Management
PA 6351: Introduction to Homeland Security

Legal Aspects and Dispute Resolutions
CRIM 6312: Legal Aspects of Justice Administration
OB 6332: Negotiation and Dispute Resolutions

Capstone Course Requirement (3 credit hours)
PA 6399: Capstone in Public Affairs (this course will involve research problem specification, literature review, research design, analysis and presentation)
Other courses may substitute for those listed with the approval of the Associate Dean for Graduate Education or the Executive MS-JAL Director.
Master of Public Affairs *(42 hours minimum)*

http://www.utdallas.edu/dept/graddean/CAT2012/EPPS/MS/ms_mpa.htm

Faculty

**Professors**: L. Douglas Kiel, Robert W. Taylor

**Associate Professors**: Paul Battaglio, Doug Goodman, Sarah Maxwell

**Assistant Professors**: Evgenia Gorina, James Harrington, Young-Joo Lee, Meghna Sabharwal

**Clinical Professors**: Donald Arbuckle

**Senior Lecturer**: Teodoro Benavides

Mission

The Master of Public Affairs program advances excellence in public service. The program is designed to prepare students to build competencies and develop creative solutions for challenges in finance, leadership, human resource, and project management.

Objectives

The Master’s degree in Public Affairs is a professional diploma that focuses on skills of management and analysis that contribute to successful carrying out of administrative and leadership responsibilities in government and nonprofit settings. The specific outcome objectives for students who graduate with the MPA degree are:

- An understanding of the philosophical, theoretical and legal foundations-
of public management, policy making, and leadership in government and nonprofit settings; Proficiency in organizational and decision analysis, research and evaluation practice, and quantitative and qualitative techniques; Sound preparation for advanced study aimed at research centers; Mastery of persuasive written and oral communication.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computer Labs. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS and Stata. A computerized geographic information system, the LexisNexis Database, and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the McDermott Library and School’s memberships in numerous organizations.

Admission Requirements

The University’s general degree requirements are discussed here http://www.utdallas.edu/dept/graddean/CAT2012/FIRST40/admissions.htm:

The Public Affairs Master’s program at UT Dallas typically admits only students who have an undergraduate GPA of 3.0 or better. Prospective students must complete the University’s online graduate application and submit a narrative outlining 1) academic interests, 2) current or long-range interests in research, teaching or other professional objectives, 3) description of publications or other scholarly endeavors, and 3) listing of academic and professional organizations and fellowships, scholarships, or other honors received. International students whose native language is not English are also required to submit the Test of English as a Second Language (TOEFL), unless they graduated from a four-year college or
university in the United States or other English speaking country. Students should submit examination scores and transcripts from all colleges previously attended to UT Dallas Admission and Enrollment Services. Three letters of recommendation from individuals (employers, community leaders, teachers, etc.) who are able to judge a student's probable success in graduate school and a current resume are required. The letters and resume may be sent directly to the program office or uploaded online.

To be guaranteed consideration for admission, fall applications must be received by July 1 (late registration deadline is August 1). Applications for spring admission must be received by November 1 (late registration deadline is December 1). Any incomplete application received after these dates will not be considered for admission during the designated semester. Students who do not meet this deadline must reapply for the following semester.

In addition to the university's transfer of credit requirements, a maximum of 9 credit hours of transfer credit can be applied to the MPA degree.

Prerequisites

While there are no specific prerequisites required for any MPA course, students who lack background in particular areas may be advised or required to take preparatory courses. In particular, students who lack background or experience in American political and policymaking institutions, in mathematics, and micro computing may be required to develop proficiency in these areas before being admitted into certain courses. Students meet with the MPA Director to determine these requirements. **Leveling courses will not count toward the MPA degree.**

Degree Requirements
The University’s general degree requirements are discussed here.

Students seeking a Master of Public Affairs (MPA) degree must complete at least 42 semester credit hours of work in the program. The program has three components: a 21 hour core, 15 hours of directed electives within a chosen specialization and the 3 hour Capstone seminar (PA 6399 Capstone in Public Affairs). For students without evidence of at least 12 months full time managerial experience in the public or nonprofit sectors, 3 hours of internship credit are also mandatory. Students for whom the internship requirement is waived must complete an additional 3 hours of approved elective coursework.

**Grade Point Requirements**

Students must maintain at least a 3.0 grade point average in the core courses and an overall grade point average of 3.0 to graduate. If a student’s GPA does not meet these standards University policy concerning academic probation and removal from the program are in effect.

**Core Courses (21 hours)**

All MPA students should complete the core courses as soon as possible. A full-time student entering the program will normally take three core courses and one additional course each semester. The Capstone or internship is usually undertaken when the student has completed most of the other degree requirements.

**Required core courses for the MPA (21 hours)**

- **EPPS 6313 Introduction to Quantitative Methods**
- **PA 6311 Public Management**
- **PA 6313 Public Policymaking and Institutions**
- **PA 6320 Organizational Theory**
- **PA 6321 Government Financial Management and Budgeting**
PA 6342 Local Economic Development
or PA 7317 Microeconomics and Policy Analysis.

PA 6345 Human Resource Management

Professional Specialization Core Courses (15 hours)


Students who specialize in Public Management take 15 hours from: PA 6344 State/Local Government Management, PA 6300 Quality and Productivity in Government, PA 6318 Information Systems in Policy Environments, PA 6324 Community Planning, PA 6370 Project and Contract Management, SOC 6341 Urban Economics, or other appropriate courses approved by the MPA Director.

Students who select the Local Government Management Track take 15 hours from: PA 6344 State/Local Government Management, PA 6345 Human Resources Management, PA 6321 Government Financial Management and Budgeting, PA 6342 Local Economic Development, or other appropriate courses approved by the MPA Director.

Students who wish to focus on the Nonprofit Management Track take 15 hours from: PA 6380 Nonprofit Organizations, PA 6381 Nonprofit Management, PA 6374 Financial Management for Nonprofit Organizations, EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences, or other appropriate courses approved by the MPA Director.

Students who choose Policy Analysis complete 15 hours from: PA 7317 Microeconomics and Policy Analysis, EPPS 6316 Applied Regression Analysis, EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences, EPPS 7304 Cost-Benefit Analysis, or other appropriate courses approved by the MPA Director.

Elective Courses (15 hours)
Students not wishing to complete a professional specialization must complete 15 hours of elective coursework in addition to the core courses, capstone and internship. These courses will be determined in consultation with the MPA Director. Other courses, including online offerings, may be authorized for all tracks at the discretion of the MPA Director.

**Capstone Course (3 hours)**

The capstone in public affairs is the culminating experience for graduating MPA students. Students integrate knowledge from across the MPA curriculum in a faculty-directed semester-long applied research project (PA 6399 Capstone in Public Affairs). This required 3 hour seminar should be taken in the semester in which the student intends to graduate.

**Internship (3 hours)**

3 hours of internship credit (PA 8v97) are required for completion of the MPA. The internship involves work in a professional capacity in an organization, under the joint supervision of an experienced professional mentor at the internship site and the MPA Internship Coordinator. The standard three hour internship requires approximately a 20-hour per week time commitment to the work experience for a total of 300 internship contact hours during the semester. The objective of the internship is to provide an introduction to professional life and to establish sound approaches to the practice of public affairs. Students shall not take more than 6 hours of approved internship credit toward the MPA. For students with evidence of at least 12 months full time managerial experience in the public or nonprofit sectors, 3 hours of internship credit may be waived at the discretion of the MPA director. Students who wish to seek the internship waiver must submit a formal written request to the MPA Director that includes a letter documenting the duration of their experience and its relevance to public or nonprofit management. This request must be approved no later than the student’s penultimate semester in the program. Students for whom the internship requirement is waived must complete an additional 3 hours of approved elective coursework in lieu of the internship.
Master of Public Policy *(36 hours minimum)*

http://www.utdallas.edu/epps/pppe/

Faculty

**Professors:** Sheila Amin de Gutiérrez de Piñeres, Brian J.L. Berry, Lloyd J. Dumas, Euel W. Elliott, Donald A. Hicks, Murray J. Leaf, Richard K. Scotch,

**Associate Professors:** Patrick T. Brandt, Simon M. Fass, Jennifer S. Holmes, Dohyeong Kim, Sheryl L. Skaggs

**Assistant Professors:** Jonas Bunte

Mission

The Mission of the Master of Public Policy is to offer students an interdisciplinary graduate education designed to develop skills for careers in which a solid understanding of the public policy process and the analysis and evaluation of public policies are essential. Students will be prepared for analytical and administrative positions and responsibilities in a wide array of professional settings in the public, non-profit, and private sectors as well as advanced study for careers in research. Specific skills include knowledge of the policy process and related ethical concerns, rigorous research skills that provide students with an essential grounding in statistical and data analysis and research design, and effective communication skills.
Objectives

Students will understand and analyze the principal policy making institutions and the ways in which they formulate debate and implement public policies at the national, sub-national and local levels. Students will examine legislative, executive, and non-governmental roles in policy formation at different levels of government. They will analyze the ways in which the various institutions interact and set policy priorities. They will study policy implementation and the interrelated functions of levels of governments, non-profit and corporate entities in policy implementation.

Students will learn and apply quantitative skills and economic theories to measure and evaluate public policies. They will learn when to apply appropriate techniques to complex policies. They will demonstrate an understanding of techniques to examine the preferred outcomes of policy alternatives to advise senior officials. Students will acquire skills in applying statistical measures of projected policy outcomes. Students will learn economic theories and acquire skills in applying those theories appropriately to establish policy objectives and outcomes.

Students will understand the role of and learn appropriate, rigorous ways to design research to increase knowledge of public policy and citizen welfare. Students will learn ways to quantitatively and qualitatively design research projects that address important public policy questions and concerns.

Students will learn and understand the unique role of ethical theories and behavior as it applies to the public and non-profit sectors. Students will understand the ethical obligation of elected and appointed governmental officials to the body politic. Students will understand the functions of internal and public oversight of the formation and implementation of public policies.

Students will develop expertise in a substantive area of public policy and learn how to effectively communicate new findings and
innovative policies to senior decision makers and the general public. Students will study one of three major public policy disciplines—social policy, health policy or the business-government relationship. Students will understand the theories and scientific principles that support these substantive policy areas and the ways in which those theories are tested. Students will understand how these policy areas contribute to the well-being of citizens to enhance the quality of life.

Qualified students are encouraged to consider the Ph.D. in Public Policy and Political Economy (PPPE). Such students should meet with Program Head of PPPE as soon as possible to discussion options.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computer Labs. The School has two computing laboratories that have over 50 computers that are network linked and equipped with major social science software packages, including EViews, R, RATS, SPSS, and Stata. A computerized geographic information system, the LexisNexis database and Westlaw are also available for student use. The University’s Computer Labs provide personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library and the school’s memberships in numerous organizations.

Admissions Requirement

The master’s program in Public Policy seeks applications from students with a baccalaureate degree from an accredited university or college. Although applications will be reviewed holistically, in general, entering students have earned a 3.0 undergraduate grade point average (on a 4.0
scale), and a combined verbal and quantitative score of at least 1100 (old scale) or 156 Verbal and 146 Quantitative (new scale) on the Graduate Records Examination (GRE). Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant’s background, education, and professional objectives.

**Prerequisites**

While there are no specific course prerequisites, entering students will benefit from exposure to undergraduate courses in the economics, political sciences, sociology, college algebra, statistics, public policy, and research design.

**Grading Policy**

In order to qualify for graduation, students must maintain a minimum 3.0 grade point average in their degree program’s core courses plus an aggregate grade point average of 3.0 for all graduate courses taken in the student’s degree program at U.T. Dallas.

**Degree Requirements**

Students seeking a Masters in Public Policy must complete at least 36 semester credit hours of graduate coursework in the program. The program has three components:

1. Twenty-one semester hours of required coursework
2. Nine semester hours of prescribed electives
3. Six hours of free electives

Students must maintain at least a 3.0 (B) grade point average to graduate.

**I. Required Core Courses**
1. Policymaking and Institutions (6 hours)

**POEC 6347 or PSCI 6347 Proseminar in Political Institutions and American Politics**

**POEC 6329 Ethics, Culture, and Public Policy**


Methods Core (Algebra-based or Calculus based)

Algebra-based series

EPPS 6313 Introduction to Quantitative Methods

EPPS 6316 Applied Regression

Or

Calculus based series

EPPS 7313 Descriptive and Inferential Statistics

EPPS 7316 Regression and Multivariate Analysis

Select one of the following:
EPPS 6310 Research Design I
EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences

3. Economics (Three hours)

POEC 6321 Economics for Public Policy
Or
POEC 7327 Innovation Dynamics and Economic Change

4. A POEC Policy Research Workshop or internship or substitution as approved by the Program Head. (3 hours)

II. Prescribed Electives

Students complete nine hours in ONE of the following areas of concentration. All courses must be approved by the Program Head.

A. Social Policy
B. Security Studies
C. Geographic Information Systems (GIS)
D. Analytic Methods
Other concentration proposed by the student and approved by the Director, Head.

Students should consult the graduate catalog, and the Program Head, for additional information regarding those courses that would best satisfy the “Prescribed Electives” requirement.

III. Free Electives

Students may select six hours of 6000 level or higher courses. Students may choose courses that are not selected under “Core Courses” to fulfill this requirement and may choose courses outside the School of Economic, Political and Policy Sciences.
Certificate Programs

The School of Economic, Political and Policy Sciences offers seven graduate certificate programs for both degree and non-degree seeking students. Certificate programs are a valuable component of the School’s educational mission and can be an important resource for both mid-career professionals and others seeking to advance their knowledge and expertise. The Certificates are offered in: City Planning, Economic and Demographic Data Analysis, Evaluation Research, Geographic Information Systems (GIS), Local Government Management, Nonprofit Management, and Remote Sensing.

Graduate Certificate in City Planning (15 hours)

The Graduate Certificate in City Planning is a 15 credit hour Master’s level certificate. The 15 hours earned in the Certificate program will count toward the Master of Public Affairs (MPA) degree if the student decides to pursue the MPA. The academic focus of the proposed certificate is the basic elements of the body of knowledge of the field of city planning. These elements include the theory and legal elements of planning, developing and implementing plans, land use management, land use law and regulation, and functional topics such as transportation and housing.

The Dallas/Ft. Worth metroplex is the fourth largest metropolitan area in the United States. The scope and growth of this urban area create many demands for professionals whose role is to plan for and manage this urban complex. The U.S. Bureau of Labor Statistics (BLS) expects the profession of city planning to grow by between 9%-14% by the year 2014. The BLS further notes that, "Most new jobs for urban and regional planners will be in local government, as planners will be needed to address an array of problems associated with population growth, especially in affluent, rapidly expanding communities. For example, new housing developments require roads, sewer systems, fire stations, schools, libraries and recreation facilities that must be planned for in the midst of a consideration of budgetary constraints."
The Certificate is intended for professionals already working in city planning in the public sector, those employed in private for-profit or governmental settings who work with planning and development projects, and students without professional experience who seek to prepare themselves for careers in city planning or local government.

The 15 hours of course offerings noted below incorporate the essential knowledge base of city planning. Students may petition the program coordinator to include other graduate courses offered by the School of Economic, Political and Policy Sciences as guided electives; however, courses from other institutions may not be applied to the required 15 semester credit hours.

PA 6324: Community Planning
PA 6330: Basics of Land Development
PA 6327: Land Use Law and Ethics
PA 6354: Transportation Planning

**GISC 6381: Geographic Information Systems Fundamentals**

or **SOC 6341: Urban Economics**

or PA 6342: Local Economic Development

### Graduate Certificate in Economic and Demographic Data Analysis (15 hours)

The Certificate in Economic and Demographic Data Analysis may be acquired by graduate degree-seeking and non-degree-seeking students. For the certificate, students must complete 15 graduate hours (5 courses). Students are required to take (A) EPPS 7313 Descriptive and Inferential Statistics and EPPS 7316 Regression and Multivariate Analysis. (B) Students must choose at least one of the following courses: ECON 6306 Applied Econometrics or EPPS 7318 Structural Equation and Multilevel or
EPPS 7344 Categorical and Limited Dependent Variables. (C) In addition, two other empirically oriented courses must be completed. Students should check with the Director of the Certificate Program or the program office for details as to the list of acceptable courses.

Students seeking the certificate who do not plan to seek a degree should (1) submit an application and (2) an undergraduate transcript. No GRE score is required. Note: (a) up to 15 hours of coursework taken as a non-degree seeking student can be applied later to a graduate degree (b) currently enrolled students may use up to 9 hours of courses required for their degree for the certificate. Non-degree seeking students interested in continuing their graduate education must formally apply to the university and their program of interest to be considered for admission.

**Graduate Certificate in Evaluation Research (15 hours)**

A graduate-level certificate program in Evaluation Research is offered jointly by the Schools of Economic, Political and Policy Sciences and Behavioral and Brain Sciences. Students who complete this program will have an opportunity to gain competencies in the design and implementation of program evaluations in fields such as education, health care, human services, criminal justice, and economic development. The Certificate in Evaluation Research program may be incorporated into graduate degree programs in the Schools of Economic, Political and Policy Sciences or Behavioral and Brain Sciences, or may be taken on its own by non-degree seeking students. Students in the Evaluation Research certificate program are normally expected to have completed undergraduate courses in social statistics and research design; students lacking appropriate preparation may be asked to take needed courses prior to admission to the program.

In order to receive the certificate, students must successfully complete three required courses and a two-semester long evaluation research project that culminates in a final report. The courses in the School of Economic, Political and Policy Sciences leading to the Certificate in Evaluation Research are EPPS 7313 Descriptive and Inferential Statistics, EPPS 6352 Evaluation Research Methods in the Economic, Political and Policy Sciences.
Policy Sciences, an elective course approved by the Evaluation Research certificate program coordinator, and POEC 6V91 Evaluation Research (six credit hours) for a total of 15 semester credit hours. With permission of the Evaluation Research program coordinator, students may substitute appropriate courses from the School of Behavioral and Brain Sciences or prior coursework taken at other institutions. This is discussed in the Behavioral and Brain Sciences section of the catalog.

Students interested in applying for admission to the Certificate in Evaluation Research program should consult the graduate advising office in the School of Economic, Political and Policy Sciences or the School of Behavioral and Brain Sciences.

**Graduate Certificate in Geographic Information Systems (GIS) (15 hours)**

The School of Economic, Political and Policy Sciences offers a certificate in Geographic Information Systems for both novice and experienced GIScience professionals. The certificate is available to both graduate degree-seeking and non-degree-seeking students. The certificate requires 15 graduate hours (5 classes).

Students seeking the GIS certificate must have completed an undergraduate degree in some area relevant to GIS. Primary admissions requirements are: (1) an application to U.T. Dallas, and (2) an undergraduate transcript. Applicants for the certificate program do not need a GRE (Graduate Record Examination) score. They should apply as "non-degree-seeking" students to the Geospatial Information Sciences program. Admissions requirements are the same for students who would simply like to take one or more of the related courses without pursuing certification.

The Graduate Certificate in Geographic Information Science requires the following three courses. Students must earn an average grade point average (GPA) of 3.0 across these classes.

GISC 6381 Geographic Information Systems Fundamentals
GISC 6382 Applied Geographic Information Systems

GISC 6387 Geographic Information Systems Workshop

In addition, students must take two courses from the following list:

- GISC 6301 GIS Data Analysis Fundamentals
- GISC 6317 Computer Programming for GIS
- GISC 6325 (GEOS 5325) Remote Sensing Fundamentals
- GISC 6383 Geographic Information Systems Management and Implementation
- GISC 6384 Spatial Analysis and Modeling
- GISC 6388 GIS Application Software Development
- GISC 7310 Regression Analysis with GIS Applications
- GISC 7360 GIS Pattern Analysis
- GISC 7361 Spatial Statistics
- GISC 7363 Internet Mapping and Information Processing
- GISC 7365 (GEOS 5326) Remote Sensing Digital Image Processing
- GISC 7366 Applied Remote Sensing
- GEOS 5322 GPS (Global Positioning System) Satellite Surveying Techniques
- GEOS 5324 3D Data Capture and Ground Lidar

Other courses in Geosciences, Computer Science, Management, or Economic, Political and Policy Sciences may be applied to the certificate at the discretion of the Director of the Certificate Program. All courses applied
to the Certificate must have been taken within the three year period prior to the award of the Certificate. No more than two courses can be transferred from another institution.

**Graduate Certificate in Geospatial Intelligence (Geoint) (15 hours)**

Geospatial Intelligence (GEOINT) is a rapidly evolving field that demands certain technical skill sets, the ability for individual rapid critical thinking and a global awareness of supporting information for national security and other intelligence activities. This certificate program produces graduates that have met the requirements for such professionals set forth by the United States Geospatial Intelligence Foundation (USGIF).

Classes are offered through the state of the art facilities housed within the Geospatial Information Sciences program in the school of Economic, Political and Policy Sciences. The certification requires 15 graduate hours (5 classes) detailed below. All courses taken as part of this certificate also count toward the Master of Science in Geospatial Information Sciences degree, and can be taken in conjunction with the Graduate Certificate in Geographic Information Systems and the Graduate Certificate in Remote Sensing.

**Mission Statement**

The mission of the Graduate Certificate in Geospatial Intelligence is to provide students with a broad set of skills in the areas of geographic information systems, remote sensing, geospatial statistical analysis, intelligence gathering and global positioning systems. Courses will emphasize these skills along with the ability to find and interpret data, conduct accurate analysis, work in a professional and collaborative environment and communicate effectively. UTD geospatial intelligence certificate graduates will have demonstrated to the intelligence community that they have acquired the basic skills needed for employment in this high growth industry.
Admission Requirements

Students seeking the Geospatial Intelligence certificate must have completed an undergraduate degree and should apply to the graduate school as "non-degree seeking" students. Admissions paperwork requires only:

- an application to UTD Graduate School
- an undergraduate transcript
- a narrative/personal statement, approximately one page in length, outlining the applicant's background and educational and professional objectives

You may complete and submit an application for admission online. You should apply as a "non-degree" student to the MGIS program. You do not need a GRE (graduate record examination) score or letters of reference for admission to the certification program.

Although applicants are not required to submit GRE scores, TOEFL scores (for International Students), or 3 letters of recommendation, but doing so will strengthen their chances of being accepted. Competence in microcomputer use and familiarity with MS Windows and file management (directories, copying, etc.) is expected. Up to 15 hours of course work taken in the certificate program can be applied later to a graduate degree should you desire to pursue such a degree.

Registration by Current UTD Students

Graduate students in any degree program within UT Dallas may register for GISC courses using standard registration procedures. Undergraduate
students eligible for the Fast Track program may also enroll. See your program adviser regarding degree-plan credit assignment. Courses are listed under geospatial information sciences (GISC) in the UTD Class Schedule, with additional offerings under Geosciences (GEOS) and Political Economy (POEC).

**Required Courses**

Five courses are required to earn the certificate:

- **GISC 6301** GIS Data Analysis Fundamentals
- **GISC 6381** Geographic Information Systems Fundamentals
- **GISC 7365** Remote Sensing Digital Image Processing
- **GISC 6387** Geographic Information Systems Workshop

**One Topics (elective) Courses** chosen from the following, or as approved by the geospatial intelligence certificate director:

School of Economic, Political and Policy Sciences

- **GISC 7310** Regression Analysis with GIS Applications
- **GISC 6317** Computer Programming for GIS
- **GISC 6325** Remote Sensing Fundamentals
- **GISC 6383** Geographic Information Systems
- **Management and Implementation**
- **GISC 6384** Spatial Analysis and Modeling
- **GISC 6385** GIS Theories, Models and Issues
- **GISC 6388** GIS Application Software Development
- **GISC 6388** GIS Application Development
- **GISC 7360** GIS Pattern Analysis
GISC 7361 Spatial Statistics
GISC 7363 Internet Mapping and Information Processing
GISC 7366 Applied Remote Sensing
GISC 7387 GIS Research Design

School of Natural Sciences and Mathematics (Geosciences)
GEOS 5322 GPS (Global Positioning System) Satellite Surveying Techniques
GEOS 5324 3D Data Capture and Ground Lidar
GEOS 5325 Introduction to Remote Sensing
GEOS 5329 Applied Remote Sensing
GEOS 5326 Remote Sensing Digital Image Processing

Naveen Jindal School of Management (MIS)
MIS 6326 Database Management
MIS 6308 Systems Analysis and Project Management
MIS 6324 Business Intelligence Software and Techniques
MIS 6360 Software Project Management

Individuals experienced with GIS may have the introductory course (GISC 6381) waived at the discretion of the Certificate Director, but must take an additional course from the topics courses listed above. No more than two courses may be transferred from another institution. Courses for the Certificate must be completed within a 3-year period with a minimum cumulative GPA of 3.0.

**Graduate Certificate in Homeland Security (to be removed, confirmed by email, 2-15-13)**

**Graduate Certificate in Local Government Management**
The School of Economic, Political and Policy Sciences offers a Graduate Certificate in Local Government Management for local government professionals and for MPA students who desire to broaden their knowledge of important issues and approaches employed by professional local public administrators. Local governments in the United States play an important role in our democratic system. They are the place in our democratic system where citizens have the most direct contact with elected and appointed officials on numerous issues.

Local government managers operate in a complex legal and political environment. They are responsible for the provision of varied services directly to citizens, such as land use planning, law enforcement, water and sewer services, and recreation. Both the method and quality of service delivery are greatly influenced by managers who are hired by elected officials. The management of cities and counties has become increasingly professional over the past several decades. How the professional staff delivers services to the public within the political environment in which it works is the topic of many of the courses in this program.

Requirements for admission to the certificate program are the same as for a non-degree seeking graduate student. Completion of fifteen (15) semester credit hours is required to attain the Graduate Certificate in Local Government Management and those hours may count toward a degree if the student completes all requirements for full admission as a graduate student. Required courses in the certificate program are PA 6345 Human Resources Management, PA 6321 Government Financial Management and Budgeting, and PA 6344 State/Local Government Management. The other two courses may be selected from among courses that pertain to local government offered in the graduate programs of the School of Economic, Political and Policy Sciences. Permission of the certificate coordinator must be obtained for the two elective courses.

Graduate Certificate in Nonprofit Management (15 hours)

Non-profit organizations constitute an increasingly significant sector of the
American economy as well as an essential element in American civic life. Non-profits are found in such diverse fields as health care, education, human services, and criminal justice, as well as in cultural and civic activities. Faced with resource constraints and rising demands for accountability, non-profit organizations require professional managers with an understanding of both administrative principles and techniques and of the distinctive legal, economic, and social environment within which non-profits operate.

The Certificate in Non-profit Management is designed to provide an overview of the nature and context of non-profit organizations combined with skill-based courses to develop the competencies needed by non-profit managers. The Certificate is intended for professionals already working in the non-profit sector, those working in private for-profit or governmental settings who would like to work or volunteer in the non-profit sector, and students without professional experience who seek to prepare themselves for non-profit careers.

Completion of fifteen (15) semester credit hours are required to attain the Certificate in Non-profit Management. Requirements include three core courses and two guided electives from the list below. Students may petition the program coordinator to include other graduate courses offered by the School of Economic, Political and Policy Sciences as guided electives. Courses from other institutions may not be applied to the required fifteen semester credit hours.

- **Core Courses – Nine (9) Hours**

  - PA 6316: Leadership in Public and Non-profit Organizations
  - PA 6380: Non-profit Organizations
  - PA 6382: Non-profit Management

- **Guided Electives – Six (6) Hours from the following:**

  - [List of guided electives]
Graduate Certificate in Remote Sensing

The Remote Sensing Certificate is administered jointly by the School of Economic, Political and Policy Sciences and the Department of Geosciences. The American Society for Photogrammetry and Remote Sensing (1997) defines remote sensing as the art, science, and technology of obtaining reliable information about physical objects and the environment through the process of recording, measuring and interpreting imagery and digital representations of energy patterns derived from non-contact sensor systems. Remote sensing involves a powerful set of computerized software and hardware, and sophisticated mathematical, statistical and logical techniques for extraction and presentation of information acquired via non-contact sensors. It provides reliable and cost-effective means of studying the Earth’s surface for urban planning, natural resources management and protection, and a wide variety of other fields. Government and non-government organizations continuously seek qualified professionals to use remote sensing for a wide range of applications.

Students seeking the Remote Sensing Certificate must have completed an undergraduate degree in some relevant area. Primary admissions requirements are: (1) an application to U.T. Dallas, and (2) an undergraduate transcript. Applicants for the certificate program do not need a GRE (Graduate Record Examination) score. They should apply as "non-degree-seeking" students to the Geospatial Information Sciences program. Admissions requirements are the same for students who would
simply like to take one or more of the related courses without pursuing certification.

The Graduate Certificate in Remote Sensing requires 15 credits earned through the following courses:

- **GISC 6325 (GEOS 5325)** Remote Sensing Fundamentals
- **GISC 6381** Geographic Information Systems Fundamentals
- **GISC 7365 (GEOS 5326)** Remote Sensing Digital Image Processing
- **GISC 7366** Applied Remote Sensing
- **GISC 7367 (GEOS 7327)** Remote Sensing Workshop
ERIK JONSSON SCHOOL OF ENGINEERING & COMPUTER SCIENCE

Advances in technology are causing some of the most dramatic changes in the history of civilization. With a mandate from the State of Texas, Texas Instruments and industry, the Jonsson School is emerging as a national leader in the technological revolution.

The achievements of the Erik Jonsson School in its short 25-year history include:

- SAT scores of freshmen that are the highest of any public university in Texas.
- The School is the third most highly ranked public engineering school in Texas, according to US News & World Report.
- The School is the fifth highest producer of women graduates in Computer Science in the U.S. and the sixth highest producer of women graduates in Electrical Engineering, according to the American Society for Engineering Education (ASEE).
- The School is among the top five producers of computer science graduates in the U.S. and among the top ten producers of Electrical Engineering graduates, according to ASEE.
- The School is home to some of the world’s top faculty in several fields.
- The School established the nation’s first accredited telecommunications engineering program.

With 900 high tech companies nearby, the Jonsson School's location
means that students and industry benefit from cutting edge research and development, top-notch internships and cooperative education programs and highly qualified employees. These are just a few benefits of a strong alliance between industry and academe.

At The University of Texas at Dallas, the strong tie that binds the University to corporations was present even at UTD’s inception. Some 44 years ago, the founders of Texas Instruments (TI) offered their private research and development institution to the State of Texas to become part of the University of Texas System. Sixteen years later, the Texas Higher Education Coordinating Board authorized UTD’s Erik Jonsson School of Engineering & Computer Science to prepare students to tackle the rapidly changing world of technology and communications.

A strategic collaboration between UTD, Texas Instruments, and the State of Texas is helping to ensure that the Erik Jonsson School will be recognized as one of the nation’s elite engineering school. This $300 million investment features construction of a 200,000 sq. ft. research building, the addition of 40 faculty members, recruitment of 400 full-time graduate research students, and the formation of new degree programs. Focusing strong interest in the investment, TI built a $3 billion semiconductor chip manufacturing facility near the university if the State of Texas allocated $50 million for research at UTD. The investment includes a commitment from UTD to raise $100 million from public and private sources.

UTD and the Jonsson School have maintained close ties with TI, but as enrollment and programs have grown, so have strong relationships with other corporations such as Alcatel, Nortel, Ericsson, Nokia, Verizon, Lucent, Zyvex, Raytheon, EDS, SBC Communications, Tri-Quint Semiconductor, Cisco Systems, Lockheed Martin, Intervoice, and many others. Industry leaders have joined with UTD and the Jonsson School to conduct research, share resources, enhance educational opportunities, and develop new technologies.
The Jonsson School is organized into six departments: Bioengineering, Computer Science, Electrical Engineering, Materials Science and Engineering, Mechanical Engineering, and Systems Engineering.

The Computer Science Department was created in 1975 and became a part of the Jonsson School in 1986. Today UTD boasts one of the largest computer science departments in the country, with a talented student body numbering more than 1,500, taught by an internationally recognized group of 46 tenured/tenure-track faculty and 13 experienced senior lecturers. The UTD Department of Computer Science is committed to excellence in three areas: providing the highest quality instruction to undergraduate and graduate students; conducting leading edge research in computer science and engineering; and providing leadership and services to professional communities. The graduate curriculum focuses on preparing students to perform fundamental and development research. Courses and research are offered in a variety of sub-fields of computer science.

The Electrical Engineering Department was founded in 1988 and graduated its first MS student in 1989. It has grown to become the third largest EE program in the State, graduating 364 students in academic year 2011–2012, and out-producing such well-known schools as the University of Colorado, Iowa State, Michigan State, and the University of Oklahoma. UTD’s Electrical Engineering Program provides high quality education and internationally competitive research to the Dallas-Fort Worth Metroplex and Texas, focusing its efforts on areas of greatest need to North Texas industry. The department features 49 tenured/tenure-track faculty members supported by 8 senior lecturers. The program specializes in the following areas: Communications and Signal Processing, Digital Systems, Microelectronic Circuits and Systems, Optical and Photonic devices, Materials and Systems, and Solid-State Devices and Circuits.

The Department of Materials Science and Engineering, created in 2006
and authorized to offer Ph.D. and Master’s degrees, already has fifteen tenure-system faculty members and world-class experimental facilities.

The rapidly growing Department of Mechanical Engineering, organized in 2008, offers Bachelor’s and Master’s degrees and, jointly with the University of Texas at Arlington, the Ph.D. degree.

The Department of Bioengineering was organized in 2010 and is authorized to offer Bachelor’s, Master’s and Ph.D. degrees in Biomedical Engineering.

The newest department in the School, Systems Engineering, offers the degree of Master of Science in Systems Engineering and Management jointly with the Naveen Jindal School of Management

**DEGREES OFFERED**

**Biomedical Engineering:** Master of Science (33 hours minimum) and Doctor of Philosophy (75 hours beyond the baccalaureate degree).

**Computer Engineering:** Master of Science (33 hours minimum and Doctor of Philosophy (75 hours beyond the baccalaureate degree).

**Computer Science:** Master of Science (33 hours minimum) and Doctor of Philosophy (75 hours beyond the baccalaureate degree).

**Electrical Engineering:** Master of Science (33 hours minimum) and Doctor of Philosophy (75 hours beyond the baccalaureate degree).

**Materials Science and Engineering:** Master of Science (33 hours minimum) and Doctor of Philosophy (75 hours beyond the baccalaureate degree).
Mechanical Engineering: Master of Science (33 hours minimum) and Doctor of Philosophy (78 minimum hours beyond the baccalaureate degree).

Systems Engineering and Management: Master of Science (33 hours minimum)

Software Engineering: Master of Science in Computer Science - Software Engineering (33 hours minimum) and Doctor of Philosophy in Software Engineering (75 hours beyond the baccalaureate degree).

Telecommunications Engineering: Master of Science (33 hours minimum) and Doctor of Philosophy (75 hours beyond the baccalaureate degree).
Department of Biomedical Engineering

http://be.utdallas.edu/

Faculty

Professors: Orlando Auciello, Stephen D. Levene, Mathukumalli Vidyasagar

Associate Professor: Shalini Prasad

Assistant Professors: Leonidas Bleris, Lan Ma, Hyun-Joo Nam, Danieli Rodrigues, Hyuntae Yoo

Affiliated Faculty: Dinesh Bhatia (Electrical Engineering), Jinming Gao (UT Southwestern), Michael Kilgard (Brain and Behavioral Science), Duncan MacFarlane (Electrical Engineering), Raimund Ober (Electrical Engineering), Issa Panahi (Electrical Engineering), Balakrishnan Prabhakaran (Electrical Engineering), Robert Rennaker (Brain and Behavioral Science), A. Dean Sherry (Chemistry), Walter Voit (Mechanical Engineering), Zhenyu Xuan (Molecular and Cell Biology) and Michael Q. Zhang (Molecular and Cell Biology)

Objectives

The M.S. and Ph.D. programs in Biomedical Engineering at UT Dallas are offered as a part of a unique tri-campus program, encompassing UT Southwestern Medical Center and UT Arlington. The objective of the Ph.D. Program in Biomedical Engineering (BME) is to train the next generation of leaders in the field through high-quality original research work, supplemented as appropriate by a broad range of interdisciplinary courses.
The new generation of biomedical engineers will address fundamental scientific questions, provide answers to critical problems and develop novel applications with commercial potential. The opportunities for interdisciplinary research and course work in several branches of engineering, coupled with the life sciences, will prepare the graduates of this program to tackle complex life sciences-related problems in novel ways and to create vital solutions for the future.

The objective of the M.S. degree program in Biomedical Engineering is to generate BME graduates who will be capable of undertaking challenging BME-related projects. The primary educational objective of the M.S. program is to expose students to the latest developments in biomedicine and to provide them with the appropriate tools to understand and contribute further to these developments. The M.S. degree program will provide the necessary education and immediately applicable skills that will enable both recent baccalaureate graduates and experienced biomedical engineers to develop new life science related technologies and applications.

Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive wet lab, fabrication, instrumentation and high performance computing facilities to foster biomedical engineering and nano-technology research. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research. In addition to the facilities on campus, students in this program will also have an opportunity to work closely with researchers in the UT Southwestern Medical Center and UT Arlington.

Master of Science in Biomedical Engineering  (33 hours minimum)

Admission Requirements
The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in Biomedical Engineering (BME) must complete these prerequisites or receive approval from the graduate advisor and the course instructor.

The student entering the M.S. BME program should meet the following guidelines:

- Undergraduate preparation equivalent to a baccalaureate in a field of engineering or the sciences
- A grade-point average in upper-division quantitative course work of 3.25 or better on a 4-point scale, and
- GRE scores from exams prior to August 2011 of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program. (See also UTD requirements for English proficiency.)

Applicants must submit three letters of recommendation, from individuals who are able to judge the candidate’s probability of success in pursuing a program of study leading to the master’s degree. Applicants must also submit an essay or “Statement of Purpose”, outlining the candidate’s background, education and professional goals.

**Degree Requirements**

The University’s general degree requirements are discussed here.

The M.S. BME requires the completion of a minimum of 33 semester hours.

For the M.S. BME program, all students must:
1) Pass at least 2 of the following three core courses with a grade of B- or better:

BMEN 6373 Anatomy and Human Physiology for Engineers,
BMEN 6374 (EEBM 6374) Genes, Proteins and Cell Biology for Engineers,
and BMEN 6375 Techniques in Cell and Molecular Biology

2) Pass at least 2 of the following four core courses with a grade of B- or better:

BMEN 6351 Biomedical Microdevices,
BMEN 6385 Biomedical Signals and Systems,
BMEN 6386 Biological Processes: Modeling and Simulation,
and BMEN 6387 Applied Bioinformatics

3) Complete a minimum of 9 credit hours from the recommended electives. The remaining credits can be selected from 6000-level courses offered by the Erik Jonsson School, or the Biology Department, or by UTSW and UTA.

The M.S. BME program has both a thesis and a non-thesis option. All part-time M.S. BME students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor. Research and thesis hours cannot be counted in an M.S. BME degree plan unless a thesis is written and successfully defended.

Students must achieve an overall GPA of 3.0 or better, a GPA of 3.0 or better in their core M.S. BME classes, and a grade of B- or better in all their core M.S. BME classes in order to satisfy their degree requirements.

All full-time, supported students are required to participate in the thesis option. All students must have an academic advisor and an approved
Doctor of Philosophy in Biomedical Engineering
(75 hours minimum beyond the baccalaureate degree)

Admission Requirements

The University’s general admission requirements are discussed here.

The Ph.D. in Biomedical Engineering is awarded primarily to acknowledge the student’s success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Biomedical Engineering Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

The following are guidelines for admission to the Ph.D. program in Biomedical Engineering:

- A master’s degree in engineering or one of the natural sciences from an accredited U.S. institution, or from an acceptable foreign university. However, consideration will be given to highly qualified students who wish to pursue the doctorate without satisfying all of the requirements for a master’s degree.

- A grade point average in graduate course work of 3.5 or better on a 4-point scale.

- GRE scores from exams prior to August 2011 of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively OR are advisable based on our experience with student success in the program. (See also UTD requirements for English proficiency.)

Applicants must submit three letters of recommendation, either on official
school or business letterhead or using the UTD Letter of Recommendation Form. Individuals who should provide recommendation letters are persons familiar with the student’s record, who are able to judge the candidate’s probability of success in pursuing doctoral study in biomedical engineering.

Applicants must also submit a narrative, describing motivation for doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students.

All students must have an academic advisor and an approved plan of study.

**Degree Requirements**

The University’s general degree requirements are discussed [here](#).

Each program for doctoral study is individually tailored to the student’s background and research objectives by the student’s supervisory committee. The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 27 semester hours of graduate level courses beyond the baccalaureate level. All PhD students must demonstrate competence in the Master’s level core courses in their research area. All students must have an academic advisor and an approved plan of study. Qualified students may request waivers on core courses from their supervisory committee.

Also required are:

- Written qualifying exams (QE), covering both BIOLOGY CORE and ENGINEERING CORE topics, as well as a research-oriented oral QE...
presentation. Both the written and oral exams should demonstrate competence in the Ph.D. candidate’s research area. A student must make an oral presentation based on a review of 2 to 4 papers, followed by a question-answer session. A student entering the Ph.D. program with an M.S. BME must pass this exam within 3 long semesters, and a student entering without an M.S. BME must pass this exam within 4 long semesters. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.

A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate’s supervising committee.

Completion of a major research project culminating in a dissertation, demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student’s supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student’s degree program.
Graduate Program in Computer Engineering

http://www.ce.utdallas.edu

Faculty


Associate Professors: Jorge A. Cobb, Yiorgos Makris, Hlaing Minn, Neeraj Mittal, Ivor P. Page, Issa Panahi, Yuke Wang, Weili Wu

Assistant Professors: Roozbeh Jafari

Senior Lecturers: Nathan Dodge, Greg Ozbirn

Objectives

The M.S. and Ph.D. degrees in Computer Engineering emerged as a bridge between the increasingly overlapping disciplines of Computer Science and Electrical Engineering. The M.S.C.E. degree program provides intensive preparation for engineers who seek knowledge and skills necessary for the design of complex systems comprised of both hardware and software components. It has a heavy emphasis on the design of high speed and complex hardware and highly reliable and time critical software systems.
Computer Engineering at UTD is a broadly based engineering discipline dealing with the sensing, processing, and transmission of information by making extensive use of electrical engineering and computer science principles. The CE program at UTD also encourages students and faculty to develop synergies with disciplines outside of engineering, such as medicine and the life sciences. CE faculty members are actively involved in advanced research and teaching in all major areas of computer engineering. The Erik Jonsson School is home to several research centers, and promotes graduate and undergraduate curriculum innovation. It is the driving force behind computer engineering’s rapid success and growth. The Erik Jonsson School has a large infrastructure of computing and other laboratory resources. The M.S.C.E. degree program provides intensive preparation for engineers who seek knowledge and skills necessary for the design of complex systems comprised of both hardware and software components. It has a heavy emphasis on the design of high speed and complex hardware and highly reliable and time critical software systems. It is designed to serve the needs of engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

**Facilities**

The Erik Jonsson School of Engineering and Computer Science has developed a state-of-the-art computational facility consisting of a network of Sun servers and Sun Engineering Workstations. All systems are connected via an extensive fiber-optic Ethernet and, through the Texas Higher Education Network, have direct access to most major national and international networks. In addition, many personal computers are available for student use.

The Engineering and Computer Science Building provides extensive facilities for research in electrical engineering, telecommunications, and computer science and engineering.

The Center for Integrated Circuits and Systems (CICS) promotes education and research in the following areas: digital, analog and mixed-
signal integrated circuit design and test; multimedia, DSP and telecom
circuits and systems; rapid-prototyping; computer architecture and CAD
algorithms. There are several laboratories affiliated with this center. These
laboratories are equipped with a network of workstations, personal
computers, FPGA development systems, prototyping equipment, and a
wide spectrum of state-of-the-art commercial and academic design tools to
support graduate research in circuits and systems.

The Center for Systems, Communications, and Signal Processing, with
the purpose of promoting research and education in general
communications, signal processing, control systems, medical and
biological systems, circuits and systems and related software, is located in
the Erik Jonsson School.

In the Digital Signal Processing Laboratory several multi-CPU
workstations are available in a network configuration for simulation
experiments. Hardware development facilities for real time experimental
systems are available and include microphone arrays, active noise
controllers, speech compressors and echo cancellers. The Distributed
Computing Laboratory has a network of personal computers running Linux
to support network simulation using discrete-event simulation packages.
The Hardware/Software Co-design Laboratory has many workstations and
PCs with DSP modules to support the experiments for various
implementations in DSP and communications.

In addition to the facilities on campus, cooperative arrangements have
been established with many local industries to make their facilities
available to U.T. Dallas graduate engineering students.

**Master of Science in Computer Engineering**
**(M.S.C.E.) (33 hours minimum)**

**Admission Requirements**

The University’s general admission requirements are discussed [here](#).
A student lacking undergraduate prerequisites for graduate courses in electrical engineering and computer science must complete these prerequisites or receive approval from the graduate advisor and the course instructor. A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.C.E. program should meet the following guidelines:

An undergraduate preparation equivalent to a baccalaureate in computer science or electrical engineering from an accredited engineering program.

A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale.

GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals able to judge the candidate’s probability of success in pursuing master’s study. Applicants must also submit an essay outlining the candidate’s background, education and professional goals.

Students from other engineering disciplines or from other science and math areas may be considered for admission to the program on a case-by-case basis; however, some additional course work may be necessary before starting the master’s program.

**Degree Requirements**

The University’s general degree requirements are discussed here.

The M.S.C.E. requires a minimum of 33 semester hours.
All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S.C.E. degree.

The M.S.C.E. program has both a thesis and a non-thesis option. All part-time M.S.C.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester hours of research, a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student’s thesis advisor prior to enrolling for thesis credit. Each student must take at least 2 courses selected from Group 1 and at least 2 courses selected from Group 2:

Group 1:

CE 6302 Microprocessor Systems
CE 6304 Computer Architecture
CE 6325 VLSI Design

Group 2:

CE 6363 Design and Analysis of Computer Algorithms
CE 6378 Advanced Operating Systems
CE 6390 Advanced Computer Networks
Approved electives must be taken to make a total of 33 hours. These courses must be at 6000 level or higher from computer engineering, electrical engineering, computer science and telecommunications engineering curricula with the approval of the advisor. It is highly recommended that two of these electives be chosen from the following list:

CE 6303 Testing and Testable Design
CE 6305 Computer Arithmetic
CE 6308 Real-Time Systems
CE 6352 Performance of Computer Systems and Networks
CS 6353 Compiler Construction
CE 6370 Design and Analysis of Reconfigurable Systems
CE 6375 Design Automation of VLSI Systems
CE 6380 Distributed Computing
CE 6397 Synthesis and Optimization of High-Performance Systems
CE 6398 DSP Architectures

Students must achieve an overall GPA of 3.0 or higher, a GPA of 3.0 or higher in their core MSCE classes, and a grade of B- or higher in all their core MSCE classes in order to satisfy their degree requirements.

Doctor of Philosophy in Computer Engineering
(75 hours minimum beyond the baccalaureate degree)

Objectives

The Ph.D. in Computer Engineering is awarded primarily to acknowledge the student’s success in an original research project, the description of which is a significant contribution to the literature of the discipline.
Applicants for the doctoral program are therefore selected by the Computer Engineering Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

**Admission Requirements**

The University’s general admission requirements are discussed [here](#).

The admission requirements will be basically the same as the existing ones for admission to the Ph.D. programs in Electrical Engineering and Computer Science. The entrance requirements are:

A master’s degree in Computer Engineering or a closely associated discipline such as Electrical Engineering or Computer Science. Consideration will be given to highly qualified students wishing to pursue the doctorate without satisfying all of the requirements for a master’s degree.

- GPA in graduate level course work of 3.5 or higher on a 4-point scale.

- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals able to judge the candidate’s probability of success in pursuing doctoral study. Applicants must also submit an essay outlining the candidate’s background, education and professional goals.

Applicants must also submit a narrative describing their motivation for doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the
program and the degree requirements are the same as for full-time Ph.D. students. All students must have an academic advisor and an approved plan of study.

Degree Requirements

The University’s general degree requirements are discussed here.

The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. The core requirements for the Ph.D. degree in Computer Engineering are the same as the ones for the M.S. in Computer Engineering. All PhD students must demonstrate competence in the Master’s level core courses in their research area. However, a student’s supervising committee may impose course requirements that are necessary and appropriate for the student’s research program. It is expected that M.S degree students planning to enter the proposed doctoral program will take most of the courses as part of their M.S. degree requirements. All students must have an academic advisor and an approved plan of study.

Also required are:

A qualifying examination (QE), as approved by the CE graduate committee, demonstrating competence in the Ph.D. candidate’s research area. A student entering the Ph.D. program with a M.S.C.E. must pass this exam within 3 long semesters, and a student entering without an M.S.C.E. must pass this exam within 4 long semesters. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.

A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate’s supervising committee.

Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The
rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student’s supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student’s degree program.

**Dissertation**

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation advisor willing to guide this dissertation. The student must have a dissertation supervising committee that consists of no less than four members. The dissertation may be in computer engineering exclusively or it may involve considerable work in an area of application.
Department of Computer Science

http://www.utdallas.edu/dept/cs/

Faculty


Assistant Professors: Álvaro Cardenas, Mark Gabel, Vaibhav Gogate, Zhiqiang Lin, Ryan McMahan.

Senior Lecturers: Ebru Cankaya, John Cole, Tim Farage, Shyam Karrah, Pushpa Kumar, Linda Morales, Nhut Nguyen, Greg Ozbirn, Mark Paulk, Miguel Razo Razo, Charles Shields, Jr., Janell Straach, Jey Veerasamy.

