January 14, 2010

TO: Academic Senate Members

FROM: Office of Academic Governance
Vicki Carlisle, Academic Governance Secretary

RE: Academic Senate Meeting

The Academic Senate will meet on **Wednesday, January 20 at 2:00 p.m. in the T.I. Auditorium, ECS South 2.102.**

Please bring the agenda packet with you to this meeting. If you cannot attend, please notify me at x6715.

Attachments

xc: David Daniel James Marquart Larry Redlinger Tricia Losavio
Hobson Wildenthal John Wiorkowski Darrelen Rachavong Sgt. Rick Bauer
Andrew Blanchard Calvin Jamison Abby Kratz Deans
Serenity King Inga Musselman Rhonda Blackburn Diana Kao, SGA President

2009-2010 Academic Senate:

Amin Gutierrez de Piñeres, Sheila
Anderson, Mark
Andreescu, Titu
Beron, Kurt
Bhatia, Dinesh
Boots, Denise
**Breen, Gail**
Burr, John
Cantrell, Cyrus
Chandrasekaran, R.
Cordell, David **
Dieckmann, Greg
Dowling, Jay
Durbin, Kelly
Hoffman, John
Holmes, Jennifer
Holub, Shayla
Huxtable-Jester, Karen
Ishak-Boushaki, Mustapha

*Speaker
**Secretary

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION UNIVERSITY
AGENDA
ACADEMIC SENATE MEETING
January 20, 2010

1. CALL TO ORDER, ANNOUNCEMENTS & QUESTIONS DR. WILDENTHAL
2. APPROVAL OF THE AGENDA DR. LEAF
3. APPROVAL OF MINUTES DR. LEAF
   November 18, 2009 Meeting
4. SPEAKER’S REPORT DR. LEAF
5. FAC REPORT DR. LEAF
6. STUDENT GOVERNMENT LIAISON REPORT DR. KAPLAN
7. REVIEW OF GRADE SUBMISSION & ORION SOFTWARE DR. GARY
8. PRESIDENT’S REPORT TO THE SENATE ON THE UNIVERSITY BUDGET DR. WILDENTHAL
9. RESPONSE TO CB RESEARCH INITIATIVE DR. LEAF
10. NEW POLICY – CAMPS & CLINICS MS. KING
11. ALCOHOLIC BEVERAGES POLICY MS. KING
12. FITNESS FOR DUTY POLICY FOR FACULTY DR. LEAF
   (Report from Committee on Faculty Standing and Conduct)
13. GRADUATE CATALOG (first 40 pages from CEP) DR. CANTRELL
14. ADMISSION REQUIREMENTS FOR GRADUATE STUDIES DR. CANTRELL
15. TIMELY FEEDBACK ON COURSE EVALUATIONS DR. REDMAN
16. APPROVAL OF SENATE ELECTION CALENDAR AND APPOINTMENT OF AD HOC ELECTION COMMITTEE DR. LEAF
17. ADJOURNMENT DR. WILDENTHAL

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION UNIVERSITY
ITEM #3

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 official minutes.

ACADEMIC SENATE MEETING
November 18, 2009

PRESENT: Sheila Amin Gutierrez de Piñeres, Kurt Beron, Dinesh Bhatia, Denise Boots, John Burr, Cyrus Cantrell, R. Chandrasekaran, David Cordell, Gregg Dieckmann, Kelly Durbin, John Hoffman, Jennifer Holmes, Karen Huxtable-Jester, Joe Izen, Marilyn Kaplan, Murray Leaf, Syam Menon, Dennis Miller, B.P.S. Murthy, Simeon Ntafos, Ravi Prakash, Tim Redman, Richard Scotch, Lucien Thompson, Tonja Wissinger

ABSENT: Mark Anderson, Titu Andreescu, Gail Breen, Jay Dowling, Shayla Holub, Mustapha Ishak-Boushaki, Nanda Kumar, Steven Nielsen, Mark Rosen, Young Ryu, Chelliah Sriskandarajah, Robert Stern

VISITORS: David Daniel, Hobson Wildenthal, Calvin Jamison, Serenity King, Daniel Calhoun, Travis Keshvari, Chris Parr, Elizabeth Organ, Michael Coleman, Abby Kratz, Mary Jane Hurst, Kamran Kiasaleh

1. CALL TO ORDER, ANNOUNCEMENTS AND QUESTIONS

President Daniel called the meeting to order.

President Daniel noted that the University had completed the purchase of the Raytheon building at the corner of Waterview and Drive A. University personnel are evaluating building design and how best to make use of the space. Information Resources is interested, which would free up space in the middle of the campus, consistent with a current goal. If faculty have ideas about special space use that would benefit academics, they should forward them to the Provost.

President Daniel indicated that there are ongoing discussions with regents and system officials about budget shortfalls, including a possible statewide deficit. There is a potential that the “rainy day fund” could be accessed. Politically, the likely case is that all agencies and universities will be told to cut expenditures by “X” percent. UTD is trying to budget now in a way that will allow flexibility later.

There is an emphasis on the so-called “lean university initiative.” This approach emphasizes evaluating a particular step in a process to see if there is value added from that step, or if that step can be eliminated to increase productivity at no real loss of
effectiveness. The key issue is identifying wasteful and inefficient activities that can be done away with to improve productivity and avoid staff cuts.