Objectives

The Graduate Program in Computer Science provides intensive preparation in the design, programming, theory, and applications of computers. The Department of Computer Science offers courses of study leading to the M.S. in Computer Science, the M.S. in Computer Science - Software Engineering, Ph.D. degree in Computer Science, and the Ph.D. degree in Software Engineering. Training is provided for both academically
oriented students and students with professional goals in the many business, industrial or governmental occupations requiring advanced knowledge of computer theory and technology. Courses and research are offered in a variety of subfields of computer science, including operating systems, computer architecture, computer graphics, pattern recognition, automata theory, combinatorics, artificial intelligence, data & network security, natural language processing, database design, computer networks, programming languages, software systems, analysis of algorithms, computational complexity, software engineering, software testing, software reliability, scheduling, visualization, fault-tolerant computing, parallel processing, telecommunications networks, telecommunications software, performance of systems, VLSI, computational geometry, and design automation.

A comprehensive program of evening courses is offered which enables part-time students to earn the master’s degree or to select individual courses of interest.

**Facilities**

The Department of Computer Science has a large number of PCs, Sun Workstations, and several servers for research use. Laboratories are available for parallel processing, distributed systems, software engineering, high-performance computing, graphics, programming languages and systems, telecommunications, CAD and graph visualization, image understanding and processing, artificial intelligence, data mining, natural language processing, speech processing, and web technologies. The Department of Computer Science has an Internet 2 connection and all major computers on campus are linked by an Ethernet network.

In addition to the Computer Science faculty, there are individuals who are involved in computer related work in many other areas of the university, including the several physical and social sciences and in various areas of business and management. Students majoring in computer science with interest in these important application areas have the opportunity to consult and work with talented faculty from a wide range of disciplines. The
department actively participates in a number of interdisciplinary degree programs which include MS and Ph.D. in Computer Engineering, MS and Ph.D. in Telecommunications Engineering, and Ph.D. in Geospatial Information Sciences.

**Master of Science in Computer Science (33 hours minimum)**

**Admission Requirements**

The University’s general admission requirements are discussed [here](#).

The student entering the Computer Science M.S. program should have an undergraduate preparation equivalent to a baccalaureate in a quantitative science, including calculus and linear algebra. However, special arrangements (requiring more than the minimal number of hours) can be made for students with good undergraduate preparation in other fields. Minimum requirements are:

- Bachelor’s degree which includes 2 semesters of calculus and 1 semester of linear algebra.
- GPA of at least 3.0 (last 60 hours). GPA in quantitative courses of at least 3.3.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students lacking undergraduate preparation in Computer Science must complete the courses listed below. At the discretion of the graduate advisor, a diagnostic exam may be required. The required prerequisite courses common to all Master’s students are:

- CS 5303 Computer Science I
- CS 5330 Computer Science II
CS 5333 Discrete Structures
CS 5343 Algorithm Analysis & Data Structures
CS 5348 Operating Systems Concepts

Substitution of CS 5303, CS 5330 by professional experience will be considered. Additional prerequisite courses required for the various degree plans are:

For the Traditional Computer Science:
CS 5349 Automata Theory
CS 5390 Computer Networks

For the Networks and Telecommunications Track:
CS 3341 Probability and Statistics in Computer Science and Software Engineering
CS 5390 Computer Networks

For the Information Assurance Track:
CS 5390 Computer Networks

For the Major in Software Engineering:
CS 3354 or SE 3354 Software Engineering or CS 5354 (SE 5354) Software Engineering

Degree Requirements
The University’s general degree requirements are discussed here.

The student may choose a thesis plan or a non-thesis plan. The thesis plan requires a minimum of 27 hours of courses, plus completion of an approved thesis (six thesis hours). This thesis is directed by a supervising professor and must be approved by the head of the Department of Computer Science. The non-thesis plan also requires a minimum of 33 hours of courses.

By a judicious planning of courses chosen from the computer science curriculum, supervised and approved by the graduate advisor, students may pursue the M.S. degree in Computer Science while emphasizing specific areas of the discipline. Students may also choose to receive the M.S. degree in Computer Science with a Major in Software Engineering. Because of the rapidly changing nature of the computer science discipline, the specific courses required may change by the time of the student’s admission. A listing of the required courses will be specified by the student’s advisor. Specific degree requirements follow.

**Core Requirements (15 hours)**

Students are required to complete one of the following:

**Traditional Computer Science Track**

- CS 6363 Design and Analysis of Computer Algorithms
- CS 6378 Advanced Operating Systems
- CS 6390 Advanced Computer Networks

Two of the following three courses:

- CS 6353 Compiler Construction
- CS 6360 Database Design
CS 6371 **Advanced Programming Languages**

**Networks and Telecommunications Track**

CS 6352 Performance of Computer Systems and Networks
CS 6363 Design and Analysis of Computer Algorithms
CS 6378 Advanced Operating Systems
CS 6385 Algorithmic Aspects of Telecommunication Networks
CS 6390 Advanced Computer Networks

**Intelligent Systems Track**

CS 6320 Natural Language Processing
CS 6363 Design and Analysis of Computer Algorithms
CS 6364 Artificial Intelligence
CS 6375 Machine Learning

One of the two following courses:

CS 6360 Database Design
CS 6378 Advanced Operating Systems

**Systems Track**
CS 6304 Computer Architecture
CS 6363 Design and Analysis of Computer Algorithms
CS 6378 Advanced Operating Systems
CS 6396 Real-Time Systems

One of the following six courses:
CS 6360 Database Design
CS 6376 Parallel Processing
CS 6380 Distributed Computing
CS 6397 Synthesis and Optimization of High-Performance Systems
CS 6399 Parallel Architectures and Systems

CS 6349 Network Security,

Information Assurance Track
CS 6363 Design and Analysis of Computer Algorithms
CS 6378 Advanced Operating Systems
CS 6324 Information Security

Two of the following four courses:
CS 6301 Special Topics in Computer Science [subtitle: System Security and Malicious Code Analysis]
CS 6348 Data and Applications Security
CS 6349 Network Security
CS 6377 Introduction to Cryptography

One from the following courses:

CS 6390 Advanced Computer Networks
CS 6360 Database Design
CS 6371 Advanced Programming Languages

*(must have completed CS 5349 Automata Theory)*

**Master of Science in Computer Science - Software Engineering (M.S. C. S.)** *(33 minimum hours)*

CS 6361 (SE 6361) Advanced Requirements Engineering
CS 6362 (SE 6362) Advanced Software Architecture and Design
CS 6367 (SE 6367) Software Testing, Validation and Verification
CS 6387 (SE 6387) Advanced Software Engineering Project

One of the following four courses:

CS 6353 Compiler Construction
CS 6360 (SE 6360) Database Design
Students must satisfy the core requirements by either earning a 3.19 minimum grade point average OR by earning a 3.0 minimum grade point average in the five core courses and taking an extra approved elective (beyond the minimum degree requirements of 33 hours) and maintain the required GPA.

**Electives (minimum of 18 hours)**

Five [15 credit hours] 6000/7000/8000 level elective CS courses, or six hours of thesis or project courses plus three elective courses [9 + 6 = 15 credit hours], with approval of a graduate advisor; a minimum grade point average of 3.0 is required. Courses that are prerequisites to the student's core requirements are especially recommended. Approved electives must be taken to make a minimum of 33 hours.

**Note:** For the information assurance track, students must also take six elective courses (three CS electives and three approved information assurance electives), and all electives must be 6000 level or above. A course cannot be used to satisfy both core and elective requirements.

While the Department of Computer Science offers both the Master of Science in Computer Science and the Master of Science in Computer Science – Software Engineering degrees, students are not permitted to pursue both degrees.

**Doctor of Philosophy in Computer Science (75 hours minimum beyond the baccalaureate degree)**

The Department of Computer Science offers Ph.D. degrees in Computer Science and in Software Engineering.

Each degree program is tailored to the student. The student must arrange a course program with the guidance and approval of a faculty member chosen as his/her graduate advisor. Adjustments can be made as the
student’s interests develop and a specific dissertation topic is chosen.

Admission Requirements

The University’s general admission requirements are discussed here.

A student may be admitted under two possible options. The student must have:

- A Master’s degree in computer science or its equivalent, and

- A GPA of at least 3.5 and GRE of at least 1200 (verbal and quantitative) or 1800 (verbal, quantitative, and analytical) is advisable based on our experience with student success in the program; or

- A B.S. in related area that includes two semesters of calculus and linear algebra with

  - GPA of at least 3.5 in the last 60 hours, and

  - A GRE of at least 1300 (verbal and quantitative) is advisable based on our experience with student success in the program.

Degree Requirements

The University’s general degree requirements are discussed here.

Core requirements:

The core requirements for the Ph.D. degree in Computer Science are the same as the ones for the M.S. in Computer Science or the M.S. in Computer Science - Software Engineering; the core requirements for the Ph.D. degree in Software Engineering are the same as those for the M.S. in Computer Science - Software Engineering.

- Pass a qualifying examination.
Pass, with a grade of B or better, courses chosen as follows:

- **CS 6382 Theory of Computation**
- Two CS/SE 7000 and above level courses
- Sufficient CS electives for a total of at least 75 hours beyond the baccalaureate degree. At least 9 hours of organized advanced Computer Science electives must be taken at UT Dallas. The student is encouraged to consult with an advisor in choosing electives.

**Dissertation**

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation advisor willing to guide this dissertation. The student must have a dissertation supervising committee that consists of no less than four members of whom at least three must be from the Computer Science faculty. The dissertation may be in computer science exclusively or it may involve considerable work in an area of application.
Faculty


**Associate Professors:** Gerald O. Burnham, Yun Chiu, Walter Hu, Hoi Lee, Dongsheng Ma, Yiorgos Makris, Hlaing Minn, Issa Panahi, Siavash Pourkamali, Robert Rennaker, M. Saquib, Murat Torlak.

**Assistant Professors:** Bilal Akin, Bhaskar Banerjee, Carlos A. Busso, Nicholas Gans, Rashaunda Henderson, Roozbeh Jafari, Chadwin D. Young.

**Research Professors:** Walter Duncan, Sam Shichijo.

**Research Assistant Professors:** Abhijeet Sangwan, Hynek Boril.

**Senior Lecturers:** Charles P. Bernardin, Peter Blakey, Nathan B. Dodge, Edward J. Esposito, Jung Lee, Randall E. Lehmann, P. K. Rajasekaran, Ricardo E. Saad, Marco Tacca.

**Affiliated Faculty:** Larry P. Ammann (Math Sciences), Leonidas Bleris.
Objectives

The program leading to the M.S.E.E. degree provides intensive preparation for professional practice in a broad spectrum of high-technology areas of electrical engineering. It is designed to serve the needs of engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

The objective of the doctoral program in electrical engineering is to prepare individuals to perform original, leading edge research in the broad areas of communications and signal processing; mixed-signal IC design; digital systems; power electronics; microelectronics and nanoelectronics, optics, optoelectronics; lightwave devices and systems; power electronics and energy systems, and wireless communications. Because of our strong collaborative programs with Dallas-area high-technology companies, special emphasis is placed on preparation for research and development positions in these high-technology industries.

Facilities

The Erik Jonsson School of Engineering and Computer Science has developed a state-of-the-art information infrastructure consisting of a wireless network in all buildings and an extensive fiber-optic and copper Ethernet. Through the Texas Higher Education Network, students and faculty have direct access to most major national and international networks. UT-Dallas has an Internet 2 connection. In addition, many personal computers and UNIX workstations are available for student use.
The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for research in microelectronics, telecommunications, and computer science. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research. The Plasma Applications and Science Laboratories have state-of-the-art facilities for mass spectrometry, microwave interferometry, optical spectroscopy, optical detection, in situ ellipsometry and FTIR spectroscopy. In addition, a modified Gaseous Electronics Conference Reference Reactor has been installed for plasma processing and particulate generation studies. Research in characterization and fabrication of nanoscale materials and devices is performed in the Nanoelectronics Laboratory. The Optical Measurements Laboratory has dual wavelength (visible and near infrared) Gaertner Ellipsometer for optical inspection of material systems, a variety of interferometric configurations, high precision positioning devices, and supporting optical and electrical components. The Optical Communications Laboratory includes attenuators, optical power meters, lasers, APD/p-i-n photodetectors, optical tables, and couplers and is available to support system level research in optical communications. The Photonic Testbed Laboratory supports research in photonics and optical communications with current-generation optical networking test equipment. The Nonlinear Optics Laboratory has a network of Sun workstations for the numerical simulation of optical transmission systems, optical routers and all-optical networks. The Electronic Materials Processing laboratory has extensive facilities for fabricating and characterizing semiconductor and optical devices. The Laser Electronics Laboratory houses graduate research projects centered on the characterization, development and application of ultrafast dye and diode lasers.

The Renewable Energy and Vehicular Technology Laboratory (REVT-Lab) is equipped with various sources of renewable energy such as wind and solar, a micro-grid formed by a network of multi-port power electronic converters, a stationary plug in hybrid vehicle testbed, a stationary DFIG-based wind energy emulator, a series of adjustable speed motor drive technologies including PMSM, SRM and induction motor drives. All of the testbeds are equipped with digital control, state-of-the-art measurement
and protection devices. REVT laboratory is also equipped with a cold plasma chamber for hydrogen harvesting and battery testing facilities. The main focus of the REVT Lab is to improve reliability and security of the power electronic-driven technologies as applied to utility and vehicular industries.

The Texas Analog Center of Excellence (TxACE) at the University of Texas at Dallas (UTD) has the mission of leading the country in analog research and education. TxACE research seeks to create fundamental analog, mixed signal and RF design innovations in integrated circuits and systems that improve energy efficiency, healthcare, and public safety and security. The center is supported by Semiconductor Research Corporation, Texas Emerging Technology Fund, Texas Instruments Inc., the UT system, and UTD. TxACE is the largest analog technology center in the world on the basis of funding and the number of principal investigators. The center funds ~70 directed research projects led by ~65 principal and co-principal investigators from 31 academic institutions including three international institutions.

The Multimedia Communications Laboratory has a dedicated network of PC’s, Linux stations, and multi-processor, high performance workstations for analysis, design and simulation of image and video processing systems. The Signal and Image Processing (SIP) Laboratory has a dedicated network of PC’s equipped with digital camera and signal processing hardware platforms allowing the implementation of advanced image processing algorithms. The Statistical Signal Processing Laboratory is dedicated to research in statistical and acoustic signal processing for biomedical and non-biomedical applications. It is equipped with high-performance computers and powerful textual and graphical software platforms to analyze advanced signal processing methods, develop new algorithms, and perform system designs and simulations. The Acoustic Research Laboratory provides number of test-beds and associated equipment for signal measurements, system modeling, real-time implementation and testing of algorithms related to audio/acoustic/speech signal processing applications such as active noise control, speech enhancement, dereverberation, echo cancellation, sensor arrays, psychoacoustic signal processing, etc.
The Center for Robust Speech Systems (CRSS) is focused on a wide range of research in the area of speech signal processing, speech and speaker recognition, speech/language technology, and multi-modal signal processing involving facial/speech modalities. CRSS is affiliated with HLTRI in the Erik Jonsson School, and collaborates extensively with faculty and programs across UTD on speech and language research. CRSS supports an extensive network of workstations, as well as a High-Performance Compute Cluster with over 30TB of disk space and 420 CPU ROCS multi-processor cluster. The center also is equipped with several Texas Instruments processors for real-time processing of speech signals, and two ASHA certified sound booths for perceptual/listening based studies and for speech data collection. CRSS supports mobile speech interactive systems through the UTDrive program for in-vehicle behavior systems, and multi-modal based interaction systems via image-video-speech research.

The Sensing, Robotics, Vision, Control and Estimation (SeRViCE) Lab focuses on topics of control and estimation with applications in robotics, autonomous vehicles and sensor management. Primary expertise is in vision-based control and estimation and nonlinear control, that is, using cameras as the primary sensor to control robots or other complex systems. Robotics resources in the lab currently include two Pioneer 3-DX mobile robots from Mobile Robots Inc. and a Stäubli TX90 robot manipulator, with six degrees of freedom, 7kg nominal payload and capable of torque level control. Camera resources include multiple web cameras, three high-quality, firewire, color, digital video cameras, and an 18Mp digital SLR camera. The SeRViCE Lab also features general support equipment, including desktop and mobile work stations DLP projectors, power tools, hand tools, oscilloscopes, and other electronic measurement equipment.

The Laboratory for Autonomous Robotics and Systems (LARS) focuses on the development of novel control theory to support autonomous and teleoperation of general robotic systems. Active research projects include: (a) human-in-the-loop multi-robot telemanipulation, (b) autonomous networked robotics, and (c) control of bipedal walking robots. The LARS is equipped with high speed high resolution 8-camera Vicon motion capture
system for general purpose motion tracking. The LARS possesses various mobile robots to support multi-robot research, including six gumstix controlled iRobot Creates and a Quanser QBall quadrotor UAV. The LARS also possesses various force feedback user interface devices, including Logitech force feedback joystick and driving wheel, and Novint Falcon, a 3-translational degree-of-freedom Delta-structure desktop haptic device.

The Broadband Communication Laboratory has design and modeling tools for fiber and wireless transmission systems and networks, and all-optical packet routing and switching. The Advanced Communications Technologies (ACT) Laboratory provides a design and evaluation environment for the study of telecommunication systems and wireless and optical networks. ACT has facilities for designing network hardware, software, components, and applications.

The Center for Systems, Communications, and Signal Processing, with the purpose of promoting research and education in general communications, signal processing, control systems, medical and biological systems, circuits and systems and related software, is located in the Erik Jonsson School.

The Wireless Information Systems (WISLAB) and Antenna Measurement Laboratories have wireless experimental equipment with a unique multiple antenna testbed to integrate and to demonstrate radio functions (i.e. WiFi and WiMAX) under different frequency usage characteristics. With the aid of the Antenna Measurement Lab located in the Waterview Science and Technology Center (WSTC), the researchers can design, build, and test many types of antennas.

The faculty of the Erik Jonsson School’s Photonic Technology and Engineering Center (PhoTEC) carry out research in enabling technologies for microelectronics and telecommunications. Current research areas include nonlinear optics, Raman amplification in fibers, optical switching, applications of optical lattice filters, microarrays, integrated optics, and optical networking.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities
available to U.T. Dallas graduate engineering students.

**Master of Science in Electrical Engineering (33 minimum hours)**

**Admission Requirements**

The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in electrical engineering must complete these prerequisites or receive approval from the graduate advisor and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.E.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in electrical engineering from an accredited engineering program.
- A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and GRE scores of 154, 156, and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals who are able to judge the candidate’s probability of success in pursuing a program of study leading to the master’s degree. Applicants must also submit an essay outlining the candidate’s background, education and professional goals. Students from other engineering disciplines or from other science and math areas may be considered for admission to the program; however, some additional course work may be necessary before starting the master’s program.

**Degree Requirements**
The University’s general degree requirements are discussed here.

The M.S.E.E. requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. These are based upon the student’s choice of concentration (Biomedical Applications of Electrical Engineering; Circuits and Systems; Communications; Control Systems; Digital Systems; Optical Devices, Materials and Systems; Power Electronics and Energy Systems, RF and Microwave Engineering, Signal Processing; Solid State Devices and Micro Systems Fabrication). Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S.E.E. degree.

The M.S.E.E. program has both a thesis and a non-thesis option. All part-time M.S.E.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor. With the prior approval of an academic advisor, non-thesis students may count no more than 3 semester-hours of research or individual instruction courses towards the 33-hour degree requirement.

All full-time, supported students are required to participate in the thesis option. The thesis option requires nine semester hours of research (of which three must be thesis hours), a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student’s thesis advisor prior to enrolling for thesis credit. Research and thesis hours cannot be counted in an M.S.E.E. degree plan unless a thesis is written and successfully defended.

Concentrations

One of the nine concentrations listed below, subject to approval by a graduate advisor, must be used to fulfill the requirements of the M.S.E.E. program. Students must achieve an overall GPA of 3.0 or better, a GPA of 3.0 or better in their core MSEE classes, and a grade of B- or better in all their core MSEE classes in order to satisfy their degree requirements.
One 5000 level electrical engineering course can be counted towards the graduate semester credit hours.

**Biomedical Applications of Electrical Engineering**

This curriculum provides a graduate-level introduction to advanced methods and biomedical applications of electrical engineering.

Each student electing this concentration must take **15 hours**: 

- EEBM 6376 Lecture Course in Biomedical Applications of Electrical Engineering,
- EEBM 6373 Anatomy and Human Physiology,
- EEBM 6374 Genes, Proteins and Cell Biology,

and two core courses from any one other concentration.

Approved electives must be taken to make a total of 33 hours.

Depending on the specific orientation of the course program it can be very beneficial to the student to take courses from other departments (e.g. Biology, Chemistry, Brain and Behavioral Sciences, Computer Science-Bioinformatics). Typically, not more than three approved courses can be taken outside the EE department. Additional courses can be taken only with the explicit approval by the Department Head.

It is highly recommended that students take an independent study course with an EE faculty member that will be counted as one of the EE electives. The independent study course is intended to gear the coursework towards one of the following research areas in the department: Biosensors, biomedical signal processing, bioinstrumentation, medical imaging, biomaterials, and bio-applications in RF.

**Circuits and Systems**

The courses in this curriculum emphasize the design and test of circuits
and systems, and the analysis and modeling of integrated circuits.

Each student electing this concentration must take five required courses. Two of the courses are:

EECT 6325 VLSI Design

and

EECT 6326 Analog Integrated Circuit Design.

The remaining three (15 hours) must be selected from:

EEDG 6301 Advanced Digital Logic,

EEDG 6303 Testing and Testable Design,

EEDG 6306 Application Specific Integrated Circuit Design,

EEDG 6375 Design Automation of VLSI Systems,

EECT 6378 Power Management Circuits,

EECT 7325 Advanced VLSI Design,

EECT 7326 Advanced Analog Integrated Circuit Design,

EECT 7327 Data Converters,

or

EERF 6330 RF Integrated Circuit Design.

Approved electives must be taken to make a total of 33 hours.

Communications
This curriculum emphasizes the application and theory of all phases of modern communications.

Each student electing this concentration must take 12 hours:

EESC 6349 *Random Processes*

and

EESC 6352 *Digital Communication Systems*,

and two of the following:

EESC 5305 *Radio Frequency Engineering*,

EEOP 6310 *Optical Communication Systems*,

EESC 6340 *Introduction to Telecommunications Networks*,

EESC 6341 *Information Theory*,

EESC 6343 *Detection and Estimation Theory*,

EESC 6344 *Coding Theory*,

EESC 6353 *Broadband Digital Communication*,

EESC 6360 *Digital Signal Processing I*,

or

EESC 6390 *Introduction to Wireless Communication Systems*

Approved electives must be taken to make a total of 33 hours.

**Control Systems**

This curriculum emphasizes methods to predict, estimate and regulate the behavior of electrical, mechanical, or other systems including robotics.
Each student electing this concentration must take four required courses (12 hours).

Two of the courses are:

ENGR 6331 Linear Systems

and

EESC 6349 Random Processes.

The remaining two must be selected from:

ENGR 6336 Nonlinear Control Systems

EESC 6364 Pattern Recognition

EEGR 6381 Computational Methods in Engineering

EESC 6343 Detection and Estimation Theory

EESC 6360 Digital Signal Processing

or

EESC 7V85 Special Topics in Signal Processing.

Approved electives must be taken to make a total of 33 hours.

Digital Systems

The goal of the curriculum is to educate students about issues arising in the design and analysis of digital systems, an area relevant to a variety of high-technology industries. Because the emphasis is on systems, course work focuses on three areas: hardware design, software design, analysis and modeling.

Each student electing this concentration must take four required courses...
Two of the courses are EEDG 6301 Advanced Digital Logic and EEDG 6304 Computer Architecture. The remaining two must be selected from EEDG 6302 Microprocessor Systems, EECT 6325 VLSI Design, or EEDG 6345 Engineering of Packet-Switched Networks. Approved electives must be taken to make a total of 33 hours.

Optical Devices, Materials and Systems

This curriculum is focused on the application and theory of modern optical devices, materials and systems. Each student electing this concentration must take the following four required courses (12 hours):

EEOP 6314 Principles of Fiber and Integrated Optics,

EEGR 6316 Fields and Waves,

EEOP 6317 Physical Optics,

and at least one of the following two courses:

EEOP 6310 Optical Communication Systems,
EEOP 6329 Optical Signal Conditioning

Approved electives must be taken to make a total of 33 hours.

Power Electronics and Energy Systems

The goal of the curriculum is to prepare students to address growing needs in contemporary power electronics and energy related areas. The course work focuses on fundamentals of power electronics, design and control of motor drives, and energy systems.

Each student electing this concentration must take five required courses (15 hours).

Three of the courses are

EEPE 6354 Power Electronics
EEPE 6356 Adjusted Speed Motor Drives
and EEPE 6357 Control, Modeling & Simulation in Power Electronics.

The remaining two must be selected from:

EEPE 6358 Electrification of Transportation
EEPE 6359 Renewable Energy Systems
EEPE 7354 Advanced Power Converters
EEPE 7356 Computer Aided Design of Electric Machines,
or

EEPE 7V91 Special Topics in Power Electronics.

Approved electives must be taken to make a total of 33 hours

RF and Microwave Engineering
This curriculum is focused on the application and theory of modern electronic devices, circuits and systems in the radiofrequency and microwave regime.

Each student electing this concentration must take the following four required courses (12 hours):

EERF 6311 RF and Microwave Circuits,
EEGR 6316 Fields and Waves,
EERF 6355 RF and Microwave Amplifier Design,
and
EERF 6395 RF and Microwave Systems Engineering.

Approved electives must be taken to make a total of 33 hours.

Signal Processing

This curriculum emphasizes the application and theory of signal processing.

Each student electing this concentration must take (12 hours):

EESC 6349 Random Processes
and
EESC 6360 Digital Signal Processing I,
and two of the following:
EESC 6343 Detection and Estimation Theory,
EESC 6350 Signal Theory,
EESC 6361 Digital Signal Processing II,
EESC 6362 Introduction to Speech Processing,
EESC 6363 Digital Image Processing,
EESC 6364 Pattern Recognition,
EESC 6365 Adaptive Signal Processing,
EESC 6366 Speech and Speaker Recognition,
EESC 6367 Applied Digital Signal Processing,
or
EESC 7V85 Special Topics in Signal Processing.

Approved electives must be taken to make a total of 33 hours.

Solid State Devices and Micro Systems Fabrication

This concentration is focused on the fundamental principles, design, fabrication and analysis of solid-state devices and associated micro systems.

Each student electing this concentration must take the following two courses:
EEGR 6316 Fields and Waves,
and
EEMF 6319 Quantum Physical Electronics

and at least two of the following four courses:
EEMF 6320 Fundamentals of Semiconductor Devices,
EEMF 6321 Active Semiconductor Devices,
EEMF 6322 Semiconductor Processing Technology

or

EEMF 6382 Introduction to MEMS

Additional standard electives include but are not limited to:

EEMF 5383 Plasma Technology and EEMF 5283 Plasma Technology Laboratory,

EEMF 6324 Electronic, Optical and Magnetic Materials,

EECT 6325 VLSI Design,

EEMF 6372 Semiconductor Process Integration,

EEMF 6383 Plasma Science and EEMF 6283 Plasma Science Laboratory,

EEMF 6382 Introduction to MEMS,

EEMF 7320 Advanced Semiconductor Device Theory,

EECT 7325 Advanced VLSI Design.

Approved electives must be taken to make a total of 33 hours.

Graduate Certificate in Infrared Technology (15 hours)

Admission Requirements

Students seeking the Graduate Certificate in IR technology may be admitted in either degree-seeking or non-degree-seeking status. The
University’s requirements for admission as a non-degree-seeking graduate student are discussed here. Up to 15 semester credit hours earned in non-degree-seeking status may be transferred for degree credit when a student is admitted to degree-seeking status. Students seeking the Infrared Technology Certificate should have an undergraduate preparation equivalent to a Bachelor of Science in Electrical Engineering or Physics. Students who lack the undergraduate prerequisites for the courses required for the Infrared Technology Certificate must complete these prerequisites or receive approval from the graduate advisor and the course instructor.

Each student electing the Graduate Certificate in IR Technology must take the following five courses:

EEGR 6316 *Fields and Waves*,
EEOP 6317 *Physical Optics*,
EEOP 6309 *Fourier Optics*,
EEOP 6315 *Engineering Optics*,
and
EEOP 6335 *Engineering of Infrared Imaging Systems*.

At the time of completion of the course requirements for the Infrared Technology Certificate, each student must have a grade point average of at least 3.00 and must meet all other requirements for good academic standing.

**Doctor of Philosophy in Electrical Engineering (75 hours minimum beyond the baccalaureate degree)**
Admission Requirements

The University’s general admission requirements are discussed here.

The Ph.D. in Electrical Engineering is awarded primarily to acknowledge the student’s success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Electrical Engineering Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

The following are guidelines for admission to the Ph.D. program in Electrical Engineering:

- A master’s degree in electrical engineering or a closely associated discipline from an accredited U.S. institution, or from an acceptable foreign university. Consideration will be given to highly qualified students wishing to pursue the doctorate without satisfying all of the requirements for a master’s degree. A grade point average in graduate course work of 3.5 or better on a 4-point scale.
- GRE scores of 154, 156, and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation on official school or business letterhead or the UTD Letter of Recommendation Form from individuals who are familiar with the student’s record and able to judge the candidate’s probability of success in pursuing doctoral study in electrical engineering.

Applicants must also submit a narrative describing their motivation for doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students. All students must have an academic advisor and an approved plan of study.
Degree Requirements

The University’s general degree requirements are discussed here.

Each program for doctoral study is individually tailored to the student’s background and research objectives by the student’s supervisory committee. The program will require a minimum of 90 semester credit hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. All PhD students must demonstrate competence in the Master’s level core courses in their research area. All students must have an academic advisor and an approved plan of study.

Also required are:

- A research oriented oral qualifying examination (QE) demonstrating competence in the Ph.D. candidate’s research area. A student must make an oral presentation based on a review of 2 to 4 papers followed by a question-answer session. Admission to Ph.D. candidacy is based on two criteria: Graded performance in the QE and GPA in graduate level organized courses. A student entering the Ph.D. program with a M.S.E.E. must pass this exam within 3 long semesters, and a student entering without an M.S.E.E. must pass this exam within 4 long semesters. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.

- A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate’s supervising committee. At least half of the supervising committee must comprise of core EE faculty members and it must be chaired or co-chaired by an EE faculty member.

- Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student’s supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student’s degree program.
Research

The principal concentration areas for the M.S.E.E. program are: Biomedical Applications of Electrical Engineering; Circuits and Systems; Communications; Control Systems; Digital Systems; Optical Devices, Materials and Systems; **Power Electronics and Energy Systems**, RF and Microwave Engineering, Signal Processing; Solid State Devices and Micro Systems Fabrication. Besides courses required for each concentration, a comprehensive set of electives is available in each area.

Doctoral level research opportunities include: VLSI design and test, analog and mixed-signal circuits and systems, RF and microwave engineering, biomedical applications of electrical engineering, power electronics, renewable energy, **motors and drives**, vehicular technology, computer architecture, embedded systems, computer aided design (CAD), ASIC design methodologies, high speed system-on-chip design and test, reconfigurable computing, network processor design, interconnection networks, nonlinear signal-processing, smart antennas and array processing, statistical and adaptive signal processing, multimedia signal processing, image processing, real-time imaging, medical image analysis, pattern recognition, speech processing and recognition, control theory, robotics, digital communications, modulation and coding, electromagnetic-wave propagation, diffractive structures, fiber and integrated optics, nonlinear optics, optical transmission systems, all-optical networks, optical investigation of material properties (reflectometry and ellipsometry), optical metrology, lasers, quantum-well optical devices, theory and experiments in semiconductor-heterostructure devices, plasma deposition and etching, nanoelectronics, wireless communication, network protocols and evaluation, mobile computing and networking, and optical networking.

**Interdisciplinary Opportunities:** Continuing with the established tradition of research at U. T. Dallas, the Electrical Engineering Program encourages students to interact with researchers in the strong basic sciences and mathematics. Cross disciplinary collaborations have been established with the Chemistry, Mathematics, and Physics programs of the School of Natural Sciences and with faculty in the School of Brain and Behavioral Science.
Department of Materials Science and Engineering

http://www.mse.utdallas.edu/

Faculty

Professors: Orlando Auciello, Yves J. Chabal (Head), Kyeongjae (KJ) Cho, Massimo V. Fischetti, Bruce E. Gnade, Julia W. Hsu (Associate Head), Moon J. Kim, Robert M. Wallace

Associate Professors: Lev D. Gelb, Jiyoung Kim, Manuel Quevedo-Lopez, Amy V. Walker

Assistant Professors: Christopher L. Hinkle, Walter E. Voit, Chadwin D. Young

Professor Emeritus: Don W. Shaw

UTD Affiliated Faculty: Kenneth Balkus (Chemistry), Ray H. Baughman (Chemistry), Wonjae Choi (Mechanical Engineering), John Ferraris (Chemistry), Xin-Lin Gao (Mechanical Engineering), Matthew J. Goeckner (Mathematics), Fatemeh Hassanipour (Mechanical Engineering), Wenchuang (Walter) Hu (Electrical Engineering), Gil S. Lee (Electrical Engineering), J.B. Lee (Electrical Engineering), Mark Lee (Physics), Hongbing Lu (Mechanical Engineering), Anton Malko (Physics), Kenneth O (Electrical Engineering), Larry J. Overzet (Electrical Engineering), Shalini Prasad (Bioengineering), Dong Qian (Mechanical Engineering), Mario Rotea (Mechanical Engineering), Dennis Smith (Chemistry), Mihaela (Iovu) Stefan (Chemistry), Anvar Zakhidov (Physics).
Adjunct Faculty: Shela Aboud (Stanford University), Husam Alshareef (KAUST, Saudia Arabia), Glen Birdwell (US Army Research Laboratory), Luigi Colombo (Texas Instruments), Mathew David Halls (Materials Design), Dale L. Huber (Sandia National Laboratories), Richard Irwin (Texas Instruments), Prashant Majhi (SEMATECH, Austin, Texas), Steven Mick (Protochips, Inc.), Sriram Muthukumar (Maxim Integrated), Bhabendra Pradahn (NanoHoldings LLC), Bin Shan (Hua-Zhong University of Science and Technology), Purushothaman Srinivasan (Texas Instruments), Scott Summerfelt (Texas Instruments), Eric M. Vogel (Georgia Tech), Weichao Wang (Nanostellar, Inc.).

Objectives

The objective of the Master of Science (M.S.) degree in materials science and engineering is to provide intensive preparation for the professional practice in modern materials science by those engineers and scientists who wish to continue their education. Courses are offered at times and locations convenient for the student who is employed on a full-time basis.

The objective of the Doctor of Philosophy (Ph.D.) program in materials science and engineering is to prepare individuals to perform original, cutting-edge research in materials science, particularly in the areas of nanostructured materials, electronics, optical and magnetic materials, biomimetic materials, polymeric materials, MEMS materials and systems, organic electronics, and advanced processing of modern materials.

Scholarship Opportunities

The Erik Jonsson School of Engineering and Computer Science offers competitive scholarship awards for very well qualified students. Interested students should request application materials by contacting the Department of Materials Science and Engineering.

Master of Science in Materials Science and Engineering (33 hours minimum)
Admission Requirements

The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in Materials Science and Engineering must complete these prerequisites or receive approval from the graduate advisor and the course instructor. A diagnostic exam may be required. Specific admission requirements are as follows:

- Student has met standards equivalent to those currently required for admission to the Ph.D. or Master's degree programs in Materials Science, Electrical Engineering, Chemistry, Physics, or Biology.
- A grade-point average in undergraduate-level course work of 3.5 or better on a 4-point scale.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students, who fulfill only some of the above requirements, if admitted conditionally, will be required to take graduate level courses as needed to make up any deficiencies.

Degree Requirements

The University’s general degree requirements are discussed here.

The MSEN M.S. degree requires a minimum of 33 semester credit hours.

All students must have an academic advisor and an approved degree plan. These are based upon the student's choice of concentration. Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S. degree.
M.S. students undertaking the non-thesis option must complete at least 33 semester credit hours of coursework with a grade of B or better.

M.S. students undertaking the thesis option must carry out a research project under the direction of a faculty or affiliated faculty in Materials Science and Engineering, and complete and defend a thesis on the research project, but they need only complete the four core courses and 9 semester credit hours of advanced coursework. A Supervisory Committee will be appointed once the faculty member accepts the student for a research project. The rules for the thesis defense are specified by the Office of the Dean of Graduate Studies.

For each of the proposed degree programs, students must obtain a grade of B- or better in each class and maintain an average core class GPA of at least 3.0 to remain in good standing and satisfy their degree requirements:

- MSEN 5310 Thermodynamics of Materials
- MSEN 5360 Materials Characterization
- MSEN 6324 (EEMF 6324) Electronic, Optical and Magnetic Materials
- MSEN 6319 Quantum Mechanics for Materials Scientists

Note: the presence of a course number in parentheses indicates that this course is cross-listed in another department.

A minimum of 9 semester credit hours of advanced coursework is required, from the following list:

- MSEN 5320 Materials Science for Sustainable Energy
- MSEN 5340 (CHEM 5340) Advanced Polymer Science and Engineering
These courses are intended to provide greater depth and advanced training in areas broadly relevant to Materials Science and Engineering research.

The remaining credit hours are to be taken from the following list of Specialized Courses (or approved electives from Physics, Chemistry, Biology, Electrical Engineering, Mechanical Engineering or other
MSEN 5300 (PHYS 5376) Introduction to Materials Science

MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I

MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II

MSEN 5341 (CHEM 5341) Advanced Inorganic Chemistry I

MSEN 5344 Thermal Analysis

MSEN 5353 Integrated Circuit Packaging

MSEN 5355 (CHEM 5355) Analytical Techniques I

MSEN 5356 (CHEM 5356) Analytical Techniques II

MSEN 5371 (PHYS 5371) Solid State Physics

MSEN 5383 (PHYS 5383, MECH 5383, and EEMF 5383) Plasma Technology

MSEN 5410 (BIOL 5410) Biochemistry

MSEN 5440 (BIOL 5440) Cell Biology

MSEN 6313 (EEOP 6313) Semiconductor Opto-Electronic Devices

MSEN 6321 (EEMF 6321) Active Semiconductor Devices

MSEN 6322 (EEMF 6322, MECH 6348) Semiconductor

Mary Jo Venetis 1/9/13 4:25 PM
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Mary Jo Venetis 2/7/13 2:32 PM
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Processing Technology

MSEN 6341 Advanced Electron Microscopy Laboratory

MSEN 6348 (EEMF 6348, MECH 6341) Lithography and Nanofabrication

BMEN 6355 (MSEN 6355) Nanotechnology and Sensors

MSEN 6358 (BIOL 6358) Bionanotechnology

MSEN 6361 Deformation Mechanisms in Solid Materials

MSEN 6371 (PHYS 6371) Advanced Solid State Physics

MSEN 6374 (PHYS 6374) Optical Properties Of Solids

MSEN 6377 (PHYS 6377) Physics of Nanostructures: Carbon Nanotubes, Fullerenes, Quantum Wells, Dots and Wires

MSEN 6382 (EEMF 6382, MECH 6347) Introduction to MEMS

MSEN 7320 (EEMF 7320) Advanced Semiconductor Device Theory

MSEN 7V80 Special Topics in Materials Science and Engineering

MSEN 8V40 Individual Instruction in Materials Science and Engineering

MSEN 8V70 Research In Materials Science and Engineering

MSEN 8V98 Thesis
The specialized courses are intended to provide Materials Science and Engineering graduate students with expertise in a specific field of endeavor.

**Doctor of Philosophy in Materials Science and Engineering (75 hours minimum beyond the baccalaureate degree)**

**Admission Requirements**

The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in Materials Science and Engineering must complete these prerequisites or receive approval from the graduate advisor and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the MSEN program should meet the following guidelines:

- Student has met standards equivalent to those currently required for admission to the Ph.D. or Master's degree programs in Materials Science, Electrical Engineering, Chemistry, Physics, or Biology.
  - a grade-point average in undergraduate-level course work of 3.5 or better on a 4-point scale
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students who fulfill some of the above requirements, if admitted
conditionally, will be required to take graduate level courses as needed to make up any deficiencies.

Degree Requirements

The University’s general degree requirements are discussed here.

The MSEN Ph.D. requires a minimum of 75 semester hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate-level courses in MSEN.

All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 75 semester-hour requirement.

Each doctoral student must carry out original research in the area of Materials Science and Engineering, under the direction of a faculty or affiliated faculty of Materials Science and Engineering, and complete and defend a dissertation on the research project. A Supervisory Committee will be appointed once the faculty member accepts the student for a research project. Students must be admitted to doctoral candidacy by passing a Qualifying Exam, which will be administered near the time that the students have completed their course work. Upon passing the Qualifying Exam, students must present and defend a Research Proposal with their Supervisory Committee within approximately nine months or sooner after passing the Qualifying Exam. The rules for the dissertation research and defense are specified by the Office of the Dean of Graduate Studies.

For the proposed degree program, students must obtain a grade of B- or better in each class and maintain an average core class GPA of at least 3.0 to remain in good standing and satisfy their degree requirements:

MSEN 5310 Thermodynamics of Materials

MSEN 5360 Materials Characterization
MSEN 6319  Quantum Mechanics for Materials Scientists

MSEN 6324 (EEMF 6324) Electronic, Optical and Magnetic Materials

Note: the presence of a course number in parentheses indicates that this course is cross-listed in another department.

A student may petition for waiver of core courses based on prior coursework of equivalent scope and level, and if the Department finds that the student has already mastered the course material, the student may replace that core course with elective courses for up to a total of twelve semester credit hours.

A minimum of 9 semester credit hours of advanced coursework is required, from the following list:

- MSEN 5320 Materials Science for Sustainable Energy
- MSEN 5340 (CHEM 5340) Advanced Polymer Science and Engineering
- MSEN 5361 Fundamentals of Surface and Thin Film Analysis
- MSEN 5370 Ceramics and Metals
- MSEN 5375 Electronic Devices Based On Organic Solids
- MSEN 5377 (PHYS 5377) Computational Physics of Nanomaterials
- MSEN 6310 (MECH 6367) Mechanical Properties of Materials
- MSEN 6320 (EEMF 6320) Fundamentals of Semiconductor Devices
These courses are intended to provide greater depth and advanced training in areas broadly relevant to Materials Science and Engineering research.

The remaining credit hours are to be taken from the following list of Specialized Courses (or approved electives from Physics, Chemistry, Biology, or Electrical Engineering, Mechanical Engineering, or other departments):

- MSEN 5300 (PHYS 5376) Introduction to Materials Science
- MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I
- MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II
- MSEN 5341 (CHEM 5341) Advanced Inorganic Chemistry
- MSEN 5344 Thermal Analysis
- MSEN 5353 Integrated Circuit Packaging
MSEN 5355 (CHEM 5355) Analytical Techniques I
MSEN 5356 (CHEM 5356) Analytical Techniques II
MSEN 5371 (PHYS 5371) Solid State Physics
MSEN 5383 (PHYS 5383, MECH 5383, and EEMF 5383) Plasma Technology
MSEN 5410 (BIOL 5410) Biochemistry
MSEN 5440 (BIOL 5440) Cell Biology
MSEN 6313 (EEOP 6313) Semiconductor Opto-Electronic Devices
MSEN 6321 (EEMF 6321) Active Semiconductor Devices
MSEN 6322 (EEMF 6322, MECH 6348) Semiconductor Processing Technology
MSEN 6341 Advanced Electron Microscopy Laboratory
MSEN 6348 (EEMF 6348, MECH 6341) Lithography and Nanofabrication
BMEN 6355 (MSEN 6355) Nanotechnology and Sensors
MSEN 6358 (BIOL 6358) Bionanotechnology
MSEN 6361 Deformation Mechanisms in Solid Materials
MSEN 6371 (PHYS 6371) Advanced Solid State Physics
MSEN 6374 (PHYS 6374) Optical Properties Of Solids
MSEN 6377 (PHYS 6377 Physics of Nanostructures:
The specialized courses are intended to provide Materials Science and Engineering graduate students with expertise in a specific field of endeavor.

**Description of Facilities Available for Conducting Research**

An extensive array of the materials characterization, synthesis, and processing tools exist in the Department for student use in research. Characterization capabilities include advanced high-resolution electron microscopy, x-ray diffraction, a large variety of surface analysis methods, and electrical characterization. Thin film deposition methods include atomic layer deposition, sputter deposition, thermal deposition, molecular beam epitaxy, chemical vapor deposition, pulsed laser deposition, and gas phase adsorption. Fabrication methods can be
accomplished in the Cleanroom Research Laboratory as well (http://www.utdallas.edu/research/cleanroom/). Computational modeling activities include studies from the atomistic to the macroscopic level. Details of the capabilities and faculty research can be obtained at: http://mse.utdallas.edu/.
Department of Mechanical Engineering

http://me.utdallas.edu

Faculty

Professors: Xin-Lin Gao, Hongbing Lu, Mario Rotea, Seung M. You

Associate Professor: Yaoyu Li, Dong Qian

Assistant Professors: Wonjae Choi, Robert Gregg, Fatemeh Hassanipour, Majid Minary, Wooram Park, Yonas Tadesse, Walter Voit

Senior Lecturers: Robert Hart, James Hilkert, Oziel Rios

AFFILIATED FACULTY


Associate Professors: Gerald O. Burnham, Wenchuang (Walter) Hu, Jiyoun Kim

Objectives

The program leading to the M.S. degree in Mechanical Engineering provides advanced studies for both recent baccalaureate graduates and experienced engineers in the following core areas: control & dynamic systems, manufacturing & design innovation, mechanics & materials, and thermal & fluid sciences. The program is designed to provide advanced...
skills in mechanical engineering. The program also provides the foundation for a Ph.D. degree in engineering or closely related disciplines.

The Ph.D. program in Mechanical Engineering at UT Dallas is offered as a joint degree program between UT Dallas and UT Arlington. The objective of the Ph.D. program is to prepare talented doctoral students for careers in which they will create new technologies and processes for the design, manufacturing, control and operation of components and systems in energy, health care, security & defense, and transportation. Given the key enabling role of mechanical engineering in all areas of technology, the graduates of this program will be technical leaders in emerging and existing scientific and industrial fields in Texas and the Nation.

Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for teaching and research. These include wind tunnels, material test systems, nanoindenter, impact facilities, ultra-high speed camera, DMA, XPS, FTIR, NMR, TGA, DSC, XRD, μ-Raman, Fluorescence Spectrometer, AFM, FIB/SEM, and TEM. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to UT Dallas graduate engineering students.

Concentration Areas

There are four technical areas of concentration for the graduate degree programs in Mechanical Engineering, which are:

- Dynamic Systems & Control (DSC)
- Manufacturing & Design Innovation (MDI)
• Mechanics & Materials (MM)
• Thermal & Fluid Sciences (TFS)

All graduate students must select a concentration area within the first two semesters in the program.

Scholarship Opportunities

The Erik Jonsson School of Engineering and Computer Science offers competitive scholarships for highly qualified students. Interested students should request application materials by contacting the Department of Mechanical Engineering.

Master of Science in Mechanical Engineering (33 hours minimum)

Admission Requirements

The University’s general admission requirements are discussed here.

The student entering the M.S.M.E. program should meet the following guidelines:

• A bachelor’s degree in engineering or one of the natural sciences from an accredited U.S. institution, or from a comparable institution abroad.
• A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and
• GRE scores of 150, 160 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.
• Three letters of recommendation from individuals who are able to judge the candidate’s potential for success in the master’s degree program.
• An essay outlining the candidate’s background, education and professional goals.
Students from other engineering disciplines or from other areas of science or mathematics may be considered for admission to the program; however, additional course work may be necessary to complete the master’s program.

A student lacking undergraduate prerequisites for graduate courses in mechanical engineering must complete these prerequisites or receive approval from the faculty advisor and the course instructor.

Degree Requirements

The University’s general degree requirements are discussed here.

The M.S.M.E. requires a minimum of 33 semester credit hours (SCH).

All students must have a faculty advisor and an approved plan of study within the first two consecutive semesters in the program. The plan of study is based upon the student’s choice of concentration area. Courses taken without advisor approval will not count towards the 33 semester-hour requirement. Successful completion of an approved plan of study leads to the M.S.M.E. degree.

The M.S.M.E. program has both a thesis and a non-thesis option. All part-time M.S.M.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester credit hours of research, a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student’s thesis advisor prior to enrolling for thesis credit. Research and thesis hours cannot be counted in a M.S.M.E. degree plan unless a thesis is written and successfully defended.
The following is a list of required courses that all M.S. students in Mechanical Engineering must take. A student must receive a grade of B- or better in each of these required courses and maintain a GPA of at least 3.0 to remain in good standing and satisfy the degree requirements.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
</tr>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
</tr>
<tr>
<td>MECH 6307</td>
<td>Thermal and Energy Principles</td>
</tr>
</tbody>
</table>

The following is a list of prescribed elective courses. Students must take at least 3 prescribed elective courses from one concentration area. All electives must be approved by faculty advisor.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Prescribed Electives (M.S. students must take at least 3 courses from one concentration area.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing &amp; Design</td>
<td>MECH 6330 Multiscale Design &amp; Optimization</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
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<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>MECH 6334</td>
<td>Smart Materials and Structures</td>
</tr>
<tr>
<td>MECH 6335</td>
<td>Flexible Manufacturing Strategies (OPRE 6340)</td>
</tr>
<tr>
<td>MECH 6341</td>
<td>Lithography &amp; Nanofabrication (EEMF 6348, MSEN 6348)</td>
</tr>
<tr>
<td>MECH 6347</td>
<td>Introduction to MEMS (EEMF 6382, MSEN 6382)</td>
</tr>
<tr>
<td>MECH 6348</td>
<td>Semiconductor Processing Technology (EEMF 6322, MSEN 6322)</td>
</tr>
<tr>
<td>MECH 649</td>
<td>Topics in Manufacturing and Design Innovation</td>
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<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
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<tr>
<td>MECH 6353</td>
<td>Computational Mechanics</td>
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<tr>
<td>MECH 6354</td>
<td>Experimental Mechanics</td>
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<tr>
<td>MECH 6355</td>
<td>Viscoelasticity</td>
</tr>
<tr>
<td>MECH 6367</td>
<td>Mechanical Properties of Materials (MSEN 6310)</td>
</tr>
<tr>
<td>MECH 6368</td>
<td>Imperfections in Solids (MSEN 6350)</td>
</tr>
<tr>
<td>MECH 649</td>
<td>Special Topics in Mechanics and Materials</td>
</tr>
<tr>
<td>MECH 6370</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>MECH 6371</td>
<td>Computational Fluid Dynamics</td>
</tr>
<tr>
<td>MECH 6384</td>
<td>Applied Heat Transfer</td>
</tr>
<tr>
<td>MECH 5383</td>
<td>Plasma Technology (EEMF 5383, MSEN 5383, PHYS 5383)</td>
</tr>
<tr>
<td>MECH 6380</td>
<td>Advanced Heat Transfer</td>
</tr>
<tr>
<td>MECH 6383</td>
<td>Plasma Science (EEMF 6383, PHYS 6383)</td>
</tr>
<tr>
<td>MECH 649</td>
<td>Special Topics in Thermal and Fluid Sciences</td>
</tr>
<tr>
<td>MECH 6391</td>
<td>Computational Methods in Engineering (ECE 6381)</td>
</tr>
<tr>
<td>MECH 649</td>
<td>Special Topics in Mechanical Engineering</td>
</tr>
</tbody>
</table>

**Common courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
</tr>
<tr>
<td>MECH 6307</td>
<td>Thermal &amp; Energy Processing</td>
</tr>
<tr>
<td>MECH 6380</td>
<td>Advanced Heat Transfer</td>
</tr>
<tr>
<td>MECH 6383</td>
<td>Plasma Science (EEMF 6383, PHYS 6383)</td>
</tr>
<tr>
<td>MECH 649</td>
<td>Special Topics in Thermal and Fluid Sciences</td>
</tr>
</tbody>
</table>

Comment [28]: Does not exist in Orion. Please verify.
Students participating in the non-thesis option must also take 4 graduate level electives. Students participating in the thesis option must take 2 graduate level electives and the following courses to fulfill the research and thesis requirements of the M.S.M.E. degree program:

- MECH 6V97 Research in Mechanical Engineering (3 SCH minimum)
- MECH 6V98 Thesis (3 SCH minimum)

All electives must be approved by the faculty advisor.

Doctor of Philosophy in Mechanical Engineering (78 hours minimum beyond the baccalaureate degree)

Admission Requirements

The University’s general admission requirements are discussed here.

The Ph.D. in Mechanical Engineering is awarded primarily to acknowledge the student’s success in an original research project, the description of which is a significant contribution to the scholarly literature. Applicants for the doctoral program are therefore selected by the Mechanical Engineering Graduate Committee on the basis of research aptitude as well as academic record.

The following are guidelines for admission to the Ph.D. program in Mechanical Engineering:

- A master’s or bachelor’s degree in engineering or one of the natural sciences from an accredited U.S. institution, or from a comparable institution abroad.
- A grade point average of 3.3 or better on a 4-point scale.
- GRE scores of 150, 160 and 4 for the verbal, quantitative and
analytical components, respectively, are advisable based on our experience with student success. (See also UTD requirements for English proficiency.)

• Three letters of recommendation from individuals who are familiar with the student’s record, and are able to judge the candidate’s preparation and ability to succeed in doctoral study in Mechanical Engineering.

• An essay describing motivation for doctoral study and how it relates to their professional goals.

Students from other engineering disciplines or from other areas of science or mathematics may be considered for admission to the program; however, additional course work may be necessary to complete the Ph.D. program.

For students who are interested in pursuing a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students.

Degree Requirements

The University’s general degree requirements are discussed here.

Doctoral students must have a faculty advisor and an approved plan of study within the first two consecutive semesters in the program. The faculty advisor shall be a faculty member, or affiliate faculty member, in Mechanical Engineering. The plan of study is based upon the student’s choice of concentration area. Each doctoral student must conduct original research in the area of Mechanical Engineering, under the direction of the faculty advisor. A supervisory committee will be formed once the faculty advisor accepts the student for a research project. The student must complete and defend a dissertation on the research project.

The Ph.D. program in Mechanical Engineering requires a minimum of 78 semester credit hours beyond the baccalaureate degree. The breakdown is shown in the table below.
The following is a list of required courses that all Ph.D. students in Mechanical Engineering must take. A student must receive a grade of B- or better in each of these required courses and maintain a GPA of at least 3.0 to remain in good standing and satisfy the degree requirements.

**MECH 6300 Linear Systems**  
**MECH 6303 Computer Aided Design**  
**MECH 6306 Continuum Mechanics**  
**MECH 6307 Thermal and Energy Principles**

The following is a list of prescribed elective courses. A Ph.D. student in Mechanical Engineering must take at least 4 courses from the list of prescribed elective courses in one of the four areas of concentration. Upon approval from the student’s faculty advisor and the Mechanical Engineering Graduate Committee, a qualified student can take other courses offered by UT Dallas or UT Arlington to satisfy the requirements on prescribed electives.

<table>
<thead>
<tr>
<th>CONCENTRATION</th>
<th>Prescribed Elective (PhD students must take at least 4 courses from one concentration area)</th>
</tr>
</thead>
</table>
| Dynamic Systems & Controls (DSC) | MECH 6311 Advanced Mechanical Vibrations  
                                        MECH 6312 Random Processes (EESC 6349)  
                                        MECH 6313 Nonlinear Control Systems (ENGR 6336, BMEN 6388, SYSE 6324) |
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation (SYM 6306, BMEN 6372)</td>
</tr>
<tr>
<td>MECH 6316</td>
<td>Digital Control of Automotive Powertrain Systems (SYSE 6322)</td>
</tr>
<tr>
<td>MECH 6323</td>
<td>Robust Control Systems (SYSE 6323)</td>
</tr>
<tr>
<td>MECH 6324</td>
<td>Robot Control</td>
</tr>
<tr>
<td>MECH 6V29</td>
<td>Special Topics in Controls and Dynamic Systems</td>
</tr>
<tr>
<td>MECH 6330</td>
<td>Multiscale Design &amp; Optimization</td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
</tr>
<tr>
<td>MECH 6334</td>
<td>Smart Materials and Structures</td>
</tr>
<tr>
<td>MECH 6335</td>
<td>Flexible Manufacturing Strategies (OPRE 6340)</td>
</tr>
<tr>
<td>MECH 6341</td>
<td>Lithography &amp; Nanofabrication (EEMF 6348, MSEN 6348)</td>
</tr>
<tr>
<td>MECH 6347</td>
<td>Introduction to MEMS (EEMF 6382, MSEN 6382)</td>
</tr>
<tr>
<td>MECH 6348</td>
<td>Semiconductor Processing Technology (EEMF 6322, MSEN 6322)</td>
</tr>
<tr>
<td>MECH 6V49</td>
<td>Special Topics in Manufacturing and Design Innovation</td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
</tr>
<tr>
<td>MECH 6353</td>
<td>Computational Mechanics</td>
</tr>
<tr>
<td>MECH 6354</td>
<td>Experimental Mechanics</td>
</tr>
<tr>
<td>MECH 6355</td>
<td>Viscoelasticity</td>
</tr>
<tr>
<td>MECH 6367</td>
<td>Mechanical Properties of Materials (MSEN 6310)</td>
</tr>
<tr>
<td>MECH 6368</td>
<td>Imperfections in Solids (MSEN 6350)</td>
</tr>
<tr>
<td>MECH 6V69</td>
<td>Special Topics in Mechanics and Design Innovation</td>
</tr>
</tbody>
</table>

**Manufacturing & Design Innovation (MDI)**

**Mechanics & Materials (MM)**
The following is a list of elective courses in mathematics. Two courses are required for mathematics electives.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal &amp; Fluid Sciences (TFS)</td>
<td>MECH 6370 Fluid Mechanics, MECH 6371 Computational Fluid Dynamics, MECH 6384 Applied Heat Transfer, MECH 5383 Plasma Technology (EEMF 5383, MSEN 5383, PHYS 5383), MECH 6380 Advanced Heat Transfer, MECH 6383 Plasma Science (EEMF 6383, PHYS 6383), MECH 6V89 Special Topics in Thermal and Fluid Sciences</td>
</tr>
</tbody>
</table>

**MECH 6391 (EEGR 6381) Computational Methods in Engineering**

MATH 5301 Elementary Analysis I and MATH 5302 Elementary Analysis II (or equivalent)

MATH 6303 Theory of Complex Functions

MATH 6313 Numerical Analysis

MATH 6315 Ordinary Differential Equations

MATH 6318 Numerical Analysis of Differential Equations

MATH 6319 Principles and Techniques in Applied Mathematics I and MATH 6320 Principles and Techniques in Applied Mathematics II

MATH 6308 Inverse Problems and Applications

MATH 6321 Optimization

STAT 6331 Statistical Inference I

STAT 6337 Advanced Statistical Methods I and STAT 6338 Advanced Statistical Methods II
Upon the approval of a student’s faculty advisor, a qualified student can request to take other graduate courses in mathematics not listed above. In addition to course requirements, the PhD students would need to complete the following:

- Qualifying Exam (QE): It tests fundamental knowledge in mathematics and one concentration area of mechanical engineering.
- Comprehensive exam (CE): Written dissertation proposal and an exam given by candidate’s supervisory committee.
- Final Exam: Completion of a major research project culminating in a dissertation demonstrating an original contribution to the body of knowledge. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies.

A student who has passed the QE and maintained the GPA requirements in Ph.D. level organized courses will be admitted to the Ph.D. candidacy.

A student entering the Ph.D. program must pass the QE exam within 3 long semesters. A student has at most two consecutive attempts at the QE. The QE will be given during the fall and spring semesters.

The following courses are required to fulfill the research and dissertation requirements of the PhD degree program:

- **MECH 8V70** Research in Mechanical Engineering (30 SCH minimum)
- **MECH 8V99** Dissertation (6 SCH minimum)

Neither a foreign language nor a minor is required for the Ph.D.
**Department of Systems Engineering**

[http://ecs.utdallas.edu/SYSE/](http://ecs.utdallas.edu/SYSE/)

**Faculty**

**Professor:** Steve Yurkovich  
**Associate Professor:** Jim Primbs  
**Affiliated Faculty:** Farokh Bastani, Alain Benoussan, Kendra Cooper, Duncan MacFarlane, Suresh Sethi, Rajiv Shah, Mark Spong, Lakshman Tamil, Mathukumalli Vidyasagar, Eric Wong

**Objectives**

Systems engineering is an interdisciplinary field of systems engineering, focusing on the design, modeling, interconnection, and management of large complex systems. In addition to the methods of traditional engineering, systems engineering relies on skills and expertise in areas such as optimization, simulation, economics and finance, risk management, and decision making under uncertainty. These skills come together to address the challenges of designing and managing complex interconnected systems, ranging from an automobile or an airplane to communication systems, financial markets, the power grid, and many more.

The Department of Systems Engineering at UT Dallas focuses research and curriculum in the fundamentals of systems engineering and management, with applications in interdisciplinary areas of interest to industry, such as energy systems, financial engineering systems, software systems, healthcare systems, cyber security systems, control and mechatronic systems, and others. In so doing, the Department of Systems Engineering offers an MS degree in Systems Engineering and Management (MS-SEM), a joint program with the UT Dallas Jindal School of Management. The program brings together faculty and disciplines from the engineering school and from the management school into a single program that has traditional and executive education formats.

**Research**

While many diverse areas of research and curriculum are represented by the core faculty and affiliated faculty in the Department of Systems Engineering, we identify with a few basic, core areas of concentration which combine graduate level research and curriculum:

- Control Systems and Mechatronic Systems  
- Financial Engineering  
- Energy Systems  

Other curriculum-centric concentration areas, discussed below for the MS-SEM degree program, are also possible areas of research focus.
In keeping with the established tradition of research at UT Dallas, the Systems Engineering Department through its research efforts and its MS-SEM degree program, encourages students to interact with researchers in other strong programs in the Jonsson School of Engineering and Computer Science and the Jindal School of Management, including computer science, electrical engineering, mechanical engineering, bioengineering, computer engineering, operations management, finance, marketing, innovation and entrepreneurship, and business management.

Master of Science in Systems Engineering and Management (MS-SEM) (36 hours minimum)

http://www.utdallas.edu/sem/

Admission Requirements

A student lacking undergraduate prerequisites for graduate courses must complete prerequisites or receive approval from the graduate advisor and the course instructor. A diagnostic examination may be required. Please consult with the University's general admission requirements, discussed elsewhere in the graduate catalog, whereas specific admission requirements for the MS-SEM follow.

A student entering the MS-SEM program should meet the following guidelines:

- A minimum of a BS in engineering, mathematics, physics, chemistry, economics or finance from an accredited program (specifically, programs that provide adequate fundamental skills in mathematics).
- Must submit GRE and/or GMAT scores, as appropriate.
- Must submit three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the MS-SEM degree.
- Must also submit an essay outlining the candidate's background, education and professional goals.

Degree Requirements

The MS-SEM program is designed to be flexible to accommodate different student backgrounds, allowing students to pick up areas in which they are deficient, while still guaranteeing core competency in systems engineering and systems management. This program has both a thesis and a non-thesis option. All part-time MS-SEM students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.
The MS-SEM degree requires a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus six hours of thesis credit for the thesis option. All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 36 semester-hour requirement. Successful completion of the approved course of studies leads to the MS-SEM degree. Please also note that the University's general degree requirements are discussed elsewhere in the graduate catalog.

**Non-thesis Option**

Completion of a minimum of 36 semester hours of graduate level lecture courses including the required core courses. With advisor approval, these may include some 5000 level courses. Students must earn a grade of B- or better in each of four core courses (see below).

**Thesis Option**

An alternative to 36 credit hours required for the MS-SEM degree, would be the completion of a minimum of 30 semester hours of graduate level lecture courses, with a grade of B- or better in each of the required core courses (see below), six semester hours of a combination of Master’s research (SYSM 6V70) and thesis (SYSM 6V90), submitted to the graduate school, and a formal public defense of the thesis.

Students enrolled in the thesis option should meet with individual faculty members to discuss research opportunities and to choose a research advisor during the first or second semester that the student is enrolled. After the second semester of study, course selection should be made in consultation with the research advisor. Part-time students are encouraged to enroll in only one course during their first semester and in no more than two courses during any semester they are also working full-time.

Research and thesis hours cannot be counted in an MS-SEM degree plan unless a thesis is written and successfully defended. A supervising committee, which must be chosen in consultation with the student's thesis advisor prior to enrolling for thesis credit, administers the defense. With advisor approval, the lecture courses may include some 5000 level courses. Full-time students at UTD who receive financial assistance are required to enroll in nine semester credit hours each semester.

**Course Requirements: Core (12 hours)**

Students are required to take four courses (a total of 12 credit hours) from a set of eight courses in the list below. Two of the courses must be from the Engineering Core section and two from the Management Core section. The four required courses contribute a total of 12 credit hours toward the MS degree.
ENGINEERING CORE COURSES:
SYSM 6301 Systems Engineering, Architecture and Design
SYSM 6302 Dynamics of Complex Networks and Systems
SYSM 6303 Quantitative Introduction to Risk and Uncertainty in Business
SYSM 6305 Optimization Theory and Practice

MANAGEMENT CORE COURSES:
SYSM 6311 Systems Project Management in Engineering and Operations
SYSM 6312 Systems Financial Management
SYSM 6318 Marketing Management
SYSM 6333 Systems Organizational Behavior

Course Requirements: Prescribed Electives (12 hours)
Students are required to take an additional four courses (a total of 12 credit hours) from the set of eight core courses listed above and/or the set of courses listed below. Two of these courses must be chosen from the two Engineering sections (core and elective), and two from the two Management sections (core and elective). Because a program objective is to maintain a high degree of flexibility, students are encouraged to work with an MS SEM program advisor to discuss possible (limited) exceptions and substitutions for the prescribed elective courses.

ENGINEERING ELECTIVE COURSES:
SYSM 6304 Risk and Decision Analysis
SYSM 6306 Engineering Systems: Modeling & Simulation
SYSM 6307 Linear Systems
SYSM 6308 Software Maintenance, Evolution & Re-Engineering
SYSM 6309 Advanced Requirements Engineering
SYSM 6310 Software Testing, Validation and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II

MANAGEMENT ELECTIVE COURSES:
SYSM 6313 Systems Negotiation Deals and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 The Entrepreneurial Experience
SYSM 6316 Managing Innovation Within the Corporation
SYSM 6317 Management of High Technology Products
SYSM 6319 Business Economics
SYSM 6320 Strategic Leadership
SYSM 6332 Technology and New Product Development

Course Requirements: Free Electives (12 hours)
Systems Engineering and Management

(\textbf{MS-SEM}) Courses

\textbf{Engineering Courses}

\textbf{SYSM 6301} Systems Engineering, Architecture and Design

\textbf{SYSM 6302} Dynamics of Complex Networks and Systems

\textbf{SYSM 6303} (\textbf{OPRE 6301}) Quantitative Introduction to Risk and Uncertainty in Business

\textbf{SYSM 6304} (\textbf{OPRE 6335}) Risk and Decision Analysis

\textbf{SYSM 6305} Optimization Theory and Practice (3 credit hours)

\textbf{SYSM 6306} (\textbf{BMEN 6372}/\textbf{MECH 6314}) Engineering Systems: Modeling & Simulation

\textbf{SYSM 6307} (\textbf{ENG}\_6331/\textbf{MECH 6300}) Linear Systems

\textbf{SYSM 6308} (\textbf{CS} 6356/\textbf{SE} 6356) Software Maintenance, Evolution & Re-Engineering

\textbf{SYSM 6309} (\textbf{SE} 6361/\textbf{CS} 6361) Advanced Requirements Engineering

Working with an MS-SEM program advisor, students are required to take four additional and distinct courses either from the remaining SYSM courses listed above or from other courses offered in management or engineering that form a “concentration” or “specialization” in systems-related, possibly industry-specific sectors. The concentration area consists of four courses (12 semester hours) in the degree program; examples include: Mechatronic and Control Systems, Financial Engineering Systems, Energy Systems, Healthcare Systems, Telecom and IT Networks, Information Assurance and Cyber-security, Global Supply Chain Management, Entrepreneurship and Innovation, and Enterprise Systems. Finally, because of the flexible nature of the MS-SEM degree program, students may submit for approval a “personalized” concentration area that focuses on aspects of systems engineering, and may combine elements of other concentration areas on a focused theme.

\[ ... \]
Management Courses

SYSM 6310 (SE 6367/CE 6367/CS 6367) Software Testing, Validation, and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II
SYSM 6V70 Research In Systems Engineering and Management
SYSM 6V80 Special Topics in Systems Engineering and Management
SYSM 6V90 Thesis

Management Courses

SYSM 6311 (OPRE 6362) Systems Project Management in Engineering and Operations
SYSM 6312 (FIN 6301) Systems Financial Management (3 credit hours)
SYSM 6313 (OB 6332) Systems Negotiation and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 (ENTP 6398) The Entrepreneurial Experience
SYSM 6316 (ENTP 6388) Managing Innovation within the Corporation
SYSM 6317 Management of High Tech Products
SYSM 6318 (MKT 6301) Marketing Management
SYSM 6319 (MECO 6303) Business Economics
SYSM 6320 (BPS 6332) Strategic Leadership
SYSM 6332 (ENTP 6375) Technology and New Product Development
SYSM 6333 (OB 6301) Systems Organizational Behavior
SYSM 6V98 Systems Management Internship
Systems Engineering Courses

SYSE 6321 Systems Integration

SYSE 6322 Digital Control of Automotive Powertrain Systems

SYSE 6323 (MECH 6323) Robust Control Systems (3 credit hours)

SYSE 6324 (BMEN 6388 / ENGR 6336 / MECH 6313 / SYSE 6324) Nonlinear Control Systems

Introduction to systems integration in complex systems using the automotive sector as an example; plan, organize and manage the integration of complex automotive systems; understand the decomposition/integration paradigm to manage complexity; define metrics to define achievement of objectives; and, demonstrate ability to work in cross-functional/multi-disciplinary teams.

Features of the course include: Team approach; simulated production environment including (virtual) client and vendor interaction in the face of unpredictable (virtual) external events; cross-disciplinary.

Intended for a broad audience of engineering graduate students regardless of their specific knowledge or interest in automotive systems or that industry. Prerequisites: none

Digital control systems, discretization and design by equivalents. Input-output design and discrete-time state variable estimation and control. Introduction to various control problems in automotive powertrains. Application of digital control principles to automotive powertrains for internal combustion engine idle speed control and air-to-fuel ratio control. Prerequisites: EE 4310 or MECH 4310 or equivalents

Theory, methodology, and software tools for the analysis and design of model-based control systems with multiple actuators and multiple sensors. Control oriented model parameterizations and modeling errors. Definitions and criteria for robust stability and...
Graduate Program in Telecommunications Engineering

http://www.te.utdallas.edu/

Faculty


**Associate Professors:** Jorge A. Cobb, Hlaing Minn, Neeraj Mittal, Mohammad Saquib, Kamil Sarac, Murat Torlak, Yuke Wang

**Senior Lecturers:** C. P. Bernardin, Nathan Dodge, P. K. Rajasekaran, Marco Tacca

Objectives

The Graduate Program in Telecommunications Engineering provides intensive preparation for professional practice in the design, programming, theory, and applications of telecommunications networks. It is designed to serve the needs of engineers who wish to continue their education. The Telecommunications Engineering Program offers courses of study leading to the M. S. and a Ph.D. degree in Telecommunications Engineering.
Education and training is provided to both academically oriented students and students with professional goals in industrial or governmental occupations requiring advanced knowledge of telecommunications and related technology. A comprehensive program of evening courses is also offered, which enables part-time students to earn the M.S. and Ph.D. degree or to select individual courses of interest. Courses and research are both offered in a variety of sub fields of telecommunications engineering, including, fault-tolerant networks, digital communications, modulation and coding, electromagnetic-wave propagation, fiber and integrated optics, lasers, wireless communications, mobile computing, wireless multimedia, DWDM networks, QoS assurance protocols, network design and optimization, telecommunications software, performance of systems, ad-hoc and PCS wireless networks, network security and high speed transmission protocols.

Facilities

The Erik Jonsson School of Engineering and Computer Science has developed a state-of-the-art computational facility consisting of a network of Sun servers and Sun Engineering Workstations. All systems are connected via an extensive fiber-optic Ethernet and, through the Texas Higher Education Network, have direct access to most major national and international networks. In addition, many personal computers are available for student use.

The Engineering and Computer Science Buildings provide extensive facilities for research in telecommunications, microelectronics, and computer science. The TARGET Laboratory has state-of-the-art telecommunications equipment, which includes a number of transport nodes, data packet routers, voice over IP gears, and a cluster of Linux workstations for protocols development and testing. The Wireless Information Systems (WISLAB) and Antenna Measurement Laboratories at UT Dallas have a wealth of experimental equipment with a unique reconfigurable multiple antenna testbed. Having this testbed allows wireless researchers to integrate and to demonstrate radio functions (i.e. WiFi and WiMAX) in geographically different regions under different frequency usage characteristics. With the aid of the Antenna Measurement
Lab located in the Waterview Science and Technology Center (WSTC), the researchers can design, build, and test many type of antennas. The Optical Communications Laboratory includes attenuators, optical power meters, lasers, APD/p-i-n photodetectors, optical tables, and couplers and is available to support system level research in optical communications.

The Center for Systems, Communications, and Signal Processing, with the purpose of promoting research and education in general communications, signal processing, control systems, medical and biological systems, circuits and systems and related software, is located in the Erik Jonsson School. The Photonic Technology and Engineering Center (PhoTEC) has produced more than thirty Ph.D. graduates. The PhoTEC faculty carry out research in enabling technologies for microelectronics and telecommunications.

The Digital Systems Laboratory includes a network of workstations, personal computers, FPGA development systems, and a wide spectrum of state-of-the-art commercial and academic design tools to support graduate research in VLSI design and computer architecture. In the Digital Signal Processing Laboratory several multi-CPU workstations are available in a network configuration for simulation experiments. Hardware development facilities for real time experimental systems are available and include microphone arrays, active noise controllers, speech compressors and echo cancellers. The Nonlinear Optics Laboratory has a dedicated network of Sun workstations for the development of simulation methods and software for optical transmission and communication systems, optical routers and all-optical networks. The Broadband Communication Laboratory has design and modeling tools for fiber and wireless transmission systems and networks, and all-optical packet routing and switching. The Advanced Communications Technologies (ACT) Laboratory provides a design and evaluation environment for the study of telecommunication systems and wireless and optical networks. ACT has facilities for designing network hardware, software, components, and applications.

In addition to the aforementioned facilities, a Class 1000 microelectronics clean room facility, including optical lithography, sputter deposition and evaporation, is available for student projects and research. An electron beam lithography pattern generator capable of sub-micron resolution is
also available for microelectronics research. The Plasma Applications Laboratory has state-of-the-art facilities for mass spectrometry, microwave interferometry, optical spectroscopy, and optical detection. In addition, a Gaseous Electronics Conference Reference Reactor has been installed for plasma processing and particulate generation studies. The Optical Measurements Laboratory has dual wavelength (visible and near infrared) Gaertner Ellipsometer for optical inspection of material systems, a variety of interferometric configurations, high precision positioning devices, and supporting optical and electrical components. The Electronic Materials Processing laboratory has extensive facilities for fabricating and characterizing semiconductor and optical devices. The Laser Electronics Laboratory houses graduate research projects centered on the characterization, development and application of ultrafast dye and diode lasers. Research in characterization and fabrication of nanoscale materials and devices is performed in the Nanoelectronics Laboratory.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to U.T. Dallas graduate engineering students.

**Master of Science in Telecommunications Engineering (33 hours minimum)**

**Admission Requirements**

The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in electrical engineering must complete these prerequisites or receive approval from the graduate advisor and the course instructor. A diagnostic examination may be required. Specific admission requirements follow.

A student entering the M.S.T.E. program should meet the following guidelines:

An undergraduate preparation equivalent to a baccalaureate in electrical engineering from an accredited engineering program,
A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and GRE scores of 154, 156, and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals who are able to judge the candidate’s probability of success in pursuing a program of study leading to the master’s degree.

Applicants must also submit an essay outlining the candidate’s background, education and professional goals.

Students from other engineering disciplines or from other areas of science or mathematics may be considered for admission to the program; however, some additional course work may be necessary before starting the master’s program.

**Degree Requirements**

The University’s general degree requirements are discussed here.

The M.S.T.E. degree requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S.T.E. degree.

The M.S.T.E. program has both a thesis and a non-thesis option. All part-time M.S.T.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester hours of research, a written thesis submitted to the graduate school, and a formal public defense of the
thesis. Research and thesis hours cannot be counted in a M.S.T.E. degree plan unless a thesis is written and successfully defended. A supervising committee, which must be chosen in consultation with the student’s thesis advisor prior to enrolling for thesis credit, administers the defense. Full-time students at UTD who receive financial assistance are required to enroll in 9 semester credit hours during the Fall, Spring and Summer semesters. Students enrolled in the thesis option should meet with individual faculty members to discuss research opportunities and to choose a research advisor during the first or second semester that the student is enrolled. After the second semester of study, course selection should be made in consultation with the research advisor. Part-time students are encouraged to enroll in only one course during their first semester and in no more than two courses during any semester they are also working full-time.

To receive a Master of Science degree in Telecommunications Engineering, a student must meet the following minimum set of requirements:

Completion of a minimum of 33 semester hours of graduate level lecture courses including the required core courses. With advisor approval, these may include some 5000 level courses.

Students must take the following five core courses and make a grade of B or better:

CS 6385 (TE 6385) Algorithmic Aspects of Telecommunication Networks
EESC 6349 Random Processes
EESC 6352 Digital Communication Systems
CS 6352 Performance of Computer Systems and Networks
CS 6390 Advanced Computer Networks

Students will take additional courses from those described in the following list.
Recommended Elective Courses: Choose any 18 hours of 6000 level courses or higher with approval of the advisor.

**RECOMMENDED ELECTRICAL ENGINEERING ELECTIVES:**

- EEOP 6310 Optical Communication Systems
- EEGR 6316 Fields and Waves
- EESC 6340 Introduction to Telecommunications Networks
- EESC 6341 Information Theory I
- EESC 6343 Detection and Estimation Theory
- EESC 6344 Coding Theory
- EEDG 6345 Engineering of Packet-Switched Networks
- EERF 6311 RF and Microwave Circuits
- EESC 6360 Digital Signal Processing I
- EESC 6361 Digital Signal Processing II
- EESC 6362 Introduction to Speech Processing
- EESC 6365 Adaptive Signal Processing
- EESC 6390 Introduction to Wireless Communications Systems
- EESC 6391 Signaling and Coding for Wireless Communication Systems
- EESC 6392 Propagation and Devices for Wireless Communications
- EERF 6394 Antenna Engineering and Wave Propagation
- EERF 6395 RF and Microwave Systems Engineering
- EEOP 7340 Optical Network Architectures and Protocols

**RECOMMENDED COMPUTER SCIENCE ELECTIVES:**
Doctor of Philosophy in Telecommunications Engineering (75 hours minimum beyond the baccalaureate degree)

Each doctoral degree program is tailored to the student. The student must arrange a course program with the guidance and approval of a faculty member chosen as his/her graduate advisor. Adjustments can be made as the student’s interests develop and a specific dissertation topic is chosen.

Admission Requirements

The University’s general admission requirements are discussed here.

The Ph.D. degree in Telecommunications Engineering is awarded primarily to acknowledge the student success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applications for the doctoral program are therefore selected by
the Telecommunications Engineering Graduate Committee on the basis of
research aptitude, as well as academic record. Applications for the
doctoral program are considered on the individual basis.

The following are guidelines for admission to the Ph.D. program in
Telecommunications Engineering.

A master’s degree in Telecommunications Engineering, or Electrical
Engineering or Computer Science or a closely associated discipline from
an accredited U.S institution or from an acceptable foreign university.
Consideration will be given to highly qualified students wishing to pursue
the doctorate without satisfying all of the requirements for a master’s
degree.

A grade point average in graduate course work of 3.5 or better
on a 4-point scale

GRE scores of 154, 156 and 4 for the verbal, quantitative and
analytical writing components, respectively, are advisable based on our
experience with student success in the program.

Applicants must submit three letters of recommendation on official
school or business letterhead or the UTD Letter of Recommendation form
from individuals who are familiar with the student record and able to judge
the candidate’s probability of success in purchasing doctoral study in
 electrical engineering.

Applicants must also submit a narrative describing their motivation for
doctoral study in telecommunications engineering.

Applicants must also submit a narrative describing their motivation for
doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D., but are unable to attend school
full-time, there is a part-time option. The guidelines for admission to the
program and the degree requirements are the same as for full-time Ph.D.,
students. All students must have an academic advisor and an approved
plan of study.
Degree Requirements

The University’s general degree requirements are discussed here.

The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. The core requirements for the Ph.D. degree in Telecommunication Engineering are the same as the ones for the M.S. in Telecommunication Engineering. All PhD students must demonstrate competence in the Master’s level core courses in their research area. However, a student’s supervising committee may impose course requirements that are necessary and appropriate for the student’s research program. It is expected that M.S degree students planning to enter the proposed doctoral program will take most of the courses as part of their M.S. degree requirements. All students must have an academic advisor and an approved plan of study.

Also required are:

- A qualifying examination (QE), as approved by the TE graduate committee, demonstrating competence in the Ph.D. candidate’s research area. A student entering the Ph.D. program with a M.S.T.E. must pass this exam within 3 long semesters, and a student entering without an M.S.T.E. must pass this exam within 4 long semesters. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.

- A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate’s supervising committee.

- Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student’s supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student’s
Degree Requirements

Dissertation

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation advisor willing to guide this dissertation. The student must have a dissertation supervising committee that consists of no less than four members. The dissertation may be in telecommunication engineering exclusively or it may involve considerable work in an area of application.

Areas of Research

The principal concentration areas for the Telecommunications Engineering graduate program are:

- Core and wireless networks
- Communications and signal processing
- Network design and protocols
- Embedded and reconfigurable systems
- Optical and photonic devices, materials and systems
- Fault-tolerant data networks

Doctoral level research opportunities include: VLSI design, reconfigurable systems, system architecture, fault-tolerant computing, digital signal processing, digital communications, modulation and coding, electromagnetic-wave propagation, fiber and integrated optics, lasers and optoelectronic devices, optical transmission systems, optical networks, wireless communications, mobile IP, wireless multimedia, DWDM networks, QoS assurance protocols, network design and optimization, ad-hoc and PCS wireless networks, network security and high speed transmission protocols.
Interdisciplinary Opportunities

In keeping with the established tradition of research at UT-Dallas, the Telecommunications Engineering Program encourages students to interact with researchers in other strong programs, including computer science, electrical engineering, computer engineering, and business management.
Combination of Engineering and Management Graduate Degrees

http://www.utdallas.edu/dept/ee

Today's graduates aspiring to assume managerial and leadership positions in high tech firms and research institutions must be knowledgeable in both the engineering and managerial dimensions of the position. In recognition of this growing reality, UT-Dallas offers a blend of courses allowing students to earn a combination of master's level degrees in both engineering and management. Specifically, graduates of this program will qualify to earn an M.S.E.E. degree in combination with an MBA, an M.S. or an M.A. degree in Management.

Faculty

The combination of master's level degrees in both engineering and management are jointly administered by the faculty members in the Department of Electrical Engineering in the Erik Jonsson School of Engineering and Computer Science and the School of Management.

Objectives

The program of studies leading to the award of an M.S.E.E. degree by the Erik Jonsson School of Engineering and Computer Science in combination with one of the following master's degrees, MBA, M.S. or M.A., offered by the School of Management, provides intensive preparation for engineers who seek knowledge and skills necessary to manage a technology firm. This program emphasizes both Electrical Engineering and Engineering Management, preparing students for a career in management and for holding leadership positions in engineering companies and research institutions. The program of studies is ideal for students interested in managing new technologies, from conceptualization and development to
introduction and production.

Admission Requirements

The University’s general admission requirements are discussed here.

Student pursuing the M.S.E.E. degree in combination with and a master's degree in management must meet the admission requirements for both graduate programs. The University’s general degree requirements are discussed here. For this program of studies, the School of Management will accept a competitive GRE performance in lieu of the GMAT.

Degree Requirements

Combination of M.S.E.E. and MBA graduate degrees (68 hours minimum)

The combination of M.S.E.E. and MBA degrees can be earned by completing a minimum of 68 graduate hours beyond prerequisite courses. This includes a minimum of 24 hours of approved electrical engineering courses in combination with a minimum of 44 hours of approved management courses.

Students enrolled in this combination of M.S.E.E. and MBA degree programs are permitted to

- utilize a maximum of 9 credit hours from the approved list of management courses together with 12 hours of approved elective EE courses to satisfy the required 21 hours of elective courses listed in the M.S.E.E. degree requirements specified here, and
- utilize a maximum of 9 credit hours from the approved list of EE courses together with 15 hours of approved elective MBA courses to satisfy the 24 hours of elective courses listed in the MBA degree requirements specified here.

Students are required to meet all other core and elective requirements for the M.S.E.E. and MBA degrees to obtain the combination of the M.S.E.E. with MBA graduate degrees.
Combination of M.S.E.E. with M.S. or M.A. graduate degrees
(51 minimum hours)

The combination of M.S.E.E. and M.S. or M.A. degrees can be earned by completing a minimum of 51 credit hours beyond prerequisites. This includes a minimum of 24 hours of approved electrical engineering courses in combination with a minimum of 27 hours of approved management courses for each of these management degrees.

Students enrolled in a combination of the M.S.E.E. and M.S. or M.A. degree programs are permitted to

- utilize a maximum of 9 credit hours from the approved list of management courses together with 12 hours of approved elective EE courses to satisfy the required 21 hours of elective courses listed in the M.S.E.E. degree requirements specified here, and
- utilize a maximum of 9 credit hours from the approved list of EE courses in satisfying elective courses requirements for the M.S. or M.A. degree requirements specified here.

Students are required to meet all other core and elective requirements for the M.S.E.E. and M.S. or M.A. degrees to obtain the combination of M.S.E.E. with M.S. or M.A. graduate degrees.

All students must have a graduate advisor in the electrical engineering department and a graduate advisor in the management school who will advise on respective programs and approve a degree plan. The advising office in each school will provide a detailed listing of approved courses. Courses taken without advisor approval may not count toward the required credit hours. No degree will be awarded until the completion of all requirements, including the requirement for the 68 or 51 credit hours for the M.S.E.E./MBA or M.S.E.E./M.S. or M.A. combinations respectively. If a student chooses at a later time to pursue only one of the two degree programs, the student MUST again seek admission into the degree program of the student's choice and satisfy the requirements of that degree.
program. Prior coursework relevant to the specific degree program will be transferred, provided the course requirements have not changed.
Doctor of Philosophy in Geospatial Information Sciences (75 hours minimum beyond the baccalaureate degree)

http://www.utdallas.edu/epps/geospatial-science/

This degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically in the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science, and is administered by the School of Economic, Political and Policy Sciences.

Faculty

Professors: Carlos Aiken (Geosciences), Brian J. L. Berry (Economic, Political and Policy Sciences), Denis J. Dean (Economic, Political and Policy Sciences), John Ferguson (Geosciences), Daniel Griffith (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Edwin Sha (Computer Science), Robert Stern (Geosciences)

Associate Professors: Alexander Braun (Geosciences), Tom Brikowski (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorf (Economic, Political and Policy Sciences), Weili Wu (Computer Science)

Assistant Professors: Yongwan Chun (Economic, Political and Policy Sciences)

Senior Lecturers: Bryan Chastain (Economic, Political and Policy Sciences), Irina Vakulenko (Economic, Political and Policy Sciences)
Powerful technologies have emerged in recent years to collect, store, manage, analyze, and communicate information regarding the features of the Earth's surface and to combine these with other types of environmental, social and economic information. These technologies, which include geographic information systems (GIS), the global positioning system (GPS), and remote sensing, are used in many ways, including the production of digital maps in vehicles, the management and maintenance of city infrastructure, agriculture and forestry, the policing of communities, and the conduct of modern warfare. The PhD in Geospatial Information Sciences aims to develop individuals capable of advancing this field by developing new knowledge or capabilities relevant to it.

The degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science. This unique structure reflects geospatial information science's origins as the confluence of multiple disciplines including geography, computer science, engineering, geology, and various social, policy and applied sciences. It is anticipated that many students will enter the program with a bachelor's or master's degree (and/or work experience) in an application area (such as public administration, geology, or economics) or in a technical specialization (such as engineering, computer science, or statistics). These students may choose to pursue research projects that advance existing geospatial information sciences practices within that application area. Alternatively, students may opt to pursue research that expands the technological or theoretical base of all the geospatial information sciences.

Mission and Objectives

The mission of the Doctor of Philosophy in Geographic Information Sciences program is to cultivate innovative researchers capable of advancing the frontiers of knowledge in the geospatial information sciences through improved theories, new technologies, innovative methodologies, sophisticated quantitative analyses, and integrative applications. Specifically, program graduates will:

Deleted: UT Dallas Doctoral graduates will find employment in research departments of public and private organizations and in major academic institutions.
• Demonstrate their knowledge of the fundamental theories and concepts underlying the geospatial sciences.
• Master the advanced methodologies and/or quantitative analyses used in at least one of three geospatial specialization areas: [a] computing and information management, [b] spatial analysis and modeling, or [c] remote sensing and satellite technologies.
• Produce innovative research that advances theory or methodology in the geospatial sciences.
• Participate at academic conferences, publish in peer-reviewed journals and find employment in research departments of public and private organizations and in major academic institutions.

Facilities

Students have access to state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and at the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University’s extensive instructional computing facilities, including those in the Eric Jonsson School of Engineering and Computer Science, are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All major industry-standard GIS and remote sensing software is available. The University is a member of the University Consortium for Geographic Information Science (UCGIS).

Admission Requirements

The University’s general admission requirements are discussed here.

The PhD program in Geospatial Information Sciences seeks applications from students with a baccalaureate, Master of Arts, Master of Science or professional masters-level degree in any field relevant to geospatial information science including, but not limited to, computer science, economics, engineering, geography, geology, management information systems, marketing, natural resource management, public affairs and public administration, statistics, and urban and regional planning. Applicants will be judged and evaluated by the existing admission
standards as set forth by the University in its Graduate Catalog and by the
standards set forth here by the Geospatial Information Sciences program.
A bachelor's degree from an accredited institution or its equivalent and
fluency in written and spoken English are required. A grade average of at
least 3.25 in undergraduate and graduate course work, and a combined
verbal and quantitative score of 1150 (old scale) or 300 (new scale) on the
GRE are desirable. An analytical writing score of at least 4.5 in the GRE is
considered desirable.

**Applicants** must submit transcripts from all higher education institutions
attended, three letters of recommendation, and an essay outlining their
background, education, and academic objectives as they specifically relate
to a Ph.D. in Geospatial Information Sciences.

**Prerequisites**

The following pre-requisites/co-requisites will also be required for
admission to the PhD program: (i) college mathematics through calculus,
(ii) competence in at least one modern programming language equivalent
to GISC 6317 *Computer Programming for GIS*, MIS 6323 *Object Oriented
Programming*, or their equivalents, and (iii) at least one course in
inferential statistics through to regression analysis equivalent to GISC
6301 *GIS Data Analysis Fundamentals*, EPPS 7313 *Descriptive and
Inferential Statistics*, or GEOS 5306 *Data Analysis for Geoscientists*.
Graduate courses taken at UT Dallas to meet these prerequisites may be
counted as electives toward the 75 credit hours required of students
entering the Ph.D. program directly from a B.A. or B.S. degree, but they
shall not be considered substitutes for any other specified course.

**Advising**

Because of the cross-disciplinary nature of this doctoral program, to
ensure adequate preparation and appropriate course sequencing, every
doctoral student is required to consult with the student’s designated
advisor and/or the GIS Doctoral Program Director prior to registration in
every semester. Students generally will not have a faculty advisor when
they first enter the Ph.D. program, but every student is required to select
(with consent of the potential advisor) an advisor from the advising faculty by the end of his/her first academic year.

**Degree Requirements**

The University’s general degree requirements are discussed here.

To receive the PhD in Geospatial Information Sciences, students must complete the Geospatial Science Core (15 SCH) to achieve a mastery of appropriate Geospatial Information Science technologies and theory, have a Geospatial Specialization Area (15 SCH), have a Specific Application area or Technical field (12 SCH), evidence research skills through successful completion and defense of a Ph. D. dissertation, and take related electives as necessary for a total of 75 semester credit hours. In addition, students must satisfy a set of exams and qualifiers. Other courses may be substituted for those listed below with the written permission in advance of the Director of the GIS Doctoral program.

**Geospatial Science Core (15 SCH)**

Students must earn a minimum grade point average (GPA) of 3.0 across the following five courses:

- GISC 6381 Geographic Information Systems Fundamentals
- GISC 6382 Applied Geographic Information Systems
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with GIS Applications

**Geospatial Specialization Area**
Students must select from one of the following, with a minimum of 15 SCH. Courses selected must include at least three at successively advanced levels.

### I. Geospatial Computing and Information Management

- CS 6359 Object-Oriented Analysis and Design
- CS 6360 Database Design
- CS 6364 Artificial Intelligence
- CS 6366 Computer Graphics
- CS 6375 Machine Learning
- CS 6378 Advanced Operating Systems
- CS 6381 Combinatorics and Graph Algorithms
- CS 6384 Computer Vision
- GEOS 5303 Computing for Geoscientists
- GISC 6317 Computer Programming for GIS
- GISC 6388 GIS Application Software Development
- GISC 7363 Internet Mapping and Information Processing
- MIS 6326 Database Management

### II. Spatial Analysis and Modeling

- ECON 6309 Econometrics I

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Comment [48]: CS 6V80 does not exist in Orion.

Vy Trang: 2-15-13: asked for CS faculty to check course; would like to retain course if still offered.

Shyam Karrah 2-20-13 email: confirmed that course does not exist; suggested that GIS faculty checks this.

Venetis: since both departments cannot verify; remove course from program.
III. Remote Sensing and Satellite Technologies

**GISC 5322** (GEOS 5322) GPS *(Global Positioning System)*
Surveying Techniques

**GISC 5324** (GEOS 5324) 3D Data Capture and Ground Lidar

**GISC 5330** (GEOS 5330) Geospatial Applications in Earth Science

**GISC 5395** (GEOS 5395) Satellite Geophysics and Applications

**GISC 6325** (GEOS 5325) Remote Sensing Fundamentals

**GISC 7366** (GEOS 5329) Applied Remote Sensing
IV. Customized Geospatial Specialization (15 SCH)

Identified by the student with approval in advance by the Director of the GIS Doctoral Program.

Application Area or Technical Field (12 SCH)

Twelve semester-credit hours of specialized course work in an application area or technical field relevant to GIScience. Normally, these will derive from the student’s Master’s degree. These hours may be transferred from another institution, or taken at UT Dallas in an existing master’s program area and may be applied toward a master’s degree in that area.

Application area examples: planning, public affairs, criminal justice, health and epidemiology, geoscience, forestry, hydrology, marketing, real estate, economics, civil engineering, etc.

Technical field examples: statistics, computer science, software engineering, management information systems, image analysis, operations research/location science, instrumentation.

Research and Dissertation (Variable SCHs)

All students must complete the following two classes as part of the research and dissertation requirement:
In addition, students must complete sufficient additional research and dissertation credit hours to bring the total number of SCHs they have earned within the UT Dallas doctoral program (or transferred into the UT Dallas doctoral program) to 75, the minimum required to earn a doctoral degree. Additional research and dissertation SCHs above and beyond those required to reach the 75 credit hour minimum may be required at the discretion of the student’s Ph.D. advisor. Additional research and dissertation SCHs can be earned through any of the following classes:

- **GISC 6387** Geographic Information Systems Workshop
- **GISC 6389** Geospatial Information Sciences Master’s Research
- **GISC 7367** (GEOS 7327) Remote Sensing Workshop
- **GISC 8V29** Research in GIS
- **EPPS 6310** Research Design I ¹ & **EPPS 6342** Research Design II ¹
- **GISC 8V99** or **GEOS 8V99** or **CS 8V99** Dissertation

### Other Related Electives (0 to 24 SCH)

Students may choose up to 24 SCHs in related electives (from CS, GEOS, GISC, etc.) with consent of their advisor or the GIS Doctoral Program Director.

### Exams and Qualifiers

#### Qualifying Examination

The GISC PhD Qualifier Examination is administered in May of a doctoral student’s first year, following the completion of the first academic year (i.e. Fall and Spring semester) by the student. This exam comprises four parts, each based upon one of the following...
core courses:

- GISC 6382 (GEOS 6383) Applied Geographic Information Systems
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with GIS Applications

A student must pass three of the four parts to pass the exam. If a student fails his/her exam, s/he may retake only the parts they failed in the subsequent August. If s/he does not pass a cumulative total of three parts after the August exam date, then s/he the Qualifier Examination, and is withdrawn from the GIS doctoral program.

**Defense of Proposal**

After completing the GIS Research Project class, doctoral students must successfully present and defend a dissertation proposal through an oral examination, according to uniform guidelines established by the GIS program.

**Grade Point Qualifier**

Doctoral students must have GPAs of at least 3.25, and preferably 3.5, in courses taken at UT Dallas at the time they register for GISC 7389 GIS Ph.D. Research Project, or they must petition the GIS faculty for an exemption for extenuating circumstances beyond the student’s control.

**Defense of Dissertation**

A dissertation must be prepared and defended successfully following the procedures established by the Dean of Graduate Studies.
may not be used in conjunction with certain other courses. Consult GIS Doctoral Program Director.
Industrial Practice Programs

The Industrial Practice Programs (IP Programs or IPP) of the Erik Jonsson School of Engineering and Computer Science include the School’s Cooperative Education, Internship, and Curricular Practical Training programs. These programs combine classroom learning with paid work experience. Qualified students are referred to participating employers seeking candidates for career-related, pre-professional, work assignments. The programs enhance a student’s education and career preparation by integrating classroom theory with on-the-job performance; providing an understanding of work environments and professional requirements; testing career and professional goals; developing confidence, maturity, and skills in human relations; and establishing professional contacts and interests.

Students enroll in Engineering Computer Science Co-op (ECSC) courses during semesters when working on an IPP assignment. Students are expected to follow the rules of the IP Programs when working in a position titled by the employer as an Internship or a Cooperative Education assignment.

For more information about the IP Programs, call (972) 883-4363. The IP Programs are located in ECSS 2.502.