There will be a review of small classes, which is an area of concern to legislators. President Daniel defends class size and workload to be competitive, especially considering the Tier 1 initiative, but stated that we need to make some changes that will help with expenses. He indicated that teaching load can improve by having administrators engage in the teaching mission, including president and other senior administrators.

President Daniel also specified looking at administrative costs—overhead—and welcomes faculty input. He stated that the university and faculty must prepare ourselves proactively for financial challenges.

There was general discussion among senators about ways to improve efficiency and save money. Speaker Leaf offered to send an email to faculty asking for possible time and/or cost saving concepts.

2. APPROVAL OF THE AGENDA

Dr. Cantrell noted that item 13 on the agenda should be “undergraduate” catalog copy rather than “graduate” catalog copy. Speaker Leaf accepted the amendment. Dr. Cantrell moved to accept the agenda as amended. Dr. Scotch seconded. The motion carried.

3. APPROVAL OF MINUTES

Speaker Leaf called for corrections to the minutes as circulated. Several names were added to the recorded attendees. Dr. Cantrell moved to approve the minutes as amended. Dr. Redman seconded. The motion carried.

4. SPEAKER’S REPORT

1. Meeting Schedules. The Academic Council has agreed to hold a December Council meeting and schedule the next Senate meeting in January. The Council will not meet at the beginning of January. The January Senate agenda will allow for additional items to be submitted from the CEP that are approved after the December Council meeting. The agenda committee for the Council (Speaker, Secretary, and President) will review the proposed additional items for inclusion in the Senate agenda. Speaker Leaf asked if the Senate concurred with this approach, and there was no disagreement.

2. Invitation of Jim Gary. The Council discussed whether to invite Jim Gary back to the Senate at this meeting. The Council agreed that there was no benefit in scheduling a presentation in November. It was agreed that the Senate should urge that final grades also be submitted through Orion rather than changing to another system, and that we have Dr. Gary back for a discussion at the Senate meeting in January.
3. Policy on Fitness for Duty. The Senate referred this policy proposal to the Committee on Faculty Standing and Conduct last month. That Committee has met and discussed the policy, with Larry Wilson included in the discussion as Director of Human Resources. The Committee and Mr. Wilson have agreed to remove references to faculty from the policy presented, and the Committee will develop a separate policy for faculty that is consistent with our policies and procedures and that will protect faculty from arbitrary assignment and dismissal. This decision has been conveyed to the HOP committee.

4. Meaning of expulsion. Dean Cunningham has asked Speaker Leaf for an opinion regarding the significance of expulsion. A student in a program seeking a Master’s degree has been accused of plagiarism, and Judicial Affairs has agreed with the allegation. This is the second instance of plagiarism for this student. The Office of Judicial Affairs therefore ordered the student expelled. The student’s academic program has subsequently filed a revised degree plan removing the course in which the plagiarism occurred and replacing it with another. Dr. Cunningham asked if, in Speaker Leaf’s view, the Senate would regard this as consistent with our policies. Speaker Leaf’s response was that in all of our Senate discussions regarding progress toward a degree as well as discussions of the way we should treat academic dishonesty, our assumption has clearly been that the meaning of expulsion is that all progress toward a degree stops at that point, and that the student’s relation to the university is severed. Hence submitting a revised degree plan is contrary to the intent of our policies and procedures. Students who are expelled cannot graduate from the university. Speaker Leaf asked if there was any disagreement with his opinion or need for the Senate to develop an explicit policy. Everyone agreed that no additional policy was needed; the concept of expulsion is clear and common sense will suffice.

5. Speaker Leaf reported that he has announced our search for a Governance Secretary in the Staff Council, and has circulated a draft to job description to our present and past Academic Senate secretaries (David Cordell and Marilyn Kaplan) and our previous Governance Secretary (Tonja Kirkwood-Brown). We expect to be able to fill the position by January 4. The search is for a person who can serve as secretary to the Senate and the Staff Council, but whether one person can actually do all of this is still somewhat of an open question that we will examine further as the search proceeds.

5. FACULTY ADVISORY COUNCIL REPORT

Speaker Leaf stated that there have been no FAC meetings or further FAC actions. The Chancellor’s Task Force on Exigency is discussing revisions to Regents Rules that have been circulated by Dr. Reyes on the basis of our meeting discussions. The revisions incorporate most of the suggestions of the meeting and are generally consistent with what we have been discussing here at UTD Senate but further development is still needed.

6. PRESIDENT’S REPORT ON THE BUDGET
President Daniel indicated that he has not been able to complete his budget report. He stated that he will present it at the January meeting.

7. APPROVAL OF CANDIDATES FOR GRADUATION

Speaker Leaf noted that the lists of candidates for undergraduate and graduate degrees had been distributed by email and asked if everyone had received them. They had received them. Secretary Cordell moved the following:

“These students have applied for graduation and have been reviewed by the Office of the Registrar. The Office of the Registrar declared that all of these students will be eligible for graduation upon completion of the current semester’s work at the necessary levels. I request, therefore, that the Academic Senate certify these students to graduate upon receipt of final grades, and notification of completion of other requirements, provided that the grades are consistent with the standards for graduation prescribed by this University. I also request that the Academic Senate certify those students designated as eligible to graduate with honors upon completion of course work and requirements consistent with the standards for honors at the levels offered by this University.”

Dr. Cantrell seconded the motion. The motion carried.