Engineering and Computer Science Co-Op Courses

- **ECSC 5177 CS IPP ASSIGNMENT**
- **ECSC 5179 ENG IPP ASSIGNMENT**
SCHOOL OF INTERDISCIPLINARY STUDIES

The Graduate Program in Interdisciplinary Studies, leading to the degree of Master of Arts in Interdisciplinary Studies, is designed for students who wish to continue their intellectual development within an interdisciplinary framework and for those with specialized training who wish to broaden their education. The objective of the program is to provide students the opportunity to develop an approach to topics and problems from the perspectives of more than one discipline and to develop a better understanding of many of the social, cultural, and scientific forces which affect the individual and society.

Teacher Development Center

The University offers opportunities in selected fields for teachers and other school personnel to earn initial teaching certification and certificate endorsements.

Students wishing to pursue an advanced degree should consider programs leading to the Master of Arts in Teaching (M.A.T.) degree in Science Education, or Mathematics Education. Students enrolling for one of these degrees should consult the appropriate subject area in this catalog. Students pursuing coursework leading to additional certificate endorsement or initial certification should seek counsel in the Teacher Development Center early in their program of study. Tel: (972) 883-2730.

DEGREES OFFERED

Master of Arts in Interdisciplinary Studies (36 Hours minimum)
Graduate Program in Interdisciplinary Studies

http://www.utdallas.edu/is/

Faculty

All faculty in the university are eligible to participate.

Professors: George W. Fair, Karen J. Prager, Lawrence J. Redlinger

Associate Professor: Erin A. Smith

Senior Lecturers: Susan P. Chizeck, Dachang Cong, Jillian Duquaine-Watson, Lynne Mabe, Elizabeth M. Salter, Tonja Wissinger, Jonathan Frome, Kathleen Byrnes

Objectives

The Graduate Program in Interdisciplinary Studies, leading to the degree of Master of Arts in Interdisciplinary Studies, is designed for students who wish to continue their intellectual development within an interdisciplinary framework and for those with specialized training who wish to broaden their education. The objective of the program is to provide students the opportunity to develop an approach to topics and problems from the perspectives of more than one discipline and to develop a better understanding of many of the social, cultural, and scientific forces which affect the individual and society.

Admission Requirements

The University’s general admission requirements are discussed here.
For admission to the program, the student must have a bachelor’s degree from an accredited institution, with a grade average of B or better. A verbal plus quantitative GRE score of 295 (or equivalent examination) is advisable based on our experience with student success in the program. All students not meeting the above criteria are considered on an individual basis. A student who has a deficit in either GRE score or grade point average may be conditionally admitted to the program.

**Degree Requirements**

The University’s general degree requirements are discussed here.

For the degree of Master of Arts in Interdisciplinary Studies, 36 hours of course work must be completed. These hours are distributed as follows:

**Interdisciplinary Seminars (3 hours)**

In the first year the student must complete an interdisciplinary seminar (MAIS 5300, MAIS 5301, MAIS 5313, MAIS 5315, MAIS 5316, MAIS 5333, MAIS 5335 or MAIS 5336). The seminars are designed to introduce students to graduate work and to give them experience in interdisciplinary approaches to subjects and problems.

**Core Requirements (9 hours)**

From the graduate courses offered in this catalog, the student selects, in consultation with the adviser, at least three hours each from at least two of the following areas: Humanities, which includes Aesthetic Studies, History of Ideas, and Studies in Literature; Natural Sciences and Mathematics, which includes courses in Biology, Chemistry, Geosciences, Mathematical Sciences, Physics, and selected courses in Science Education; Economic, Political and Policy Sciences, which includes courses in Public Affairs, Criminology, Economics, Geospatial Science, Public Policy & Political Economy, Political Science, and Sociology; Management, which includes Management and International Management Studies, Accounting, Information Technology, Innovation and Entrepreneurship, Management and Administrative Sciences, Finance and Healthcare Management.
Concentration (12 hours)

From the graduate courses offered in this catalog, the student selects, in consultation with the adviser, at least 12 additional hours of course work in one or two of the general areas listed above.

Electives (6 hours)

From the graduate courses offered in this catalog, the student selects, in consultation with the adviser, at least six semester hours of courses.

Capstone Seminar and Research Project (6 hours)

The seminar and project are the culmination of the student's program. The seminar includes readings in, and discussion of, interdisciplinary theory and preparation for the research project. Each student will develop a research topic which lends itself to an interdisciplinary approach. The topic should be sufficiently broad to draw upon knowledge and techniques gained throughout the program. To complete the project, students should synthesize and integrate information from various sources, utilizing different methodologies, and thus draw conclusions which present a new perspective on the topic as a result of this interdisciplinary approach.

Graduate Program in Interdisciplinary Studies

At the beginning of the degree program each student participates in a specially designed interdisciplinary seminar on topics related to the development of human beings and their world. At the end of the program, each student participates in a capstone seminar and completes an interdisciplinary research project. The remainder of the program is individually designed by the student, in consultation with the adviser, to meet particular personal interests and professional needs.
Graduate Instruction in Education

Faculty

Professors: George W. Fair, Dean of School of Interdisciplinary Studies, Mary L. Urquhart, Associate Professor; Homer Montgomery, Associate Professor; Barbara Curry, Senior Lecturer

Post-Baccalaureate Program for Teacher Certification

Teacher Development Center: Persons who already have baccalaureate degrees may seek teacher certification in all fields. They should consult with an advisor in the Teacher Development Center to develop a certification plan after they have been admitted to the university through the School of Interdisciplinary Studies as a Post-Baccalaureate student. Post-Baccalaureate students must meet the 24 semester hour requirement in the appropriate teaching field. A certification plan will be developed based on an evaluation of the student's transcript. Post-Baccalaureate students must demonstrate computer literacy, effective public speaking, and complete 12 semester hours of English. All students must fulfill the U.T. Dallas requirements for student teaching or supervised internship.

See the website – http://www.utdallas.edu/teach for the most current information and course requirements.

Science/Mathematics Certification: Persons who already have baccalaureate degrees may seek teacher certification in science and/or
mathematics have two options: (1) they may work through the Teacher Development Center as described in the paragraphs above, or (2) they may pursue certification through UTeach Dallas in the School of Natural Sciences and Mathematics. Post-Baccalaureate students must meet the 24 semester hour requirement in the appropriate STEM teaching field. A certification plan will be developed based on an evaluation of the student’s transcript. Post-Baccalaureate students must demonstrate computer literacy and effective public speaking. All students must fulfill the U.T. Dallas requirements for student teaching or supervised internship.

See the UTeach Dallas website – http://www.utdallas.edu/uteach for the most current information and course requirements.

Graduate Degrees

Programs leading to a Master of Arts in Teaching in Mathematics Education or a Master of Arts in Teaching in Science Education are offered through the Department of Science/Mathematics Education in the School of Natural Sciences and Mathematics. http://www.utdallas.edu/scimathed/

Graduate Degrees

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Programs leading to a Master of Arts in Teaching in Mathematics Education or a Master of Arts in Teaching in Science Education are offered through the Department of Science/Mathematics Education in the School of Natural Sciences and Mathematics. http://www.utdallas.edu/scimathed/

Graduate Degrees

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The Naveen Jindal School of Management was established in 1975 as the academic unit responsible for (1) the Master of Science (MS) degree in Management and Administrative Sciences; (2) the Master of Arts (MS) degree in International Management Studies; (3) the Doctor of Philosophy (PhD) degrees in Management Science and in International Management Studies; and (4) an upper-division program leading to a Bachelor of Science (B.S.) degree in Business Administration.

The School added a Master of Business Administration (MBA) degree in 1983, and in 1992, in conjunction with UT Dallas’ expansion to include a full undergraduate program, lower-division instruction was initiated. The Master of Science in Accounting started in 1994. In 1996, the School added the Cohort MBA, a full-time MBA program in which students take all of their courses together in a fixed sequence.

In 1997, the School formed a strategic alliance with The University of Texas Southwestern Medical Center at Dallas to offer a Master of Science in Medical Management for medical doctors. In 1999, Global MBA (online) program was added in which students take all core and elective courses online (distance learning). In 2007, the program was split into two parts and renamed the Master of Science in Healthcare Management Executive Track in 2007 (for medical doctors) and the Master of Science in Healthcare Management Professional Track for all other healthcare professionals.

To help bridge the gap between business and information technology, the School established the Master of Science in Information Technology and Management in 2003. In Fall 2008, the school added two new masters’ degree programs, the MS in Finance and the MS in Supply Chain Management. The school then added the MS in Innovation and Entrepreneurship, and the MS in Systems Engineering and Management, a joint degree with the Eric Jonsson School of Engineering and Computer Science, which both opened in 2010. The last degree to be added was the MS in Marketing in 2011.

Since its inception, the Naveen Jindal School of Management has offered a range of degree options and program formats designed to serve the diverse needs of a student population primarily composed of working adults, but also including traditional full-time graduate students and, more recently, residential undergraduate students.

The graduate programs in the Naveen Jindal School of Management stress the theory and use of applied sciences for successful management and administration of private and public institutions. Courses provide an opportunity to gain integrated and detailed knowledge of the functional areas of management as well as analytical tools for effective appraisal and decision-making. Seminars and research on specific projects are designed to develop creativity and to stimulate the student toward an integrated application of the acquired knowledge.

The Naveen Jindal School of Management’s mission is to meet the challenges of a rapidly changing, technology-driven, global society by partnering with the business community to:

- deliver high quality management education to a diverse group of undergraduate and graduate students and practicing executives;
• develop and continuously improve programs advancing management education and practice; and,
• conduct world-class research enhancing cutting-edge management knowledge.

Degrees Offered
Master of Science in Accounting (MS) (36 Hours minimum)
Master of Business Administration (MBA) (53 Hours minimum)
Master of Science in Finance (MS) (36 Hours minimum)
Master of Science in Healthcare Management - Executive Track (MS) (36 Hours minimum)
Master of Science in Healthcare Management - Professional Track (MS) (36 Hours minimum)
Master of Science in Information Technology and Management (MS) (36 Hours minimum)
Master of Science in Innovation and Entrepreneurship (MS) (36 Hours minimum)
Master of Science in International Management Studies (MS) (36 Hours minimum)
Master of Science in Management and Administrative Sciences (MS) (36 Hours minimum)
Master of Science in Marketing (MS) (36 Hours minimum)
Master of Science in Supply Chain Management (MS) (36 Hours minimum)
Master of Science in Systems Engineering and Management (MS) (36 Hours minimum)

Doctor of Philosophy in International Management Studies (PhD) (75 hours minimum beyond the baccalaureate degree)
Doctor of Philosophy in Management Science (PhD) (75 hours minimum beyond the baccalaureate degree)

Certificates Offered
Business Intelligence and Data Mining (Certificate)
Enterprise Systems (Certificate)
Healthcare Information Technology (Certificate)
Lean 6 Sigma Green Belt in Healthcare Management (Certificate)
Lean 6 Sigma Yellow Belt in Healthcare Management (Certificate)
Marketing Analytics and Market Research (Certificate)
Product Lifecycle/Supply Chain Management (Executive Certificate)
Product Management (Certificate)
Project Management (Executive Certificate)
Systems Engineering (Certificate)
Systems Management (Certificate)
Executive and Professional Coaching (Executive Certificate)
Graduate Programs in Management
http://jindal.utdallas.edu/

Faculty

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Gary Bolton
R. Chandrasekaran
William Cready
Milind Dawande
Ted Day
Greg Dess
Adolf Enthoven
Varghese Jacob
Irena Katok
Constantine Konstans

Dmitri Kuksov
Stan Liebowitz
Zhang Lin
Sumit Majumdar
Vijay Mookerjee
B.P.S. Murthi
Shun-Chen Niu
Dale Osborne
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Suresh Radhakrishnan

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Xianjun Geng
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Bin Li
Jun Li

Meng Li
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Andrei Strijnev
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Han Xia
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Alejandro Zentner
Jun Zhang
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Clinical Professor
Abhijit Biswas
Larry Chasteen
David Cordell
Tevfik Dalgc
Michael Deegan
Howard Dover
Forney Fleming
Pamela Foster-Brady
Ayfer Gurun
Randy Guttery
Charlie Hazzard
Robert Hicks
Peter Lewin
John McCracken
Dennis McCuistion
Mark McNabb
Kumar Nair
Joseph Picken
Divakar Rajamani
Robert Robb
Rajiv Shah
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Joe Wells
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Laurie Ziegler

Clinical Associate Professors: Sonia Leach, Kelly Slaughter, Carolyn Reichert, Mark Thouin
Clinical Assistant Professors: Hans-Joachim Adler, Vance Johnson Lewis, Radha Mookerjee, Justice Tillman

Senior Lecturers
Art Agulnek
Shawn Alborz
Frank Anderson
Mark Anderson
Amal El-Ashmawi
John Barden
Ron Blair
Daniel Bochsler
Tiffany Bortz
Richard Bowen
Judd Bradbury
Monica Brussolo
Bobby Chang
George DeCourcy
Gene Deluke
Alexander Edsel
Carol Flannery
John Fowler
Mary Goodrich
Maria Hasenhuttl
Julie Haworth
Jennifer Johnson
Marilyn Kaplan
Jackie Kimzey
Kristen Lawson
Chris Linstead
Diane McNulty
Jared Pickens
Matt Polze
Kannan Ramanathan
Jim Richards
Mark Salamasick
Awanti Sethi
Jeanne Sluder
Steven Solcher
James Sztot
Lou Thompson
Amy Troutman
McClain Watson

Visiting Faculty: Xuying Cao, Emily Choi, Harini Mittal, Ishwar Murthy

Objectives
The MS in Accounting provides a tailored educational experience that encourages (1) a globally-oriented, interdisciplinary focus, (2) a balanced conceptual and pragmatic approach, (3) development of written and oral communication skills, (4) a refinement of research and analytical skills that result in enhanced decision-making abilities, and (5) a commitment to lifelong learning. Within the program, students are offered a choice of 18 graduate accounting electives. Classes are tailored towards typical career paths in areas such as corporate accounting, assurance services, taxation services and internal audit. The MS Accounting is available as on campus or as an online degree program. Upon completion of the MS in Accounting, students may be eligible to sit for the Uniform CPA Examination, provided they meet the educational requirements.
The Master of Business Administration (MBA) degree provides students with a broad managerial education drawing from all business disciplines. It is obtained by completing the program course requirements of 53 hours beyond the prerequisites. UT Dallas offers several distinct approaches to obtaining an MBA. These include:

- The Cohort MBA Program, a full-time program in which students are admitted as a group each Fall and take their required classes together in a fixed sequence
- The Professional MBA Flex Program for students attending school part-time, with classes largely meeting in the evening,
- The Professional MBA Evening Cohort Program in which students are admitted as a group each Fall and take their required classes together in a fixed sequence, and
- The Professional MBA Online with all core and elective courses available online.

Each of these MBA programs consists of 29 hours of required core courses and 24 hours of elective course work, which may include an optional concentration in a selected area of business study. Courses in the Professional MBA Online use audio streaming lectures supported by downloadable presentations, online text-based conferences, bulletin board and e-mail exchanges and teleconferences.

The MS in Finance is designed for students either with or without previous educational background in finance. At least 36 hours of management course work beyond prerequisite courses is required, including 18 hours of basic business core courses and 18 hours of graduate finance and/or finance-related courses. Most MS Finance students will select the Financial Management option, which provides a generalist approach to the degree while allowing maximum flexibility to design a program tailored to their needs. Students can also choose one of the six concentrations: investment management, financial analysis, financial risk management, management of financial institutions, real estate finance and financial information management.

The MS in Healthcare Management prepares students for roles in the leadership and management of the US healthcare industry. The 36 credit hour program integrates a thorough grounding in advanced business management theory and practice with an understanding of the structure, operation and financing of the US healthcare system. The curriculum is customized to accommodate the needs of two different audiences: the Professional Track for healthcare administrators and those desiring a management career in healthcare; and the Executive Track, for physicians.

The Professional Track classes are offered on a semester-long basis in the evenings, with core business classes also offered online. Admission may be in fall, spring or summer semesters. The Executive Track is delivered in a different format, consisting of nine 4-day residential classes. A different class is offered every two months and classes may be started at any time and taken in any order. The Executive curriculum is jointly taught by faculty from the UT Dallas, Naveen Jindal School of Management and the University of Texas Southwestern Medical Center.

The MS in Information Technology and Management (MS ITM) bridges the gap between the pure information technologist and the business professional. By providing a technology intensive program with a business focus, the program prepares graduates to apply information
technology to business problems and create efficient and effective solutions. The degree requires a minimum of 36 credit hours, consisting of basic business courses, IT foundation courses, IT elective courses and free electives. The business core courses are designed to provide incoming students with the context to better appreciate and understand the complex issues that occur at the interface between IT and business. The IT foundation courses cover the essentials of IT knowledge that any student must possess. The IT elective courses provide in-depth knowledge of the technology and technology management issues. The MS ITM is available as on campus or as an online degree program. In addition, students may choose approved electives that maximize their individual educational and professional goals. The program also offers opportunities for students to concentrate in specific tracks such as ‘Enterprise Systems’, ‘Business Intelligence and Analytics’, ‘Healthcare Systems’, ‘IT Consulting’ and ‘Information Security and Assurance’ depending on their interests and goals.

The **MS in Innovation and Entrepreneurship (MS IE)** prepares students for successful business careers in entrepreneurial new ventures, entrepreneurial finance (venture capital/private equity), or innovation-related roles in mature organizations (product planning, product marketing, product development, etc.). This degree complements baccalaureate or advanced degrees in management, scientific or engineering disciplines, and is valued by employers in technology-related or consumer products industries.

The program provides a solid foundation in the management disciplines essential to innovation, with specific focus on the tools, techniques and skills required to develop and lead product, service and business model innovation.

The **MS in International Management Studies (MS IMS)** degree program provides relevant knowledge and training in international management, which includes trade across national boundaries, management practices within multinational firms as well as international organizations. The program provides students the opportunity to learn in-depth the fundamentals of (1) functional areas of management, (2) international management practices and strategies, and (3) cultural, sociopolitical, and geographical constraints affecting international business decisions. The program also provides students with opportunity to learn about international business environments through international study trips conducted in various regions of the world. The international study courses are usually offered between semesters and vary in length from two to three weeks and are generally taken as part of an Area Studies course. Many of the courses for this degree can also be taken via distance learning.

The **MS in Management and Administrative Sciences (MS MAS)** degree provides students the opportunity for specialized education in a specific management discipline built upon a core of business courses. It is obtained by completing the program course requirements of 36 hours beyond all prerequisites. The program consists of 10 hours of business core courses, and the remaining hours as elective courses. Potential concentration areas for students include: accounting, enterprise systems, internal audit, corporate finance, investments, marketing, e-commerce, information systems, operations and supply chain, real estate, innovation and entrepreneurship, organizations, organizational behavior and coaching, strategy and international topics. The classes for this degree are largely offered in the evenings or online.

The **MS in Marketing** program prepares students seeking higher level positions in marketing and/or pursuing a graduate program to further advance their marketing knowledge. The MS in
Marketing program offers five specialized tracks: advertising & branding, digital advertising and marketing, marketing analytics, product management and a general track of marketing management. The program also offers an opportunity to obtain academic certifications in marketing analytics or product management.

The **MS in Supply Chain Management (MS SCM)** is the management of business activities from product development, sourcing, production and logistics to managing the resources and related capabilities the organization needs in the accomplishment of its strategic objectives. This 36 credit-hours program explores the key issues associated with the design and management of industrial supply chains and provide students with advanced knowledge on how to identify, resolve and manage complex operational problems. The program also introduces students to current supply chain operating practices, analysis methods, technology, applications and strategy developments. Students will acquire not only the crucial knowledge of business management but also analytical decision-making skills (especially for complex systems) along with real-life experiences gained through industry projects with area companies.

The **MS in Systems Engineering and Management (MS SEM)**, will focus on educating industry-sponsored corporate employees in the disciplines of Systems Engineering, Systems Management, Entrepreneurship & Intrapreneurship, Product Line Development and Management, and Strategic Business Management. Target industries for the program include: aerospace, defense and space systems; transportation systems; information and communications technology (ICT) systems; information assurance and cyber-security systems; healthcare systems; energy, environment and infrastructure systems; complex biological systems; and macro-economic and financial systems.

**Dual Degree, Executive MS SEM/GLE MBA:** The Naveen Jindal School of Management and the Erik Jonsson School of Engineering and Computer Science offer a Joint Executive MS SEM and Global Leadership Executive MBA (GLE MBA) program because today’s experienced graduate students — seasoned by three or more years as workforce professionals — often seek a more comprehensive education in technical skills as well as broad-based business-leadership capabilities for the global economy. The joint-degree option provides both deep knowledge in SEM, as well as a broad knowledge of all areas of management with an enhanced worldwide perspective of business leadership for increasing productivity, efficiency and profitability.

The joint-degree program allows students to earn a combination of an MS SEM degree and a Global Leadership Executive MBA degree together. Separately, each degree would require 36 (MS) + 53 (MBA) credit hours, or 89 credit hours total. However, in the joint program students can earn both degrees with a smaller total of 63 to 65 semester credit hours.

The **MD/MBA program** is a joint effort of the school of medicine at UT Southwestern and the Jindal School of Management. Students usually complete the first three years of the medical curriculum (all basic science courses and third-year clinical rotations) and then take a one-year leave of absence from the medical school to complete the business education. Students then return to the medical school for completion of the medical curriculum in the required fourth-year clinical clerkships and electives. At the end of the five years, the medical degree will be awarded by UT Southwestern and the MBA by UT Dallas.

The Naveen Jindal School of Management also offers **Executive Education** degree programs.
Executive Education MBA programs are offered for students with more than five years of experience. These include (1) the Executive MBA Program with classes meeting for three to four days (Friday and two Saturdays) a month, (2) the Executive MBA with emphasis in Project Management that highlights managing complex projects, (3) the Healthcare Management Executive MBA for physicians interested in learning how to improve the leadership and management of their organizations, and (4) Global Leadership Executive MBA is delivered on campus and by distance learning with a focus on international management. Students in Executive Education programs are assessed program related fees beyond those charged to other graduate students to cover the additional costs of unique scheduling, events, and services associated with these programs. Each of these programs requires 53 credit hours to graduate.

Leaders in high tech firms often need expertise in both engineering and management. Through a unique combined master’s level degree program, graduate students may earn an MSEE degree from the Jonsson School of Engineering and Computer Science in combination with an MBA, or an MS degree from the Naveen Jindal School of Management. This combined degree program is ideal for students interested in managing new technologies, from conceptualization and development to introduction and production. Students must meet the admission requirements in both schools and have an advisor in both schools. The combination of MSEE and MBA degrees can be earned by completing a minimum of 68 graduate hours, compared to 86 hours if completing the two degrees separately. The combination of MSEE and MS degrees can be earned by completing a minimum of 51 credit hours beyond prerequisites, compared to 69 hours if completing the two degrees separately. See Electrical Engineering for details.

The PhD in International Management Studies provides the opportunity to conduct research in the analysis of international business, emphasizing a strong foundation in theory and research in organizations and strategy. International Management Studies focuses on the analysis of organizations, industries and markets as interdependent systems, stressing structural, strategic, environmental and international considerations and their implications for management. Topics such as corporate strategy, international business, multinational management, organization design and change, technological and industrial development, and managerial decision-making are examined using management theories and empirical methods.

The PhD in Management Science provides the opportunity to conduct research in a functional business area to contribute to the knowledge in that field with respect to its intellectual content or professional practice. The Naveen Jindal School of Management defines Management Science as the use of economics, behavioral science, mathematics and statistics to conduct rigorous scientific research. It encompasses both theory and empirical analysis. Management Science embraces areas of specialization like marketing, finance, accounting, organizational behavior, management strategy and public policy, and decision sciences. It has no clear boundaries among the various areas, places emphasis on science, and is not constrained by the culture of individual disciplines. It is the underlying orientation of science and integration that distinguishes Management Science from other philosophies and approaches to the study of management.

Both doctoral programs offer preparation for academic and/or research positions in universities, with organizations such as the World Bank, and in industry, both in the United States and in other countries.
Facilities
The Naveen Jindal School of Management’s 200,000 square foot (approximate) building opened in the Fall of 2003. The three wings, arranged around a courtyard, provide classrooms, meeting rooms office space and state-of-the-art wireless access to the internet throughout the facility.

Admission Requirements to Master’s Programs
Please visit the university’s general admission criteria for the graduate programs. The following factors are considered in arriving at an admission decision:

- A bachelor’s degree from an accredited institution in the United States, or its equivalent, as determined by the Dean of Graduate Studies,
- International applicants must submit a TOEFL score of at least 80 on the internet based test that is less than two years old,
- Personal essay outlining academic interests and goals
- Three letters of recommendation,
- Resume,
- Competitive GMAT (GRE also accepted) performance based on a score that is less than five years old,

Applications are due in the Admissions Office 90 days prior to registration for international students and 45 days prior to registration for all other students. Students are admitted three times per year and can start their studies during any one of the three semesters.
Students may apply for the Dean’s Excellence Scholarship, which provides financial support in the form of scholarships.

Admission Requirements to Full-time (Cohort) MBA program: In addition to the factors required for admission to the evening programs, admission to the Full-time, Cohort MBA program requires the capability to perform well in a fast-paced, team-oriented curriculum. Applicants are admitted based on a composite evaluation of the submitted measures of performance which include the GMAT, GPA, recommendation letters, and work experience, as well as initiative and interest suggested through essays. The Admission Committee seeks academic and professional excellence. Applications completed by March 1 will be considered for financial support. International applications are due May 1 and domestic applications by July 1.
Students are admitted each fall.

Admission Requirements to Executive MBA programs: Admissions are based on academic transcripts, a personal essay, letters of recommendation, and knowledge of elementary calculus and basic financial accounting. Also, approximately 10 years of business experience with relevant managerial experience. The GMAT is encouraged, but not required.

Admission Requirements to Master of Science in Healthcare Management for physicians (admission to the Executive Track) requires an MD or DO degree from an accredited school of medicine or school of osteopathy, a copy of a current unrestricted license to practice medicine in the U.S. and a medical school transcript.

Admission Requirements for Non-Degree Seeking Students: Students may be admitted as non-degree seeking students. To be admitted as a non-degree seeking student, students will have to meet all the admission requirements specified for degree seeking students including relevant
test scores (GMAT/GRE, TOEFL). Students who want to switch to degree-seeking status, will have to apply to the degree program. If they are admitted, at most six credits taken as a non-degree seeking student can be transferred to the degree program.

Substitutions and Transfers of Credit
Substitutions of program requirements may be granted in recognition of previous coursework taken in a specific business program area. Substitutions are approved by the appropriate Program Director through a process which allows a student to skip a core course and take the next higher level course in that area with no reduction in the overall program hour requirements.

Transfers of credit may be granted for equivalent graduate coursework taken at other universities with a grade of "B" or better within the past six years. The appropriate Program Director initiates such transfers, which must be approved by the Dean of Graduate Studies. The total number of transfers of credit toward the completion of a master's degree cannot exceed nine hours toward the MS degree, and twelve hours toward the MBA degree.

Applications for approval of substitutions and transfers of credit may be obtained in and submitted to the Naveen Jindal School of Management Advising Office.

Prerequisites for Graduate Programs
Knowledge of calculus is a requirement for certain programs (see individual programs for details). Students who have not completed an undergraduate calculus course at the level of MATH 1325 Applied Calculus I or higher may satisfy the prerequisite by completing MATH 5304 Applied Mathematical Analysis for Non-Majors. Degree credit is not earned for program prerequisites; however, the grade achieved in MATH 5304 will count toward the student's grade point average. For the MS in International Management Studies, FIN 6301 Financial Management has a prerequisite of OPRE 6301, its equivalent or consent of instructor. Prerequisites must be satisfied within the first twelve hours of graduate study as a degree-seeking student.
Master of Science in Accounting (36 hours minimum)

Degree Requirements
The University’s general degree requirements are discussed here. The MS in Accounting is a 36 credit-hour degree program focused primarily on educating students in Accounting while recognizing the need for a business foundation. The degree is separated into three components:
1. Basic Business Core
2. Accounting Foundation
3. Accounting Electives

The classes can be completed in any order as long as the following specific program course prerequisites have been met with a grade of a “B” or better:
- Introduction to Financial Accounting (ACCT 6201) or its equivalent, and
- Introduction to Managerial Accounting (ACCT 6202) or its equivalent

Students must address any deficiencies in these prerequisites within the first twelve hours of graduate work and prior to taking any course with these defined prerequisites. Also, students do not earn degree credit for program prerequisites.

Within the MS in Accounting degree program, students must choose 18 elective hours. Students can pick and choose the courses that best fit their unique career goals and needs. Typical career paths include areas such as corporate accounting, assurance services, tax, or internal audit. Students must maintain a 3.0 grade point average in both business core courses and in aggregate to qualify for the MS in Accounting degree.

The Texas State Board of Public Accountancy (TSBPA) accepts certain courses towards the requirement of 30 semester hours of upper level accounting for CPA eligibility. Courses accepted by the TSBPA are subject to change based on catalog review. Please inquire with the Program Director or the MS Accounting website for the most current list.

Prerequisites
Calculus is required as a graduate program prerequisite. If a student has not taken an equivalent course already, he/she will need to complete a Math refresher course (e.g., OPRE 6303, MATH 5304) with a grade of “B” or better to meet the calculus requirement. For specific course prerequisite information, please visit the UT Dallas Graduate Catalog for further details at www.utdallas.edu/student/catalog/.

A. Basic Business Core (12 credit hours)
Each candidate must satisfactorily complete the following four courses (with 3.0 or higher GPA in both core courses and in aggregate courses).
- ACCT 6343 Accounting Information Systems OR OPRE 6302 Operations Management
- ACCT 6344 Financial Statement Analysis
- MECO 6303 Business Economics OR FIN 6301 Financial Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business

B. Accounting Foundation (6 credit hours)
Each candidate must satisfactorily complete the following two accounting foundation courses:
ACCT 6330 Intermediate Financial Accounting I
ACCT 6332 Intermediate Financial Accounting II

Note: candidates who have completed the accounting foundation courses (or their undergraduate equivalents) may be able to obtain a course waiver and substitute for these required courses with other graduate level ACCT electives. Substitutions are approved by the appropriate Program Director, and forms may be obtained in and submitted to the Jindal School of Management Advising Office.

C. Accounting Electives (18 credit hours), select from any of the following courses:
ACCT 6203 Professional Accounting Communications (Meets TSBPA requirement of 2 credit hours of communication for CPA eligibility.)
ACCT 6309 Business Data Warehousing
ACCT 6320 Database Foundations
ACCT 6331 Cost Accounting
ACCT 6333 Advanced Financial Reporting*
ACCT 6334 Auditing*
ACCT 6335 Ethics for Professional Accountants (Meets the TSBPA requirement of 3 credit hours of ethics for CPA eligibility.)
ACCT 6336 Information Technology Audit and Risk Management
ACCT 6338 Accounting Systems Integration and Configuration
ACCT 6341 Planning, Control and Performance Evaluation
ACCT 6345 Business Valuation
ACCT 6350 Fundamentals of Taxation I
ACCT 6353 Fundamentals of Taxation II
ACCT 6354 Partnership Taxation
ACCT 6355 Fundamentals of Taxation II
ACCT 6356 Tax Research* (Meets the TSBPA requirement of 2 credit hours of research for CPA eligibility.)
ACCT 6362 International Accounting
ACCT 6365 Governmental and Not-For-Profit Accounting
ACCT 6370 Business Law
ACCT 6377 Corporate Governance
ACCT 6380 Internal Audit
ACCT 6382 Advanced Auditing
ACCT 6383 Fraud Examination
ACCT 6384 Analytical Reviews Using Audit Software
ACCT 6386 Governance, Risk Management and Compliance (GRC)*
ACCT 6388 Accounting Communications
ACCT 6389 Volunteer Income Tax Assistance Practicum
ACCT 6V98 Accounting Internship
ACCT CPA Review Courses (Various #s)
And other courses as listed in the Course Catalog.
For students interested in the Internal Audit program and the CIA or CISA designation, 12-18 credit hours from the following courses are required:

ACCT 6380 Internal Audit (This core course is required and must be taken in the first semester.)
ACCT 6334 Auditing
ACCT 6335 Ethics for Professional
ACCT 6336 Information Technology Audit and Risk Management
ACCT 6377 Corporate Governance and Accounting
ACCT 6382 Advanced Auditing
ACCT 6383 Fraud Examination*
ACCT 6384 Analytical Reviews Using Audit Software
ACCT 6V98 Accounting Internship [Internal Audit Internship]
Master of Business Administration (53 hours minimum)

Degree Requirements
The MBA degree is obtained by completing a 53-hour program beyond prerequisite courses consisting of 29 hours of core courses and 24 hours of elective courses. At the option of the student, a concentration may be developed by taking a set of electives related to an area of interest. Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MBA degree.

There are four different programs for students interested in the MBA. We offer an MBA full-time (cohort) program, a professional MBA evening cohort program, professional MBA Flex and an professional MBA online.

Note: The Executive Education area of the Jindal School of Management offers four distinctive and separate MBA programs, which retain the same set of MBA core courses but have their own set of specific topical electives. These include the Executive MBA (EMBA), the Global Leadership Executive MBA (GLEMBA), the Executive MBA with an emphasis in project management, product lifecycle and supply chain, or organizational behavior and coaching, and the Executive Healthcare MBA.

Prerequisite
Calculus is required as a prerequisite for some of the coursework in the MBA. Candidates that have not taken calculus or an equivalent course will need to take MATH 5304, MATH 1325 or OPRE 6303 to meet this requirement.

Core Courses (29 hours)
Each candidate must satisfactorily complete the following core of 11 courses.
ACCT 6201 Introduction to Financial Accounting
ACCT 6202 Introduction to Managerial Accounting
BPS 6310 Strategic Management
FIN 6301 Financial Management
IMS 6204 Global Business
MIS 6204 Information Technology and MIS Fundamentals
MECO 6303 Business Economics
MKT 6301 Marketing Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
OPRE 6302 Operations Management
OB 6301 Organizational Behavior

Elective Courses (24 hours)
Each candidate must also complete an additional 24 hours of elective graduate course work. Students may develop a concentration within the 24 hours of electives, but are not required to do so. Students cannot include more than 15 hours in any single functional area (demarcated by the area prefix) beyond the required core courses.
Concentrations
Concentrations are informal collections of electives that address a student’s educational goals. A concentration may be aligned with functional area specialties, or may cut across functional areas. Students are encouraged to develop their concentration with the help of a faculty member, area coordinator, or the Advising Office. Typical concentrations include:

Accounting: In today’s global and technology-driven environment, managers need skills to effectively analyze accounting information and make value-enhancing decisions. Students may select accounting courses to concentrate in financial analysis, consulting, corporate governance and tax management.

Finance: Students can prepare for careers in corporate finance, investment management, or the management of financial institutions. Courses in this area emphasize creative solutions to business financing problems, the development of value maximizing investment and financing strategies, and the analysis and management of fixed income and equity investments. Students may choose to concentrate in either corporate financial planning or the analysis of financial securities and investment portfolios.

Healthcare Administration: The primary goal of this concentration is to prepare students for leadership positions in healthcare organizations. The healthcare concentration is cross-functional and industry focused. Courses will contain cases, projects, and assignments that are centered around applying management skills to healthcare issues and organizations. Classes are taught by faculty and healthcare executives who bring special expertise and experience to the program.

Information Technology Management: Information Technology permeates all aspects of modern business and our courses will enable you to make the most of information technology to solve business problems and gain strategic advantage. We also provide advanced courses for students who wish to be on the “supply” side of information technology in the areas of IT consulting, software management, and e-business.

Innovation and Entrepreneurship: Focused on the processes of technological innovation in both large and small organizations, a set of multidisciplinary courses prepares students for successful careers either as principals or key functional managers in emerging growth firms, or as leaders of technological innovation in established firms.

International Management: In this concentration, students can take a multi-disciplinary approach to the study of international management, with courses in finance, marketing, strategic management, and the legal and cross-cultural differences that effect business.

Leadership in Organizations: The leadership concentration prepares students for upper management positions through the study of the psychological, sociological and organizational behavior disciplines. The program provides a foundation of leadership theory, building and problem solving in interpersonal work relationships, group dynamics, organizational decision making and change, and ethics.

Marketing: Students learn to understand customers’ needs and purchase behaviors, how to
satisfy those needs, and how to make a profit in competitive industries and markets. Topics include: developing an effective marketing strategy, developing new products, and managing different brands and product categories. Students can also acquire expertise in pricing, advertising and promotions, market research, and retailing strategies. Courses are also available on the Internet’s effect on marketing and business.

**Operations/Supply Chain Management:** Firms can use effective and innovative operations to create and sustain competitive advantages. Students in these courses gain a deep, analytical understanding of how challenges posed by fast developing business environments can become profit-making opportunities. Integration of various parties (suppliers, factories, stores) and various functional areas (marketing, finance, procurement) is an important theme. In particular, incentives, contracts and information technologies fostering collaboration among financially independent parties are emphasized.

**Organizations:** This concentration emphasizes organizational behavior and theory, and human resources management. Students learn how to effectively integrate and leverage human resources to create sustainable advantages in a competitive marketplace. Courses chosen in this area integrate a wide variety of disciplines, including economics, organization theory, finance, psychology, and sociology.

**Real Estate:** this concentration includes courses in: real estate finance and capital markets, covering real estate loans, syndication, securitization, and regulation; investment and analysis, combining lectures and case studies to explore the sources of real estate value, project feasibility, strategies for financing, and portfolio management; and, development, covering market analysis, government approvals, financing and risk assessment.

**Strategy:** This concentration focuses on corporate level strategic management, including: implementation of strategic designs; top management team leadership; the strategic implications of the social, governmental, technological, and international environments; organization structuring; and strategic alliances. Students will learn how to integrate accounting, finance, economics and organization theory to create sustainable competitive advantage.
Master of Science in Finance (36 hours minimum)

Degree Requirements
At least 36 hours of management course work beyond prerequisite courses is required, including 18 hours of basic business core courses and 18 hours of graduate finance courses. The MS in Finance is designed for students with or without previous educational background in finance. Many students will select the Financial Management option, which allows them to design a program to their needs.

For students wanting a more focused program, six concentrations are available: Investment Management, Financial Analyst, Financial Risk Management, Management of Financial Institutions, Real Estate, or Financial Information Management. The Investment Management concentration is designed for students interested in pursuing an investment career and completing the Chartered Financial Analyst (CFA) examinations. The Financial Analyst concentration is designed for students interested in corporate finance, investment banking, venture capital, private equity, or corporate restructuring and turnarounds. The Financial Risk Management concentration is designed for students with the quantitative ability to pursue a career applying quantitative methods to risk management problems and prepares students for the Financial Risk Manager (FRM) examinations. The Management of Financial Institutions concentration prepares students for careers in banking or other financial institutions. The Real Estate concentration prepares students for various types of careers in the real estate industry. The Financial Information Management concentration prepares students to apply information technology to financial analysis, investment management and trading. Because these concentrations have been designed to prepare students for certain certifications, students are recommended to focus only on the course work within a particular concentration in order to prepare for its associated certification.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Prerequisites
Calculus, basic statistics and competence in personal computing are required as prerequisites. Candidates that have not taken equivalent courses will need to take MATH 5304 to meet the calculus requirement; OPRE 6301 to complete the basic statistics requirement, and MIS 3300 to complete the personal computing requirement.

Basic Core Courses (18 credit hours)
All students enrolling in the Master of Science in Finance program must complete the following Basic Business Core courses, or their equivalents. Please see the catalog for further prerequisite information.
ACCT 6305 Accounting for Managers or ACCT 6201 Introduction to Financial Accounting and ACCT 6202 Introduction to Managerial Accounting
MECO 6303 Business Economics
FIN 6301 Financial Management
FIN 6306 Quantitative Methods in Finance
Financial Management Option (18 hours):
Students must complete eight courses; of which at least one course must come from category A and at least five must come from category B. Students may do an internship (FIN 6V98) as part of this option.

**Category A:** ACCT 6330, ACCT 6332, ACCT 6344, ACCT 6345, ACCT 6350, ACCT 6353, MECO 6312, MECO 6315, ECON 6305, ECON 6306, ECON 6311, ENTP 6390, OPRE 7310, MIS 6324, MIS 6326, MIS 6344. Note: Either MECO 6312 or ECON 6306 can be counted as they are substitutes. Similarly, either OPRE 7310 or ECON 6311 can be counted as they are substitutes.

**Category B:** FIN 6308, FIN 6311, FIN 6314, FIN 6315, FIN 6316, FIN 6320, FIN 6321, FIN 6322, FIN 6323, FIN 6325, FIN 6330, FIN 6340, FIN 6352, FIN 6355, FIN 6356, FIN 6357, FIN 6360, FIN 6364, FIN 6366, FIN 6368, FIN 6370, FIN 6378, FIN 6380, FIN 6381, FIN 6382, FIN 6383, FIN 6V98, and FIN 6V99.

Concentrations (18 hours):  
**Investment Management (CFA) Concentration recommended coursework:**
ACCT 6344 Financial Statement Analysis  
FIN 6311 Valuation Models and Practices  
FIN 6314 Fixed Income Securities  
FIN 6320 Financial Markets and Institutions  
FIN 6325 Macroeconomics and Financial Markets  
FIN 6330 Behavioral Finance  
FIN 6360 Options and Futures Markets  
FIN 6364 Advanced Investment Management  
FIN 6378 Emerging Market Investment Analysis  
FIN 6380 Global Fund Management

**Financial Analyst Concentration recommended coursework:**
ACCT 6330 Intermediate Financial Accounting I  
ACCT 6332 Intermediate Financial Accounting II  
FIN 6311 Valuation Models and Practices  
FIN 6316 Private Equity Finance  
FIN 6352 Corporate Financial Modeling  
FIN 6355 Corporate Finance and Policy  
FIN 6356 Mergers and Acquisitions  
FIN 6357 Corporate Restructuring and Turnarounds  
FIN 6366 International Financial Management

**Financial Risk Management Concentration recommended coursework:**
FIN 6314 Fixed Income Securities  
FIN 6360 Options and Futures Markets
OPRE 7310 Probability and Stochastic Processes
MECO 6312 Applied Econometrics and Times Series Analysis or ECON 6306 Applied Econometrics
FIN 6370 The Theory of Finance and Its Applications
FIN 6381 Introductory Mathematical Finance or ECON 6305 Mathematical Economics
FIN 6382 Numerical Methods in Finance
FIN 6383 Financial Risk Management

Management of Financial Institutions Concentration - recommended coursework:
FIN 6308 Regulation of Business and Financial Markets
FIN 6311 Valuation Models and Practices
FIN 6314 Fixed Income Securities
FIN 6320 Financial Markets and Institutions
FIN 6325 Macroeconomics and Financial Markets
FIN 6340 Management of Financial Institutions
FIN 6360 Options and Futures Markets
FIN 6383 Financial Risk Management

Real Estate Finance Concentration – recommended coursework:
FIN 6314 Fixed Income Securities
FIN 6321 (REAL 6321) Introduction to Real Estate
FIN 6322 (REAL 6322) Real Estate Finance and Investment
FIN 6323 (REAL 6323) Real Estate Market Analysis and Commercial Investment
FIN 6324 (REAL 6324) Real Estate Valuation
FIN 6320 Financial Markets and Institutions

Financial Information Management Concentration - recommended coursework:
MECO 6312 Applied Econometrics and Times Series Analysis or ECON 6306 Applied Econometrics
FIN 6360 Options and Futures Markets
FIN 6364 Advanced Investment Management
FIN 6368 Financial Information and Trading
FIN 6382 Numerical Methods in Finance
MIS 6324 Business Intelligence Software and Techniques
MIS 6326 Data Management
MIS 6344 Web Analytics
Master of Science in Healthcare Management (36 hours minimum)

Degree Requirements
The Master of Science in Healthcare Management prepares students for roles in the leadership and management of the U.S. healthcare industry. It integrates a thorough grounding in advanced business management theory and practice with an understanding of the structure, operation and financing of the U.S. healthcare system. The curriculum is customized to accommodate the needs of two different audiences:

Professional Track – for healthcare administrators and those desiring a management career in the healthcare industry; and

Executive Track – for physicians and senior healthcare executives.

Professional Track
The Professional Track MS in Healthcare Management is a 36 credit hour program consisting of business core, healthcare management courses and electives. Students must maintain a 3.0 grade point average in both core courses and overall to qualify for the MS degree.

Required Business Core (15 hours)
OB 6301 Organizational Behavior
FIN 6301 Financial Management
ACCT 6305 Accounting for Managers
MKT 6301 Marketing Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business

Healthcare Management Core (12 hours)
The following four courses are required:
HMGT 6320 The American Healthcare System
HMGT 6321 Strategic Leadership of Healthcare Organizations
HMGT 6323 Healthcare Informatics
HMGT 6330 Healthcare Law, Policy, and Regulation

Choose at least 6 credit hours from the following:
HMGT 6322 Healthcare Cost Management and Control
HMGT 6324 (OPRE 6396, OB 6332, SYSM 6313) Healthcare Negotiation and Dispute Resolution
HMGT 6325 Healthcare Operations Management
HMGT 6327 Information and Knowledge Management in Healthcare
HMGT 6329 Seminar in Healthcare Management
HMGT 6331 Healthcare Economics
HMGT 6332 Quality Improvement in Healthcare: Six Sigma and Beyond
HMGT 6333 Ethics in Healthcare Management
HMGT 6334 Healthcare Analytics or MIS 6324 Business Intelligence Software and Techniques
HMGT 6380 (ACCT 6380) Internal Audit
Other Electives (3 hours)
The 3 hour Business Management elective requirement may be met by additional healthcare courses as well as by advanced courses in other management disciplines.

Suggested elective concentrations:

**Healthcare Informatics**
For students desiring a strong background in the application of IT in the healthcare field.
HMGT 6323 Healthcare Informatics (core course)
HMGT 6327 Information and Knowledge Management in Healthcare
HMGT 6334 Healthcare Analytics or MIS 6324 Business Intelligence Software and Techniques

**Healthcare Internal Auditing**
For students with a desire for an internal auditing career with a healthcare provider organization
HMGT 6380 Internal Audit
HMGT 6382 Advanced Auditing
HMGT 6336 Information Technology Audit and Risk Management

**Healthcare Operations**
For students desiring a broad-based background in management of healthcare organizations
HMGT 6325 Healthcare Operations Management
HMGT 6332 Quality Improvement in Healthcare; Six Sigma and Beyond
HMGT 6322 Healthcare Cost Management and Control or HMGT 6334 Healthcare Analytics

**Executive Track**
The Executive Track for physicians is delivered in a non-semester format. The 36 credit hour curriculum consists of nine 4-day residential classes. A different class is offered every two months and classes may be started at any time and taken in any order. The program is jointly taught by faculty from UT Dallas, Naveen Jindal School of Management and The University of Texas Southwestern Medical Center. Eight classes are eligible for up to 36 hours each of Category 1 CME credit toward the AMA Physician's Recognition Award and CEU credit for healthcare executives.

Successful completion of any five classes is recognized by the award of a Graduate Certificate in Healthcare Management. Completion of the nine healthcare management classes OR any eight classes plus a self-directed field study is recognized by the award of a Master of Science in Healthcare Management. Students must maintain a 3.0 overall grade point average in order to qualify for the MS degree.

The Executive Track MS in Healthcare Management is supported entirely by participant fees and special admission requirements apply. The class is open only to physicians with a current license.
to practice medicine in the U.S. For information, contact the program office at (972) 883-6252.
HMGT 6401 Negotiation and Conflict Management in Healthcare
HMGT 6402 Financial Management of Healthcare Organizations
HMGT 6403 Medical Cost and Performance Management
HMGT 6404 Service Quality Improvement and Patient Satisfaction
HMGT 6405 Healthcare Information, Management and Technology
HMGT 6406 Strategic Management of Healthcare Organizations
HMGT 6407 Healthcare Policy and Regulation
HMGT 6408 Motivational Leadership in Healthcare Organizations
HMGT 6410 Coaching as a Leadership Style
HMGT 6V15 Self-Directed Field Study
Master of Science in Information Technology and Management (36 hours minimum)

Degree Requirements
The Master of Science in Information Technology Management (MS ITM) degree requires a minimum of 36 credit hours, consisting of basic business courses, IT foundation courses, IT elective courses and free electives. The business core courses are designed to provide incoming students with the context to better appreciate and understand the complex issues that occur at the interface between IT and business.

The IT foundation courses cover the essentials of IT knowledge that any student must possess. The IT elective courses provide in-depth knowledge of the technology and technology management issues. In addition, students may choose approved electives that maximize their individual educational and professional goals. The program also offers opportunities for students to concentrate in specific tracks such as ‘Enterprise Systems’, ‘Business Intelligence and Analytics’, ‘IT Consulting’, ‘Healthcare Systems’, and ‘Information Security and Assurance’ depending on their interests and goals. The students can contact the advising office for the recommended courses for these tracks.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Basic Business Core Courses (minimum of 9 credit hours from the following)
ACCT 6305 Accounting for Managers  
FIN 6301 Financial Management  
MECO 6303 Business Economics  
MKT 6301 Marketing Management  
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business  
OPRE 6302 Operations Management  
OB 6301 Organizational Behavior

IT Foundation Courses (12 credit hours)
MIS 6316 Data Communications  
MIS 6323 Object Oriented Programming  
MIS 6326 Data Management  
MIS 6308 Systems Analysis and Project Management

IT Electives Choose 9 hours from the list of courses that have an MIS prefix, excluding MIS 6204.
MIS 6302 Information Technology Strategy and Management  
MIS 6309 Business Data Warehousing  
MIS 6314 System ReEngineering  
MIS 6317 Healthcare Informatics  
MIS 6319 Enterprise Resource Planning
MIS 6324 Business Intelligence Software and Techniques
MIS 6330 Information Technology Security
MIS 6332 Advanced ERP: Sales and Distribution
MIS 6334 Advanced Business Intelligence
MIS 6338 Accounting Systems Integration and Configuration
MIS 6344 Web Analytics
MIS 6352 Web Systems Design and Development
MIS 6360 Software Project Management
MIS 6362 Service Oriented Computing
MIS 6363 Cloud Computing
MIS 6364 Enterprise IT Architecture
MIS 6369 Supply Chain Software
MIS 6372 IT Services Management
MIS 6373 Social Media and Business
MIS 6378 Enterprise Systems and CRM
MIS 6379 SAP ABAP Programming
MIS 6V98 Information Systems Internship

Free Electives (6 credit hours)
Any course from the set of IT electives may be used as a free elective. Also any course from the set of business core courses, or any other graduate level business course, except MIS 6204, may be used as a free elective.
Master of Science in Innovation & Entrepreneurship (36 hours minimum)

Objectives
The MS in Innovation and Entrepreneurship (MSIE) prepares students for successful business careers in entrepreneurial new ventures, entrepreneurial finance (venture capital/private equity), or innovation-related roles in mature organizations (product planning, product marketing, product development, etc.). This degree complements baccalaureate or advanced degrees in a business, scientific or engineering discipline, and is valued by employers in technology-related or consumer products industries.

Prerequisites
Prerequisite knowledge in statistics is a requirement for the program. Candidates who have not taken equivalent courses will need to take OPRE 6301 to meet the statistics requirement. Degree credit is not earned for program prerequisites. If required, OPRE 6301 may be included as an additional elective (but it will not count as part of the 36 credit hours required for the degree).

Degree Requirements
The Master of Science in Innovation and Entrepreneurship degree requires 12 hours of basic core courses, including foundational courses in entrepreneurship and entrepreneurial finance. The curriculum also provides two concentration areas, the first focuses on entrepreneurial startups (New Venture concentration) and the second on the challenges of managing entrepreneurial innovation within the more structured environment of a mature organization (Innovation within the Corporation concentration). The student must take a minimum of 12 hours within one of the designated concentration areas.

An additional 12 hours of electives must be taken, including at least one course from among the experiential courses taught in the Venture Development Center (ENTP 6360, ENTP 6365, or ENTP 6398). The remaining electives may be chosen from among any of the concentration area courses not already taken, the other ENTP electives offered, the non-ENTP courses listed as electives below, or, with permission, from among any of the other JSOM offerings in the ACCT, BPS, FIN, IMS, MIS, MKT, OPRE, or OB areas.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Basic Core Courses (12 hours)¹
Each candidate must satisfactorily complete the 12-hour basic core consisting of the following courses:

¹ Business statistics is required as a prerequisite for the degree program. Candidates who have not taken an equivalent course will need to take OPRE 6301 to meet the statistics requirement. If required, OPRE 6301 may be included as an additional elective (but it will not count as part of the 36 credit hours for the degree).
ACCT 6305 Accounting for Managers
MKT 6301 Marketing Management
ENTP 6370 Entrepreneurship
ENTP 6315 (FIN 6315) Entrepreneurial Finance

**Concentration Area Courses (12 hours)**
Each candidate must complete a minimum of 12 credit hours within one of the two concentration areas shown below:
- New Venture Concentration
  - ENTP 6375 Technology and New Product Development
  - ENTP 6378 Managing the Emerging Enterprise
  - ENTP 6380 Marketing Entry Strategies
  - ENTP 6390 Business Model Innovation

- Entrepreneurship Concentration
  - ENTP 6375 Technology and New Product Development
  - ENTP 6380 Marketing Entry Strategies
  - ENTP 6388 Managing Innovation within the Corporation
  - ENTP 6390 Business Model Innovation

**Elective Courses (12 hours)**
Each candidate must complete a sufficient number of electives to earn a minimum of 36 hours toward the MS degree. At least one course must be chosen from among the experiential courses taught in the Venture Development Center (indicated by an asterisk below). The remaining electives may be chosen from:
- ENTP 6311 (FIN 6311) Valuation Models and Practices
- ENTP 6316 (FIN 6316) Private Equity Finance
- ENTP 6360 Start-up Launch I, ENTP 6361 Start-up Launch II
- ENTP 6365 Integrated Venture Development
- ENTP 6382 (MKT 6382) Professional Selling
- ENTP 6392 Entrepreneurship in the Social Sector
- ENTP 6398 The Entrepreneurial Experience*
- ENTP 6V97 Entrepreneurial Internship
- BPS 6310 Strategic Management
- OB 6301 Organizational Behavior
- OB 6321 Principles of Leadership
- Any Concentration Area Courses not yet taken (listed above)
- Other JSOM graduate course offerings (with permission)

**Start-up Launch Program**
A student or student team with an approved business concept may elect the Start-up Launch Option. The option requires completion of the Basic Core courses, the New Venture Concentration, and up to 12 credit hours of the ENTP 6360, ENTP 6361, and ENTP 6362 series of Start-up Launch electives, pursuing concept validation and business development leading to the launch of the new business while at UT Dallas or upon completion of the program.
Master of Science in International Management Studies (36 hours minimum)

Degree Requirements
The MS degree is obtained by completing satisfactorily a 36-hour program beyond prerequisite courses for the Jindal School of Management graduate programs. The program provides students the opportunity to learn in-depth the fundamentals of (1) functional areas of management, (2) international management, and (3) cultural, sociopolitical and geographical constraints affecting international business decisions. It also provides educational opportunities for the student with non-business undergraduate training to prepare for a career in the management of international trade and industry.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Basic Business Core (8 credit hours)
All students enrolling in MS-IMS must complete the following Basic Business Core Courses:

ACCT 6201 Introduction to Financial Accounting
FIN 6301 Financial Management *
MKT 6301 Marketing Management

IMS Foundation Courses (11 credit hours)
IMS 6204 Global Business
IMS 6310 International Marketing
IMS 6360 International Strategic Management
IMS 6365 Cross-Culture Communication and Management

IMS Electives (6 credit hours), select a minimum of 6 hours from the following:
IMS 6302 Legal Aspects of International Business Transactions
IMS 6320 International Corporate Finance or FIN 6366 International Financial Management (3)
BPS 6332 Strategic Leadership
IMS 6314 Global E-Business Marketing
IMS 6205 Export Market Planning

Free Elective Courses (11 credit hours)
Four hours of area study is strongly recommended. Any course from the set of IMS electives may be used as a free elective. Also, any advanced courses from other departments within the Jindal School of Management may be used as a free elective.

The following are some of the other IMS related courses offered with the Jindal School of Management:

MKT 6332 Advertising and Promotional Strategy
IMS 6314 Global E-Business Marketing
IMS 6V9X  Regional Area Studies: Faculty led study trip (see specific course number for an area study**)  
OB 6301 Organizational Behavior (3)  
OB 6303 Managing Organizations (3)  
OB 6307 Strategic Human Resource Management  
OB 6308 Contemporary Business Ethics and Social Responsibility  
OB 6331 Power and Politics in Organizations  
OB 6332 Negotiation and Dispute Resolution  
OB 6333 Managerial Decision Making  
IMS 6340 Managing Strategy and People in International Techno-Creative Industries  
IMS 6341 International Human Resource Management  
IMS 6343 Sustainability in a Global Business Environment  

Additionally, up to 6 hours of a graduate level language courses may be applied to your degree plan as a Free Elective. The following are the list of courses available with the University:  
HUMA 6320 French Review  
HUMA 6321 Spanish Review  
HUMA 6323 German Review  
HUMA 6330 French Workshop  
HUMA 6331 Spanish Workshop  
HUMA 6333 German Workshop  

The MS-IMS degree program can be taken by itself or with a concentration in one of the six provided degree program areas. Once students take the 25 credit hours (8 credit hours of basic business core courses, 11 hours of IMS foundation course and 6 hours of IMS elective courses), they can take 11 credit hours of free elective courses from the optional electives or the areas of concentration. However, if students decide to take the MS-IMS with a specific choice of concentration, the students should take 12 credit hours entirely from that specific area of concentration.

**Areas of Concentration**

**Supply Chain Management (12 hours)**  
OPRE 6332 Spreadsheet Modeling and Analytics  
OPRE 6350 Global Supply Chain Management  
OPRE 6362 Project Management in Engineering and Operations  
OPRE 6370 Logistics, Distribution and Warehousing  
OPRE 6371 Purchasing, Sourcing and Contract Management  
OPRE 6389 Managing Energy: Risks, Investment, Technology (MERIT)

**Human Resources/Organization Behavior (12 credit hours)**  
OB 6308 Contemporary Business Ethics and Social Responsibility  
IMS 6341 International Human Resource Management  
OB 6301 Organizational Behavior  
OB 6303 Managing Organizations  
OB 6307 Strategic Human Resource Management
OB 6331 Power and Politics in Organizations
OB 6332 Negotiation and Dispute Resolution

**Marketing (12 credit hours)**
IMS 6314 Global E-Business Marketing
MKT 6309 Marketing Research
MKT 6310 Consumer Behavior
MKT 6321 Interactive & Digital Marketing
MKT 6332 Advertising and Promotional Strategy
MKT 6339 Capstone Marketing Decision Making
MKT 6350 Competitive Marketing Strategy

**Finance (12 credit hours)**
FIN 6308 Regulation of Business and Financial Markets
FIN 6310 Investment Management
FIN 6320 Financial Markets and Institutions
FIN 6322 Real Estate Finance & Investment
FIN 6330 Behavioral Finance
FIN 6366 International Financial Management

**Innovation and Entrepreneurship (12 credit hours)**
ENTP 6315 (FIN 6315) Entrepreneurial Finance
ENTP 6370 Entrepreneurship
ENTP 6375 Technology and New Product Development
ENTP 6380 Market Entry Strategies
ENTP 6388 Managing Innovation within the Corporation
ENTP 6390 Business Model Innovation

**Information Management Technology (12 credit hours)**
MIS 6319 Enterprise Resource Planning
MIS 6324 Business Intelligence Software and Techniques
MIS 6326 Data Management
MIS 6344 Web Analytics

**Foreign study trips: **
The Jindal School of Management encourages all students studying for the MS degree to master one foreign language. However, equally important is direct experience of business practices in a foreign country. UT Dallas has organized study abroad opportunities in Latin America, Western Europe, Asia, Africa, North America and Eastern Europe. Foreign study courses, usually offered between semesters, vary in length from two to three weeks and are generally taken as part of an Area Studies course. Area study course is preceded by two weeks of seminar and followed by two weeks of post-trip seminar.

IMS 6V91 Regional Area Studies: Latin America.
IMS 6V92 Regional Area Studies: Western Europe.
IMS 6V93 Regional Area Studies: Asia.
IMS 6V94 Regional Area Studies: Africa.
IMS 6V95 Regional Area Studies: North America.
IMS 6V96 Regional Area Studies: Eastern Europe.

**Program Notes**
Students are encouraged to complete the basic core courses before beginning the advanced core courses. International Strategic Management (IMS 6360) serves as the capstone course and should be taken during the last semester prior to graduation. The classes for this degree are largely offered in the evenings.

*FIN 6301 Financial Management requires as a co-prerequisite OPRE 6301 or a substantial background in statistics leading to a waiver of the requirement by consent of the instructor. See the School of Management Advising Office for waiver procedures. Consult the catalog for complete prerequisite information.

** Regional Area Studies course(s) may be repeated for credit if regions of study differ.
Master of Science in Management and Administrative Sciences (36 hours minimum)

Degree Requirements
The MS in Management and Administrative Sciences degree is a flexible degree that allows students to design a program of study that fits their specific needs. Students complete a 36-hour program, beyond prerequisite courses, consisting of 10 hours of basic core courses, and 26 credit hours of graduate level electives. Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Students should be aware that separate Master of Science programs, with varying core and elective requirements exist in the following areas:

- Accounting
- Finance
- Healthcare Management (for Professionals)
- Information Technology and Management
- Innovation & Entrepreneurship
- Supply Chain Management
- International Management Studies

For the MS-MAS degree program, students choose their own course of study, pulling courses from the School of Management graduate catalog.

Note: The Executive Education area of the School of Management offers three additional and separate MS-MAS programs, which retain the same set of core courses but have their own set of specific topical electives. These include: the MS-MAS with an emphasis in project management, the Executive Healthcare MS-MAS, and the MS-MAS with an emphasis in Organizational Behavior and Coaching. These are described in the Executive Education section of the School of Management chapter. All three programs are supported entirely by participant fees and special admissions requirements apply.

MS-MAS Program Description
Basic Core Courses (10 hours)
Each candidate must satisfactorily complete the following 10 hour basic core:

ACCT 6201 Introduction to Financial Accounting
MECO 6303 Business Economics
MIS 6204 Information Technology and MIS Fundamentals
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business

Elective Courses (26 credit hours)
A student’s course of study beyond the core can be determined in consultation with faculty members, area coordinators, or the Advising Office. A student can continue to generalize in
management courses or choose to concentrate in a given subject.

Concentrations
Students may choose to concentrate in one of the areas listed below that have historically been offered as defined specialties in the masters programs. Concentrations are informal collections of electives that address a student’s educational goals. A concentration may be aligned with functional area specialties, or may cut across functional areas. Typical concentrations have a minimum of 15 credit hours in a given area, and include:

**Accounting:** In today’s global and technology-driven environment, managers need skills to effectively analyze accounting information and make value-enhancing decisions. Students may select accounting courses to concentrate in financial analysis, consulting, corporate governance and tax management.

**Finance:** Students can prepare for careers in corporate finance, investment management, or the management of financial institutions. Courses in this area emphasize creative solutions to business financing problems, the development of value maximizing investment and financing strategies, and the analysis and management of fixed income and equity investments. Students may choose to concentrate in either corporate financial planning or the analysis of financial securities and investment portfolios.

**Healthcare Administration:** The primary goal of this concentration is to prepare students for leadership positions in healthcare organizations. The healthcare concentration is cross-functional and industry focused. Courses will contain cases, projects, and assignments that are centered around applying management skills to healthcare issues and organizations. Classes are taught by faculty and healthcare executives who bring special expertise and experience to the program.

**Information Technology Management:** Information Technology permeates all aspects of modern business and our courses will enable you to make the most of information technology to solve business problems and gain strategic advantage. We also provide advanced courses for students who wish to be on the “supply” side of information technology in the areas of IT consulting, software management and e-business.

**Innovation and Entrepreneurship:** Focused on the processes of technological innovation in both large and small organizations, a set of multidisciplinary courses prepares students for successful careers either as principals or as key functional managers in emerging growth firms, or as leaders of technological innovation in established firms.

**International Management:** In this concentration, students can take a multi-disciplinary approach to the study of international management, with courses in finance, marketing, strategic management, and the legal and cross-cultural differences that effect business.

**Leadership in Organizations:** The leadership concentration prepares students for upper management positions through the study of the psychological, sociological, and organizational behavior disciplines. The program provides a foundation of leadership theory, building and problem solving in interpersonal work relationships, group dynamics, organizational decision
Making and change, and ethics.

**Marketing:** Students learn to understand customers’ needs and purchase behaviors, how to satisfy those needs, and how to make a profit in competitive industries and markets. Topics include: developing an effective marketing strategy, developing new products, and managing different brands and product categories. Students can also acquire expertise in pricing, advertising and promotions, market research, and retailing strategies.

**Operations/Supply Chain Management:** Firms can use effective and innovative operations to create and sustain competitive advantages. Students in these courses gain a deep, analytical understanding of how challenges posed by fast developing business environments can become profit-making opportunities. Integration of various parties (suppliers, factories, stores) and various functional areas (marketing, finance, procurement) is an important theme. In particular, incentives, contracts and information technologies fostering collaboration among financially independent parties are emphasized.

**Organizations:** This concentration emphasizes organizational behavior and theory, and human resources management. Students learn how to effectively integrate and leverage human resources to create sustainable advantages in a competitive marketplace. Courses chosen in this area integrate a wide variety of disciplines, including economics, organization theory, finance, psychology, and sociology.

**Real Estate:** this concentration includes courses in real estate finance and capital markets, covering real estate loans, syndication, securitization, and regulation; investment and analysis, combining lectures and case studies to explore the sources of real estate value, project feasibility, strategies for financing, and portfolio management; and, development, covering market analysis, government approvals, financing and risk assessment.

**Strategy:** This concentration focuses on corporate level strategic management, including implementation of strategic designs; top management team leadership; the strategic implications of the social, governmental, technological and international environments; organization structuring; and strategic alliances. Students will learn how to integrate accounting, finance, economics and organization theory to create sustainable competitive advantage.
Master of Science in Marketing (36 hours minimum)

Degree Requirements
The Master of Science in Marketing program is designed to meet the needs of students in today’s data driven marketplace, where the exponential growth in data generated from store scanners and web transactions, navigation, search, and more recently, social media requires new marketing skills and knowledge.

The Master of Science in Marketing program allows students to choose from five different tracks:

- Advertising & Brand Management
- Digital Advertising & Marketing
- Marketing Analytics and Market Research (optional Academic Certificate)
- Marketing Management
- Product Management (optional Academic Certificate)

The Master of Science in Marketing is designed for students with or without previous educational background in this area. Courses are primarily offered in the late afternoon and evenings of weekdays. Several courses are currently offered through the World Wide Web. At least 36 hours of management course work is required for the Master of Science degree, including nine (9) hours of business core courses, nine (9) hours of marketing core courses and 18 hours of marketing focused core courses and/or electives depending on the track chosen.

Students can obtain a dual MS and MBA degree by taking a total of 63 credits (assuming they meet all the degree requirements for both programs). Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Prerequisites
Calculus is NOT a requirement or prerequisite for the MS in Marketing degree program.

Business Core Courses (9 credit hours)
MKT 6301 Marketing Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
MIS 6326 Data Management or MIS 6320 Database Foundations

Marketing Core Courses (9 credit hours)
MKT 6309 Marketing Research
MKT 6310 Consumer Behavior
MKT 6339 Capstone Marketing Decision Making or MKT 6350 Competitive Marketing Strategy

Choose from one of the following four specialized tracks or from the Marketing Management track (18 credit hours)

Specialized Tracks
Advertising & Branding (12 credit hours)
MKT 6321 Interactive & Digital Marketing
MKT 6330 Brand Management
MKT 6332 Advertising and Promotional Strategy
MKT 6335 Advertising Research

*Elective options (select 6 credit hours)*
MKT 6323 Database Marketing
MIS 6373 Social Media and Business
MKT 6340 Marketing Projects
MKT 6350 Competitive Marketing Strategy
MKT 6365 Marketing Digital Lab
MIS 6344 Web Analytics
MIS 6373 Social Media and Business

**Digital Advertising & Marketing Core Courses (9 credit hours)**
MKT 6321 Interactive & Digital Marketing
MKT 6365 Marketing Digital Lab
MKT 6332 Advertising and Promotional Strategy

*Elective options (select 9 credit hours)*
IMS 6314 Global E-Business Marketing
MIS 6373 Social Media and Business
MKT 6320 New Technology Forecasting
MKT 6323 Database Marketing
MKT 6335 Advertising Research
MKT 6340 Marketing Projects
MIS 6344 Web Analytics

**Marketing Analytics & Market Research (12 credit hours)**
MKT 6321 Interactive & Digital Marketing
MKT 6323 Database Marketing
MKT 6337 Marketing Analytics using SAS (or MIS 6334 with consent of Program Director)
MKT 6362 Marketing Models

*Elective options (select 6 credit hours)*
MIS 6344 Web Analytics
MKT 6320 New Technology Forecasting
MKT 6335 Advertising Research
MKT 6336 Pricing
MKT 6340 Marketing Projects
OPRE 6332 Spreadsheet Modeling

*For optional SAS Graduate certification (all 3 plus OPRE 6301)*
MIS 6324 Business Intelligence Software and Techniques
MIS 6309 Business Data Warehousing [with SAP]
MIS 6334 Advanced Business Intelligence [with SAS]

**Product Management (12 credit hours)**
MKT 6362 Marketing Models  
MKT 6329 New Product Development  
MKT 6330 Brand Management  
MKT 6336 Pricing  

Elective options (select 6 credit hours)  
IMS 6310 International Marketing  
MKT 6320 New Technology Forecasting  
MKT 6331 Building and Managing Professional Sales Organizations  
MKT 6332 Advertising and Promotional Strategy  
MKT 6333 Channels of Distribution and Retailing  
MKT 6340 Marketing Project  
MKT 6350 Competitive Marketing Strategy  
MKT 6360 Services Marketing  
MKT 6380 Entrepreneurial Marketing  
OPRE 6362 Project Management  

Marketing Management Track: For this track, there are no track core courses. Students may select any 18 hours from the offerings listed below; however, at least 9 hours must be from the marketing area courses (i.e. have a MKT prefix in the course number).  

Marketing Area Courses  
MKT 6320 New Technology Forecasting  
MKT 6321 Interactive & Digital Marketing  
MKT 6323 Database Marketing  
MKT 6328 Product Management  
MKT 6329 New Product Development  
MKT 6330 Brand Management  
MKT 6331 Building and Managing Professional Sales Organizations  
MKT 6332 Advertising and Promotional Strategy  
MKT 6333 Channels of Distribution and Retailing  
MKT 6335 Advertising Research  
MKT 6336 Pricing  
MKT 6337 Marketing Analytics Using SAS  
MKT 6338 Enterprise Systems and CRM  
MKT 6340 Marketing Projects  
MKT 6350 Competitive Marketing Strategy  
MKT 6360 Services Marketing  
MKT 6362 Marketing Models  
MKT 6380 Marketing Entry Strategies  

Non-Marketing Area Courses  
ACCT 6201 Introduction to Financial Accounting (dual MS MKT-MBA only)  
ACCT 6305 Accounting for Managers (dual MS MKT-MBA only)  
ENTP 6382 Professional Selling  
ENTP 6390 Business Model Innovation  
FIN 6301 Financial Management (dual MS MKT-MBA only)
IMS 6310 International Marketing
IMS 6314 Global E-Business Marketing
MIS 6309 Business Data Warehousing [with SAP]
MIS 6324 Business Intelligence Software and Techniques
MIS 6334 Advanced Business Intelligence [with SAS]
MIS 6344 Web Analytics
OB 6301 Organizational Behavior
OPRE 6332 Spreadsheet Modeling and Analytics
OPRE 6362 Project Management
Master of Science in Supply Chain Management (36 hours minimum)

Degree Requirements
The Master of Science in Supply Chain Management (MS SCM) explores the key issues associated with the design and management of industrial supply chains, including methods for improving supply chain operations by lowering costs, speeding delivery, improving quality and expanding variety. The ultimate objective is to use SCM to mold traditional business operations into competitive tools for today's global economy. Students acquire not only knowledge of business management but also analytical decision-making skills (especially for complex systems) along with real-life experiences gained through projects with area companies.

The MS SCM program at UT Dallas is 36 credit hours and a full-time student can complete it in 12-24 months. The depth of our supply chain program, uniquely prepares students to be the next generation business leaders with skills and competencies necessary to perform across functions within an organization.

At least 36 credit hours of management course work beyond prerequisite courses is required to earn the MS SCM degree. Students can also obtain a dual MS SCM/MBA degree by successfully completing a total of 63 credit hours (if all prerequisites are met). The MS SCM program is designed for students with or without previous educational background in supply chain management. Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the MS degree.

Waivers and Transfer of Credit
Waivers of program requirements may be granted in recognition of previous coursework completed with grade "B" or better within the past six years in a specific business program area. Waivers are approved by the appropriate program director through a process that allows a student to skip a core course and take the next higher level course in the same academic area with no reduction in the overall program hour requirements.

Transfer of credits may be granted for equivalent graduate course work taken at other universities with a grade of "B" or better within the past six years. Up to 9 credit hours of course work from other universities may be waived from or transferred to the MS SCM program. Please visit the UT Dallas Graduate Catalog for further details at www.utdallas.edu/student/catalog/.

Prerequisites
Calculus is required as a graduate program prerequisite. If a student has not taken an equivalent course already, he/she will need to complete a Math refresher course (e.g., OPRE 6303, MATH 5304) with a grade of "B" or better to meet the calculus requirement. For specific course prerequisite information, please visit the UT Dallas Graduate Catalog for further details at www.utdallas.edu/student/catalog/.

Basic Business Core Courses (9 credit hours)
All students enrolling in the MS SCM program must complete the following Basic Business Core: OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
OPRE 6302 Operations Management

And one of the following courses:
ACCT 6305 Accounting for Managers
FIN 6301 Financial Management

Supply Chain Management Core Courses (9 credit hours)
OPRE 6366 Global Supply Chain Management
OPRE 6370 Logistics, Distribution and Warehousing
OPRE 6371 Purchasing, Sourcing and Contract Management

Supply Chain Management Elective Courses (15 credit hours)
OPRE 6311 Game Theory
OPRE 6325 Healthcare Operations Management
OPRE 6332 Spreadsheet Modeling and Analytics
OPRE 6335 Risk and Decision Analysis
OPRE 6340 Flexible Manufacturing Strategies
OPRE 6361 Production Planning and Control
OPRE 6362 Project Management in Engineering and Operations
OPRE 6363 Inventory Control
OPRE 6364 Quality Control (Lean Six Sigma)
OPRE 6367 Capstone Projects in Supply Chain Management
OPRE 6368 Industrial Applications in Supply Chains
OPRE 6369 Supply Chain Software [SAP APO]
OPRE 6377 Demand and Revenue Management
OPRE 6378 Supply Chain Strategy
OPRE 6379 Product Lifecycle Management
OPRE 6385 Scheduling
OPRE 6388 Engineering Packaged Goods Distribution
OPRE 6389 Managing Energy, Risk, Investment, Technology (MERIT)

Supply Chain Technology Based Elective Courses (3 credit hours)
OPRE 6390 Enterprise Resource Planning (ERP)
OPRE 6391 Business Data Warehousing with SAP
OPRE 6392 IT Services Management
OPRE 6393 Database Foundations
OPRE 6394 Technology and New Product Development
OPRE 6395 The Management of High Tech Products
OPRE 6396 Negotiation and Dispute Resolution
OPRE 6397 Cross-Culture Communication and Management

Free Elective Course (optional 3 credit hours)
This is optional. Students may choose any three credit hour graduate level course in the School of Management to satisfy this portion of the degree plan. For example:
IMS 6V96 Regional Area Studies: Eastern Europe
OPRE 6396 Negotiation and Dispute Resolution
OPRE 6397 Cross-Culture Communication and Management
Master of Science in Systems Engineering and Management (MS SEM) (36 hours minimum)

Admission Requirements
A student lacking undergraduate prerequisites for graduate courses must complete prerequisites or receive approval from the graduate adviser and the course instructor. A diagnostic examination may be required. Please consult with the University's general admission requirements, discussed elsewhere in the graduate catalog, whereas specific admission requirements for the MS SEM follow.

A student entering the MS SEM program should meet the following guidelines:

- A minimum of a BS in engineering, mathematics, physics, chemistry, economics or finance from an accredited program (specifically, programs that provide adequate fundamental skills in mathematics).
- Must submit GRE and/or GMAT scores, as appropriate.
- Must submit three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the MS SEM degree.
- Must also submit an essay outlining the candidate's background, education and professional goals.

Degree Requirements
The MS SEM program is designed to be flexible to accommodate different student backgrounds, allowing students to pick up areas in which they are deficient, while still guaranteeing core competency in systems engineering and systems management. This program has both a thesis and a non-thesis option. All part-time MS SEM students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

The MS SEM degree requires a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus six hours of thesis credit for the thesis option. All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 36 semester-hour requirement. Successful completion of the approved course of studies leads to the MS SEM degree. Please also note that the University's general degree requirements are discussed elsewhere in the graduate catalog.

Non-thesis Option
Completion of a minimum of 36 semester hours of graduate level lecture courses including the required core courses. With advisor approval, these may include some 5000 level courses. Students must earn a grade of "B" or better in each of four core courses (see below).

Thesis Option
An alternative to 36 credit hours required for the MS SEM degree, would be the completion of a minimum of 30 semester hours of graduate level lecture courses, with a grade of "B" or better in each of the required core courses (see below), six semester hours of a combination of Master’s
research (SYSM 6V70) and thesis (SYSM 6V90), submitted to the graduate school, and a formal public defense of the thesis.

Students enrolled in the thesis option should meet with individual faculty members to discuss research opportunities and to choose a research advisor during the first or second semester that the student is enrolled. After the second semester of study, course selection should be made in consultation with the research advisor. Part-time students are encouraged to enroll in only one course during their first semester and in no more than two courses during any semester they are also working full-time.

Research and thesis hours cannot be counted in an MS SEM degree plan unless a thesis is written and successfully defended. A supervising committee, which must be chosen in consultation with the student’s thesis advisor prior to enrolling for thesis credit, administers the defense. With advisor approval, the lecture courses may include some 5000 level courses. Full-time students at UTD who receive financial assistance are required to enroll in nine semester credit hours each semester.

**Course Requirements: Core (12 hours)**

Students are required to take four courses (a total of 12 credit hours) from a set of eight courses in the lists below. Two of the courses must be from the Engineering Core section and two from the Management Core section. The four required courses contribute a total of 12 credit hours toward the MS degree.

**ENGINEERING CORE COURSES:**
- SYSM 6301 Systems Engineering, Architecture and Design
- SYSM 6302 Dynamics of Complex Networks and Systems
- SYSM 6303 Quantitative Introduction to Risk and Uncertainty in Business
- SYSM 6305 Optimization Theory and Practice

**MANAGEMENT CORE COURSES:**
- SYSM 6311 Systems Project Management in Engineering and Operations
- SYSM 6312 Systems Financial Management
- SYSM 6318 Marketing Management
- SYSM 6333 Systems Organizational Behavior

**Course Requirements: Prescribed Electives (12 hours)**

Students are required to take an additional four courses (a total of 12 credit hours) from the set of eight core courses listed above and/or the set of courses listed below. Two of these courses must be chosen from the two Engineering sections (core and elective), and two from the two Management sections (core and elective). Because a program objective is to maintain a high degree of flexibility, students are encouraged to work with an MS SEM program advisor to discuss possible (limited) exceptions and substitutions for the prescribed elective courses.

**ENGINEERING ELECTIVE COURSES:**
- SYSM 6304 Risk and Decision Analysis
- SYSM 6306 Engineering Systems: Modeling & Simulation
- SYSM 6307 (ENGR 6331, MECH 6300) Linear Systems
- SYSM 6308 Software Maintenance, Evolution and Re-Engineering
SYSM 6309 Advanced Requirements Engineering
SYSM 6310 Software Testing, Validation and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II

**MANAGEMENT ELECTIVE COURSES:**
SYSM 6313 Systems Negotiation and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 The Entrepreneurial Experience
SYSM 6316 Managing Innovation Within the Corporation
SYSM 6317 The Management of High Tech Products
SYSM 6319 Business Economics
SYSM 6320 Strategic Leadership
SYSM 6322 Technology and New Product Development

**Course Requirements: Free Electives (12 hours)**
Working with an MS SEM program advisor, students are required to take four additional and distinct courses either from the remaining SYSM courses listed above or from other courses offered in management or engineering that form a “concentration” or “specialization” in systems-related, possibly industry-specific sectors.

The concentration area consists of four courses (12 semester hours) in the degree program; examples include: Mechatronic and Control Systems, Financial Engineering Systems, Energy Systems, Healthcare Systems, Telecom and IT Networks, Information Assurance and Cybersecurity, Global Supply Chain Management, Entrepreneurship and Innovation, and Enterprise Systems. Finally, because of the flexible nature of the MS SEM degree program, students may submit for approval a “personalized” concentration area that focuses on aspects of systems engineering, and may combine elements of other concentration areas on a focused theme.

**SEM Certificate Programs**
**Curriculum Requirements**

Students have a choice of two different SEM certificates: a Certificate in Systems Engineering, or, a Certificate in Systems Management. Each certificate requires 12 credit hours. The courses are offered in an Executive Education, 4-hour module format.

(1) The **Certificate in Systems Engineering** requires students to complete over the period of one academic year two courses from the set of engineering courses listed below, and any two additional courses from the remainder of the 20 SYSM-prefix courses listed below in either group, engineering or management.

**Systems Engineering Courses**
SYSM 6301 Systems Engineering, Architecture and Design
SYSM 6302 Dynamics of Complex Networks and Systems
SYSM 6303 Quantitative Introduction to Risk and Uncertainty in Business
SYSM 6304 Risk and Decision Analysis
SYSM 6305 Optimization Theory and Practice
SYSM 6306 Engineering Systems: Modeling & Simulation
SYSM 6307 (ENGR 6331, MECH 6300) Linear Systems
SYSM 6308 Software Maintenance, Evolution and Re-Engineering
SYSM 6309 Advanced Requirements Engineering
SYSM 6310 Software Testing, Validation and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II

(2) The Certificate in Systems Management requires students to complete over the period of one academic year two courses from the set of management courses listed below, and any two additional courses from the remainder of the 20 SYSM-prefix courses listed in either group, engineering or management.

Systems Management Courses
SYSM 6311 Systems Project Management in Engineering and Operations
SYSM 6312 Systems Financial Management
SYSM 6313 Systems Negotiation and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 The Entrepreneurial Experience
SYSM 6316 Managing Innovation Within the Corporation
SYSM 6317 The Management of High Tech Products
SYSM 6318 Marketing Management
SYSM 6319 Business Economics
SYSM 6320 Strategic Leadership
SYSM 6332 Technology and New Product Development
SYSM 6333 Systems Organizational Behavior
School of Management Executive Education Degree

UT Dallas School of Management Executive Education combines the best of the School’s nationally recognized faculty with a select group of executives to provide an innovative, relevant portfolio of programs. Designed to advance knowledge and skills that improve organizational performance, these programs include both MBA and Master of Science degree programs, as well as certificate programs. Courses are taught on campus, on site, or online.

Executive MBA and Master’s Degrees

- Executive MBA (EMBA)
- Global Leadership Executive MBA (GLEMBA)
- Executive MBA with an emphasis in Project Management
- Master of Science in Management and Administrative Sciences with an emphasis in Project Management
- Healthcare Management Executive MBA for physicians
- Master of Science in Healthcare Management for physicians
- Master of Science in Management and Administrative Sciences with an emphasis in Organizational Behavior and Coaching
- Executive Master of Science Degree and Certificate Programs in Systems Engineering and Management (MS SEM)
- Joint Executive MS SEM/Global Executive MBA Program (Dual Degree)

Special admission and fee requirements apply to the following programs and courses.

Executive MBA Program (53 hours minimum)

Ranked nationally and worldwide, the Executive MBA (EMBA) program prepares experienced professionals for upper management, executive levels, and the C-suite. Based in part on personal executive coaching, the program provides a transformative, leadership, educational and personal improvement experience that enhances your success and takes your career to a higher level. The 21-month program has only 3 class days per month, minimizing disruptions for those with busy schedules. Executive MBA students learn versatile confidence and performance-oriented capabilities in an integrated curriculum. Two trips, 1 international, expose students to corporate and governmental decision makers and take you behind the scenes with one-on-one conversations with global leaders.

The EMBA program is supported entirely by participant fees and special admissions requirements apply.

Executive MBA degree programs in the Naveen Jindal School of Management require a core of 29 credit hours, along with a set of specially designed elective courses equivalent to 24 credit hours, for a total of 53 credit hours. The MBA core is comprised of the following courses:

MBA Core Curriculum (29 Credit Hours):
ACCT 6201 Introduction to Financial Accounting
ACCT 6202 Introduction to Managerial Accounting
BPS 6310 Strategic Management
FIN 6301 Financial Management
IMS 6204 Global Business
MIS 6204 Information Technology and MIS Fundamentals
MECO 6303 Business Economics
MKT 6301 Marketing Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
OB 6301 Organizational Behavior

The following courses, comprising a total of 21 semester hours, are currently offered in the Executive MBA Program curriculum:

BPS 6251 Capstone: Integration/Transformation
FIN 6251 Strategic Financial Management and Valuation I
IMS 6150 International Business Management - EMBA
BPS 6252 Executive Study Trip: Washington DC
IMS 6351 Executive International Studies Trip - EMBA
OB 6260 Executive Coaching
OB 6261 Executive Workshop
BPS 6332 (SYSM 6320) Strategic Leadership
OB 6332 (OPRE 6396, HMGT 6324, SYSM 6313) Negotiation and Dispute Resolution

To complete the requirements for the EMBA, students take an additional 3 credit hour elective.

Global Leadership Executive MBA Program – GLEMB (53 hours minimum)

The Global Leadership Executive MBA (GLEMB) program emphasizes international skills, business operations and transformative leadership. Courses are taught and experiences are provided to working professionals to gain the skills and knowledge needed to assume global leadership responsibilities. This 23 month program includes: on-line learning, five retreats held on campus and a one week international study tour as part of this accredited Executive MBA program. A defined degree plan expands the MBA core curriculum with an international curriculum.

GLEMBA students take additional courses comprising a total of 24 semester hours from the following list specific to the Global Leadership Executive MBA Program curriculum. The following courses are currently offered in the Global Leadership Executive MBA Program curriculum:

IMS 6368 Cross-Culture Communication and Management
IMS 6151 Global Business
IMS 6355 Global Communications and Negotiations
IMS 6354 Global Marketing
IMS 6213 Global Politics in Business
Certificate and Degree Programs with an emphasis in Project Management

The Executive Education Project Management Program is one of the emphasis areas designed to begin with a set of specialization area courses followed by additional business management core courses and leading to either a Master of Science or a Master of Business Administration degree with the chosen emphasis. Upon completion of the project management core courses, students earn a graduate certificate in project management and are prepared to take the Project Management Institute’s Project Management Professional (PMP®) certification exam. Following completion of the project management core, students may then continue to complete the requirements for the Master of Science or the Master of Business Administration degree.

Project management faculty members have industrial project management, operations management, management consulting and teaching experience. The program curriculum is delivered both on campus and online. The on-campus program accommodates work and travel schedules by meeting 8 hours per day on one consecutive Thursday, Friday, and Saturday per month. The online program is designed as weekly modules equivalent to one half-day on campus and includes live interaction.

The project management emphasis certificate and degree programs are supported entirely by participant fees and special admissions requirements apply. Both degree and non-degree seeking students with undergraduate degrees can study towards the Graduate Certificate in Project Management. Potential students are required to complete an application, provide written professional references from 3 people, attend an interview with the program director, and request all universities attended send an official transcript.

Graduate Certificates in Project Management (21 hours minimum)

The graduate certificate in Project Management is awarded after completion of the project management core courses described below totaling 21 credit hours. These courses emphasize a systems approach to project management and follow the lifecycle of a project, integrating relevant topics from multiple knowledge areas rather than presenting topical courses in isolation. This type of learning environment more closely tracks an actual work experience and facilitates learning and application.

Courses Required for Certificate in Project Management:
OPRE 6271 Project Overview, Strategic and Process Management
OPRE 6372 Project Initiation
OPRE 6373 Project Planning
OPRE 6374 Project Planning and Execution
OPRE 6375 Project Execution and Closeout
OPRE 6376 Advanced Project Management and Simulation
MAS 6101 Legal Considerations in Project Management
Master of Science in Management and Administrative Sciences with an emphasis in Project Management (36 hours minimum)

A Master of Science degree is awarded after the completion of an additional 18 credit hours beyond the Project Management Core requirements. The MS–MAS in Project Management requires the following coursework:

MS-MAS in Project Management supplemental curriculum:
- ACCT 6201 Introduction to Financial Accounting
- ACCT 6202 Introduction to Managerial Accounting
- MECO 6303 Business Economics
- MIS 6204 Information Technology and MIS Fundamentals
- OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
- IMS 6370 Seminar in International Operations Management
- IMS 6371 Seminar in International Strategic Management

Executive MBA degree with an emphasis in Project Management (53 hours minimum)

The Executive MBA is earned by waiving the Master of Science degree and completing an additional 14 credit hours, for a total of 53 hours. Students must include the executive core courses listed below to earn the degree. Additional courses to fulfill requirements for the Executive MBA:

- BPS 6310 Strategic Management
- FIN 6301 Financial Management
- IMS 6204 Global Business
- MKT 6301 Marketing Management
- OPRE 6302 Operations Management

Certificate and Degree Programs with an emphasis in Product Lifecycle and Supply Chain Management

The graduate certificate and degree programs in Product Lifecycle and Supply Chain Management focus on educating executives and industry-sponsored employees by combining theory and practice. It emphasizes the need to understand “the big picture”, the importance of renewed focus on product lifecycle from design to disposal and supply chain from end to end. Students are trained to be effective problem solvers, and to continuously improve product performance and supply chain efficiency. The program will employ lectures, case studies, site visits, and the use of quantitative and qualitative methods to meet the learning objectives of the program. Students are required to integrate classroom learning with work projects. The program leverages the world-class faculty in the operations management and industry leaders/practitioners to deliver the program. Following completion of the product lifecycle and
supply chain management core, students may then continue to complete the requirements for the Master of Science or the Master of Business Administration degree.

The product lifecycle and supply chain emphasis certificate and degree programs are supported entirely by participant fees and special admissions requirements apply. Both degree and non-degree seeking students with undergraduate degrees can study towards the Graduate Certificate in Project Management. Potential students are required to complete an application, provide written professional references from 3 people, attend an interview with the program director, and request all universities attended send an official transcript.

**Graduate Certificates in Product Lifecycle and Supply Chain Management (15 hours minimum)**

The Graduate certificate in Product Lifecycle and Supply Chain Management is awarded after completion of the product lifecycle and supply chain management core courses described below, totaling 15 credit hours. Courses Required for Graduate Certificate in Product Lifecycle and Supply Chain Management (15 credit hours):

- OPRE 6366 Global Supply Chain Management
- OPRE 6370 Logistics, Distribution and Warehousing
- OPRE 6371 Purchasing, Sourcing and Contract Management
- OPRE 6379 Product Lifecycle Management
- OPRE 6364 Quality Control (Lean 6 Sigma)

**Master of Science in Supply Chain Management (36 hours minimum)**

A Master of Science in supply chain management degree is awarded after the completion of an additional 22 credit hours beyond the product lifecycle and supply chain management Core requirements. The MS in supply chain requires the following coursework:

**MS in Supply Chain Management supplemental curriculum (22 credit hours):**
- ACCT 6201 Introduction to Financial Accounting
- ACCT 6202 Introduction to Managerial Accounting
- FIN 6301 Financial Management
- OB 6301 Organizational Behavior
- OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
- OPRE 6302 Operations Management
- OPRE 6367 Capstone Projects in Supply Chain Management (International Study)
- OPRE 6368 Industrial Applications in Supply Chains (International Study)

**Executive MBA degree with an emphasis in Product Lifecycle and Supply Chain Management (53 hours minimum)**

The Executive MBA is earned by waiving the Master of Science degree and completing an additional 16 credit hours, for a total of 53 hours. Students must include the executive core courses listed below to earn the degree. Additional courses to fulfill requirements for the Executive MBA (16 Credit Hours):
BPS 6310 Strategic Management
MIS 6204 Information Technology and MIS Fundamentals
IMS 6204 Global Business
MKT 6301 Marketing Management
MECO 6303 Business Economics
OPRE Elective

**Executive Programs in Healthcare Management for Physicians**

**Master of Science in Healthcare Management (36 hours minimum)**

The *Master of Science in Healthcare Management* is a specialized business degree available to licensed MDs and DOs. The 36 credit hour healthcare management curriculum consists of nine 4-day residential classes OR any eight classes plus a self-directed field study. A different class is offered every two months and classes may be started at any time and taken in any order. Eight classes are eligible for up to 36 hours each of Category 1 CME credit toward the AMA Physician’s Award. Successful completion of any five classes is recognized by the award of a Graduate Certificate in Healthcare Management.

The curriculum is centered on real-life healthcare problems and cases. Classes are jointly taught by senior business and medical school faculty with outstanding academic credentials and real-world healthcare experience. Physicians and faculty work collaboratively in small teams to examine facts, evaluate alternatives and develop workable solutions.

**The healthcare management curriculum consists of the following courses:**

- HMGT 6401 Negotiation and Conflict Management in Healthcare
- HMGT 6402 Financial Management of Healthcare Organizations
- HMGT 6403 Medical Cost and Performance Management
- HMGT 6404 Service Quality Improvement and Patient Satisfaction
- HMGT 6405 Healthcare Information, Management and Technology
- HMGT 6406 Strategic Management of Healthcare Organizations
- HMGT 6407 Healthcare Policy and Regulation
- HMGT 6408 Motivational Leadership in Healthcare Organizations
- HMGT 6410 Coaching as a Leadership Style
- HMGT 6V10 Special Topics in Healthcare Management
- HMGT 6V15 Self-Directed Field Study

**Healthcare Management Executive MBA (53 hours minimum)**

The *Healthcare Management Executive MBA* is a general business degree preferred by physicians who wish to pursue a career in healthcare consulting. It requires the completion of the healthcare management curriculum plus an additional 17 credit hours consisting of six non-healthcare related general business classes. These classes provide an integrated overview of functional areas of management as well as analytical tools for effective decision making. The general business classes are taken on line for maximum flexibility and convenience. The on-line classes require no on-campus visits.
The six general business classes required are:
FIN 6301 Financial Management
IMS 6204 Global Business
MECO 6303 Business Economics
MKT 6301 Marketing Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
OPRE 6302 Operations Management

The Healthcare Management Executive MS and MBA degrees are supported entirely by participant fees and special admissions requirements apply. Further information may be obtained from the program website: http://amme.utdallas.edu/

Executive Program in Organizational Behavior and Coaching

As is the case with both Project Management and Healthcare Management for Physicians, students in the executive program in Organizational Behavior and Coaching can complete multiple levels of recognition in the program, including:

1. A Graduate Certificate in Executive and Professional Coaching after 15 credit hours
2. A Master of Science degree in Management and Administrative Sciences after the completion of an additional 21 credit hours beyond certificate requirements.

This concentration focuses on organizational behavior and coaching theory, methodology and techniques. Students learn how to become instruments of individual and organizational change, lead and manage organizational transitions, work effectively when there is resistance to change, and develop skills as an internal and external practitioner. Students deepen their knowledge of individual and organizational behavior through the integration of theory and practice. They leave the program with a set of tools for personal, group, organization and community transformation, qualified to apply for professional accreditation by the International Coach Federation.

Classes are conducted utilizing the very best in interactive distance learning methodologies, making the program convenient, efficient, and geographically independent for busy professionals. Students are taught by outstanding master coaches with real-world coaching experience within business settings and School of Management faculty. Participants will be eligible to receive fifteen graduate credit hours upon completion of the graduate certificate.

Graduate Certificate in Executive and Professional Coaching (15 hours minimum)

The graduate level certificate requires the successful completion of the following six courses specific to Executive and Professional Coaching, including two Coaching Practice/Practicum courses, OB 6248, OB 6249, or OB 6253:
OB 6248 Coaching Practice Lab I
OB 6249 Coaching Practice Lab II
OB 6350 Introduction to Executive and Professional Coaching
OB 6351 Coaching in the Business or Organizational Setting
OB 6352 Advanced Coaching Models and Methods
OB 6253 Coaching Practicum.

**Master of Science in Management and Administrative Sciences with a Concentration in Organizational Behavior and Coaching (36 hours minimum)**

After completion of the certificate requirements, students can go on to complete a Master of Science in Management and Administrative Sciences by completing another 21 hours of graduate level courses, including the courses in the MS-MAS core curriculum. The MS-MAS core is comprised of the following courses:

**MS MAS Core Curriculum:**
- ACCT 6201 Introduction to Financial Accounting
- MECO 6303 Business Economics
- MIS 6204 Information Technology and MIS Fundamentals
- OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
- OB 6301 Organizational Behavior

Organizational Behavior and Coaching students take the executive MS-MAS core set, and then draw the remainder of their courses from the following list specific to the Organizational Behavior component of the curriculum.

**Organizational Behavior Electives:**
- OB 6331 Power and Politics in Organizations
- OB 6332 Negotiation and Dispute Resolution
- OB 6337 Motivational Leadership in Organizations (On Campus Only)
- OB 6338 Coaching as a Leadership Style (On Campus Only)
- OB 6355 Capstone in Organizational Behavior and Coaching
Executive Master of Science Degree and Certificate Programs in Systems Engineering and Management (MS SEM) Joint Degree Program offered by the Erik Jonsson School of Engineering and Computer Science and the Naveen Jindal School of Management (36 hours minimum)

Admission Requirements
A student lacking undergraduate prerequisites for graduate courses must complete prerequisites or receive approval from the graduate adviser and the course instructor. Specific admission requirements for the MS SEM follow.

A student entering the MS SEM program should meet the following guidelines:

- A minimum of a BS in engineering, mathematics, physics, chemistry, economics or finance from an accredited program (specifically, programs that provide adequate fundamental skills in mathematics).
- A minimum of three years of work experience.
- Submission of three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the MS SEM degree.
- Submission of an essay outlining the candidate’s background, education and professional goals.

Degree Requirements
The MS SEM program is designed to be flexible to accommodate different student backgrounds, allowing students to learn in areas in which they are deficient, while still guaranteeing core competency in systems engineering and systems management. This program has both a thesis and a non-thesis option. All part-time MS SEM students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

The MS SEM degree requires a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus six hours of thesis credit for the thesis option. All students must have an academic adviser and an approved degree plan. Courses taken without adviser approval will not count toward the 36 semester-hour requirement. Successful completion of the approved course of studies leads to the MS SEM degree. Please also note that the University’s general degree requirements are discussed in the graduate catalog.