Secretary Cordell moved the following:

“These students have applied for graduate degrees and have been reviewed by the Graduate Dean. The Graduate Dean certifies that all these students will be eligible for the degrees indicated upon satisfactory completion of the current semester’s work. I request, therefore, that the Academic Senate certify these students to receive the degrees as indicated upon receipt of final grades and notification of completion of other requirements, provided that the grades received are consistent with the standards for credit prescribed by this University.”

Dr. Izen seconded the motion. The motion carried.

8. APPOINTMENT OF DANIEL BOCHSLER TO LEARNING MANAGEMENT SYSTEMS COMMITTEE

Dr. Leaf noted that this action had been requested by Rhonda Blackburn, RUO of the Committee, and that Dr. Bochsler has been attending meetings. Ms. Blackburn has asked for the appointment to recognize his service. Dr. Redman moved to approve the appointment. Dr. Kaplan seconded. The motion passed.

9. APPOINTMENT OF LEONIDAS BLERIS TO INSTITUTIONAL ANIMAL CARE COMMITTEE
Speaker Leaf noted that the Animal Care Committee is a university committee rather than a Senate Committee. He also noted that the committee’s activities were very appropriate to Dr. Bleris’s field, and that Dr. Bleris had already begun to participate with the committee. Dr. Cantrell moved to make the appointment. Dr. Redman seconded. The motion passed.

10. **APPOINTMENT OF TRACY ROCKETT TO SCHOLARSHIP COMMITTEE**

Dr. Leaf asked for a motion to approve the appointment of Tracy Rockett to the Scholarship Committee. Dr. Redman noted that Dr. Elizabeth Salter had tendered her resignation from the Committee because the committee had declined to follow the procedures established over the past two years, and that we should not simply appoint a replacement without addressing both the reason for this resignation and the proper functioning of the Committee. Speaker Leaf responded that this was only a motion to appoint Dr. Rockett. The Council had declined to accept Dr. Salter’s resignation and charged Speaker Leaf to find out what had happened and what might be done by way of corrective action if corrective action were needed. Dr. Leaf had not yet contacted Dr. Salter, but would do so promptly. Since it was, therefore, not a straightforward replacement, several Senators asked what the current composition of the committee was. He responded that he was uncertain, especially given the unclear status of the resignation of Dr. Salter. Dr. Kaplan noted that the present chair, Douglas Eckel, is seriously ill and may be unable to serve the rest of the year. He is certainly unable to serve for the next few weeks, and this is when many decisions must be made. Dr. Leaf noted that the motion had not been made, and asked for it again with the understanding that he would work out the implementation in consultation with the concerned individuals and in accordance with the Committee charge. Dr. Murthi moved to make the appointment. Dr. Kaplan seconded. The motion passed with one nay and one abstention who wished to be noted.

11. **UNIVERSITY SAFETY AND SECURITY COUNCIL ADD CHAIR**

Speaker Leaf called for a motion to add the Chair of the Compliance Committee to the membership of the University Safety and Security Council. This change is at the request of the Chair of the Compliance Committee and in consultation with the Chair of Safety and Security Council. Dr. Cantrell made the motion. Dr. Scotch seconded. The motion carried.

12. **SENATE STRATEGIC PLANNING COMMITTEE**

The draft charge for the Senate Strategic Planning Committee was discussed. Several revisions were suggested, but the consensus was that the Senate could not work out all the necessary details in a reasonable amount of time. Dr. Cantrell moved to endorse the concept and aim of the committee in principle, and to empower the Academic Council to refine the charge. Dr. Kaplan seconded the motion. The motion carried.
13. CEP – UNDERGRADUATE CATALOG COPY

Dr. Cantrell introduced the revisions for the CEP and moved approval. Several Senators objected to the third revision, changing the way grading and credit was recorded in courses repeated for credit and failed. Pursuant to a request from the floor and with concurrence of Dr. Cantrell, Speaker Leaf divided the motion into three separate motions.

Dr. Cantrell moved to amend the second sentence in the second paragraph in the section titled Scholastic Probation to read: “Such students may register for a maximum of 14 semester credit hours, must earn a semester 2.20 GPA, and may not withdraw from classes.” Dr. Izen seconded the motion. The motion carried.

Dr. Beron moved to amend the second sentence in the section titled Repeating Course Work, changing the phrase “attempting the same class for the third time will” to “attempting the same class for the third time may.” Dr. Holmes seconded. The motion carried.

Dr. Cantrell moved to amend the second paragraph of the same section by deleting the sentence “The grade from the last attempt will determine credit earned to satisfy degree requirements” and replacing it with “In cases where students fail a repeated class they had passed previously, a content exception for the previous attempt will be applied to their degree plan but the last grade earned will be used for their grade point average. All grades will appear on the student’s transcript.” Dr. Holmes seconded the motion. Speaker Leaf called for a vote by show of hands. There were seven votes in favor and seven opposed. Speaker Leaf declined to vote to break the tie.

Dr. Cantrell asked if a quorum was present. Speaker Leaf counted 18 members still present, including the Speaker. Since there are 37 Senators including the Speaker, there was not a quorum.

14. ADJOURNMENT

A quorum having been called for and declared not to be present, under Robert’s Rules we could not vote on the remaining agenda items. Dr. Leaf asked President Daniel to adjourn the meeting. The remaining three items (New Policy: Camps and Clinics, Alcoholic Beverages Policy, and PM-15 Committee on Parking and Transportation) will carry over to the January agenda. The meeting adjourned at 3:45 pm.