Non-Thesis Option
Completion of a minimum of 36 semester hours of graduate-level lecture courses including the required core courses. With adviser approval, these may include some 5000 level courses. Students must earn a grade of B- or better in each of four core courses (see below).

Thesis Option
An alternative to the 36 credit-hour requirement for the MS SEM degree is the completion of a minimum of 30 semester hours of graduate-level lecture courses, with a grade of B- or better in each of the required core courses (see below), six semester hours of a combination of master’s
research (SYSM 6V70) and thesis (SYSM 6V90), submitted to the graduate school, and a formal public defense of the thesis.

Students enrolled in the thesis option should meet with individual faculty members to discuss research opportunities and to choose a research adviser during the first or second semester that the student is enrolled. After the second semester of study, course selection should be made in consultation with the research adviser. Part-time students are encouraged to enroll in only one course during their first semester and in no more than two courses during any semester they are also working full-time.

Research and thesis hours cannot be counted in an MS SEM degree plan unless a thesis is written and successfully defended. A supervising committee, which must be chosen in consultation with the student’s thesis adviser prior to enrolling for thesis credit, administers the defense. With advisor approval, the lecture courses may include some 5000 level courses. Full-time UT Dallas students who receive financial assistance are required to enroll in nine semester credit hours each semester.

REQUIRED COURSES:
Students are required to take four courses (a total of 12 credit hours) from a set of eight courses in the list below. Two of the courses must be from the Engineering Core section and two from the Management Core section. The four required courses contribute a total of 12 credit hours toward the MS degree.

PREScribed ELECTIVE COURSES:
These consist of an additional four courses (a total of 12 credit hours) from the set of eight core courses listed above and/or the set of courses listed below. Two of these courses must be chosen from the two Engineering sections (core and elective), and two from the two Management sections. Because a program objective is to maintain a high degree of flexibility, students are encouraged to work with a SEM program advisor to discuss possible (limited) exceptions and substitutions for the prescribed courses.

SEM Core Curriculum
Engineering 1 (Core)
SYSM 6301 Systems Engineering, Architecture and Design
SYSM 6302 Dynamics of Complex Networks and Systems
SYSM 6303 Quantitative Introduction to Risk and Uncertainty in Business
SYSM 6305 Optimization Theory and Practice

Management 1 (Core)
SYSM 6311 Systems Project Management in Engineering and Operations
SYSM 6312 Systems Financial Management
SYSM 6318 Marketing Management
SYSM 6333 Systems Organizational Behavior

Engineering 2 (Prescribed Elective)
SYSM 6304 Risk and Decision Analysis
SYSM 6306 Engineering Systems: Modeling & Simulation
SYSM 6307 Linear Systems
SYSM 6308 Software Maintenance, Evolution and Re-Engineering
SYSM 6309 Advanced Requirements Engineering
SYSM 6310 Software Testing, Validation and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II

Management 2 (Prescribed Elective)
SYSM 6313 Systems Negotiation and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 The Entrepreneurial Experience
SYSM 6316 Managing Innovation within the Corporation
SYSM 6317 The Management of High Tech Products
SYSM 6319 Business Economics
SYSM 6320 Strategic Leadership
SYSM 6332 Technology and New Product Development

Free Elective Courses
For the free elective, students will be able to take, with prior approval from the program director, any four additional and distinct courses of the remaining 12 core courses that have not already been taken as required courses or prescribed elective courses. Students will also be able to take additional free elective courses that are already being offered in management or in engineering that will allow “concentration” or “specialization” in specific industry sectors, including the following:

- Healthcare Services
- Energy, Resources and Infrastructure
- Complex Brain, Biological and Behavioral
- Aerospace, Defense and Space
- Telecom and IT Networks
- Information Assurance and Cyber-Security
- Arts and Technology and Web Media
- Transportation
- Macro-economic and Finance
- Global Supply Chain Management
- Enterprise Systems
- Entrepreneurship and Innovation

Students must take a minimum of five core and prescribed elective courses before taking any free elective courses.

Certificates
The program offers two certificates: a Certificate in Systems Engineering and a Certificate in Systems Management. Each certificate requires 12 credit hours and is offered in an Executive Education, four-hour module format. See Course Descriptions for information on course content.
Certificate in Systems Engineering
Students are required to complete two from the set of engineering courses listed below, and any two additional from the remainder of the 20 SYSM-prefix listed below in either group, engineering or management.

**Systems Engineering Courses**
- SYSM 6301 Systems Engineering, Architecture and Design
- SYSM 6302 Dynamics of Complex Networks and Systems
- SYSM 6303 Quantitative Introduction to Risk and Uncertainty in Business
- SYSM 6304 Risk and Decision Analysis
- SYSM 6305 Optimization Theory and Practice
- SYSM 6306 Engineering Systems: Modeling and Simulation
- SYSM 6307 Linear Systems
- SYSM 6308 Software Maintenance, Evolution and Re-Engineering
- SYSM 6309 Advanced Requirements Engineering
- SYSM 6310 Software Testing, Validation and Verification
- SYSM 6321 Financial Engineering I
- SYSM 7321 Financial Engineering II

Certificate in Systems Management
Students are required to complete two from the set of management courses listed below, and any two additional from the remainder of the 20 SYSM-prefix listed in group, engineering or management.

**Systems Management Courses**
- SYSM 6311 Systems Project Management
- SYSM 6312 Systems Financial Management
- SYSM 6313 Systems Negotiation and Dispute Resolution
- SYSM 6314 Manufacturing & Service Systems Planning & Analysis
- SYSM 6315 The Entrepreneurial Experience
- SYSM 6316 Managing Innovation Within the Corporation
- SYSM 6317 The Management of High Tech Products
- SYSM 6318 Marketing Management
- SYSM 6319 Business Economics
- SYSM 6320 Strategic Leadership
- SYSM 6332 Technology and New Product Development
- SYSM 6333 Systems Organizational Behavior

Engineering Courses
- SYSM 6301 Systems Engineering, Architecture and Design
- SYSM 6302 Dynamics of Complex Networks and Systems
- SYSM 6303 (OPRE 6301) Quantitative Introduction to Risk and Uncertainty in Business
- SYSM 6304 (OPRE 6335) Risk and Decision Analysis
- SYSM 6305 Optimization Theory and Practice
- SYSM 6306 (BMEN 6372, MECH 6314) Engineering Systems: Modeling and Simulation
- SYSM 6307 (ENGR 6331, MECH 6300) Linear Systems
- SYSM 6308 (CS 6356, SE 6356) Software Maintenance, Evolution and Re-Engineering
- SYSM 6309 (SE 6361, CS 6361) Advanced Requirements Engineering
SYSM 6310 (CE 6367, CS 6367, SE 6367) Software Testing, Validation and Verification
SYSM 6321 Financial Engineering I
SYSM 7321 Financial Engineering II
SYSM 6V70 Research in Systems Engineering and Management
SYSM 6V80 Special Topics in Systems Engineering and Management
SYSM 6V90 Thesis

Management Courses
SYSM 6311 (OPRE 6362) Systems Project Management in Engineering and Operations
SYSM 6312 (FIN 6301) Systems Financial Management
SYSM 6313 (OPRE 6396, OB 6332, HMG 6324) Systems Negotiation and Dispute Resolution
SYSM 6314 Manufacturing & Service Systems Planning & Analysis
SYSM 6315 (ENTP 6398) The Entrepreneurial Experience
SYSM 6316 (ENTP 6388) Managing Innovation within the Corporation
SYSM 6317 The Management of High Tech Products
SYSM 6318 (MKT 6301) Marketing Management
SYSM 6319 (MCO 6303) Business Economics
SYSM 6320 (BPS 6332) Strategic Leadership
SYSM 6332 (ENTP 6375) Technology and New Product Development
SYSM 6333 (OB 6301) Systems Organizational Behavior
Joint Executive MS SEM/Global Executive MBA Program (63-65 minimum hours)

The Naveen Jindal School of Management and the Erik Jonsson School of Engineering and Computer Science offer a Joint Executive MS SEM and Global Executive MBA (GLEMBA) program because today's experienced graduate students — seasoned by three or more years as workforce professionals — often seek a more comprehensive education in technical skills as well as broad-based business-leadership capabilities for the global economy. The joint-degree option provides both deep knowledge in SEM, as well as a broad knowledge of all areas of management with an enhanced worldwide perspective of business leadership for increasing productivity, efficiency and profitability.

The joint-degree program allows students to earn a combination of an MS SEM degree and a Global Executive MBA degree together. Separately, each degree would require 36 (MS) + 53 (MBA) credit hours, or 89 credit hours total. However, in the joint program students can earn both degrees with a smaller total of 63 to 65 semester credit hours. The two degrees are awarded at the same time, upon completion of the requisite number of hours.

Those students who start out in the Executive MS SEM Program and wish to join the joint program will (1) first complete 36 credit hours in the Executive MS SEM program, and (2) will then transition to the 2nd year of the GLEMBA Program and complete the remaining 27 credit hours, by taking the following GLEMBA courses, for a total of 63 credit hours towards getting their joint degree:

- BPS 6310 Strategic Management
- IMS 6365 Cross-Culture Communication and Management
- IMS 6151 Global Business Ethics
- IMS 6355 Global Communications and Negotiations
- IMS 6354 Global Marketing
- IMS 6214 Global Mergers & Acquisitions
- IMS 6213 Global Politics in Business
- OPRE 6250 Global Supply Chain Management
- ENTP 6352 International Business Plan
- ENTP 6351 International Entrepreneurship and Innovation
- IMS 6353 International Study Tour - GLEMBA

Those students who start out in the GLEMBA Program and wish to join the joint program will:

1. First finish 29 credit hours by completing the 1st year of GLEMBA, and
2. Then join the Executive SEM Program. Five of the courses they will have taken (OPRE 6301, FIN 6301, OB 6301, MKT 6301 and MECO 6303) in the 1st year of GLEMBA, overlap with five core required or prescribed elective courses in Executive MS SEM - one engineering (SYSM 6303) and four management (SYSM 6312, SYSM 6333, SYSM 6318, and SYSM 6319). They will thus be required to take 4 more core or prescribed elective courses in Executive MS SEM for a total of 12 credit hours, at least 3 of which will need
to be engineering courses, and at least one of those will be from the core engineering courses.

3. They will then rejoin the 2nd year of the GLE MBA Program and complete the remaining 24 credit hours. They will thus have completed a total of 65 credit hours towards getting the joint degree.
Combination of Engineering and Management Graduate Degrees

Today's graduates aspiring to assume managerial and leadership positions in high tech firms and research institutions must be knowledgeable in both the engineering and managerial dimensions of the position. In recognition of this growing reality, UT-Dallas offers a blend of courses allowing students to earn a combination of master's level degrees in both engineering and management. Specifically, graduates of this program will qualify to earn an MSE degree in combination with an MBA, an MS or an MA degree in Management.

Faculty
The combination of master's level degrees in both engineering and management are jointly administered by the faculty members in the Department of Electrical Engineering in the Erik Jonsson School of Engineering and Computer Science and the School of Management.

Objectives
The program of studies leading to the award of an MSE degree by the Erik Jonsson School of Engineering and Computer Science in combination with one of the following master's degrees, MBA, MS or MA, offered by the School of Management, provides intensive preparation for engineers who seek knowledge and skills necessary to manage a technology firm. This program emphasizes both Electrical Engineering and Engineering Management, preparing students for a career in management and for holding leadership positions in engineering companies and research institutions. The program of studies is ideal for students interested in managing new technologies, from conceptualization and development to introduction and production.

Admission Requirements
The University's general admission requirements are discussed here. Student pursuing the MSE degree in combination with and a master's degree in management must meet the admission requirements for both graduate programs. The University's general degree requirements are discussed here. For this program of studies, the School of Management will accept a competitive GRE performance in lieu of the GMAT.

Degree Requirements
Combination of MSE degree and MBA degree
The combination of MSE degree and MBA degree can be earned by completing a minimum of 68 graduate hours beyond prerequisite courses. This includes a minimum of 24 hours of approved electrical engineering courses in combination with a minimum of 44 hours of approved management courses.

Students enrolled in this combination of MSE degree and MBA degree are permitted to:

- utilize a maximum of 9 credit hours from the approved list of management courses together with 12 hours of approved elective EE courses to satisfy the required 21 hours of elective courses listed in the MSE degree requirements specified here, and
- utilize a maximum of 9 credit hours from the approved list of EE courses together with 15 hours of approved elective MBA courses to satisfy the 24 hours of elective courses
Students are required to meet all other core and elective requirements for the MSEE and MBA degrees to obtain the combination of the MSEE with MBA graduate degrees.

**Combination of MSEE with MS or MA graduate degrees**
The combination of MSEE and MS or MA degrees can be earned by completing a minimum of 51 credit hours beyond prerequisites. This includes a minimum of 24 hours of approved electrical engineering courses in combination with a minimum of 27 hours of approved management courses for each of these management degrees. Students enrolled in a combination of the MSEE and MS or MA degree programs are permitted to:

- utilize a maximum of 9 credit hours from the approved list of management courses together with 12 hours of approved elective EE courses to satisfy the required 21 hours of elective courses listed in the MSEE degree requirements specified here, and
- utilize a maximum of 9 credit hours from the approved list of EE courses in satisfying elective courses requirements for the MS or MA degree requirements specified here.

Students are required to meet all other core and elective requirements for the MSEE and MS or MA degrees to obtain the combination of MSEE with MS or MA graduate degrees. All students must have a graduate advisor in the electrical engineering department and a graduate advisor in the Naveen Jindal School of Management who will advise on respective programs and approve a degree plan. The advising office in each school will provide a detailed listing of approved courses. Courses taken without advisor approval may not count toward the required credit hours. No degree will be awarded until the completion of all requirements, including the requirement for the 51 or 58 credit hours for the MSEE/MBA or MSEE/MS or MA combinations respectively. If a student chooses at a later time to pursue only one of the two degree programs, the student MUST again seek admission into the degree program of the student's choice and satisfy the requirements of that degree program. Prior coursework relevant to the specific degree program will be transferred, provided the course requirements have not changed.
Doctor of Philosophy

Admission Requirements
The University’s general admission requirements are discussed here.

Application for admission to the PhD program should normally include (1) a GMAT test score of 600 that is advisable based on our experience with student success in the program, (2) an undergraduate degree with a good academic record from an accredited institution of higher learning, (3) letters of recommendation, and (4) a personal statement of goals in relation to seeking the degree. In the case of international students, TOEFL scores or other evidence of English proficiency are required. No student will be admitted without the approval of the concentration area to which the student applies. Financial support is often available to PhD students in the form of teaching assistantships and/or scholarships.

Degree Requirements
The University’s general degree requirements are discussed here.

Each doctoral candidate is required to complete a minimum of 75 semester credit hours of applicable graduate work in specific program areas beyond the baccalaureate and prerequisites. Throughout their programs, PhD students are encouraged to participate in ongoing research activities and to develop their own lines of research. Research activities include research seminars, directed reading courses and research assistantships. Research supervision is available in the areas of Accounting, Finance and Economics, Information Systems, International Management Studies, Marketing, and Operations Management.

Doctor of Philosophy in International Management Studies (75 hours beyond the baccalaureate degree)

Students may enter the International Management Studies (IMS) doctoral program after previous graduate training or directly from undergraduate programs. Desirable educational backgrounds include graduate training in any area of business and graduate or undergraduate degrees in areas such as economics, sociology, political science, mathematics, and engineering, although students from all areas are considered.

The IMS PhD curriculum includes a business foundation, core courses, advanced seminars, a methodology requirement, directed readings and independent research courses, and the dissertation. All students must take the PhD courses that are offered in each of the first two years in the program.

Students must pass the comprehensive qualifying examination, which is administered at the end of the second year of study when all the relevant course requirements (*) below have been satisfied. It is intended to assess the student’s mastery of the basic theories and methodologies central to the program and to evaluate the student’s potential to do original research in an area of specialization. After passing the comprehensive exam, each student writes a dissertation proposal. This must be completed within six months of the comprehensive exam. The proposal
is defended before a faculty committee appointed in consultation with the student, dissertation chair, and PhD advisor. This committee also serves as the supervising committee for the dissertation after the proposal is approved.

**Foundation Courses (minimum of 12 hours)**
These courses provide a foundation in basic business topics such as economics, marketing, finance and accounting. These courses may be waived for students with master’s degrees in management or other academic backgrounds that provide an equivalent foundation.

**Core Courses (21 hours)**
- OB 7300 Organization Theory
- MAS 8V42 Seminar Series in Management Science - Organizational Behavior
- IMS 7300 International Management
- IMS 8v40 Seminar in International Business
- BPS 7300 Advanced Strategic Management Seminar I
- BPS 7303 Doctoral Teaching and Writing Seminar
- MAS 8V51 Seminar Series in Management Science - Strategic Management

**Advanced Seminars (9 hours)**
Advanced seminars are offered on topics in international management, organizational behavior, organization theory and strategic management. These courses are an opportunity for students to explore areas of study in greater depth, to develop short-term research projects, and to develop working relationships with faculty members with a view towards research publications and the dissertation.

**Research Methods (15 hours)**
- OB 7303 Research Methodology in Behavioral Sciences
- OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business
- ECON 6309 Econometrics I **
- OB 7306 Macro-Organizational Empirical Investigation

Students are encouraged to take additional methods courses consistent with their research interests.

**Students desiring a methods sequence with a greater emphasis on mathematical statistics may substitute OPRE 6303 or STAT 5351, STAT 5352, and MECO 6320 for these three courses.**

**Directed readings and independent research courses (21 hours)**
Students can take further courses with selected faculty members to develop more specialized knowledge in areas of research interest before and after the comprehensive exam.

**Dissertation (minimum of 15 hours)**
The PhD degree is conferred when the dissertation is successfully defended.

**Doctor of Philosophy in Management Science (75 hours beyond the baccalaureate degree)**
The PhD program in Management Science is characterized by a high ratio of research faculty to students, which fosters close working relationships. Core and elective courses provide the students with a thorough understanding of management principles. Course work incorporates a broad business outlook into the study of theory and practice. A sequence of PhD seminars exposes students to traditional and emerging research issues. Students have the opportunity to be involved in ongoing research projects under the mentorship of experienced faculty. We emphasize involving students in research early in their graduate careers. The close interaction with faculty members enables students to learn to identify and develop research ideas and create their own research agenda. Students also develop their teaching competence under faculty mentorship by teaching organized classes.

The course of study for the PhD in Management Science consists of three phases. First is attaining a background in business concepts. Second are the requirements for doctoral proficiency. Third is the dissertation. Each area of study – Accounting, Finance, Information Systems, Marketing, and Operations Management – determines the specific requirements for the three phases. Details can be obtained from the Director of the PhD programs in the Jindal School of Management.

Students admitted into the program typically devote two years to the doctoral proficiency course work and research projects. They then take a comprehensive qualifying exam, based on the course work. Following passing the qualifying exam, each student develops his or her dissertation research area, which is usually completed over the next two years.

Doctoral proficiency encompasses courses in research methods, electives or a specialization, doctoral seminars, and a written and oral qualifying examination.

**Required core courses:**
- OPRE 7310 Probability and Stochastic Processes
- MECO 6315 Approaches to Statistical Inference (or a similar course such as STAT 5352)
- MAS 6V00 Special Topics in Management Science [Data Analysis and Software]
- MECO 6320 Econometrics (or ECON 6309 Econometrics I)
- MECO 6345 Advanced Managerial Economics
- OPRE 7320 Optimal Control Theory and Applications
- MAS 8V00 Special Topics in Management Science [Teaching Practicum]

**Secondary Core Courses (6-12 hours):**
Students must take at least two of the following courses:
- OPRE 6311 Game Theory
- MECO 7320 Advanced Econometrics (or ECON 7309 Econometrics II)
- OPRE 7311 Stochastic Models in Operations Research
- OPRE 7330 Deterministic Models in Operations Research

Remaining requirements beyond the core consist of research courses, electives, independent study and seminars as approved by the program committee appointed to guide and evaluate each student. After completion of the coursework to achieve doctoral proficiency, the student will sit for a written qualifying exam which must be passed before formal admission to candidacy for the doctorate. The student must also orally defend the dissertation proposal.
before starting the dissertation. Written examination in the area of specialization may also be required.

The focal point of the PhD program is the dissertation. The dissertation is written under the direction of the candidate’s committee. Twelve to twenty-four semester hours may be granted for the dissertation toward the minimum 75 hour requirement for the degree. At a time mutually agreeable with the candidate and the members of the committee, the student will orally defend his or her dissertation to the satisfaction of the committee. A student must pass in order to have the PhD degree conferred.

Accounting Concentration
This program is for individuals seeking training in the most advanced issues, both theoretical and applied, in the field of Accounting. It is designed to prepare them primarily for teaching positions in research-oriented universities. Some students may be placed in senior positions in industry, government or consulting organizations. The program requires a hands-on training in accounting research, supported by work in the disciplines of economics, mathematics, psychology and statistics, culminating in a doctoral dissertation.

Finance Concentration
This program is for individuals seeking the most advanced academic degree with an emphasis in Finance. It is designed to prepare them for (1) teaching positions in research-oriented universities, (2) senior staff positions in industry or government, or (3) senior positions in consulting organizations; however, the emphasis is on (1). The program consists of coursework in financial management, investments, and money and capital markets, together with work in the supporting areas of economics, mathematics, and statistics; it culminates in a doctoral dissertation. The program is designed to be completed in three years of full-time study by a student entering with an appropriate master’s degree.

Information Systems Concentration
This program is designed for individuals who seek training in advanced theoretical and applied issues in the field of information systems. The training prepares students for conducting leading edge research in topics ranging from the design of optimized systems to the effective use of such systems in organizations. Students undergo rigorous training in research methodologies as well as in the design of information systems. The research conducted is often interdisciplinary in nature, and is characterized by strong analytical modeling of new and emerging issues in information technology creation and management. The program prepares students mainly for academic positions in research universities; some students may be placed in research positions in industry, government or consulting organizations.

Marketing Concentration
The purpose of the PhD Program in Management Science with a marketing major is to train researchers capable of dealing with the most advanced issues, both theoretical and applied, in the field of marketing. Universities as well as major companies with marketing orientation aggressively recruit PhD’s with strong theoretical and research training in marketing. Graduates will have rigorous training in disciplinary areas and research methodology. They will have knowledge of the various research streams in marketing, will have developed a research specialization and a clear perspective on management issues.
Operations Management Concentration

Operations Management emphasizes the development of models, methods, applications, and algorithms as they apply to problems in manufacturing and services. All students will be exposed to deterministic and stochastic modeling and will have the option of applying and/or developing these and new methods to solve problems in their selected topics. There will also be an option of combining a major in Finance, Information Systems or Marketing with one in Operations Management. The goal of the doctoral program in Operations Management is to educate future practitioners and researchers in the concepts and analytical techniques needed to understand and advance scientific solutions to the problems currently faced by operations managers.

Research

The faculty of the School makes intellectual contributions in two areas: fundamental scholarship that advances theory and practice and applied scholarship focusing on practical issues. The fundamental work includes traditional basic research as well as applied research that defines new areas of practice and provides general frameworks that address a wide range of application problems. The applied scholarship provides "how to" frameworks for skilled practitioners, uses demonstration cases to show how theories can be applied, and defines new areas of application for existing tools and techniques.
SCHOOL OF NATURAL SCIENCES AND MATHEMATICS

The School of Natural Sciences and Mathematics houses six departments, each with graduate programs: Actuarial Science (MS), Chemistry (M.S., Ph.D.); Geosciences (M.S., Ph.D.); Mathematical Sciences, emphasizing Applied Mathematics and Statistics (M.S., Ph.D.); Molecular and Cell Biology (M.S., Ph.D.); Physics (M.S., Ph.D.); and Science and Mathematics Education (Master of Arts in Teaching). In addition, there are two interdisciplinary degrees offered: Master of Science in Bioinformatics and Computational Biology, and Master of Science in Biotechnology. Each is relatively small and thus able to provide excellent graduate student-faculty contact. However, each maintains a strong research program. Increasingly, Departments interact with each other in research, allowing interdisciplinary efforts to flourish. A number of well-funded Research Centers and Institutes are also housed in NS&M; these allow graduate students to approach real world, cutting edge research problems while working side by side with professional research staff and internationally recognized faculty. They are: the Center for Applied Biology; the Center for Lithospheric Studies; the UTD NanoTech Institute; the Center for Quantum Electronics; and the Center for Space Sciences.

DEGREES OFFERED

ACTUARIAL SCIENCE

Master of Science in Actuarial Science (36 hours minimum)

BIOLOGY

Master of Science in Molecular and Cell Biology (36 hours minimum)

Doctor of Philosophy in Molecular and Cell Biology (75 hours minimum beyond the baccalaureate degree)
CHEMISTRY

Master of Science in Chemistry (30 hours minimum)

Doctor of Philosophy in Chemistry (75 hours minimum beyond the baccalaureate degree)

GEOSCIENCES

Master of Science in Geosciences (36 hours minimum)

Master of Science in Geographic Information Sciences (30 hours minimum)

Doctor of Philosophy in Geosciences (75 hours minimum beyond the baccalaureate degree)

Doctor of Philosophy in Geospatial Information Sciences (75 hours minimum beyond the baccalaureate degree)

Graduate Certificate in Remote Sensing (15 hours minimum)

MATHEMATICAL SCIENCES

Master of Science in Actuarial Science (36 hours minimum)

Master of Science in Mathematics – Specialization in Applied Mathematics (36 hours minimum)

Master of Science in Mathematics – Specialization in Engineering Mathematics (36 hours minimum)

Master of Science in Mathematics – Specialization in Mathematics (36 hours minimum)

Master of Science in Mathematics – Specialization in Statistics (36 hours minimum)

Doctor of Philosophy in Mathematics – Specialization in Applied Mathematics (75 hours minimum beyond the baccalaureate degree)
Doctor of Philosophy in Mathematics – Specialization in Statistics (75 hours beyond the baccalaureate degree)

PHYSICS
Master of Science in Physics (30 hours minimum)
Doctor of Philosophy in Physics (75 hours minimum beyond the baccalaureate degree)

MATHEMATICS/SCIENCE EDUCATION
Master of Arts in Teaching in Science Education (37 hours minimum)
Master of Arts in Teaching in Mathematics Education (37 hours minimum)

INTERDISCIPLINARY PROGRAMS
Master of Science in Bioinformatics and Computational Biology (36 hours minimum)
Master of Science in Biotechnology (36 hours minimum)
Need NEW URL for ACTUARIAL SCIENCE

http://www.utdallas.edu/nsm/math/

Faculty

Professors: Larry P. Ammann, Michael Baron, Sam Efromovich (Endowed Professorship), Robert Serfling

Associate Professors: Pankaj Choudhary

Clinical Associate Professor: Natalia Humphreys

Master of Science in Actuarial Science (36 hours minimum)

The Master of Science in Actuarial Science (AS) Program at the University of Texas at Dallas is administered through the Department of Mathematical Sciences.

The objective of the program is to educate future leaders of the actuarial industry with training in actuarial theory and methods in a wide spectrum of actuarial applications involving probabilistic and statistical models. All students will be prepared to take five actuarial preliminary exams and will take two advanced actuarial classes to prepare for professional accreditation. Furthermore, students who did not take classes required for VEE (Validation of Educational Experience) credits in statistics, finance, and economics will have such opportunity. With this combined knowledge of mathematics – particularly of probability, statistics, and decision theory – together with knowledge of financial mathematics and insurance, the expected passing of five actuarial exams, and the three required VEE credits, graduates of the program will be able to work as senior actuaries in insurance, consulting, finance, government, and emerging markets.
The minimal total required number of classes for graduation is 36 SCH. Among them, 27 SCH of required courses and 9 of elective.

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Required Courses</th>
<th>SCH</th>
<th>Affiliation with actuarial exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 5351</td>
<td>Probability and Statistics I</td>
<td>3</td>
<td>Exam 1/P</td>
</tr>
<tr>
<td>STAT 6337</td>
<td>Advanced Statistical Models</td>
<td>3</td>
<td>VEE, Applied Statistical Methods</td>
</tr>
<tr>
<td>ACTS 6301</td>
<td>Theory of Actuarial Models: Life Contingencies I</td>
<td>3</td>
<td>Exam 3L/MLC, Part I</td>
</tr>
<tr>
<td>ACTS 6303</td>
<td>Theory of Actuarial Models: Life Contingencies II</td>
<td>3</td>
<td>Exam 3L/MLC, Part II</td>
</tr>
<tr>
<td>ACTS 6304</td>
<td>Theory of Actuarial Methods I</td>
<td>3</td>
<td>Exam 4/C, Part I</td>
</tr>
<tr>
<td>ACTS 6305</td>
<td>Theory of Actuarial Methods II</td>
<td>3</td>
<td>Exam 4/C, Part II</td>
</tr>
<tr>
<td>ACTS 6306</td>
<td>Advanced Actuarial Applications</td>
<td>3</td>
<td>Exam 5/FAP</td>
</tr>
</tbody>
</table>
For the prescribed elective courses student chooses three of the following.

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Prescribed Elective Courses</th>
<th>SCH</th>
<th>Affiliation with actuarial exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 6329</td>
<td>Applied Probability and Stochastic Processes</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6338</td>
<td>Advanced Statistical Methods II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6343</td>
<td>Experimental Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6347</td>
<td>Applied Time Series Analysis</td>
<td>3</td>
<td>VEE, Applied Statistical Methods</td>
</tr>
<tr>
<td>STAT 7338</td>
<td>Time Series Modeling and Filtering</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6348</td>
<td>Applied Multivariate Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6390</td>
<td>Topics in Statistics – Level 6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 7334</td>
<td>Nonparametric and Robust Statistical</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td></td>
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<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>MATH 6313</td>
<td>Numerical Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>STAT 6331</td>
<td>Statistical Inference I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FIN 6301</td>
<td>Financial Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VEE, Corporate Finance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIN 6308</td>
<td>Regulation of Business and Financial Markets</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FIN 6310</td>
<td>Investment Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FIN 6314</td>
<td>Fixed Income Securities</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FIN 6360</td>
<td>Options and Future Markets</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FIN 6382</td>
<td>Numerical Methods in Finance</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>OPRE 6335</td>
<td>Risk and Decision Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MECO 6303</td>
<td>Business Economics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VEE, Economics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCT 6305</td>
<td>Accounting for</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Credits</td>
<td>VEE, Economics</td>
</tr>
<tr>
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<td>--------------------------------------------</td>
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</tr>
<tr>
<td>POEC 7306</td>
<td>Macroeconomic Theory and Policy</td>
<td>3</td>
<td>VEE, Economics</td>
</tr>
<tr>
<td>POEC 6321</td>
<td>Economics for Public Policy</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Preparation for Actuarial Exams**

- Exam 1/P: STAT 5351
- Exam 2/FM: ACTS 6308
- Exam 3L/MLC: ACTS 6301
- Exam 3F/MFE: ACTS 6302
- Exam 4/C: ACTS 6304
- Exam 5/FAP: ACTS 6306

**Validation by Educational Experience (VEE) Credits**

- Applied Statistical Methods: STAT 6337 and STAT 6347
- Corporate Finance: FIN 6301
- Economics: MECO 6303 and POEC 7306
Faculty

**Professors:** Larry P. Ammann, Matthew J. Goeckner, M. Ali Hooshyar, Wieslaw Krawcewicz, Susan Minkoff, Robert Serfling, Janos Turi, John Zweck

**Associate Professors:** Yan Cao

**Affiliated Faculty:** Zhenyu Xuan (Biology), Hyuntae Yoo (Biology), Michael Zhang (Biology)

**Master of Science in Bioinformatics and Computational Biology (36 hours minimum)**

The Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematical Sciences and Molecular and Cell Biology. This program will combine coursework from the disciplines of biology, computer science, and mathematics. The BCBM program seeks to answer the demand for a new breed of scientist who has fundamental understanding in the fields of biology, mathematics, statistics, and computer science. With this interdisciplinary training, these scientists will be well prepared to meet the demand and challenges that have arisen and will continue to develop in the biotechnology arena.

Faculty from both Mathematical Sciences (MMS) and Molecular and Cell Biology (MCB) will participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments will participate in advising students.

For the Master’s degree in Bioinformatics and Computational Biology, beginning students are expected to have completed multivariate calculus,
linear algebra, two semesters of general chemistry, two semester of organic chemistry, two semesters of general physics, programming in C/C++, and two semesters of biology.

Requirements for completing a degree in BCBM are:

Core courses:

BIOL 5410 Biochemistry
BIOL 5420 Molecular Biology
BIOL 5381 Genomics
STAT 5351 Probability and Statistics I
STAT 5352 Probability and Statistics II
MATH 6341 Bioinformatics

Additional core courses for the Computational Biology track:

MATH 6313 Numerical Analysis
MATH 6343 Computational Biology
MATH 6345 Mathematical Methods in Medicine and Biology

Additional core courses for the Bioinformatics track:

CS 5333 Discrete Structures
CS 5343 Algorithms Analysis & Data Structures
CS 6360 Database Design
**Elective**: A minimum of 7 semester credit hours of elective, approved by the student’s advisor. Typically, electives are 6000- and 7000-level courses in mathematical sciences, biology or computer science. Courses from other disciplines may also be used upon approval.
Department of Molecular and Cell Biology

http://www.utdallas.edu/nsm/biology/

Faculty

Professors: Hans Bremer (emeritus), Lee A. Bulla, Santosh R. D’Mello, Rockford K. Draper, Juan E. González, Donald M. Gray (emeritus), Lawrence J. Reitzer, C. S. Rupert (emeritus), Stephen Spiro, Li Zhang, Michael Zhang

Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Dennis L. Miller

Assistant Professors: Heng Du, Jung-whan (Jay) Kim, Kelli Palmer, Zhenyu Xuan, Hyuntae Yoo

Senior Lecturers: Irena Borovkov, Mehmet Candas, Vincent P. Cirillo, Monique Duncan, Wen-Ju Lin, Robert C. Marsh, David Murchison, Elizabeth Pickett, Ruben Ramirez, Scott A. Rippel, Elizabeth Rugg, Illya Sapoznikov, Uma Srikanth, Michelle Wilson, Wen-Ho Yu

Lecturers: Uyen Henson, John Kolar

Objectives
The Graduate Program offers training in those aspects of molecular and cell biology that are the bases of modern biological and biomedical sciences.

The Master of Science degree is designed for students who wish to learn the methodology of research in molecular and cell biology and the fundamentals of problem solving in these areas.

The Master of Science degree without thesis is intended for students who wish to acquire a working knowledge of biotechnology, for other students who seek to gain knowledge of modern biology without the intent to seek positions as technical laboratory personnel, and for those students who are seeking additional preparation for admission to professional schools.

The Master of Arts in Teaching degree in Science Education with a specialization in Biology is designed to strengthen the knowledge of high school teachers in fundamental aspects of biology and to bring them up to date on advances in this rapidly developing field. For further information on this program and for course descriptions, see the Science/Mathematics Education section of this catalog.

The Doctor of Philosophy degree with a major in Molecular and Cell Biology is appropriate for students who show a potential for originality in research and is designed to develop a critical and analytical understanding of current developments, which will enable them to keep abreast of the rapid advances that are likely to occur in the biological and biomedical fields.

The M.S. and Ph.D. degree plans offer students the opportunity to prepare for academic careers in colleges and universities including medical and dental schools, and for careers in industrial, hospital, public health, environmental and governmental laboratories and organizations.

**Specializations**

First-year students will normally complete a body of core courses that emphasize fundamental aspects of biochemistry, biophysics, molecular
biology, and cell biology. Students may then proceed to advanced course work in any of these four general areas. Elective courses are open to all qualified students as recommended by their supervising committees. First year students are also encouraged to participate in rotations through research laboratories.

In the second year, research is initiated under the supervision of one or more of the Molecular and Cell Biology faculty. The faculty and their research interests are listed below. Prospective students should recognize that it is possible to do research in closely related areas not mentioned in this list, provided a faculty member is prepared to supervise the work.

**Gail A.M. Breen**, Isolation and characterization of the genes that code for proteins of the mammalian mitochondrion; mitochondrial biogenesis; eukaryotic gene regulation.

**Lee A. Bulla**, Molecular basis of biopesticides.

**John G. Burr**, Eukaryotic growth regulation; mechanism of viral oncogenic transformation.

**Santosh D'Mello**, Molecular control of neuronal apoptosis

**Jeff L. DeJong**, Eukaryotic transcription; initiation and activation of RNA polymerase II.

**Rockford K. Draper**, Membrane traffic; protein toxins; bio-nanotechnology

**Heng Du**, Role of mitochondria in synaptic and neural degeneration in Alzheimer’s disease

**Juan E. González**, Cell-cell interactions, role of exopolysaccharides in nodulation of legumes by rhizobia; molecular genetics of plant-microbe interactions.


**Jung-whan (Jay) Kim**, Cancer cell metabolism and the tumor microenvironment

**Dennis L. Miller**, Structure and organization of mitochondrial DNA;
mitochondrial gene expression; RNA editing; mitochondrial biogenesis.


**Lawrence J. Reitzer**, Regulation of gene expression and metabolism in prokaryotes.

**Stephen Spiro**, Regulation of bacterial gene expression by environmental signals; genetic and physiological adaptation to stress.

**Zhenyu Xuan**, Computational biology and bioinformatics

**Hyuntae Yoo**, Systems biology for drug discovery

**Li Zhang**, Molecular mechanisms of cell signaling, heme signaling and oxygen sensing, genomics, and systems biology

**Michael Zhang**, Computational biology; gene regulation and epigenomics

**Facilities**

Major items of equipment used by the faculty and available for graduate student research include a Leica TCS SP2 AOBS confocal microscope system, complete Spectra-Physics femtosecond laser system, Becton Dickson fluorescence activated cell sorter, Veeco MultiMode SPM atomic force microscope, Molecular Dynamics Phospholmager, BioRad real-time polymerase chain reaction instruments, Beckman scintillation counters and Optima ultracentrifuges, a Jasco J-715 spectropolarimeter, and an Agilent 5975C series GC/MS with associated software. Individual laboratories are well-equipped with instrumentation needed for research in molecular and cell biology, including thermal cyclers, spectrophotometers, chromatography and electrophoresis systems, chemical hoods, and mammalian cell culture facilities.

Other shared biology facilities include environmental chambers, a staffed media kitchen with autoclaves and washing machines, a darkroom with an x-ray film developer, and an electronics workshop. There is a modern research animal housing facility on campus, as well as a GE 500 MHz FT
multinuclear magnetic resonance spectrometer.

**Admission Requirements**

The University’s general admission requirements are discussed here.

For full participation in the Graduate Program in Molecular and Cell Biology, the student should have a good background in calculus, general physics, organic chemistry, biochemistry, and general biology, including genetics. Entering students not having this background may be required to take some additional course work in their first year or in the summer immediately preceding entry. A minimum GRE score of 295 (verbal plus quantitative) with a minimum of 147 for the verbal component is advisable based on our experience with student success in the program.

**Degree Requirements**

The University’s general degree requirements are discussed here.

Upon satisfactory completion of the core courses (and, for Ph.D. candidates, a favorable evaluation following the Spring semester as described below), a Supervising Committee is appointed for each student (except non-thesis M.S. students) based upon mutual agreement between student and faculty. The Supervising Committee, with the Supervising Professor as chairperson, will help the student plan an elective course curriculum and will oversee the student’s research and thesis or dissertation.

**Master of Science (36 hours minimum)**

All students seeking the Master of Science degree in Molecular and Cell Biology must satisfactorily complete a total of at least 36 graduate semester hours, which must include the following core courses:

- BIOL 5410 **Biochemistry**
- BIOL 5420 **Molecular Biology**
M.S. students intending to submit a thesis must, in addition to the core courses specified above, satisfactorily complete a further 20 hours of Biology courses which includes BIOL 6193 Colloquium in Molecular and Cell Biology, BIOL 801 Research in Molecular Biology, BIOL 6V98 Thesis, and a minimum of 6 credit hours of general electives for which a letter grade is assigned. The remainder of the credit hours usually reflects experimental research but may also be based on literature research as determined by mutual agreement of the student and Supervising Committee. For M.S. (thesis) students, the maximum number of Pass/Fail credits allowed within the 36 credit hour minimum is 13 semester credit hours.

M.S. (non-thesis) students must, in addition to the core courses specified, satisfactorily complete a minimum of four general elective courses in Biology (for which a letter grade is assigned) for a minimum of 9 credit hours, up to 11 semester credit hours of special electives, and/or, with approval of the Graduate Advisor, other graduate courses. For non-thesis M.S. students, the maximum number of Pass/Fail credits allowed within the 36 credit hour minimum is 11 semester credit hours.

A Master of Science Degree in Biotechnology is also offered through the Department of Molecular and Cell Biology.

In addition to the above Master of Science Degrees, a Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematics and Molecular and Cell Biology. This program combines coursework from the disciplines of biology, computer science, and mathematics. Faculty from both Mathematics (MMS) and Molecular and Cell Biology (MCB) participate in the Bioinformatics and Computational Biology program, with the Mathematics Department serving as the administrative unit. Both departments participate in advising students.

See the Department of Mathematics for more information on this degree.
Doctor of Philosophy (75 hours minimum beyond the baccalaureate degree)

All Ph.D. students must satisfactorily complete a total of at least 90 credit hours beyond the bachelor’s degree. All core courses are mandatory. Students must include a minimum of four general elective courses in Biology (for which a letter grade is assigned) for a minimum of 9 credit hours. After core courses, BIOL 5410 Biochemistry, BIOL 5420 Molecular Biology, BIOL 5430 Mathematical Biology, and BIOL 5440 Cell Biology [and, in addition, two laboratory rotations, BIOL 6V02 The Art of Scientific Presentation, and BIOL 6193 Colloquium in Molecular and Cell Biology] have been completed, students are evaluated following the Spring semester. The evaluation is based upon performance in the core classes, laboratory rotations, and performance as teaching assistants (if applicable). Students who pass this evaluation must then pass an oral qualifying examination within three semesters to determine the student’s aptitude for continuation of dissertation research. A dissertation defense will be conducted after the dissertation has been written. All students are required to submit a minimum of one manuscript for publication in an internationally recognized, peer-reviewed scientific journal. There is no foreign language requirement.
Master of Science in Biotechnology
(36 hours minimum)

http://www.utdallas.edu/biotechMS/

Faculty

The following faculty members work with and teach students in the M.S. in Biotechnology degree program:

Professors: Lee A. Bulla (Molecular and Cell Biology), Santosh R. D'Mello (Molecular and Cell Biology), Rockford K. Draper (Molecular and Cell Biology), Donald M. Gray (Molecular and Cell Biology), Stephen D. Levene (Bioengineering), Lawrence J. Reitzer (Molecular and Cell Biology), Stephen Spiro (Molecular and Cell Biology), Li Zhang (Molecular and Cell Biology), Michael Q. Zhang (Molecular and Cell Biology)

Associate Professors: Gail A. Breen (Molecular and Cell Biology), John G. Burr (Molecular and Cell Biology), Jeff L. de Jong (Molecular and Cell Biology), Ernest M. Hannig (Molecular and Cell Biology), Dennis L. Miller (Molecular and Cell Biology)

Assistant Professors: Kelli Palmer (Molecular and Cell Biology), Zhenyu Xuan (Molecular and Cell Biology), Hyuntae Yoo (Molecular and Cell Biology)

Senior Lecturers: Mehmet Candas (Molecular and Cell Biology), Li Liu (Molecular and Cell Biology), Robert Marsh (Molecular and Cell Biology)

Objectives
The M.S. degree in biotechnology is intended to prepare students for careers in biotechnology and biomedicine and to assist currently employed professionals in enhancing their career opportunities.

Biotechnology captures the exciting possibilities made possible by the decoding of the human genome and by the advances in bioanalytical instrumentation, and the field is projected for continued rapid growth. The M.S. in Biotechnology is designed so that students may enter the program with a wide range of prior disciplinary backgrounds, prepare for and take the four core courses, and, by choice from a wide range of approved electives, tailor the remainder of the degree program to their career opportunities. In this manner, students may develop areas of additional depth in fields such as:

- molecular and cell biology
- chemistry
- engineering and computer science
- health care policy
- management and business administration

The M.S. in Biotechnology requires 36 hours of courses, typically twelve courses of three semester hours each. Students may also elect to prepare and defend a thesis; more than 36 hours may be required for such a program.

The M.S. in Biotechnology is administered by the Department of Molecular and Cell Biology. Students seeking further information or advisement should contact the Molecular and Cell Biology Department office.

**Core Courses**

The core consists of four courses – BIOL 5376 Applied Bioinformatics, BIOL 5381 Genomics, BIOL 6373 Proteomics, and BIOL 6384 Biotechnology Laboratory. Students enrolled in the M.S. in Biotechnology
program will have priority for enrollment in BIOL 6384. Students who can demonstrate that they have acquired the material and/or skills in a core course may petition the Committee on Biotechnology for permission to substitute an approved elective course.

Program Policies

The program is open to all students who hold a bachelors degree, although those with laboratory science, mathematics, computer science, or engineering degrees are particularly encouraged to apply. In general, students will not be admitted to the M.S. in Biotechnology program if they require more than two courses in order to be ready to take the core courses.

Every student admitted to the M.S. in Biotechnology program shall consult with the program advisor(s) and develop a mutually agreed degree plan. All requests for deviations from the degree program described in this catalog shall be discussed first with a program advisor, who will forward the request to the Committee on Biotechnology for decision.

There are no formal prerequisites for most of the core courses, and a student, after obtaining consent of the program advisor, may attempt one or more core courses. However, the level of the BIOL core courses is such that most students will want to have mastered the material in the following courses:

- General Chemistry (two semesters, with lab)
- Organic Chemistry (two semesters, with lab)
- BIOL 2311 Introduction to Modern Biology I (with workshop)
- BIOL 3361 Biochemistry or BIOL 6352 Modern Biochemistry I
- BIOL 3301 Classical and Molecular Genetics or BIOL 6V31 Molecular Genetics
- BIOL 3302 Eukaryotic Molecular and Cell Biology or BIOL 6356 Eukaryotic Molecular and Cell Biology
The four core courses should be taken in the following order: BIOL 5376 Applied Bioinformatics, BIOL 5381 Genomics, BIOL 6373 Proteomics, BIOL 6384 Biotechnology Laboratory. Consent of instructor is required for core courses taken out of this sequence.

BIOL 6384 Biotechnology Laboratory is a skills based course. Students must show that they have adequate laboratory skills in order to enroll in BIOL 6384.

Students who elect to prepare and defend a thesis must satisfy the M.S. thesis procedures specified by the department of their thesis supervisor.

Electives

As a general rule, any UTD graduate course that is approved by the advisor as being relevant to the student's tailored degree plan may be taken as an elective for the Biotechnology M.S. program. Students should consult the program advisor for the current list of recommended electives.
Department of Chemistry

http://www.utdallas.edu/dept/chemistry/

Faculty

Robert A. Welch Chair in Chemistry; Professor of Chemistry: Ray H. Baughman
Robert A. Welch Chair in Chemistry; Professor of Chemistry: Dennis W. Smith
Cecil and Ida Green Distinguished Chair in Systems Biology; Professor of Chemistry: A. Dean Sherry

Professors: Kenneth J. Balkus, Jr., Rockford K. Draper (Biology), John P. Ferraris, Bruce E. Gnade (Materials Science and Engineering), Inga H. Musselman, Bruce M. Novak
Associate Professors: Michael C. Biewer, Gregg R. Dieckmann, Jinming Gao (UT Southwestern), Warren J. Goux, Paul Pantano, John W. Sibert
Assistant Professors: Jung-Mo Ahn, Mihaela C. Stefan, Steven O. Nielsen, Jie Zheng, Ronald Smaldone, Jiyong Lee
Affiliated Professors: Anvar A. Zakhidov (Physics), Yves Chabal (MSE), Lev Gelb (MSE), Amy Walker (MSE)

Research Professors: Garry E. Kieler, Duck Joo Yang
Emeritus Professors: Richard A. Caldwell
Senior Lecturers: Sergio Cortes, Sandhya R. Gavva, Claudia Taenzler, Amandeep Sra, Umut Bulut, Yanping Qin, Christina Thompson

Objectives

The Ph.D. program is designed to produce graduates with a focus on innovation and problem solving in interdisciplinary cutting edge research areas such as organic and inorganic materials, nanotechnology, biotechnology, and polymer chemistry. These graduates, with their broad course background, research skills, and practical attitudes should find ready employment in industry or academic positions. A spectrum of courses provides the student with a broad knowledge of chemistry.

The Master of Science program offers students the opportunity to prepare for positions in industry, for further training in related scientific fields, or for further training in chemistry.

Facilities
The department has the equipment and facilities necessary for routine use by its faculty and students in teaching and research. Larger items include: 270 MHz (2), 400 MHz, and 500 MHz multi-nuclear FT-NMR spectrometers; a powder x-ray diffractometer; assorted spectrophotometers utilizing fluorescence, phosphorescence and absorption; three peptide synthesizers; gel permeation chromatographs; workstations with molecular modeling software; and scanning tunneling and atomic force microscopes. Chemistry also participates in the Alan G. MacDiarmid NanoTech Institute, which houses instrumentation for modern materials science research. Facilities external to chemistry, but readily available to its use, include a library, the computer center, the cleanroom, and well-equipped machine and electronics shops.

**Admission Requirements**

The University’s general admission requirements are discussed [here](#).

Undergraduate preparation equivalent to the degree of Bachelor of Science in Chemistry is required. The Chemistry program has no other requirements above the general admission requirements. However, admission is competitive and is decided case by case on the basis of the quality of previous relevant academic work, GRE scores, letters of reference, the student’s statement of academic interests and, for foreign students, evidence of fluency in English. Foreign students with TOEFL scores less than 600 (paper test), 250 (computer test), or 100 (internet test) are admitted only in special circumstances.

**Degree Requirements**

The University’s general degree requirements are discussed [here](#).

Graduate students in chemistry are expected to demonstrate fundamental knowledge of lecture and laboratory skills by completing the following courses with a grade of B or better.  

**Core Courses (12 hours)**

- CHEM 5314 Advanced Physical Chemistry
- CHEM 5331 Advanced Organic Chemistry I
- CHEM 5341 Advanced Inorganic Chemistry I
- CHEM 5355 Analytical Techniques I

**Master of Science (30 hours minimum)**

A minimum of 30 total graduate semester hours is required. The M.S. degree can be pursued on a full- or part-time basis.

**Doctor of Philosophy (75 hours minimum beyond the baccalaureate degree)**

Normally pursued by full-time students enrolled in a minimum of 9 credit hours of approved graduate level courses per semester.

**Other Course Requirements**

In addition to the 12-semester hour core course requirements listed above, students seeking the Ph.D. degree must take two upper level elective courses that are approved by the student’s faculty research advisor and the Chemistry Graduate Advisor. Ph.D. students are expected to
complete these six required courses within the first two years of their enrollment. CHEM 8399 is also required as part of the preparation of the dissertation. Additional courses may be required by the student’s Supervisory Committee.

Well-prepared students may request substitution of portions of the course requirements from the Committee on Graduate Studies in Chemistry. At least three organized courses must be taken at the University of Texas at Dallas. The opportunity exists to take elective courses during their second and subsequent years.

Qualifying Examination: Original Research Proposal

All Ph.D. students must take the qualifying examination. In the second year, students seeking the Ph.D. degree are required to write, present, and defend an original research proposal. In addition to providing valuable experience to the student, this exam is used to assess the student’s originality and skills in organizing an effective approach to solving a novel problem. The results of this examination will be one criterion upon which admission to doctoral candidacy will be judged.

Research

Students have the option of completing a thesis Master’s degree as part of their doctoral candidacy preparation, unless this requirement has been satisfied at the time of admission. The doctoral research project may be conducted in the same laboratory as the Master’s degree research or, in order to gain a broader research experience, in another laboratory. A manuscript embodying a substantial portion of the Ph.D. dissertation research accomplished by the student must be submitted to a suitable professional refereed journal prior to the public seminar and dissertation defense. A public seminar, successful defense of the dissertation, and its acceptance by the Supervising Committee and the Graduate Dean conclude the requirements for the Ph.D.

Representative Research Areas

Within the Chemistry program, opportunities exist for course work and/or research in nanotechnology, biochemistry/biotechnology, organic, inorganic, materials, analytical, and physical chemistry. The opportunity to take course work in several of the other university programs allows the student to prepare for interdisciplinary work. Specific topics within these broad research areas include nanoscience (carbon nanotubes, sensors, actuators, nanoscale devices, synthesis of nanoporous materials); organic solid-state and polymer chemistry (energy storage, electrochromism, light-emitting polymers, solar cells, membrane separations); inorganic solid-state (zeolites, membranes, laser ablation, sensors, fuel cells, electrospinning); biological NMR (structural biology, using NMR active tracers to follow metabolism in cells, isolated tissues and in vivo); supramolecular chemistry (design of novel host-guest systems; biologically responsive MRI agents, design, synthesis and study of macrocyclic receptors with applications in catalysis, materials science, and medicine); scanning probe microscopy (instrument development, image contrast, application to polymer microstructure); bioanalytical and bionano chemistry, synthetic chemistry (macrocycles, metalloprotein function); biochemistry/ enzymology (study of oxidative stress; oxidative metabolism of signaling molecules; molecular modeling; and catalysis).
Department of Geosciences

http://www.utdallas.edu/geosciences/

Faculty

Professors: Carlos L. V. Aiken, David E. Dunn (emeritus), John F. Ferguson, John W. Geissman, William I. Manton, George A. McMechan, Richard M. Mitterer (emeritus), John S. Oldow, Emile A. Pessagno, Jr. (emeritus), Dean C. Presnall (emeritus), Robert H. Rutford (emeritus), Robert J. Stern

Associate Professors: Alexander Braun, Thomas H. Brikowski, James L. Carter (emeritus), Georgia Fotopoulos

Senior Lecturers: William R. Griffin, Ignacio Pujana

Objectives

The basic objective of the Department of Geosciences Graduate Program is to provide students with a broad fundamental background in geosciences as well as an in-depth emphasis in a particular specialty.

The Master of Science degree (thesis option) is designed for students desiring research experience in a specific area of the geosciences. This degree will prepare the student for professional employment in the energy, mining, or environmental industries or government, as well as those seeking a doctoral degree. The Master of Science degrees (non-thesis options) are designed for students who are employed or seek employment in the energy, mining, or environmental industries, and the industrial application of Geospatial Information Sciences (GIS).

The Doctor of Philosophy degree in Geosciences emphasizes basic
research in one of the specialties in geosciences and is designed to prepare students for advanced positions in the energy, environmental or mining professions in industry or government, or for positions in academia.

The Doctor of Philosophy degree in Geospatial Information Sciences (GIS) is supported by the Department of Geosciences, the School of Economic, Political and Policy Sciences, and the School of Engineering and Computer Science. The degree reflects geospatial information science origins at the confluence of work in multiple disciplines. The degree focuses on advancement of the technology, its associated theory, and the enhancement of its applications. Graduates of this program will be well suited to advanced positions in the geospatial technology industry and academic positions.

Facilities

Departmental research facilities include: digital imaging petrographic microscopes, rock preparation and mineral separation facilities, electronics shop and machine shop. Separate research facilities for computing, hydrology, thermal ionization mass spectrometry, geophysics and paleomagnetism/rock magnetism are described below.

Computing Facilities

The Geosciences Department has a large number of networked Windows/PC and Unix/Linux workstations in several laboratories accessible to the students and faculty. A number of laser printers are available, including a color printer. A large format HP 2500CP printer/plotter is available for creating maps and posters. A variety of software licenses are supported for GIS, remote sensing, image processing, geophysical data processing, graphics and visualization. Large scale computing is supported by two state of the art Linux clusters, one with 32 and one with 192 64-bitcores, and 30 terabytes of disk. A GeoWall visualization facility permits immersive interaction with 3-D data and is supported by high-resolution 3D HDTV visualization systems.
Hydrology Laboratory

Field equipment for measuring ground and surface water flow and chemistry, including borehole bailers, electric water level meter, FlowProbe hand-held flow meter, Hach DREL 2010 Basic Water Quality Lab (field spectrophotometer, pH and salinity meters), and YSI-85 DO/salinity/conductivity meter. Software for modeling water flow and transport, including general interfaces GMS and WMS, Hydrus-2D (unsaturated flow and transport), TOUGH2 and Tetrad (2-3D multiphase flow and transport), and many public-domain models. Hardware and software for visualizing model results, including Windows and Linux workstations.

Geochemical Laboratories

A Perkin-Elmer 6100 DRC ICP-MS is used for determining concentrations of a wide range of elements in materials. A Finnigan MAT 261 equipped with 9 collectors and a secondary electron multiplier is supported by Class 100 clean room facilities with sub-boiling acid distillation apparatus, micro- and semi-microbalances, and vessels for pressure decomposition of refractory silicates. Studies focus on using the evolution of Sr, Nd and Pb as indexes of petrogenetic processes, geochronology, environmental Pb, and evolution of marine Sr.

Geophysics Facilities

Geophysical research is supported by two Scintrex CG-5 gravimeters; a variety of surveying instruments including a Nikon theodolite and data collector, a TOPCON GPT 3005LW total station electronic distance meter and theodolite, two Laser Atlanta Advantage CI reflectorless laser rangefinders, a Riegl LMP 3800 laser scanner and a Riegl LSM Z620 laser scanner, seven dual frequency Leica Viva RTK GPS systems, three dual frequency Topcon HyperLite RTK GPS systems (6 receivers), nine dual frequency Leica SR9500 GPS receiver systems with choke-ring antennas, a Trimble GeoXT GPS system, a Trimble GeoHT GPS system and GPS post-processing software including Leica SKI, Trimble Pathfinder Office and BERNESE. A Geometrics proton-procession total
field magnetometer system, An AGI SuperSting R1/IP DC resistivity and induced polarization system is available for near surface electrical conductivity mapping. Seismic and radar equipment include a Geometrics 48-channel floating point seismic acquisition system with Betsy, hammer, and explosive sources for shallow to deep exploration; and pulse EKKO IV, 1000 and PRO ground penetrating radars.

**Paleomagnetism and Rock Magnetism Laboratory**

The newly completed Paleomagnetism and Rock Magnetism laboratory, including a low magnetic field induction space designed and constructed by Dr. Gary Scott of Lodestar Magnetics, is about 2,600 sq. feet in footprint, and includes an attached sample preparation/wet chemistry laboratory, equipped with a fume hood, and an attached meeting/office space area for graduate and undergraduate students. The laboratory includes all non-magnetic furniture and cabinetry installed by Dr. Gary Scott and colleagues in the low magnetic field space. The workhorse instrument for all remanence measurements is a 2G Enterprises Model 760R horizontal access, three measurement axis (DC SQUID) superconducting rock magnetometer, equipped with DC SQUIDS and superinsulation. A fully automated specimen handling system is interfaced with an on-line alternating field (AF) demagnetizer capable of reaching peak inductions of 160 mT, allowing for automated demagnetization of specimens. We have initiated the purchase of a new, pulse-cooled magnetometer from 2G Enterprises, with anticipated delivery in early 2013. AGICO JR-5 and AGICO JR-6 spinner magnetometers allow for the remanence measurements in both automated and static mode. Thermal demagnetization is conducted using Shaw (MMTD), and three ASC (TD48) furnaces, a Schonstedt (TSD-1), as well as a home built large-volume, three heating zone furnace capable of heating/cooling in an inert atmosphere. A large-volume furnace is capable of conducting long-term, elevated temperature magnetic viscosity experiments in a controlled atmosphere. The laboratory includes two ASC impulse magnetizers, with the full range of coil sizes. Two home built impulse magnetizers capable of peak DC induction of 1.3 T and 3.4 T and a horizontal Curie balance for measuring saturation magnetization as a function of temperature in an inert atmosphere. An additional, home built impulse magnetizer, capable
of reaching about 9 T, is currently being tested. Two ASC D-2000 AF demagnetizers provide peak field values of 200 mT and are capable of imparting anhysteretic remanent magnetization (ARM) and partial ARM with DC fields up to 1.0 mT. A D-Tech coil interfaced with an externally tuned Schonstedt GSD 1 AF demagnetizer also allows for AF demagnetization and ARM acquisition. Chemical demagnetizations are carried out in a fume hood environment in the laboratory. The leaching and drying of specimens is carried out in a field-reduced environment (less than 300 nT) in the fume hood. Kappabridge KLY-3S, KLY-4S, and MFK1-FA automated susceptibility systems allow bulk and anisotropy of magnetic susceptibility measurements to be made in both static and automated modes. The KLY-3S and MFK1-FA susceptibility units are interfaced with a CS-4 furnace assembly for measuring susceptibility as a function of temperature in an inert atmosphere. The laboratory also has over ten sets of mu-metal shields of different volumes and geometries, to provide very low magnetic field environments for different purposes. We are equipped for all aspects of field sampling and specimen preparation, including four complete sets of drilling equipment and three dual bladed trim saws. An Olympus BX51TRF-5 transmitted light/reflected light microscope, equipped with a dedicated DP72, 12.8 mp digital camera. A Princeton Instruments AGM/VSM, equipped with a high temperature furnace assembly, acquired by the Physics Department in 2010, has been transferred to the Geosciences Department, and a space remote from the Paleomagnetism Laboratory houses the magnetometer and internal water chiller system. The Physics Department at UTD maintains a Quantum Designs Magnetic Property Measurement System and this is available for use by the PI and students. The UTD Paleomagnetism Laboratory has dedicated field vehicle.

Admission Requirements

The University’s general admission requirements are discussed here.

Applicants are typically expected to take the GRE General Test (Verbal, Quantitative, and Analytical Writing). A combined score of no less than 1000 on the Verbal and Quantitative portions of the exam is advisable.
based on our experience with student success in the program. In addition, students should complete and submit a Supplemental Geosciences Application Form which can be obtained from the Geosciences Department Office by mail (ROC 21, University of Texas at Dallas, 800 W. Campbell Road, Richardson, TX, 75080, USA), telephone (972-883-2401), or e-mail (geosciences@utdallas.edu).

Entering students are expected to have completed the equivalent of the University’s B.S. degree in Geosciences, including courses in physics, mathematics and chemistry. Students whose undergraduate training is in a science other than geology or geophysics are admitted to the program when their previous course work complements or supports their intended research interests. Deficiencies in the undergraduate background of admitted students will be addressed through a sequence of four required graduate courses. It is understood that the minimum course requirements for the intended degree, as specified below, apply to well-prepared students.

**Degree Requirements**

The University’s general degree requirements are discussed [here](#).

Additional requirements are specified below for each degree.

**Graduate Certificate in Remote Sensing (15 hours)**

The Remote Sensing Certificate is supported by the Department of Geosciences and the School of Economic, Political and Policy Sciences.

The American Society for Photogrammetry and Remote Sensing (1997) defined remote sensing as the art, science, and technology of obtaining reliable information about physical objects and the environment, through the process of recording, measuring and interpreting imagery and digital representation of energy patterns derived from non-contact sensor systems.

Remote sensing is a powerful set of software and hardware, computer-
based techniques for extraction and presentation of information represented by raster and vector spatial data acquired via non-contact sensors. It provides reliable and cost-effective means of studying the environment for protection, natural resources management and urban planning. Government and non-government organizations continuously seek qualified professionals to use remote sensing for a wide range of applications.

Pre-requisites and Admission

- B.S. or B.A. Degree. Competence in personal computers, especially Windows-based, is expected.
- Application for admission to UTD Graduate School as "non-degree or degree seeking"
- Only B.S. or B.A. transcripts are needed. No GRE score or reference letters are needed for non-degree seeking students.
- On-line registration is at: www.utdallas.edu/admissions

Course Requirements

The Graduate Certificate in Remote Sensing is obtained by completing 15 hours of courses. Students must complete the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>GEOS 5325</td>
<td>Remote Sensing Fundamentals</td>
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<tr>
<td>GEOS 6381 or GISC 6381</td>
<td>Geographic Information Systems Fundamentals</td>
</tr>
<tr>
<td>GEOS 5326 or GISC 7365</td>
<td>Remote Sensing Digital Image Processing</td>
</tr>
<tr>
<td>GEOS 5329 or GISC 7366</td>
<td>Applied Remote Sensing</td>
</tr>
<tr>
<td>GEOS 7327 or GISC 7367</td>
<td>Remote Sensing Workshop</td>
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Master of Science in Geosciences (36 hours minimum)
**Thesis Option**

All students seeking the Master of Science degree (thesis option) must satisfactorily complete the following requirements (a minimum of 36 graduate semester hours):

**GEOS 5315** *The Earth: An Overview*
**GEOS 5330** *Geospatial Applications in Earth Science*
**GEOS 5375** *Tectonics*
**GEOS 5387** *Applied Geophysics*

A minimum of 15 hours of additional graduate courses.

A minimum of nine semester hours of thesis research including **GEOS 8398** *Thesis* and submit an acceptable thesis.

In addition to the above requirements, students seeking the M.S. degree (thesis option) must submit, no later than the second semester of enrollment, an acceptable degree plan and a research proposal to their supervising committee. Upon completion of the thesis research, the M.S. degree candidate will publicly defend the thesis.

**Non-Thesis Option**

All students seeking the Master of Science degree (non-thesis option) must satisfactorily complete a minimum of 36 graduate semester hours including the specified Geosciences courses below.

**GEOS 5315** *The Earth: An Overview*
**GEOS 5330** *Geospatial Applications in Earth Science*
**GEOS 5375** *Tectonics*
**GEOS 5387** *Applied Geophysics*

A minimum of 21 hours of additional graduate courses, to be selected in consultation with the graduate advisor.

Research: An 8000 level, 3-hour research course.
In addition to the above requirements, students seeking the M.S. degree (non-thesis option) must submit, no later than the second semester of enrollment, an acceptable degree plan.

**Master of Science in Geographic Information Sciences (30 hours minimum)**

The Master of Science in Geographic Information Sciences (MGIS) is a professional program that is offered jointly by the School of Economic, Political and Policy Sciences and the School of Natural Sciences and Mathematics. The program focuses on the use of Geographic Information Systems (GIS) and associated technologies such as remote sensing and global positioning systems for managing spatially referenced information. Students are provided with the concepts underlying GIS, the skills for implementing GIS projects in public and private sector organizations, and the ability to use GIS in pure or applied research in substantive areas. Prospective students should apply using established procedures to either Geosciences or the School of Economic, Political and Policy Sciences depending on their background.

For the Master’s degree in Geographic Information Sciences, beginning students are expected to have completed college Mathematics through Calculus and at least one programming or computer applications course or possess equivalent knowledge. Students must have the equivalent of GISC 6381 Geographic Information Systems Fundamentals and GISC 6382 Applied GIS, or they must take these courses at UTD in addition to the 30 credit hours required for the MGIS. Additional details of the curriculum can be found under “Master of Science in Geographic Information Sciences,” in the School of Economic, Political and Policy Sciences section of the catalog.

**Doctor of Philosophy in Geosciences (75 hours minimum beyond the baccalaureate degree)**

All students seeking a Doctor of Philosophy degree in Geosciences must satisfactorily complete the following requirements (75 graduate hours
A minimum of 18 hours of additional Geosciences graduate courses to be specified by the student's research supervisory committee and the Graduate Advisor.

A minimum of 36 hours of additional graduate courses or research.

A minimum of nine semester hours of thesis research including GEOS 8399 Dissertation and submit an acceptable dissertation.

In addition to the above course requirements, students seeking the Ph.D. degree must submit an acceptable degree plan and research proposal describing the intended project to be completed for the dissertation. Students entering with a Master’s should complete this proposal in the third semester; students entering without a Master’s have until the fourth semester. An oral qualifying examination covering the broad background and detailed knowledge relating to the student’s specialization and research proposal will be held in the same semester that the proposal is submitted. After satisfactory performance on the Qualifying Examination, the student will complete and publicly defend the dissertation.

Also, see the University’s general degree requirements. Please note that more detailed instructions for Geosciences Graduate students are given in the "Guideline for Graduate Students - Geosciences" that is available in the office of the Department Head.

**Doctor of Philosophy in Geospatial Information Sciences (75 hours minimum beyond the baccalaureate degree)**

The Doctor of Philosophy in Geospatial Information Sciences is an
advanced degree offered jointly by the School of Natural Sciences and Mathematics, the School of Economic, Political and Policy Sciences and the Eric Jonsson School of Engineering and Computer Science. Geospatial information is a unifying theme across a wide range of disciplines and the unique organization of this program permits a diverse range of expertise to the prospective student. The Ph.D. in GIS is intended to go beyond the M.S. in GIS degree in terms of analysis, the creation of new technology and the novel application of geospatial information technology. This program will prepare students for leadership positions in academy, industry or government.

Individual students can concentrate in particular discipline areas. The Geosciences component focuses on remote sensing and mapping technologies, including global positioning satellite and three-dimensional laser ranging based data capture as well as other imaging technologies. In particular, these methodologies are applied to geological, hydrological and environmental problems associated with the physical Earth.

It is expected that students will enter this program with diverse educational backgrounds. Applicants may have Bachelors, Masters or other advanced degrees in any relevant field including computer science, economics, engineering, geography, geology, information system management, resource management, geographical information science and possibly others. At least a Bachelors degree from an accredited (or equivalent) institution with an undergraduate/graduate grade point average of 3.25 or better is required. A GRE score of 1150 or higher is desirable. Fluency in written and spoken English is required. (Please see detailed degree requirements under "Doctor of Philosophy in Geospatial Information Sciences," listed in the School of Economic, Political and Policy Sciences section of the catalog.)
Doctor of Philosophy in Geospatial Information Sciences (75 hours minimum beyond the baccalaureate degree)

This degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically in the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science, and is administered by the School of Economic, Political and Policy Sciences.

Faculty

Professors: Carlos Aiken (Geosciences), Brian J. L. Berry (Economic, Political and Policy Sciences), Denis J. Dean (Economic, Political and Policy Sciences), John Ferguson (Geosciences), Daniel Griffith (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Edwin Sha (Computer Science), Robert Stern (Geosciences)

Associate Professors: Alexander Braun (Geosciences), Tom Brikowski (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorf (Economic, Political and Policy Sciences), Weili Wu (Computer Science)

Assistant Professors: Yongwan Chun (Economic, Political and Policy Sciences),
Senior Lecturers: Bryan Chastain (Economic, Political and Policy Sciences), Irina Vakulenko (Economic, Political and Policy Sciences)

Powerful technologies have emerged in recent years to collect, store, manage, analyze, and communicate information regarding the features of the Earth's surface and to combine these with other types of environmental, social and economic information. These technologies, which include geographic information systems (GIS), the global positioning system (GPS), and remote sensing, are used in many ways, including the production of digital maps in vehicles, the management and maintenance of city infrastructure, agriculture and forestry, the policing of communities, and the conduct of modern warfare. The PhD in Geospatial Information Sciences aims to develop individuals capable of advancing this field by developing new knowledge or capabilities relevant to it.

The degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science. This unique structure reflects geospatial information science’s origins as the confluence of multiple disciplines including geography, computer science, engineering, geology, and various social, policy and applied sciences. It is anticipated that many students will enter the program with a bachelor’s or master’s degree (and/or work experience) in an application area (such as public administration, geology, or economics) or in a technical specialization (such as engineering, computer science, or statistics). These students may choose to pursue research projects that advance existing geospatial information sciences practices within that application area. Alternatively, students may opt to pursue research that expands the technological or theoretical base of all the geospatial information sciences.

Mission and Objectives

The mission of the Doctor of Philosophy in Geographic Information Sciences program is to cultivate innovative researchers capable of advancing the frontiers of knowledge in the geospatial information sciences through improved theories, new technologies, innovative
methodologies, sophisticated quantitative analyses, and integrative applications. Specifically, program graduates will:

- **Demonstrate** their knowledge of the fundamental theories and concepts underlying the geospatial sciences.
- **Master** the advanced methodologies and/or quantitative analyses used in at least one of three geospatial specialization areas: [a] computing and information management, [b] spatial analysis and modeling, or [c] remote sensing and satellite technologies.
- **Produce** innovative research that advances theory or methodology in the geospatial sciences.
- **Participate** at academic conferences, publish in peer-reviewed journals and find employment in research departments of public and private organizations and in major academic institutions.

**Facilities**

Students have access to state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and at the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University’s extensive instructional computing facilities, including those in the Eric Jonsson School of Engineering and Computer Science, are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All major industry-standard GIS and remote sensing software is available. The University is a member of the University Consortium for Geographic Information Science (UCGIS).

**Admission Requirements**

The University’s general admission requirements are discussed [here](#). The PhD program in Geospatial Information Sciences seeks applications from students with a baccalaureate, Master of Arts, Master of Science or professional masters-level degree in any field relevant to geospatial information science including, but not limited to, computer science, economics, engineering, geography, geology, management information...
systems, marketing, natural resource management, public affairs and public administration, statistics, and urban and regional planning. Applicants will be judged and evaluated by the existing admission standards as set forth by the University in its Graduate Catalog and by the standards set forth here by the Geospatial Information Sciences program. A bachelor’s degree from an accredited institution or its equivalent and fluency in written and spoken English are required. A grade average of at least 3.25 in undergraduate and graduate course work, and a combined verbal and quantitative score of 1150 (old scale) or 300 (new scale) on the GRE are desirable. An analytical writing score of at least 4.5 in the GRE is considered desirable.

Applicants must submit transcripts from all higher education institutions attended, three letters of recommendation, and an essay outlining their background, education, and academic objectives as they specifically relate to a Ph.D. in Geospatial Information Sciences.

Prerequisites

The following pre-requisites/co-requisites will also be required for admission to the PhD program: (i) college mathematics through calculus, (ii) competence in at least one modern programming language equivalent to GISC 6317 *Computer Programming for GIS*, MIS 6323 *Object Oriented Programming*, or their equivalents, and (iii) at least one course in inferential statistics through to regression analysis equivalent to GISC 6301 *GIS Data Analysis Fundamentals*, EPPS 7313 *Descriptive and Inferential Statistics*, or GEOS 5306 *Data Analysis for Geoscientists*. Graduate courses taken at UT Dallas to meet these prerequisites may be counted as electives toward the 75 credit hours required of students entering the Ph.D. program directly from a B.A. or B.S. degree, but they shall not be considered substitutes for any other specified course.

Advising

Because of the cross-disciplinary nature of this doctoral program, to ensure adequate preparation and appropriate course sequencing, every doctoral student is required to consult with the student’s designated

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Deleted: 5303 and CS
Mary Jo Venetis 1/25/13 9:02 AM
Deleted: MIS 6322 *Developing Business Applications with Visual Basic,*
Mary Jo Venetis 1/25/13 9:03 AM
Deleted: Systems
Mary Jo Venetis 1/25/13 9:04 PM
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Mary Jo Venetis 1/25/13 9:05 PM
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Mary Jo Venetis 1/25/13 9:06 PM
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advisor and/or the GIS Doctoral Program Director prior to registration in every semester. Students generally will not have a faculty advisor when they first enter the Ph.D. program, but every student is required to select (with consent of the potential advisor) an advisor from the advising faculty by the end of his/her first academic year.

Degree Requirements

The University's general degree requirements are discussed here.

To receive the PhD in Geospatial Information Sciences, students must complete the Geospatial Science Core (15 SCH) to achieve a mastery of appropriate Geospatial Information Science technologies and theory, have a Geospatial Specialization Area (15 SCH), have a Specific Application area or Technical field (12 SCH), evidence research skills through successful completion and defense of a Ph. D. dissertation, and take related electives as necessary for a total of 75 semester credit hours. In addition, students must satisfy a set of exams and qualifiers. Other courses may be substituted for those listed below with the written permission in advance of the Director of the GIS Doctoral program.

Geospatial Science Core (15 SCH)

Students must earn a minimum grade point average (GPA) of 3.0 across the following five courses:

- GISC 6381 Geographic Information Systems Fundamentals
- GISC 6382 Applied Geographic Information Systems
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with GIS Applications
Geospatial Specialization Area

Students must select from one of the following, with a minimum of 15 SCH. Courses selected must include at least three at successively advanced levels.

I. Geospatial Computing and Information Management

CS 6359 Object-Oriented Analysis and Design
CS 6360 Database Design
CS 6364 Artificial Intelligence
CS 6366 Computer Graphics
CS 6375 Machine Learning
CS 6378 Advanced Operating Systems
CS 6381 Combinatorics and Graph Algorithms
CS 6384 Computer Vision
GEOS 5303 Computing for Geoscientists
GISC 6317 Computer Programming for GIS
GISC 6388 GIS Application Software Development
GISC 7363 Internet Mapping and Information Processing
MIS 6326 Database Management

II. Spatial Analysis and Modeling
ECON 6309 Econometrics I
ECON 7309 Econometrics II
EPPS 7318 Structural Equation and Multilevel Modeling
EPPS 7370 Time Series Analysis
ECON 6316 Spatial Econometrics

GISC 7364 Demographic Analysis and Modeling
EPPS 7368 Spatial Epidemiology

GEOS 5306 Data Analysis for Geoscientists
GISC 6311 Statistics for Geospatial Science
GISC 7360 GIS Pattern Analysis
GISC 7361 Spatial Statistics

EPPS 7313 Descriptive and Inferential Statistics
EPPS 7316 Regression and Multivariate Analysis

III. Remote Sensing and Satellite Technologies

GISC 5322 (GEOS 5322) GPS (Global Positioning System) Surveying Techniques
GISC 5324 (GEOS 5324) 3D Data Capture and Ground Lidar
GISC 5330 (GEOS 5330) Geospatial Applications in Earth Science
GISC 5395 (GEOS 5395) Satellite Geophysics and Applications
GISC 6325 (GEOS 5325) Remote Sensing Fundamentals
IV. Customized Geospatial Specialization (15 SCH)

Identified by the student with approval in advance by the Director of the GIS Doctoral Program.

Application Area or Technical Field (12 SCH)

Twelve semester-credit hours of specialized course work in an application area or technical field relevant to GIScience. Normally, these will derive from the student’s Master’s degree. These hours may be transferred from another institution, or taken at UT Dallas in an existing master’s program area and may be applied toward a master’s degree in that area.

Application area examples: planning, public affairs, criminal justice, health and epidemiology, geoscience, forestry, hydrology, marketing, real estate, economics, civil engineering, etc.

Technical field examples: statistics, computer science, software engineering, management information systems, image analysis, operations research/location science, instrumentation.

Research and Dissertation (Variable SCHs)

All students must complete the following two classes as part of the
research and dissertation requirement:

- GISC 7387 GIS Research Design
- GISC 7389 GIS Ph.D. Research Project

In addition, students must complete sufficient additional research and dissertation credit hours to bring the total number of SCHs they have earned within the UT Dallas doctoral program (or transferred into the UT Dallas doctoral program) to 75, the minimum required to earn a doctoral degree. Additional research and dissertation SCHs above and beyond those required to reach the 75 credit hour minimum may be required at the discretion of the student’s Ph.D. advisor. Additional research and dissertation SCHs can be earned through any of the following classes:

- GISC 6387 Geographic Information Systems Workshop
- GISC 6389 Geospatial Information Sciences Master’s Research
- GISC 7367 (GEOS 7327) Remote Sensing Workshop
- GISC 8V29 Research in GIS
- EPPS 6310 Research Design I & EPPS 6342 Research Design II
- GISC 8V99 or GEOS 8V99 or CS 8V99 Dissertation

Other Related Electives (0 to 24 SCH)

Students may choose up to 24 SCHs in related electives (from CS, GEOS, GISC, etc.) with consent of their advisor or the GIS Doctoral Program Director.

Exams and Qualifiers

Qualifying Examination

The GISC PhD Qualifier Examination is administered in May of a doctoral student’s first year, following the completion of the first
academic year (i.e. Fall and Spring semester) by the student. This exam comprises four parts, each based upon one of the following core courses:

- **GISC 6382 (GEOS 6383) Applied Geographic Information Systems**
- **GISC 6384 Spatial Analysis and Modeling**
- **GISC 6385 GIS Theories, Models and Issues**
- **GISC 7310 Regression Analysis with GIS Applications**

A student must pass three of the four parts to pass the exam. If a student fails his/her exam, s/he may retake only the parts they failed in the subsequent August. If s/he does not pass a cumulative total of three parts after the August exam date, then s/he the Qualifier Examination, and is withdrawn from the GIS doctoral program.

**Defense of Proposal**

After completing the GIS Research Project class, doctoral students must successfully present and defend a dissertation proposal through an oral examination, according to uniform guidelines established by the GIS program.

**Grade Point Qualifier**

Doctoral students must have GPAs of at least 3.25, and preferably 3.5, in courses taken at UT Dallas at the time they register for GISC 7389 GIS Ph.D. Research Project, or they must petition the GIS faculty for an exemption for extenuating circumstances beyond the student’s control.

**Defense of Dissertation**

A dissertation must be prepared and defended successfully following the procedures established by the Dean of Graduate Studies.
may not be used in conjunction with certain other courses. Consult GIS Doctoral Program Director.
Department of Mathematical Sciences

http://www.utdallas.edu/nsm/math/

Objectives

The Mathematical Sciences Department at The University of Texas at Dallas offers graduate study in five specializations: Applied Mathematics, Engineering Mathematics, Mathematics, Statistics, and an interdisciplinary degree in Bioinformatics and Computational Biology. The degree programs offer students the opportunity to prepare for careers in these disciplines themselves or in any of the many other fields for which these disciplines are such indispensable tools. As other sciences develop, problems which require the use of these tools are numerous and pressing.

In addition to a wide range of courses in mathematics and statistics, the Mathematical Sciences Department offers a unique selection of courses that consider mathematical and computational aspects of engineering, biology and other scientific problems.

The Master of Science degree programs are designed for persons seeking specializations in Applied Mathematics, Engineering Mathematics, Mathematics, Statistics, or Actuarial Science, or Bioinformatics and Computational Biology.

The Master of Science degree is available also for those who plan to teach Mathematics or Statistics above the remedial level at a community college or at a college or university. The Master of Science degree is recommended as a minimum, since an earned doctorate is sometimes required.
For information concerning the Master of Arts in Teaching in Mathematics Education, designed for persons who are teaching in grades 6-12, see the Science and Mathematics Education section.

The Doctor of Philosophy degree programs cover two basic areas of concentration: Statistics and Applied Mathematics. They are designed for those who plan to pursue academic, government, financial, actuarial, or industrial careers.

Facilities

The faculty, staff and students have access to a large network of workstations and servers on campus.

Admission Requirements

The University’s general admission requirements are discussed here.

Specific additional admission requirements for students in degree programs in the Department of Mathematical Sciences follow. Students lacking undergraduate prerequisites for graduate courses in their area must complete these prerequisites or receive approval from the graduate advisor and the course instructor before registering.

One of the components of a student’s academic history which is evaluated when the student is seeking admission to the graduate program is his/her performance on certain standardized tests. Since these tests are designed to indicate only the student’s potential for graduate study, they are used in conjunction with other measures of student proficiency (such as GPA, etc.) in determining the admission status of a potential graduate student. Accordingly, there is no rigid minimum cut–off score for admission to the program. Most applicants admitted to either the MS or PhD programs have GRE scores of at least 400 verbal, 700 quantitative, and 1200 combined. However, exceptions are made in some cases when other credentials are especially strong. Higher standards prevail for applicants seeking Teaching Assistantships.
Degree Requirements

Master of Science in Actuarial Science (36 hours minimum)

The Master of Science in Actuarial Science (AS) Program at the University of Texas at Dallas is administered through the Department of Mathematical Sciences.

The objective of the program is to educate future leaders of the actuarial industry with training in actuarial theory and methods in a wide spectrum of actuarial applications involving probabilistic and statistical models. All students will be prepared to take five actuarial preliminary exams and will take two advanced actuarial classes to prepare for professional accreditation. Furthermore, students who did not take classes required for VEE (Validation of Educational Experience) credits in statistics, finance, and economics will have such opportunity. With this combined knowledge of mathematics – particularly of probability, statistics, and decision theory – together with knowledge of financial mathematics and insurance, the expected passing of five actuarial exams, and the three required VEE credits, graduates of the program will be able to work as senior actuaries in insurance, consulting, finance, government, and emerging markets.

The minimal total required number of classes for graduation is 36 SCH. Among them, 27 SCH of required courses and 9 of elective.

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Required Courses</th>
<th>SCH</th>
<th>Affiliation with actuarial exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 5351</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>Exam 1/P</td>
</tr>
<tr>
<td>Prefix and</td>
<td>Prescribed Elective</td>
<td>SCH</td>
<td>Affiliation with</td>
</tr>
<tr>
<td>-----------</td>
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<td>-----</td>
<td>-----------------</td>
</tr>
<tr>
<td>STAT 6337</td>
<td>Advanced Statistical Models</td>
<td>3</td>
<td>VEE, Applied Statistical Methods</td>
</tr>
<tr>
<td>ACTS 6301</td>
<td>Theory of Actuarial Models: Life Contingencies I</td>
<td>3</td>
<td>Exam 3L/MLC, Part I</td>
</tr>
<tr>
<td>ACTS 6303</td>
<td>Theory of Actuarial Models: Life Contingencies II</td>
<td>3</td>
<td>Exam 3L/MLC, Part II</td>
</tr>
<tr>
<td>ACTS 6304</td>
<td>Theory of Actuarial Methods I</td>
<td>3</td>
<td>Exam 4/C, Part I</td>
</tr>
<tr>
<td>ACTS 6305</td>
<td>Theory of Actuarial Methods II</td>
<td>3</td>
<td>Exam 4/C, Part II</td>
</tr>
<tr>
<td>ACTS 6306</td>
<td>Advanced Actuarial Applications</td>
<td>3</td>
<td>Exam 5/FAP</td>
</tr>
<tr>
<td>ACTS 6308</td>
<td>Advanced Actuarial Financial Mathematics</td>
<td>3</td>
<td>Exam 2/FM</td>
</tr>
</tbody>
</table>

For the prescribed elective courses student chooses three of the following.
<table>
<thead>
<tr>
<th>Number</th>
<th>Courses</th>
<th>actuarial exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 6329</td>
<td>Applied Probability and Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6338</td>
<td>Advanced Statistical Methods II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6343</td>
<td>Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6347</td>
<td>Applied Time Series Analysis</td>
<td>3 VEE, Applied Statistical Methods</td>
</tr>
<tr>
<td>STAT 7338</td>
<td>Time Series Modeling and Filtering</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6348</td>
<td>Applied Multivariate Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6390</td>
<td>Topics in Statistics – Level 6</td>
<td>3</td>
</tr>
<tr>
<td>STAT 7334</td>
<td>Nonparametric and Robust Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6313</td>
<td>Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 6331</td>
<td>Statistical Inference I</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>FIN 6301</td>
<td>Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 6308</td>
<td>Regulation of Business and Financial Markets</td>
<td>3</td>
</tr>
<tr>
<td>FIN 6310</td>
<td>Investment Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 6314</td>
<td>Fixed Income Securities</td>
<td>3</td>
</tr>
<tr>
<td>FIN 6360</td>
<td>Options and Future Markets</td>
<td>3</td>
</tr>
<tr>
<td>FIN 6382</td>
<td>Numerical Methods in Finance</td>
<td>3</td>
</tr>
<tr>
<td>OPRE 6335</td>
<td>Risk and Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MECO 6303</td>
<td>Business Economics</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 6305</td>
<td>Accounting for Managers</td>
<td>3</td>
</tr>
<tr>
<td>POEC 7306</td>
<td>Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td>POEC 6321</td>
<td>Economics for Public Policy</td>
<td>3</td>
</tr>
</tbody>
</table>
Preparation for Actuarial Exams

Exam 1/P: STAT 5351
Exam 2/FM: ACTS 6308
Exam 3L/MLC: ACTS 6301
Exam 3F/MFE: ACTS 6302
Exam 4/C: ACTS 6304
Exam 5/FAP: ACTS 6306

Validation by Educational Experience (VEE) Credits

Applied Statistical Methods: STAT 6337 and STAT 6347
Corporate Finance: FIN 6301
Economics: MECO 6303 and POEC 7306

Master of Science in Mathematics (36 hours minimum)

The University’s general degree requirements are discussed here.

Students seeking a Master of Science in Mathematics must complete a total of 12 three-credit hour courses. In some cases, credit for 3 hours is approved for good mathematics background. The student may choose a thesis plan or a non-thesis plan. In the thesis plan, the thesis replaces two elective courses with completion of an approved thesis (six thesis hours). The thesis is directed by a Supervising Professor and must be approved by the Head of the Mathematical Sciences Department.

Each student must earn a 3.0 minimum GPA in the courses listed for the student’s program.
### Applied Mathematics Specialization

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5301</td>
<td>Elementary Analysis I (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>MATH 5302</td>
<td>Elementary Analysis II (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>MATH 6303</td>
<td>Theory of Complex Functions</td>
<td></td>
</tr>
<tr>
<td>MATH 6313</td>
<td>Numerical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 6315</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 6318</td>
<td>Numerical Analysis of Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 6319</td>
<td>Principles and Techniques in Applied Mathematics I,</td>
<td></td>
</tr>
<tr>
<td>MATH 6320</td>
<td>Principles and Techniques in Applied Mathematics II</td>
<td></td>
</tr>
<tr>
<td>MATH 6308</td>
<td>Inverse Problems and their Applications</td>
<td></td>
</tr>
<tr>
<td>MATH 6321</td>
<td>Optimization</td>
<td></td>
</tr>
</tbody>
</table>

Plus two guided electives.

### Engineering Mathematics Specialization

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5301</td>
<td>Elementary Analysis I (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>MATH 5302</td>
<td>Elementary Analysis II (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>MATH 6303</td>
<td>Theory of Complex Functions</td>
<td></td>
</tr>
<tr>
<td>MATH 6313</td>
<td>Numerical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 6315</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 6318</td>
<td>Numerical Analysis of Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 6319</td>
<td>Principles and Techniques in Applied Mathematics I,</td>
<td></td>
</tr>
<tr>
<td>MATH 6320</td>
<td>Principles and Techniques in Applied Mathematics II</td>
<td></td>
</tr>
</tbody>
</table>
MATH 6331 Linear Systems and Signals
MATH 6305 Mathematics of Signal Processing
plus two guided electives.

Mathematics Specialization

MATH 5301 Elementary Analysis I (or equivalent)
MATH 5302 Elementary Analysis II (or equivalent)
MATH 6303 Theory of Complex Functions
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6301 Real Analysis
MATH 6302 Real and Functional Analysis
MATH 6306 Topology and Geometry
MATH 6311 Abstract Algebra I
plus two guided electives.

Statistics Specialization

Students seeking a Master of Science in Mathematics with a specialization in Statistics must complete the following core courses:

STAT 6331 Statistical Inference I
STAT 6337 Advanced Statistical Methods I
STAT 6338 Advanced Statistical Methods II
STAT 6339 Linear Statistical Models

STAT 6341 Numerical Linear Algebra and Statistical Computing

One course from each of any two of the following sets of courses:

- {STAT 6329, STAT 6343, STAT 7334} Applied Probability and Stochastic Processes or Experimental Design or Nonparametric and Robust Statistical Methods
- {STAT 6348, STAT 7331} Multivariate Analysis
- {STAT 6347, STAT 7338} Time Series Analysis

Students must choose remaining courses as electives approved by the Graduate Advisor for Statistics. Up to two of the following prerequisite 5000-level courses may be counted as electives: MATH 5301 Elementary Analysis I, MATH 5302 Elementary Analysis II and STAT 5351 Probability and Statistics I, STAT 5352 Probability and Statistics II.

Other Requirements

Electives must be approved by the assigned graduate advisor. Typically, electives are 6000- and 7000-level Mathematics or Statistics courses. Courses from other disciplines may also be used upon approval. Substitutions for required courses may be made if approved by the assigned graduate advisor. Instructors may substitute stated prerequisites for students with equivalent experience.

Master of Science in Bioinformatics and Computational Biology (36 hours minimum)

Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematical Sciences and Molecular and Cell Biology. This program combines coursework from the disciplines of biology, computer science, and Mathematics. The BCBM program seeks

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to answer the demand for a new breed of scientist that has fundamental understanding in the fields of biology, mathematics, statistics, and computer science. With this interdisciplinary training, these scientists will be well prepared to meet the demand and challenges that have arisen and will continue to develop in the biotechnology arena.

Faculty from the Mathematical Sciences Department and the Molecular and Cell Biology Department participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments

For the Master's degree in Bioinformatics and Computational Biology, beginning students are expected to have completed multivariate calculus, linear algebra, two semesters of general Chemistry, two semester of organic Chemistry, two semesters of general physics, programming in C/C++, and two semesters of biology. Students without the basic knowledge in one area will be required to take leveling courses.

Requirements for completing a degree in BCBM are:

Core courses:

- BIOL 5410 Biochemistry
- BIOL 5420 Molecular Biology
- BIOL 5381 Genomics
- STAT 5351 Probability and Statistics I
- STAT 5352 Probability and Statistics II
- MATH 6341 Bioinformatics

Additional core courses for the Computational Biology track:

- MATH 6313 Numerical Analysis
MATH 6343 Computational Biology

MATH 6345 Mathematical Methods in Medicine and Biology

**Additional core courses for the Bioinformatics track:**

CS 5333 Discrete Structures

CS 5343 Algorithms Analysis & Data Structures

CS 6360 Database Design

**Elective:** A minimum of 7 semester credit hours of elective, approved by the student's advisor. Typically, electives are 6000- and 7000-level courses in mathematics, statistics, biology or computer science. Courses from other disciplines may also be used upon approval.

**Doctor of Philosophy in Mathematics (75 hours minimum beyond the baccalaureate degree)**

The University's general degree requirements are discussed [here](#).

Each Doctor of Philosophy degree program is tailored to the student. The student must arrange a course program with the guidance and approval of the graduate advisor. Adjustments can be made as the student's interests develop and a specific dissertation topic is chosen. A minimum of 75 semester hours beyond the bachelor's degree is required.

**Applied Mathematics Specialization**

MATH 6301 Real Analysis

MATH 6302 Real and Functional Analysis

MATH 6303 Theory of Complex Functions I
MATH 6306 Topology and Geometry
MATH 6311 Abstract Algebra I
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6316 Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6319 Principles and Techniques in Applied Mathematics I
MATH 6320 Principles and Techniques in Applied Mathematics II
MATH 7313 Partial Differential and Integral Equations I
MATH 7319 Functional Analysis

Statistics Specialization

STAT 6331 Statistical Inference I
STAT 6332 Statistical Inference II
STAT 6337 Advanced Statistical Methods I
STAT 6338 Advanced Statistical Methods II
STAT 6339 Linear Statistical Models
STAT 6344 Probability Theory I

Three courses approved by the student’s Ph.D. advisor from the following list:

STAT 7330 Decision Theory and Bayesian Inference
STAT 7331 Multivariate Analysis
STAT 7334 Nonparametric and Robust Statistics Statistical Methods

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Larry Ammann 2/6/13 1:11 PM
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Mary Jo Venetis 2/1/13 9:41 AM
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Mary Jo Venetis 2/1/13 9:41 AM
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Mary Jo Venetis 2/1/13 9:41 AM
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Mary Jo Venetis 2/1/13 9:41 AM
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Electives and Dissertation

An additional 18-24 credit hours for Applied Math and 18-24 credit hours for Statistics designed for the student’s area of specialization are taken as electives in a degree plan designed by the student and the Graduate Advisor. This plan is subject to approval by the Department Head. After completion of the first 3 or 4 academic semesters of the course program, the student must pass a Ph.D. Qualifying Examination in order to continue on to the research and dissertation phase of the Ph.D. program. Finally, a dissertation is required and must be approved by the graduate program. Areas of specialization include, for example:

- **Applied Mathematics**: applied analysis, biomathematics, differential equations, relativity, scattering theory, systems theory, signal processing.

- **Statistics**: statistical inference, applied statistics, biostatistics, statistical computing, probability, stochastic processes, time series analysis, multivariate analysis, nonparametric and robust statistics, asymptotic theory.

Other specializations are possible, including interdisciplinary topics. There must be available a dissertation research advisor or group of dissertation advisors willing to supervise and guide the student. A dissertation Supervising Committee should be formed in accordance with the UT Dallas policy memorandum (87-III.25-48). The dissertation may be in Applied Mathematics or in Statistics exclusively, or it may include considerable work in an area of application.

Research

Within the Mathematical Sciences Department opportunities exist for work
and/or research in Applied Mathematics, Engineering Mathematics, Mathematics, and Statistics. The opportunity to take course work in several of the other university programs also allows the student to prepare for interdisciplinary work. Such coursework must be approved by the assigned graduate advisor.

Special topics within the Applied Mathematics research area include functional analysis, operator theory, differential and integral equations, optimization, numerical analysis, system theory and control with application in material and molecular sciences, inverse problems with applications in geosciences and medical sciences, relativistic cosmology, differential geometry, applications of topology to biology, mathematical logic, quantum computation and mathematical and computational biology with applications in cardiovascular physiology, neurobiology and cell biology.

Special topics within the Statistics research area include: probability theory, applied probability, stochastic processes, mathematical statistics, statistical inference, asymptotic theory, time series analysis, Bayesian analysis, robust multivariate statistical methods, robust linear models, robust and nonparametric methods, nonparametric curve estimation, sequential analysis, statistical computing, remote sensing, change-point problems, and spatial statistics.

For a complete list of faculty and their areas of research, visit the website www.utdallas.edu/nsm/math/faculty.
Department of Physics

http://www.utdallas.edu/physics

Faculty
Cecil and Ida Green Chair in Physics: Roderick A. Heelis
Green Distinguished Chair in Academic Leadership: B. Hobson Wildenthal
Distinguished Chair in Physics: Myron B. Salamon
Associate Professors: Yuri Gartstein, Mustapha Ishak-Boushaki, Lindsay King, David Lary, Chuanwei Zhang
Assistant Professors: Anton Malko, Fabiano Rodrigues, Jason Slinker
Senior Lecturers: Paul MacAlevey, Beatrice Rasmussen
Affiliated Faculty: Cyrus D. Cantrell (Engineering), Yves Chabal (Engineering), Kyeongjae Cho (Engineering), John P. Ferraris (Chemistry), Matt Goeckner (Engineering), Christopher Hinkle (Engineering), Wenchuang Hu (Engineering), Stephen Levene (Biology), Larry Overzet (Engineering), Dean Sherry (Chemistry), Duck-Joo Yang (Chemistry), Mary Urquhart (Science/Mathematics Education)

Objectives
The goal of the Graduate Program in Physics is to develop individual creativity and expertise in the fields of physics. In pursuit of this objective, study in the program is strongly focused on research. Students are encouraged to begin participating in ongoing research activities from the beginning of their graduate studies. The research experience culminates with the doctoral dissertation, the essential element of the Ph.D. program that prepares students for careers in academia, government laboratories, or industry.

A Master of Science degree is offered to those seeking to acquire or maintain technical mastery of both fundamentals and current applications.