APPROVED: ___________________________  DATE: ____________________
Murray J. Leaf
Speaker of the Academic Senate
1. State appropriations increased by $10,096,161
2. American Recovery and Reinvestment Act (ARRA) Special Items
   a. Special Item - Middle School Brain Years - $3,000,000
   b. Special Item - Academic Bridge - $231,250
   c. Special Item - Center for Values in Medicine, Science and Technology - $2,500,000
3. Incentive Funding, $1,210,600
4. TRIP Funding, $7,727,501 (not included in the original budget)
5. Investment Income – decrease of $840,000
6. Increased Tuition/Fee income available to allocate: $11,300,000
7. **Total New Funds Available: $14,865,000**
8. Plan:
   a. Salary Program (2%), $2,735,000
   b. Academic Affairs, $8,534,000
      i. New Faculty, programs and other initiatives, $5,500,000
      ii. Academic Excellence Scholarships, $2,194,000
      iii. Library Acquisition Reserves, $90,000
      iv. Doctoral Student Research Assistantships, $750,000
   c. Student Affairs, Disability Services, $88,000
   d. Diversity Office, $118,000
   e. Strategic Planning, $87,000
   f. Business Affairs, $515,000
   g. Information Resources, $220,000
   h. Enrollment Management, $200,000
   i. Transfer Scholarships, $275,000
   j. Communications, $200,000
   k. Communications/Development, $70,000
   l. Development, $40,000
   m. Audit and Compliance, $120,000
   n. Research, $100,000
   o. Staff Education Benefit Scholarships, $350,000
   p. Strength In Numbers, $713,000
   q. Guaranteed plan tuition future salary savings reserves, $500,000
STRATEGIC PLAN
FOR
THE UNIVERSITY OF TEXAS
AT DALLAS

Submitted to:
The Texas Higher Education Coordinating Board
Austin, Texas

Draft
January 13, 2010
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<th>Section</th>
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<td>INTRODUCTION</td>
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EXECUTIVE SUMMARY

The Texas Higher Education Coordinating Board has requested strategic plans from each of Texas’ emerging research universities. The plans should describe each institution’s plan to develop into a nationally competitive research university. This is the UT Dallas plan.

The challenge for UT Dallas is scale. With an enrollment of only 15,800 total students and 12,100 full-time equivalent (FTE) students, and a faculty comprised of just 419 tenured and tenure-track faculty members, UT Dallas is not yet large enough to be competitive with major research universities in key areas of research. UT Dallas is relatively small because it is young (40 years old), started as a graduate institution, and has maintained rigorous admission standards for undergraduates. While these factors limited enrollment growth to about 5% per year, they also created an excellent foundation for building a high-quality, research focused institution.

This plan does not call for any change in direction for UT Dallas. For more than a decade, UT Dallas has been growing in a careful and measured way. Within 10 years, UT Dallas will achieve sufficient scale to compete with major national research universities.

Specific goals for the next 10 years are summarized as follows:

- Increase the number of tenured and tenure-track faculty from 419 (current) to 610
- Increase total enrollment from 15,800 (current) to 21,000 students, and increase FTE students from 12,100 to 16,000 students – meet “closing the gaps” goals in this process
- Increase total research expenditures from $66 M (current) to $130 M, increase restricted research expenditures as defined by the Coordinating Board from $37 M (current) to $70 M, and increase federal research expenditures from $26 M (current) to $50 M per year
- Increase the number of doctorates awarded from 124 per year (current) to 200 per year
- Increase new National Merit Scholars enrolled each fall from 41 (current) to 75
- Add approximately 15 new doctoral programs in high-need, high-opportunity areas that are natural extensions of existing programs
- Increase endowment from $250 M (current) to $400 M, plus the Permanent University Fund (PUF) assets.

The growth plan for UT Dallas is accompanied by a realistic business plan. New revenue sources in 10 years, estimated to total $90 M per year, exceed the anticipated new operating expenses of $80 M per year. Missing from this economic equation, however, is funding for new buildings. At least one major building will need to come from the state and two from the UT System Permanent University Fund (PUF) over the next 10 years, which is not unrealistic. About 500,000 sq ft of vacant office space is available for lease within 2 miles of campus, which can serve as temporary space if UT Dallas is unable to build new space fast enough.

Strong demand and need for top talent in the Dallas-Fort Worth area provides powerful synergism between UT Dallas and the surrounding community, which has been supportive of UT Dallas’ quest to become a major research university and can support one (and probably more) more major research universities. Thus, all the essential elements are in place to achieve the goal of top-tier status – top students, an ideal location, and an appropriate institutional focus.
INTRODUCTION

In accordance with Chapter 5, Subchapter G of Coordinating Board rules, as mandated by House Bill 51, an emerging research university must develop a long-term strategic plan for achieving recognition as a national research university. UT Dallas has a comprehensive strategic plan in place, finalized in 2007 and currently being implemented. This document represents an update of that plan, with additional information provided per Coordinating Board guidelines.

The institution that is now UT Dallas started in the early 1960’s as the Graduate Research Center of the Southwest (later renamed the Southwest Center for Advanced Studies) with an educational core in science, technology, and mathematics. The institution was given to the UT System in 1969, when it officially became UT Dallas.

The University is now 40 years old, has approximately 16,000 students of which an unusually large fraction, 38%, is comprised of graduate students; 62% of UT Dallas’ students are undergraduates. Also unusual is the fact that 82% of all degrees at UT Dallas are awarded in science, engineering, mathematics, and business, which is a much higher fraction in these fields than any other university in Texas. The strong emphasis on science, engineering, and business is viewed as an advantage as UT Dallas builds national competitiveness in research.

UT Dallas has a high-quality undergraduate student body – its average SAT score for incoming freshmen has typically been among the highest for public universities in Texas. The number of National Merit Scholars (41 in the Fall 2009 freshman class) is competitive with many of the nation’s top universities (in 2008, UT Dallas was 25th among all public universities in the U.S.).

The university has a solid foundation upon which to build and is located in one of the nation’s largest and most economically vibrant metropolitan areas. Dallas-Fort Worth is the only metropolitan area among the nation’s most productive without a top-tier research university.

In 2004, the Washington Advisory Group assessed the potential for research expansion of UT Dallas and stated that “The main obstacle that UTD faces in achieving its goals relates to scale – UTD is simply too small in terms of the total number of faculty in each disciplinary or sub-disciplinary area.” The challenge for UT Dallas is to increase scale.

The essence of UT Dallas’ strategic plan is to scale up the university, adding new degree programs as appropriate in critical areas of need for North Texas, recruiting and graduating more students, hiring more nationally competitive research-intensive faculty, building the necessary facilities and infrastructure, and attracting the required private support.

The 2007 Strategic Plan, Creating the Future, which this document updates, was developed in a broadly collaborative manner that engaged nearly 300 faculty members and students in the process. The process engaged the university’s Faculty Senate and Student Government, and was vetted with all constituent groups. The Faculty Senate and Student Government likewise were closely involved in developing this plan. Thus, this plan has buy-in and support from the entire university community.
VISION STATEMENT

The vision statement for UT Dallas, approved by the UT System Board of Regents in 2007, is as follows:

To be one of the nation’s best public research universities and one of the great universities of the world.

The mission statement for UT Dallas, articulated in its 2007 strategic plan “Creating the Future,” is as follows:

The University of Texas at Dallas serves the Metroplex and the State of Texas as a global leader in innovative, high quality science, engineering, and business education and research.

The University is committed to (1) producing engaged graduates, prepared for life, work, and leadership in a constantly changing world, (2) advancing excellent educational and research programs in the natural and social sciences, engineering and technology, management, and the liberal, creative, and practical arts, and (3) transforming ideas into actions that directly benefit the personal, economic, social, and cultural lives of the citizens of Texas.

The targeted status of the university is a nationally competitive public research university with an enrollment of approximately 25,000 students. This target size was selected because it is big enough to enable UT Dallas to be competitive with leading public research universities but small enough to preserve the quality and focus of UT Dallas.

To help define strategic goals and metrics for measuring progress, UT Dallas has compared its status with the relatively small, highly ranked public research universities. Table 1 summarizes characteristics of major research universities that are ranked among the Top 50 public universities by U.S. News and World Report (September, 2009) and that have fewer than 30,000 enrolled students.

Thirteen universities comprise this comparative university group. The average enrollment is 23,130 students and average total research funding is $195 M per year. Since total research funding is loosely defined, a valuable and consistent measure of external research funding support is federally funded research, which averages $107 M for this group of 13 universities. Note that the “entry level” of research funding for this group is total research expenditures above $100 M and federally funded research above about $50 M.
Table 1. Summary of Selected Characteristics of Relatively Small, Top-Tier Public Research Universities (Institutions Ranked among the Top 30 Public Universities by *U.S. News and World Report* and with an Enrollment < 30,000 Students)

<table>
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<tr>
<th>University</th>
<th>Ranking among Public Universities&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Medical School?</th>
<th>Association of American Universities? (AAU?)</th>
<th>Enrollment&lt;sup&gt;2&lt;/sup&gt;</th>
<th>No. of Tenured and On-Track Faculty&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Total Research in 2006&lt;sup&gt;4&lt;/sup&gt; ($M)</th>
<th>Federally Funded Research in 2006&lt;sup&gt;4&lt;/sup&gt; ($M)</th>
<th>No. of National Academy Members&lt;sup&gt;4&lt;/sup&gt;</th>
<th>No. of Doctorates Awarded per Year&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Annual Giving&lt;sup&gt;4&lt;/sup&gt; ($M)</th>
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<td><strong>$186</strong></td>
<td><strong>31</strong></td>
<td><strong>345</strong></td>
<td><strong>$112</strong></td>
</tr>
<tr>
<td>UT Dallas in Fall 2009</td>
<td><em>No</em></td>
<td></td>
<td></td>
<td><strong>15,783 (12,123 FTE)</strong></td>
<td><strong>419</strong></td>
<td><strong>$66</strong></td>
<td><strong>$26</strong></td>
<td><strong>3</strong></td>
<td><strong>124</strong></td>
<td><strong>$33</strong></td>
</tr>
</tbody>
</table>

<sup>1</sup>U.S. News “America’s Best Colleges 2010” (Fall 2008 data)
<sup>2</sup>IPEDS enrollment, Fall 2008
<sup>3</sup>IPEDS Faculty Salaries 2007-08 for full-time assistant, associate, and full professors
<sup>4</sup>The Center for Measuring University Performance, Arizona State University
<sup>5</sup>IPEDS completions 2007-08
A comparison between UT Dallas in Fall 2009 and the average of the 5 institutions without a medical school is presented in Table 2. An important difference between UT Dallas and the group of comparative universities is not only the total number of students but also the number full-time-equivalent (FTE) students at UT Dallas. UT Dallas has a significant number of part-time masters students, especially in business. Part-time students are viewed as an important asset for UT Dallas and its community; as UT Dallas grows, the number of part-time students is expected to increase slightly, but growth in full-time students will be even faster. The small number of full-time-equivalent (FTE) students at UT Dallas highlights the challenge of scale.