Admission Requirements
The University's general admission requirements are discussed [here](http://www.utdallas.edu/dept/graddean/CAT2012/NSM/PHYS/dept_physics.htm).

The Graduate Physics Program seeks students who have a B.S. degree in Physics or closely related subjects from an accredited university or college, and who have superior skills in quantitative and deductive analysis. Decisions on admission are made on an individual basis. However, as a guide, a combined score on the verbal and quantitative parts of the GRE of 308 is recommended.
with at least 155 on the quantitative part, is advisable based on past experience with student success in the program. In addition, an official score on the GRE Subject Test in Physics is required.

For graduate work it is assumed that the student has an undergraduate background that includes the following courses at the level indicated by texts referred to: mechanics at the level of Symon, Mechanics; electromagnetism at the level of Reitz and Milford, Foundations of Electromagnetic Theory; thermodynamics at the level of Kittel, Thermal Physics; quantum mechanics at the level of Griffiths, Introduction to Quantum Mechanics (chapters 1-4), some upper-division course(s) in modern physics, and atomic physics. Students who lack this foundation may be required to take one or more undergraduate courses to complete their preparation for graduate work.

**Financial Support**

A limited number of teaching assistantships (TAs) are awarded to those students displaying the most promise in teaching or research. Specific decisions regarding TA awards are made on an individual basis. Students who wish to be considered for financial support are encouraged to submit completed applications by February 1st for admission in the fall semester. Admission for the spring term is possible, but opportunities for financial support in such cases are extremely limited, and not guaranteed. Teaching assistantship awardees are required to complete 12 graduate physics courses approved by the graduate advisor during the first 24 months in residence. Continuation of support is evaluated yearly and requires achievement of a minimum GPA of 3.0, and a satisfactory record in teaching or research assignments.

Financial support is preferentially provided to students in the PhD track.

**Specializations**

The central principle in the structure of the graduate program is that a student’s progress and ultimate success is best served by early and varied research experiences coupled with individually tailored course sequences.

Current areas of research specialization in the physics program are: Atmospheric and Space Physics; Astrophysics/Cosmology/Relativity; Condensed Matter Physics/Materials Science; and High Energy Physics. Further details on the current research topics in these areas are provided below.

**Astrophysics, Cosmology and Relativity**

This research group studies fundamental problems in theoretical astrophysics, contemporary cosmology, and relativity. These research efforts typically involve analytical, numerical, and cosmological-data related projects. The group is instrumental in organizing the biennial Texas Symposia on Relativistic Astrophysics, beginning in Dallas in 1963 and recurring regularly all over the world since then. Current areas of research include: gravitational lensing (lenses) and its applications to cosmology; the acceleration of the expansion of the universe (cosmological constant, dark energy); fitting cosmological models to observational data (e.g. CMB, lensing, supernovae); dark matter; the structure of the big bang; the role of inflation; computer algebra systems applied to general relativity and cosmology; space-time junction conditions and wormholes; cosmological models of wider generality than the classical homogeneous models and their possible observational signatures. More specific information is available at [http://www.utdallas.edu/~mishak/relativitycosmology.html](http://www.utdallas.edu/~mishak/relativitycosmology.html).
Atmospheric and Space Physics
Research in Atmospheric and Space Physics encompasses both theory and experiment, with emphasis on aeronomy, ionospheric physics, planetary atmospheres, atmospheric electricity and its effects on weather and climate, and space instrumentation. Much of the research occurs in the William B. Hanson Center for Space Sciences, which includes laboratory facilities for instrument design, fabrication, and testing. Faculty and students participate in ongoing satellite missions sponsored by NASA and DoD, and suborbital sounding rockets. Most students participate in analysis of large data sets from previous missions, and from ground-based optical and radar instruments at locations ranging from Greenland to South America. Particular areas of interest include large and small scale dynamics and electrodynamics, numerical modeling of the thermosphere and ionosphere, characteristics of the near earth plasma environment, the effects of solar variability on atmospheric electricity, cloud microphysics and tropospheric dynamics, plasma instabilities and irregularities, and development and testing of innovative space flight instrumentation. Computer facilities include a network of dedicated workstations and access to supercomputers. For further details see http://www.utdallas.edu/research/spacesciences.

High Energy Physics and Elementary Particles
The UTD High Energy Physics Group collaborates on the Atlas experiment at the CERN Large Hadron Collider (LHC) and the BaBar experiment, at the PEP-II asymmetric b factory located at the Stanford Linear Accelerator Center (SLAC). Atlas will search for the Higgs boson, believed to be responsible for electroweak symmetry breaking, for new physics beyond the standard model such as supersymmetric partners to known particles, and for new hadrons. Atlas data-taking will begin in 2009. BaBar measures CP violation in the decays of bottom mesons and is exploring whether the origin of this CP violation lies within the Standard Model. BaBar data is fertile ground for precision and rare decays of bottom and charm particles, and tau lepton. The group explores both charmonia and a class of unexpected particles with charm-anticharm quark content with properties that are quite different from conventional charmonium. BaBar has completed data-taking and is analyzing its data. The group's research is funded by the U.S. Department of Energy. The UTD High Energy Physics group specializes in high performance computing, simulation production, and data analysis while contributing to the commissioning and operation of experiments. Additional information can be found at: http://www.utdallas.edu/~joe/hepweb/utdhep.html.

Solid State/Condensed Matter Physics/Materials Science
Materials Science is at the interface of many disciplines and involves a collaborative approach with colleagues in chemistry, and electrical engineering. Our research facilities are distributed over the physics laboratories, NanoTech Institute (nanotech.utdallas.edu) and Electrical Engineering Clean Room. Research in Materials Science involves both experiment and theory with emphasis on the physical aspects of solid state materials, optical properties of solids, Raman scattering, physical properties of thin films, and carbon nanotubes. Various nanoscale and synthetic materials are being studied for their optical, electronic, magnetic and transport properties, as well as applications in photonics, spintronics and (opto)electronics. The materials of interest include nanostructures (quantum dots and wires, fullerenes and carbon nanotubes) and low-dimensional systems, photonic band gap crystals and "left-handed" electromagnetic meta-materials, organic and polymeric materials. Unconventional superconductivity and superconducting nanostructures are also under investigation. The interaction of nanoscale materials, such as carbon nanotubes, with biological entities are being investigated for prospective biomedical and electronic applications. For example,
chemically functionalized carbon nanotubes are being studied as building blocks in transistor and sensor applications.

**Degree Requirements**

The University's general degree requirements are discussed here.

All candidates for graduate degrees in physics must satisfy general University degree requirements. Well prepared students may demonstrate by examination adequate knowledge of the core and basic course material. In addition to the general university graduation requirements, graduation in physics requires achieving a grade of B or better in each core course in the MS and Ph. D. programs.

**Master of Science (30 hours minimum)**

A minimum total of 30 graduate credit hours is required, including the core courses listed below.

1. **MS Core courses (12 hours)**
   - PHYS 5301 Mathematical Methods of Physics I
   - PHYS 5311 Classical Mechanics
   - PHYS 5320 Electromagnetism I
   - PHYS 6300 Quantum Mechanics I

2. **MS Elective courses (18 hours)**
   In addition to the core courses, 18 hours of additional graduate level physics or related field courses must be successfully completed by MS candidates in physics, with prior approval from the Graduate Advisor. Up to 6 hours of elective credit may be satisfied through approved industrial internships, supervised research, or the satisfactory completion of an MS thesis. Prior approval for these options must be obtained from the Graduate Advisor.

**Doctor of Philosophy (75 hours minimum beyond the baccalaureate degree)**

A minimum of 24 credit hours in the graduate core sequence are required for the Ph. D. degree, plus additional courses specified by the student's thesis committee chair. The required core courses must include:

- PHYS 5301 Mathematical Methods of Physics I,
- PHYS 5302 Mathematical Methods of Physics II,
- PHYS 5311 Classical Mechanics,
- PHYS 5313 Statistical Physics,
- PHYS 5320 Electromagnetism I,
- PHYS 5322 Electromagnetism II,
PHYS 6300 Quantum Mechanics I, and
PHYS 6301 Quantum Mechanics II.

Students in space sciences must also take PHYS 6383 Plasma Science.

A candidate must also take a minimum of 3 elective courses, 1 from within his/her area of specialization and 2 selected from outside the student’s specialty area. Additional courses may be required to satisfy the particular degree requirements and/or to ensure sufficient grounding in physical principles. The graduate advisor and the student’s supervisory committee must approve course selections. A minimum of one year residency after admission to the doctoral program is required.

Students are required to take and pass a qualifying examination during their first year in the Ph.D. program. The qualifying examination is normally given in January of the first year of graduate study. At the discretion of the Physics Qualifying Exam Committee, a student may pass the exam, fail the exam, or be offered a second attempt at the qualifying examination. A second attempt, if offered, will normally be given before the end of the summer semester of the first year of graduate study. A student taking the second attempt will either pass or fail the exam; under no circumstances will a third attempt be given. Students who fail the qualifying examination will be ineligible to continue enrollment in the physics graduate program after the completion of their first full year in residence.

After a student has completed the required course work with a minimum grade of B in each core course and a minimum GPA of 3.0 for all courses, passed the qualifying examination, and decided upon his/her field of specialization, the student is required to identify a dissertation topic and form a Supervising Committee to guide the student's dissertation work. The student must submit a proposal that outlines the present state of knowledge of the field and presents the research program the student expects to accomplish for the dissertation. This proposal must be approved by the Supervising Committee and the Department Head. A seminar on the dissertation proposal must be presented, followed by an oral examination conducted by the faculty on the proposed area of research and related topics. The Supervising Committee shall determine by means of the exam and any ancillary information whether the student is adequately prepared and has the ability to conduct independent research. The approved dissertation proposal is then filed with the Dean of Graduate Studies. An approved dissertation proposal is normally expected no later than the end of the first semester of the student’s third year.

A manuscript embodying a substantial portion of the dissertation research accomplished by the student must be submitted to a suitable professional refereed journal prior to the public seminar and dissertation defense. A public seminar, successful defense of the dissertation, and its acceptance by the supervising committee conclude the requirements for the Ph.D. In lieu of the traditional dissertation, and at the discretion of the supervising professor, a manuscript dissertation following the guidelines published by the Graduate Dean’s Office may be substituted.
**Core Course listing for Doctor of Philosophy** (24 credit hours required, 27 for Space Science.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PHYS 5311</td>
<td>Classical Mechanics</td>
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<tr>
<td>PHYS 5313</td>
<td>Statistical Physics</td>
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<tr>
<td>PHYS 5320</td>
<td>Electromagnetism I</td>
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<td>PHYS 5322</td>
<td>Electromagnetism II</td>
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<tr>
<td>PHYS 5301</td>
<td>Mathematical Methods of Physics I</td>
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<tr>
<td>PHYS 5302</td>
<td>Mathematical Methods of Physics II</td>
</tr>
<tr>
<td>PHYS 6300</td>
<td>Quantum Mechanics I</td>
</tr>
<tr>
<td>PHYS 6301</td>
<td>Quantum Mechanics II</td>
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<tr>
<td>PHYS 6383</td>
<td>Plasma Science (required core course for Space Science students)</td>
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Department of Science and Mathematics Education

http://www.utdallas.edu/dept/graddean/CAT2012/NSM/EDU/dept_mathsciedu.htm

Preface

The department of Science and Mathematics Education offers two graduate degree programs: Science Education and Mathematics Education.

Degrees Offered

Master of Arts in Teaching/Science Education (37 hours minimum)

Master of Arts in Teaching/Mathematics Education (37 hours minimum)

Faculty

Professors: Thomas R. Butts (emeritus), Frederick L. Fifer, Jr. (emeritus), Cynthia Ledbetter (emerita), Lynn Melton

Associate Professors: Titu Andreescu, Homer Montgomery, Mary L. Urquhart (Head)

Assistant Professors: Nikki Hanegan, Phillip Kisunzu

Science Education Specialist and Senior Lecturer: Barbara A. Curry

Clinical Professors: Katherine Donaldson, Floyd Dorsey, Bill Gammons, Amin Lalani, Jim McConnell, Bill Neal

Affiliate Faculty: John Burr, Gregg Dieckmann, Joe Ferrara, Matthew Goeckner, Pamela Gossin, John Hoffman, Joe Izen, Susan Minkoff, Felicia Pittman, Christine Salmon, Robert Stern, John Zweck

Objectives and Structure

The Master of Arts in Teaching (M.A.T.) in Science Education Program and the M.A.T. in Mathematics Program are designed to enhance the content knowledge and pedagogical content knowledge of science, technology, engineering, and mathematics (STEM) teachers. Both programs share a set of core courses that allow students to explore knowledge common to both disciplines. Students in Science Education or Mathematics Education can then collaborate to integrate science and mathematics education and to provide a better education for their students. Because many graduates of these M.A.T. programs will rise to leadership positions such as department head or science/mathematics coordinator, the core courses provide fundamental skills in cognition, education research, and assessment so that M.A.T. graduates can evaluate educational strategies and thoughtfully advise their colleagues about them. The STEM Content
courses provide additional depth in specific science and mathematics content areas. Students may elect to write and defend a research-based thesis.

Both programs are designed for individuals with significant ability in a science/mathematics discipline and a serious commitment to teaching. They provide forward-looking opportunities for professional development for both new and experienced teachers.

**Departmental Activities and Facilities**

The Science/Mathematics Education (SME) Department is a hub for many important activities. In addition to the graduate M.A.T. in Science Education and M.A.T. in Mathematics Education degree programs, faculty in the Science/Mathematics Education Department direct and carry out the UT-Dallas implementation of UTeach, the nationally-acclaimed program for recruitment, preparation, and support of STEM teachers. The Science and Engineering Education Center, directed by Nobel Laureate Russell Hulse, is housed in facilities adjoining the SME area, and collaborations with SEEC continue to grow. Joint meetings with faculty from the School of Brain and Behavioral Sciences and the Center for BrainHealth lead to discussions of ways in which neuroscience and STEM education can grow symbiotically. The Center for Science/Education and Research and the UT-Dallas T-STEM Center provide partnership and professional development support for T-STEM Academies in Texas.

In Fall 2010, UT-Dallas opened its new Science Learning Center. It contains not only undergraduate teaching areas for the science students, but also a specially designed classroom area for SME that can be configured for interactive classes. SME instructors can model the best of educational practices and develop research projects to evaluate such strategies.

Scientific equipment supporting the various programs at the university can be available to students in the M.A.T. program. Facilities in biology, chemistry, computer science, geosciences, mathematics and physics are briefly described in the respective sections of the catalog.

**Admission Requirements**

The University’s general admission requirements are discussed here.

**Science Education**

Admission to the Graduate Program in Science Education requires, in addition to general University requirements, a significant background in science. A background of 24 semester hours in science at the undergraduate level or higher is preferred. An interview with an SME faculty member may also be required.

**Mathematics Education**

Admission to the Graduate Program in Mathematics Education requires, in addition to the general University requirements, an adequate background in mathematics. Applicants for the Upper Elementary/Middle School Mathematics and Applications track should have mastered pre-calculus and have experience with mathematical problem solving (e.g., MATH 3307 or
equivalent). Applicants for the High School Mathematics track should have at least one year of calculus, a course in linear algebra, and a junior-level course involving mathematical proof. An interview with an SME faculty member may also be required.

Background Checks

For both Science Education and Mathematics Education programs, opportunities may arise for students to work directly in local schools. Public schools and many private schools in the state of Texas require criminal background checks of all volunteers or individuals working within the schools regardless of the potential for direct contact with students.

Degree Requirements

The University’s general degree requirements are discussed here.

The M.A.T. in Science Education and the M.A.T. in Mathematics Education have a common set of four core courses. Both degrees require satisfactory completion of a minimum of 37 semester credit hours, and both degrees allow a student to select a Practitioner Option (coursework only) or a Research Option (coursework plus thesis).

A grade of B or better must be obtained in the Introductory Graduate Seminar and the four core courses, and an overall grade point average of B (3.00) or better is required for graduation.

Requirements common to the M.A.T. in Science Education and to the M.A.T. in Mathematics Education

1. SMED 5100 Introductory Graduate Seminar
2. Four (4) Core courses:
   - SMED 5301 Science, Mathematics, and Society
   - SMED 5302 Teaching and Learning of Science and Mathematics
   - SMED 5303 Introduction to Research and Evaluation in Science and Mathematics Education
   - SMED 5304 Reflections on Science and Mathematics Education
3. Six (6) STEM Content Courses (Practitioner Option) or four (4) STEM content courses plus at least six semesters hours of SMED 6V98 (Research Option). In both cases, four STEM content courses must be taken within a single STEM content area subject to the specific requirements for each program given below.
4. Elective Courses sufficient to bring the total hours to a minimum of 37 SCH. Electives must be approved by the SME Graduate Studies Committee. Research Option students must use one of their electives to take SCI 5340 Statistics for Science/Mathematics Education, which must be taken prior to enrolling in thesis hours.

Students may petition the Graduate Studies Committee for waiver of requirements or substitution of alternate means of meeting requirements. Students who have particularly strong STEM content...
backgrounds are encouraged to meet with the Graduate Advisor and develop an appropriate
degree plan.

**Thesis Option**

Students who wish to pursue the thesis option must consult with potential faculty advisors and
present to the Graduate Studies Committee the name of the proposed thesis advisor, the
proposed thesis topic, and potential committee members. The Graduate Studies Committee,
after consultation with the student and appropriate faculty members, may approve the project and
committee or require changes. In order to fulfill the thesis requirement, the student must pass a
minimum of six semester hours in thesis research, SME 6V98, and submit an acceptable thesis.
The thesis is directed by a Supervising Professor and must be approved by the student’s thesis
supervisory committee. In addition, the student must comply with the rules set by the Graduate
Dean and successfully defend the thesis.

**Requirements Specific to the M.A.T. in Science Education**

Students in the M.A.T. in Science Education must pass four courses in one of the following
Science Content areas: (1) Earth and Space Sciences, (2) Life Sciences, or (3) Physical
Sciences. For Practitioner Option students, the other two courses must be taken in a different
STEM content area, which may include both Mathematics content areas described below.

**Requirements Specific to the M.A.T. in Mathematics Education**

Students in the M.A.T. in Mathematics Education may choose between two tracks: (1) Upper
Elementary/Middle School Mathematics and Applications and (2) High School Mathematics.

(1) Upper Elementary/Middle School Mathematics and Applications

Students must pass MTHE 5327 *Functions and Modeling* and five of the six courses in the
Mathematics B content area.

(2) High School Mathematics.

Students must pass four courses in the Mathematics A content area and at least two courses in
the Mathematics B content area. It is recommended that those in the Practitioner Option use their
elective courses to take two additional courses in the Mathematics B content area.

**Requirements Associated with Community College Teaching**

Many community colleges require that instructors have 18 SCH of graduate course work in the
discipline to be taught. Students with an interest in teaching in community colleges should consult
with the Graduate Studies Committee as soon as possible to identify the courses taken as part of the
M.A.T. in Science Education or the M.A.T. in Mathematics Education that meet the expected
requirements.

**STEM Content Area Courses**
Earth and Space Sciences

SCI 5322 Basis of Evolution
SCI 5337 Rockin’ Around Texas
SCI 5326 Astronomy: Our Place in Space
SCI 5327 Comparative Planetology

Life Sciences

SCI 5322 Basis of Evolution
SCI 5324 Ecology
SCI 5329 Bioethics
SCI 5330 Emerging Topics in Biology

Physical Sciences

SCI 5323 Laboratories and Demonstrations for Middle School Science Teachers
SCI 5331 Conceptual Physics I: Force and Motion
SCI 5332 Conceptual Physics II: Particles and Systems
SCI 5333 Conceptual Physics III: Atoms, Charges, and Interactions

Mathematics A

MATH 5301 Elementary Analysis I
MATH 5302 Elementary Analysis II
MATH 5305 Higher Geometry for Teachers
MATH 5306 Non-Euclidean Geometry for Teachers
MATH 6311 Abstract Algebra I

STAT 5351 Probability and Statistics I
STAT 5352 Probability and Statistics II
Mathematics B

MTHE 5321 Problems Using Algebra
MTHE 5322 Problems Using Geometry
MTHE 5323 Problems Using Pre-calculus
MTHE 5324 Problems Using Discrete Mathematics
MTHE 5325 Problems Using Mathematical Modeling
MTHE 5326 Problems Using Statistics and Probability

Mathematics C

MTHE 5327 Functions and Modeling

The courses available to students to meet the STEM Content requirements include, but are not limited to, the courses listed in the STEM Content areas above. Use of courses outside these sets must be approved by the Graduate Studies Committee.

Online Course Work and Degree Options

Courses applicable to the M.A.T. in Science Education and M.A.T. in Mathematics Education may be offered online. However, the Science/Mathematics Education Department cannot guarantee that a student can carry out the entire degree program online. Students interested in online work should consult course schedules and contact the Graduate Studies Committee for current advice.

Undergraduate UTeach Dallas Students May Begin an MAT Program

Undergraduate students at UTD who anticipate entering one of the Master of Arts in Teaching programs after obtaining a bachelor's degree are encouraged to begin taking MAT courses under UTD's reserved for graduate credit option. The most appropriate courses for such students to take are

SME D 5100 Introductory Graduate Seminar,
SME D 5301 Science, Mathematics, and Society,
SME D 5302 Teaching and Learning of Science and Mathematics,
UTeach students are encouraged (1) to explore with their advisors the possibility that some graduate courses, such as SME 5302 and SCI 5342 Research Methods in STEM may satisfy a portion of the UTeach requirements and (2) to contact the Graduate Advisor to discuss a smooth transition to the Master of Arts in Teaching programs.

MAT and Other Post Baccalaureate Students May Apply to UTeach Dallas

UTeach Dallas is an innovative teacher preparation program that allows students to pursue middle school and high school teacher certification within a science-technology-engineering-mathematics (STEM) degree program. While learning STEM subject matter, students also learn--through courses taught by some of Texas's most respected secondary school math and science teachers -- how to teach. Upon completing the UTeach program, students are recommended for a middle school or high school teaching certificate. Both degree seeking and non-degree seeking students may apply. Interested students should contact the Graduate Advisor or the UTeach Dallas Advisor.

Teacher certification requirements are described in the following section of the undergraduate catalog: http://catalog.utdallas.edu/2012/undergraduate/programs/teacher-education-certification.
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Mary Jo Venetis 1/26/13 5:59 PM
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Deleted: SCI 6201 Scientific Writing (2 semester hours) Lectures and workshop on the principles of clear scientific exposition and the requirements for preparation of scientific papers for publication. Normally taken by students about to begin writing a thesis or dissertation. (P/F grading) (2-0) R... [5421]
POSTHUMOUS DEGREE POLICY

Definition:

A deceased student may be considered a candidate for a posthumous degree when nominated by the Dean of the School in which the student was enrolled. Posthumous degrees may be awarded provided minimum academic degree requirements have been satisfied and verified.

Requirements for Nomination:

1. A student must have been in good academic standing with the institution at the time of death. University requirements for earned credits in residence must have been satisfied.

2. Student must have been enrolled at time of death (summer excluded) or is/was on an approved leave of absence.

3. An undergraduate or professional student must have been within 15 credits of degree completion to be nominated for a posthumous degree.

4. A graduate student who was not required to complete a dissertation or thesis as part of his/her plan of study must have been within 75% of degree completion to be nominated for a posthumous degree.

5. A graduate student must have completed an adequate amount of research/work toward a thesis, paper, dissertation or comprehensive project as determined by the department/program and school in which the student was enrolled.

6. The Dean of the School in which the student was enrolled, following consultation with the academic program in which the student was enrolled, recommends the awarding of a posthumous degree.

Nomination/Approval Process:

1. The formal process of nominating a candidate for a posthumous degree award can be initiated by any individual with knowledge of the academic profile/record of the student. The nomination is made to the dean of the appropriate school for consideration.

2. The school dean, in consultation with the academic program will verify that the nomination, degree plan and progress toward degree completion meets the specified requirements.

3. The dean of the school in which the student was enrolled will recommend the candidate for a posthumous degree in the form of a formal written request to the Provost/Vice President for Academic Affairs. The request must include the name and ID of the student, the degree/program/plan to be awarded, and the recommended semester for degree conferral. The provost may choose to present this to the council of deans for review/discussion.

4. If supported by the provost, the provost will submit the recommendation to the university president for formal approval. If approved by the president,
   1. The provost or dean will notify the registrar to begin the process for degree posting and commencement proceedings, if applicable.

      2. The dean will inform the immediate family of the university’s decision and desire to recognize their student with this honor (this process should be kept confidential until and unless approved at all levels). If the family desires to represent the student and receive the diploma at a commencement ceremony, this must be relayed to the registrar for planning.

Miscellaneous Details/Considerations:
1. A posthumous degree will be printed in commencement programs within the appropriate school section. If the family chooses not to participate, this award may still be read during the ceremony (unless explicitly requested otherwise by the family).

2. The student must be in good financial standing with no outstanding balance.

3. Exceptions to the aforementioned minimum requirements may be considered in special cases, with support of the dean and provost and approval of the president.

4. The statement "awarded posthumously" will be printed on the student’s academic record, but not on the diploma.
Academic Certificate Program
Title: Graduate Certificate in Corporate Innovation
School: Naveen Jindal School of Management

Contact:
Dr. Joseph Picken, Program Director
jpicken@utdallas.edu
972-883-4986

Implementation Date: Fall 2013 (to be announced upon approval)

Introduction/Description: The Graduate Certificate in Corporate Innovation is focused on the management of innovation within the context of an established organization. The basic processes of innovation are essentially the same in a startup venture or within an established organization, but because the context and constraints are markedly different, corporate innovation requires a different set of skills and approaches. The essential processes and management disciplines are well-understood and can be successfully taught through the courses offered in this certificate program. The certificate is obtained by completing 15 credit hours of study as detailed below. All courses must be completed with a B or better.

Academic Focus of the Certificate: The certificate will provide the tools and essential skills and perspectives necessary for the successful launch of new businesses within the context of an established organization.

Student Demand: Student demand will be generated from among individuals who seek to complement their technical or functional skill sets with the skills and perspectives required to lead innovation within established organizations. Such individuals will be recruited from among: (a) engineering or technical professionals in established organizations who recognize that innovation management skills will further their career objectives; and (b) UT Dallas graduate students currently enrolled in advanced degree programs in engineering, technical or other management disciplines who seek to prepare themselves to lead innovation initiatives in established organizations. In addition this program will be offered to corporate training departments as an opportunity to upgrade the innovation management skills of their organizations by enrolling multiple students to pursue the certificate as a cohort.

Job Market for the Certificate: The certificate is designed for students desiring to augment their skills in a technical or functional discipline with the management skills and perspectives necessary for the successful launch of new businesses or other innovations within established organizations. There is a recognized need, among established technology organizations, for engineers and scientists who possess sufficient business training and expertise to effectively evaluate opportunities and risks and to manage and facilitate the processes of innovation. A senior manager at Raytheon observed:

“This program…addresses a vacuum that exists in most businesses: few people have the experience and/or knowledge to successfully craft, sell and launch a new business area.

“High-tech businesses…would hire as well as send existing employees into the program. It fits well into a number of our more externally focused functions: business development, product management, marketing and sales, program management, and even engineering management.”
Other local technology companies have also acknowledged the need to supplement the technical skills of employees seeking to move into upper management roles with specific training in the disciplines surrounding new product development, innovation and technology commercialization.¹

Most of the students currently enrolled in the Master of Science in Innovation and Entrepreneurship degree program have technical backgrounds and have enrolled specifically for the reasons cited in the preceding paragraph. We believe that many organizations and individuals would recognize the benefits of this certificate and enroll high potential employees as a part of their internal programs of management development.

**Admission Policy:** Open to degree seeking and non-degree seeking students admitted to the Naveen Jindal School of Management.

**Degree seeking:** Students already enrolled in a degree program in the Naveen Jindal School of Management are automatically eligible for enrolling in the certificate program and may begin taking required courses immediately via normal course registration procedures. Students should notify the Program Director or Associate Program Director regarding their desire to receive a certificate. A follow up notification should be sent as the student completes the final required course that includes the courses completed and the grades received in each course.

**Non-degree seeking:** Non-degree seeking students must contact the Program Director or Associate Director in advance and provide a copy of their resume and a narrative of why they are interested in pursuing the certificate. Once approved, applicants will need to complete an online application and be accepted as a non-degree seeking student in the Naveen Jindal School of Management at UT Dallas. Once admitted to the JSOM, students may enroll in courses, provided they meet the course prerequisites, if any. A follow up notification must be sent as the student completes the final required course. The notification must include the courses completed, semester in which each course was completed, and the grades received in each course.

**Organizational Arrangement:** The certificate will be managed by the Director of Programs in Innovation and Entrepreneurship in the Jindal School of Management.

**Credit Hours and Degree Programs:** The certificate is obtained by completing 15 credit hours of study as detailed below. All courses must be completed with a B or better

**Course Offerings and Site Locations** (all courses are offered in the Jindal School of Management, either in the classroom or online):

- **ENTP 6388 (SYSM 6316) Managing Innovation within the Corporation** (3 semester hours) Innovators and entrepreneurs within established corporations combine innovation, creativity and leadership to develop and launch new products, new product lines and new business units that grow revenues and profits from within. The course seeks to equip students with the skills and perspectives required to initiate new ventures and create viable businesses in dynamic and uncertain environments in the face of organizational inertia and other sources of resistance to innovation. Course topics include the elements of strategic analysis and positioning for competitive advantage in dynamic markets, and the structuring, utilization and mobilization of the internal resources of existing firms in the pursuit of growth and new market opportunities. Prerequisites: None. (3-0) Y

- **ENTP 6375 Managing Technology and New Product Development** (3 credit hours) - This course addresses the strategic and organizational issues confronted by firms in technology-intensive

¹ The Institute for Innovation and Entrepreneurship recently completed a year-long in-house training program addressing these skill requirements for a group of 40 high potential employees at Texas Instruments.
environments. The course reflects five broad themes: (1) managing firms in technology-intensive industries; (2) linking technology and business strategies; (3) using technology as a source of competitive advantage; (4) organizing firms to achieve these goals; and (5) implementing new technologies in organizations. Students will analyze actual situations in organizations and summarize their findings and recommendations in an in-depth term paper. Case studies and class participation are stressed. Prerequisites: none (3-0) Y

**ENTP 6380 (MKT 6380) Market Entry Strategies** (3 semester hours) This course addresses the marketing challenges facing the entrepreneurial firm, with specific emphasis on the choice and implementation of an initial market entry strategy. This choice typically involves multiple decisions, each based on critical assumptions about customers, markets and competitors. Early validation of these key assumptions is an essential element of the strategic decision process. Topics include understanding the context and the customer, developing and validating the business concept, defining the product/service offering and customer value proposition, positioning, creating awareness, and developing and implementing the market entry strategy. This course is equivalent to MKT 6380 and only one of these may be counted toward a degree. Prerequisites: MKT 6301 and/or ENTP 6370 or consent of the instructor. (3-0) Y

**ENTP 6390 Business Model Innovation** (3 semester hours) Business model innovation is a logical and internally consistent approach to the design and operations of a new venture, capturing the essence of how the business will be focused and providing a concise representation of how an interrelated set of decision variables will be addressed to create sustainable competitive advantage. This course will explore the range and diversity of existing business models and the analytical tools essential to their understanding, define a logical and internally consistent approach to the choice or development of an appropriate business model for a new enterprise and demonstrate the application of these tools and techniques through case studies and exercises. Prerequisite: ENTP 6370 or consent of instructor. (3-0) R

**ENTP 6398 (SYSM 6315) The Entrepreneurial Experience** (3 semester hours) This course is designed to provide student teams with practical experience in the investigation, evaluation and recommendation of technology and/or market entry strategies for a significant new business opportunity. Projects will be defined by the faculty and will generally focus on emerging market opportunities defined by new technologies of interest to a sponsoring corporate partner. Teams will be comprised of management and engineering graduate students, mentored by faculty and representatives of the partnering company. Evaluation will be based on papers, presentations and other deliverables defined on a case-by-case basis. Prerequisites: ENTP 6370 or consent of instructor (3-0) R

**Faculty/Staffing (assign each course to a faculty member):** 

Students will be enrolled in courses taught as part of the current graduate curriculum. No additional sections or faculty will be required.

1. **ENTP 6388 (SYSM 6316) Managing Innovation within the Corporation**- Dr. Rajiv Shah
2. **ENTP 6375 Managing Technology and New Product Development** – Dr. Rajiv Shah
3. **ENTP 6380 (MKT 6380) Market Entry Strategies**- Dr. Joseph Picken
4. **ENTP 6390 Business Model Innovation**- Dr. Joseph Picken
5. **ENTP 6398 The Entrepreneurial Experience** – Dr. Rajiv Shah
Academic Certificate Program  
**Title: Graduate Certificate in New Venture Entrepreneurship**  

**School:** Naveen Jindal School of Management  

**Contact:**  
Dr. Joseph Picken, Program Director  
jpicken@utdallas.edu  
972-883-4986  

**Implementation Date: Fall 2013**  

**Introduction/Description:** Many entrepreneurs have formal training and experience in engineering or scientific fields, but lack a sufficient understanding of the management disciplines essential to successful innovation in a new venture startup. It has been observed that:  

*Entrepreneurship is “risky” because so few of the so-called entrepreneurs know what they are doing. They lack the methodology. They violate elementary and well-known rules.*

The basic processes and management disciplines essential to entrepreneurial innovation are well-understood and can be successfully taught to prospective entrepreneurs through the courses offered in this certificate program. The Graduate Certificate in New Venture Entrepreneurship is focused on the management of innovation within the context of a new venture startup. The certificate is obtained by completing 15 credit hours of study as detailed below. All courses must be completed with a B or better.  

**Academic Focus of the Certificate:** The certificate will provide students with a comprehensive understanding of the management disciplines essential to entrepreneurial innovation and will equip the student with the essential skills and perspectives necessary to successfully launch and grow an entrepreneurial new venture.  

**Student Demand:** Student demand will be generated from among individuals who seek to complement their technical or functional skill sets with the skills and perspectives required to successfully launch entrepreneurial new ventures. Such individuals will be recruited from among: (a) current or prospective entrepreneurs who recognize that new venture management skills will increase the odds of success in launching their ventures; and (b) UT Dallas graduate students currently enrolled in advanced degree programs in engineering, technical or other management disciplines who either plan to launch an entrepreneurial venture of their own or to seek employment in an entrepreneurial venture upon completion of their studies.  

**Job Market for the Certificate:** Entrepreneurial job creation is the engine of our economy. The overwhelming majority of net new job creation in our economy is concentrated in new and younger enterprises – the byproduct of a high rate of innovation and new enterprise formation. In the current economic environment of high unemployment and sluggish job creation, the education and training of individuals capable of providing energy and leadership to this essential market segment has never been more needed.  

This certificate is aimed not at preparing individuals for jobs in an existing market, but rather toward entrepreneurs or prospective entrepreneurs desiring to create their own employment opportunities and, in  

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the process create additional jobs for others. The ideal candidate is a prospective entrepreneur with training and experience in a technical or functional area and a desire to launch an entrepreneurial new venture. Less experienced individuals may seek employment in an entrepreneurial startup to gain additional experience prior to launching their venture.

**Admission Policy:** Open to degree seeking and non-degree seeking students admitted to the Naveen Jindal School of Management.

**Degree seeking:** Students already enrolled in a degree program in the Naveen Jindal School of Management are automatically eligible for enrolling in the certificate program and may begin taking required courses immediately via normal course registration procedures. Students should notify the Program Director regarding their desire to receive a certificate. A follow up notification should be sent as the student completes the final required course that includes the courses completed and the grades received in each course.

**Non-degree seeking:** Non-degree seeking students must contact the Program Director in advance and provide a copy of their resume and a narrative of why they are interested in pursuing the certificate. Once approved, applicants will need to complete an online application and be accepted as a non-degree seeking student in the Naveen Jindal School of Management at UT Dallas. Once admitted to the JSOM, students may enroll in courses, provided they meet the course prerequisites, if any. A follow up notification must be sent as the student completes the final required course. The notification must include the courses completed, semester in which each course was completed, and the grades received in each course.

**Organizational Arrangement:** The certificate will be managed by the Director of Programs in Innovation and Entrepreneurship in the Jindal School of Management.

**Credit Hours and Degree Programs:** The certificate is obtained by completing 15 credit hours of study as detailed below. All courses must be completed with a B or better

**Course Offerings and Site Locations** (all courses offered in the Jindal School of Management, either in the classroom or online):

**ENTP 6370 Entrepreneurship** (3 semester hours) This course provides an introduction to entrepreneurship, with an emphasis on identifying, evaluating and developing new venture opportunities. Topics include opportunity identification and evaluation, startup strategies, business valuation, business plan development, attracting stakeholders, financing the venture, managing the growing business and exit strategies. Case studies and guest lectures by entrepreneurs and venture capital partners provide a real-world perspective. The major deliverable of this course is an early stage feasibility analysis of a venture of the student’s choosing. Topics may vary. Prerequisites: None. (3-0) S

**ENTP 6380 (MKT 6380) Market Entry Strategies** (3 semester hours) This course addresses the marketing challenges facing the entrepreneurial firm, with specific emphasis on the choice and implementation of an initial market entry strategy. This choice typically involves multiple decisions, each based on critical assumptions about customers, markets and competitors. Early validation of these key assumptions is an essential element of the strategic decision process. Topics include understanding the context and the customer, developing and validating the business concept, defining the product/service offering and customer value proposition, positioning, creating awareness, and developing and implementing the market entry strategy. This course is equivalent to MKT 6380 and only one of these may be counted toward a degree. Prerequisites: MKT 6301 and/or ENTP 6370 or consent of the instructor. (3-0) Y

**ENTP 6390 Business Model Innovation** (3 semester hours) Business model innovation is a logical and internally consistent approach to the design and operations of a new venture, capturing the essence of how the business will be focused and providing a concise representation of how an interrelated set of decision variables will be addressed to create sustainable competitive advantage. This course will
explore the range and diversity of existing business models and the analytical tools essential to their understanding, define a logical and internally consistent approach to the choice or development of an appropriate business model for a new enterprise and demonstrate the application of these tools and techniques through case studies and exercises. Prerequisite: ENTP 6370 or consent of instructor. (3-0) R

**ENTP 6378 Managing the Emerging Enterprise** (3 semester hours) The course focuses on the challenges of growing a small company from early startup to a professionally managed business, as the entrepreneur struggles to maintain the entrepreneurial spirit of the firm while introducing the professional management disciplines essential to sustained and profitable growth. Topics include shaping and communicating the entrepreneur’s vision, developing a viable business model, positioning products and services in a broader market, implementing business strategies, building an organization and infrastructure, molding the culture, developing and managing critical relationships with banks, suppliers and customers, and managing growth with limited resources. The course makes extensive use of case studies and visiting lectures by entrepreneurs. Prerequisite: ENTP 6370 or consent of the instructor. (3-0) Y

Either **ENTP 6360 Startup Launch** or **ENTP 6365 Integrated Venture Development** (Courses taught by JSOM faculty in the UT Dallas Venture Development Center):

**ENTP 6360 Start-up Launch** (3 semester hours) This course provides an opportunity for a student or a student team to develop a business concept and proceed toward the launch of a business. The course will follow a structured and defined methodology for the refinement and validation of a business concept based on leading industry practices. Participants will be selected and enrolled in the course on the basis of a proposal for a business concept, approved prior to registration in the course. Participant business ideas can come from many sources, including concepts or ideas developed in other entrepreneurship courses or during the Business Idea Competition. Additional resources including office space or laboratory facilities in the Venture Development Center may be applied for. Additionally, as concepts are refined, student teams may modify or pivot their approach during the semester with faculty consent. Students will enroll and complete the course either individually or as a venture team. Prerequisite: Approval of the supervising faculty is required. (3-0) R

**ENTP 6365 Integrated Venture Development** (3 semester hours) This course provides an opportunity for a student or student team to contribute to the commercialization of an early stage concept, technology or invention developed by a UT Dallas researcher. The course will follow: (a) a structured and defined methodology for the identification and validation of a business concept for the technology or invention based on leading industry practice; or (b) an alternate plan of milestones and deliverables mutually agreed by the faculty and the inventor/researcher. Student participants will be selected and enrolled in the course on the basis of their prior course background and ability to contribute. Teams will be guided by the faculty and the inventor/researcher, with Office of Technology Commercialization oversight. Participants will execute any necessary intellectual property agreements. This course may be repeated one time for course credit. Prerequisite: ENTP 6370 or approval of the supervising faculty is required. (3-0) R

**Faculty/Staffing (assign each course to a faculty member):**

Students will be enrolled in courses taught as part of the current curriculum. No additional sections or faculty will be required.

1. **ENTP 6370 Entrepreneurship**- Jackie Kimzey
2. **ENTP 6380 (MKT 6380) Market Entry Strategies**- Dr. Joseph Picken
3. **ENTP 6390 Business Model Innovation**- Dr. Joseph Picken
4. **ENTP 6378 Managing the Emerging Enterprise**- Jackie Kimzey
5. **ENTP 6360 Startup Launch** – Daniel Bochsler
6. **ENTP 6365 Integrated Venture Development**- Daniel Bochsler
University Mission: The University of Texas at Dallas provides the State of Texas and the nation with excellent, innovative education and research. The University is committed to graduating well-rounded citizens whose education has prepared them for rewarding lives and productive careers in a constantly changing world; to continually improving educational and research programs in the arts and sciences, engineering, and management; and to assisting the commercialization of intellectual capital generated by students, staff, and faculty.

Program Mission: The mission of the Graduate Certificate Program in Corporate Innovation is to provide students with a comprehensive understanding of the management disciplines necessary for the successful launch of new businesses within the context of an established organization.

PROGRAM LEARNING OUTCOMES:

1. Students will understand: (a) how value is created for customers; and (b) how ventures are structured to capture value for the entrepreneur and investors.
2. Students will learn how to validate an entrepreneurial business concept prior to the commitment of significant resources through the use of customer discovery, customer validation and business model validation techniques.
3. Students will develop the broad skills and perspectives necessary to successfully launch and grow a new business venture within an established organization.

ASSESSMENTS (Frequency and location):

1. Student learning will be assessed with respect to the first Program Learning Outcome by their performance on the final assignments in the courses focused on value creation (ENTP 6380 Market Entry Strategies) and value capture (ENTP 6390 Business Model Innovation).
2. Student learning will be assessed with respect to the second Program Learning Outcome by their performance on the final assignment in the portion of ENTP 6398 dealing with Customer Development/Customer Validation.
3. Student learning will be assessed with respect to the third Program Learning Outcome by the Final Report and Presentation in the experiential course (ENTP 6398 The Entrepreneurial Experience).

ACTION PLAN:

DOCUMENTATION:

DISSEMINATION/DISCUSSION OF RESULTS:

MODIFICATIONS AND RECOMMENDATIONS:

TIMELINE, REQUIREMENTS AND APPROVALS:

SIGNATURES: ________________________  ________________________
Program Assessment Lead                  Assessment/Provost Office

FINAL DATES:

__________________________________________  _________________________
Approval                                    Implementation
FOR ACADEMIC YEAR: 2013-2014
PROGRAM: Graduate Certificate in New Venture Entrepreneurship
SCHOOL: Naveen Jindal School of Management
SUBMISSION DATE: February 1, 2013

University Mission: The University of Texas at Dallas provides the State of Texas and the nation with excellent, innovative education and research. The University is committed to graduating well-rounded citizens whose education has prepared them for rewarding lives and productive careers in a constantly changing world; to continually improving educational and research programs in the arts and sciences, engineering, and management; and to assisting the commercialization of intellectual capital generated by students, staff, and faculty.

Program Mission: The mission of the Graduate Certificate Program in New Venture Entrepreneurship is to provide students with a comprehensive understanding of the management disciplines essential to entrepreneurial innovation and to equip the student with the skills and perspectives necessary to successfully launch and grow an entrepreneurial new venture.

PROGRAM LEARNING OUTCOMES:

1. Students will understand: (a) how value is created for customers; and (b) how ventures are structured to capture value for the entrepreneur and investors.

2. Students will learn how to validate an entrepreneurial business concept prior to the commitment of significant resources through the use of customer discovery, customer validation and business model validation techniques.

3. Students will learn the actions required to create a sustainable and scalable business for the implementation of a validated entrepreneurial business concept.

ASSESSMENTS (Frequency and location):

1. With respect to the first Program Learning Outcome, student learning will be assessed by their performance on the final assignments in the courses focused on value creation (ENTP 6380 Market Entry Strategies) and value capture (ENTP 6390 Business Model Innovation).

2. Student learning will be assessed with respect to the second Program Learning Outcome by their Final Presentation in the experiential course (ENTP 6360 Startup Launch or ENTP 6365 Integrated Venture Development).

3. Student learning will be assessed with respect to the third Program Learning Outcome by their performance on the final assignment in ENTP 6378 Managing the Emerging Enterprise.

ACTION PLAN:

DOCUMENTATION:

DISSEMINATION/DISCUSSION OF RESULTS:

MODIFICATIONS AND RECOMMENDATIONS:

TIMELINE, REQUIREMENTS AND APPROVALS:
SIGNATURES: ____________________________ ________________________
                        Program Assessment Lead             Assessment/Provost Office

FINAL DATES: ____________________________ ________________________
                        Approval                               Implementation
The University Senate’s Committee on Effective Teaching proposes that the Senate establish a University of Texas at Dallas Center for Teaching and Learning. The Academic Senate of the University of Texas at Dallas recommends that the University of Texas at Dallas establish a center for Teaching and Learning. This Center will report to the Office of the Provost, with its Director accountable directly to the Provost. This Center and its Director will support, encourage, and promote a culture in the University that validates the importance of teaching in a scholar’s career. The Director will be a person trained in the scholarship of teaching and learning who will in turn facilitate discipline-specific applications of that scholarship as it develops over time. The Director will have the advice and assistance of a committee consisting of one tenured or tenure-line faculty member from each School, with a documented commitment to excellence in teaching.

The Center will begin official operations on September 1, 2013, with the hiring of a Director and one administrative assistant to commence immediately.
Resolutions for Chancellor Cigarroa.

Resolution on Guns on Campus to the Chancellor
The University of Texas Faculty Advisory Council believes that the carrying of firearms on campus by anyone other than law enforcement officers is detrimental to the safety and security of all on campus.
Passed with one opposed and with one abstention

Resolution on Encryption
Whereas computer encryption programs can directly inhibit certain kinds of faculty research and communication, each UT System campus should establish an information security advisory committee with substantial faculty membership to receive and to make recommendations with regard to faculty requests for exemptions from requirements for the encryption of university owned computers and mobile communication devices.
Passed Unanimously

Resolution on Conflict of Interest and Conflict of Commitment to the Chancellor and the Executive Vice Chancellor of Health Affairs and the Executive Vice Chancellor of Academic Affairs
Work that is considered to be integral to the duties of faculty as teachers and scholars is already reported in annual evaluation reports and other periodic personnel processes. Therefore, FAC recommends that local policy not require faculty to report such information in annual Conflict of Commitment and Conflict of Interest disclosures, unless, in the opinion of a reasonable person, there is a prima facie conflict of interest or commitment.
Passed Unanimously

Resolution on Faculty and Staff Rights to Privacy to the Chancellor and to the Executive Vice Chancellor of Health Affairs and the Executive Vice Chancellor of Academic Affairs
Faculty and staff of the University of Texas System have the same inalienable rights as other citizens of the United States and as are recognized in international conventions on human rights. These include the rights of freedom of speech and of the press, the right of association, the right to petition the government, and rights to dignity and privacy.
The University of Texas System may properly disclose information pertaining to its relationships with its faculty and staff if that information is otherwise public, such as employment titles, pay, and assigned duties. It may, subject to appropriate laws, disclose information on arrangements it has made with faculty and staff members to assure that their activities and associations outside of their employment with the university do not interfere with their abilities to carry out their obligations to the university.
The University of Texas System should not disclose information on employees’ associations, activities, speech, or sources of income outside their relationships to the university and not within the scope of their employment in the university. This specifically includes, but is not limited to, information on their domestic arrangements, business activities, charitable activities, political activities or associations, publications or other speech activities, appearances as expert witnesses under subpoena or otherwise, and employment in other organizations outside of the university, or such associations or activities of the members of their households or family relations.

Passed Unanimously

Resolution on the formation of the new UT in South Texas

Whereas, HB 1000 and SB 24 section 4 (c) states “In recognition of the abolition of The University of Texas--Pan American and The University of Texas at Brownsville as authorized by this Act, the board of regents shall facilitate the employment at the university created by this Act of as many faculty and staff of the abolished universities as is prudent and practical”;
Whereas, the companion House and Senate bills contain vague language concerning retention of UTB and UTPA faculty and staff;
Whereas, The UT Board of Regents’ Rule contains no specific policy governing the merger of academic or medical campuses;
Therefore, be it resolved that the UT System Faculty Advisory Council strongly recommends that, should the legislation be enacted into law, the following guiding principles be implemented:
“All faculty and staff employed by the University of Texas--Pan American and the University of Texas at Brownsville, upon dissolution of the two institutions and merger into one newly created South Texas university, will have their positions, salaries, and tenure statuses as well as time and rank transferred to the newly established institution.
In the event that duplication of duties necessitates reconsideration of existing administrative structures leading to the elimination of current positions in either Brownsville or Edinburg, Board of Regents’ Rules and pre-existing UTPA and UTB policies shall be followed in a manner that is mindful and respectful of shared governance. In the event of a situation where no extant local or Regents' policy specifically governs the issue, a policy shall be created through existing shared governance procedures including the UT System Faculty Advisory Council and local faculty and staff governance bodies.”

Passed Unanimously