Table 2. Comparison of UT Dallas with the Average of 6 Comparative Universities without Medical Schools from Table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>UT Dallas</th>
<th>Average of 6 Comparative Universities without a Medical School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>15,783 (12,123 FTE)</td>
<td>19,342 (≈19,000)</td>
</tr>
<tr>
<td>Tenured &amp; Tenure-Track Faculty</td>
<td>419</td>
<td>814</td>
</tr>
<tr>
<td>Total Research</td>
<td>$66 M</td>
<td>$205 M</td>
</tr>
<tr>
<td>Total Research per Faculty</td>
<td>$158,000</td>
<td>$252,000</td>
</tr>
<tr>
<td>Federal Research</td>
<td>$26 M</td>
<td>$113 M</td>
</tr>
<tr>
<td>Federal Research per Faculty</td>
<td>$63,000</td>
<td>$139,000</td>
</tr>
<tr>
<td>Doctorates per Year</td>
<td>124</td>
<td>263</td>
</tr>
<tr>
<td>Doctorates per Year per Faculty</td>
<td>0.30</td>
<td>0.32</td>
</tr>
<tr>
<td>National Academy Members</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Annual Giving</td>
<td>$33 M</td>
<td>$71 M</td>
</tr>
</tbody>
</table>

In terms of research productivity, UT Dallas is within reach of the group of comparative universities on a per-faculty-member basis, especially considering that UT Dallas is expanding its faculty and replacing departing faculty members with more individuals who more active in externally funded research.

Table 2 illustrates that while its total annual production of doctorates is significantly lower than the comparative group, the productivity is essentially identical when measured on a per-faculty-member basis.

Description of Targeted Status of UT Dallas

As indicated by the university’s vision statement, UT Dallas aspires to be a major, nationally competitive public research university. The University plans to maintain its strong focus on science, engineering, mathematics, and business, and to add appropriate degree programs that have natural affinity with existing programs and represent high-need areas for the North Texas region. The University currently has a mix of 38% graduate students and 62% undergraduate students – it plans to maintain this general balance.
Its 2007 Strategic Plan outlines the targeted status of UT Dallas over both a 10-year time frame and a longer time frame. The updated targeted status is summarized in Table 3. The key column is the one labeled “Target: 10 years.” These goals are the focus of this strategic plan.

Table 3. Summary of Key Goals for Growth and Research Expansion.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Current</th>
<th>Target: 10 years</th>
<th>Target: 20+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>15,783 (12,123 FTE)</td>
<td>21,000 (16,000 FTE)</td>
<td>25,000 (20,000 FFE)</td>
</tr>
<tr>
<td>Tenure/TT Faculty</td>
<td>419</td>
<td>610</td>
<td>800</td>
</tr>
<tr>
<td>Staff</td>
<td>2,301</td>
<td>3,500</td>
<td>5,000</td>
</tr>
<tr>
<td>Total Research</td>
<td>$61 M</td>
<td>$130 M</td>
<td>$250 M</td>
</tr>
<tr>
<td>Restricted Research</td>
<td>$37 M</td>
<td>$70 M</td>
<td>$140 M</td>
</tr>
<tr>
<td>Federal Research</td>
<td>$26 M</td>
<td>$50 M</td>
<td>$100 M</td>
</tr>
<tr>
<td>Endowment</td>
<td>$250* M + PUF</td>
<td>$400 M + PUF</td>
<td>$1 B + PUF</td>
</tr>
<tr>
<td>Doctorates Awarded</td>
<td>120</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>National Academy Mem.</td>
<td>3</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Nat. Merit Scholars</td>
<td>41</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>
*Estimated and including gifts in hand and not yet deposited into endowment accounts.

Does the Plan Reflect a Change in Direction?

This plan does not reflect a change in direction. The University of Texas at Dallas has a strategic plan in place (developed in 2006 and approved in 2007) that represented a natural continuation, with intensified vigor and even clearer focus, of the university’s past efforts. The main challenge for UT Dallas is not remaking the culture or changing direction – the main challenge is scaling up the university in a focused, intelligent manner. The level of support that the university receives, such as from private donors, will play a significant role in the speed with which the continued evolution of the university can occur.

PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY

Faculty Growth Plan

To compete successfully with leading, relatively small, nationally competitive public research universities, UT Dallas needs a faculty comprised of at least 600 to 800 members, with high research productivity per faculty member.

UT Dallas plans to increase the number of tenured and tenure-track faculty members from the current (Fall 2009) 419 faculty members to 610 faculty members within 10 years. Figure 1 provides information on the actual growth in the size of the tenured and tenure-track faculty over the past several years, and shows planned growth over the next 10 years. The planned rate of growth is very similar to the past rate of growth.
Figure 1. Past and Projected Trends in Number of Tenured and Tenure-Track Faculty. (Larry will update this graph to show 610 in 2019)

The recent history of faculty hiring is illustrated in Figure 2. In the past few years, UT Dallas has been adding 20 to 40 new faculty members per year. In the most recent year, FY2009 (the 2008-09 academic year), UT Dallas added a total of 37 new faculty members, lost 12 due to attrition, and netted 25 new faculty members.

Figure 2. Recent Trends in Hiring at UT Dallas for Tenured and Tenure-Track Faculty.
In FY2009, UT Dallas had 158 tenured and tenure-track faculty members holding external research grants as principal or co-principal investigators. The productivity on a per-faculty basis was:

- $418,000 per faculty member in total research expenditures ($66 M total)
- $234,000 per faculty member in restricted research expenditures ($37 M total)
- $165,000 per faculty member in federal research expenditures ($26 M total)

This is very good research productivity for individuals involved in externally funded research.

Table 4 summarizes the plan to increase the number of tenured and tenure-track faculty to 610 faculty members over the next 10 years. Growth is expected across the board, although proportionally higher growth is planned in the areas in which research, new degree programs, and enrollment are expected to expand the most (i.e., engineering).

Table 4. Plan for Faculty Growth.

<table>
<thead>
<tr>
<th>School</th>
<th>Current Faculty</th>
<th>Faculty in 7-10 yrs</th>
<th>New Faculty in 7-10 yrs</th>
<th>New Faculty in 10 yrs</th>
<th>Faculty Engaged in Externally Funded Research in 7-10 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Humanities</td>
<td>57</td>
<td>70</td>
<td>+13</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Behavioral &amp; Brain Sciences</td>
<td>42</td>
<td>53</td>
<td>+11</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Economic, Political, &amp; Policy Sciences</td>
<td>61</td>
<td>80</td>
<td>+19</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Engineering &amp; Computer Science</td>
<td>97</td>
<td>170</td>
<td>+73</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>General Studies</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>79</td>
<td>107</td>
<td>+28</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Natural Sciences &amp; Mathematics</td>
<td>80</td>
<td>127</td>
<td>+47</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>419</strong></td>
<td><strong>610</strong></td>
<td><strong>191</strong></td>
<td><strong>300</strong></td>
<td></td>
</tr>
</tbody>
</table>

1Tenured and Tenure-Track Faculty, Census Day, Fall, 2009

To achieve these goals, over the next 10 years UT Dallas will: (1) hire 191 net new faculty members to increase the size of the faculty to 610 faculty members (i.e., “new faculty positions”); and (2) replace faculty members who leave the University due to retirement, resignation, or termination. In the past several years, UT Dallas has lost about 3.5% of its faculty each year due to attrition. Over a 10 years period, it is estimated that about 159 faculty members will need to be replaced due to attrition. Thus, over the next 10 years, UT Dallas will be hiring approximately 350 new faculty members – 191 “new faculty positions” and 159 “replacement faculty positions” – for an average total hiring rate of 35 per year.
The required hiring rate of 35 new faculty members per year is consistent with hiring for the most recent (2008-09) academic year when UT Dallas hired 37 new tenured and tenure-track faculty members (25 "new positions" and 12 "replacement positions"). Thus, the planned rate of hiring will not require any new emphasis or change in direction.

As indicated in Table 4, UT Dallas plans to increase the number of faculty members who are actively engaged in externally funded research from 158 (current) to 300 in 10 years, which is an increase of 162. The University believes that realistically, nearly all this increase will come from new faculty hires – not from current faculty members who have not been active in externally funded research. To achieve the goal, 46% of the 350 faculty hires over the next 10 years must be active in externally funded research. In the 2008-09 recruiting year, 45% of the 37 newly hired faculty members are in fields where external research funding is expected. Thus, the hiring pattern in the future does not need to change from that of the recent past.

The University recognizes that not all faculty members will or should be engaged in externally funded research. In addition, the intellectual merit of research is not measured by dollars – it is measured by the quality and significance of the work done, which can include the education and training of students, publications, discoveries, intellectual property, new forms of artistic expression, and new products and services. External research support is only a significant in fields of science, engineering, and medicine where it is impossible to conduct competitive research without resources to pay for equipment, materials, and personnel such as graduate students and post doctoral scholars. But UT Dallas will not use research dollars as a measure of excellence – just as a measure of individual and institutional vitality and vigor in areas for which external resources are necessary to compete effectively with national research universities.

Table 5 provides information on some of the recent successes in attracting senior, research-active faculty members to UT Dallas. Millions in start-up funds have been provided by the UT System STARS program and the Governor’s Emerging Technology Fund.

The 9 faculty members listed in Table 5 have collectively brought with them, or attracted to UT Dallas after arrival, a total of more than $20 M in external research funding. The university has demonstrated the ability to recruit top researchers in multiple fields. Not listed in Table 5 are the numerous top-quality recruits in fields that are not traditionally supported by externally funded research, as well, such as public affairs and the arts. UT Dallas will continue to recruit top people, and not just in the fields with potential for external research funding.
Table 5. Examples of Outstanding Faculty Members Recruited to UT Dallas Recently and Active in Externally Funded Research.

<table>
<thead>
<tr>
<th>Name and UTD start date</th>
<th>Position at UTD</th>
<th>Previous Position</th>
<th>PhD school</th>
<th>Research Awards since joining UT Dallas</th>
<th>Notable accomplishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Hart (2006)</td>
<td>Medical Director, Center for BrainHealth; Jane and Bud Smith Distinguished Chair and Cecil Green Distinguished Chair</td>
<td>Professor, Johns Hopkins Univ.</td>
<td>Univ. of Maryland, MD 1983</td>
<td>$2.1M DoD, NIH</td>
<td>President, Soc. for Behavioral and Cognitive Neurology</td>
</tr>
<tr>
<td>Yves Chabal (2007)</td>
<td>Head, Dept. of Material Science and Engineering; TI Distinguished Chair in Nanoelectronics</td>
<td>Professor, Rutgers University</td>
<td>Cornell 1980</td>
<td>$2.5M NSF, DOE, SRC</td>
<td>2009 recipient of APS Davisson-Germer Prize</td>
</tr>
<tr>
<td>Li Zhang (2008)</td>
<td>Head, Molecular and Cellular Biology, Green Distinguished Chair in Systems Biology</td>
<td>Professor Columbia Univ.</td>
<td>UCLA 1990</td>
<td>$208K</td>
<td>Leader in understanding molecular mechanisms for oxygen sensing</td>
</tr>
<tr>
<td>Denise Park (2008)</td>
<td>Distinguished Chair in BBS Regents Scholar Prof. of BBS</td>
<td>Professor Univ. of Illinois UC</td>
<td>SUNY Albany 1977</td>
<td>&gt;$7M NIH</td>
<td>NIH Merit Award AAAS Fellow</td>
</tr>
<tr>
<td>Ken O (2009)</td>
<td>Director TX Analog Center TI Distinguished Chair in Analog Systems, Prof. EE</td>
<td>Prof. Univ. of Florida</td>
<td>MIT 1989</td>
<td>$4M SRC, DARPA</td>
<td>NSF Career Award 1996</td>
</tr>
</tbody>
</table>
The Opportunities that Growth Presents for Each School within the University

Each of UT Dallas’ schools will contribute to the realization of the University's goals. The rationale and opportunity for growth in each school is summarized as follows:

- **Arts & Humanities**: The Art and Technology Program has experienced strong growth in enrollment (800 new students in the program in just 5 years) and external research funding. Also, the new degree program, emerging media and communications, offers major potential for growth and research.

- **Behavioral & Brain Sciences**: Research opportunities exist in communication disorders (Callier Center), cognitive psychology, and neurosciences (Center for BrainHealth), each of which has major opportunities for research growth.

- **Economic, Political, & Policy Sciences**: Interest in public policy, geographic information systems, and economics create significant research opportunities. Educational and non-profit organizational leadership is also an area of opportunity.

- **Engineering & Computer Science**: Many of the programs typically found at leading engineering schools have not yet been implemented in this young School. New programs that have recently been implemented include materials science and engineering, biomedical engineering, and mechanical engineering. New opportunities of importance to engineering and North Texas include systems engineering and management, chemical and biomolecular engineering, and environmental engineering, among others.

- **General Studies**: This popular, interdisciplinary degree program will continue to play a significant role. The program is not a major research program but is vital to the academic mission of the institution.

- **Management**: The School of Management is the University’s largest school and one of the most research intensive business schools in the nation. Strengths in quantitative aspects of business systems, such as supply chain logistics, create opportunity for externally funded research and collaboration with other schools. Growth will emphasize research, technology, and the needs of the area’s businesses.

- **Natural Science and Mathematics**: Large growth potential exists for research in the biological, chemical, physical, and mathematical sciences.

**External Funding**

The University monitors three types of research expenditures: total research expenditures (all resources obtained externally and committed internally to research), restricted research expenditures (a measure of direct expenditures from external funds dedicated to research such as research contracts), and federal research expenditures (non-agricultural, federally supported
research, most of which is awarded competitively from agencies such as the National Science Foundation and National Institutes of Health).

Federal research funding is a critical measure of success for a national research university. Federal research expenditures for UT Dallas were $21 M in 2007-08 and were $26 M in 2008-09. UT Dallas plans for federal research expenditures to double to $50 M over the next 10 years. Based on recent past performance, federal research expenditures could potentially increase by as much as 300% (federal research expenditures increased by 300% over the past 9 years at UT Dallas) to $75 M, but this is not thought to be likely so quickly. The longer-term goal is to increase federal research expenditures to more than $100 M, which would be fully competitive with top-tier national research universities.

Restricted research expenditures stood at $37 M in 2008-09 and have increased by 350% over the past 9 years. Restricted research includes federal research funding as well as corporate funding and research supported by individuals and foundations, e.g., in health fields. UT Dallas has historically attracted support from numerous technology companies in the DFW area, as well as significant private and foundation support for research organizations such as the Center for BrainHealth. The 10-year goal for restricted research funding is $70 M (90% increase over current $37 M), and the longer-term goal is in excess of $140 M.

Total research expenditures, not including research equipment, were $66 M in 2009, which was 320% percent higher than 9 years earlier. The goal in 10 years is total research expenditures of at least $130 M (approximately double the current total research expenditures) and eventually more than $250 M.

Figure 3 summarizes trends over the past few years in research expenditures as well as plans for growth for the next 9 years.

![Graph showing trends in research expenditures](image-url)
Figure 3. Past and Projected Trends in Federal and Restricted Research Expenditures. (Larry will update this to show 10 years forward through FY19, and include 3 graphs for federal, restricted and total research expenditures)

The UT Dallas plan for meeting its research goals boils down to:

- **Increase the size of the UT Dallas faculty** from 419 (Fall, 2009) to 610 in 10 years, and eventually to 800 in 20+ years.

- **Increase the number of faculty who are actively engaged in externally funded research** from the current 158 to 300 in 10 years

- **Hire established “star” faculty members** in new areas and in areas of critical growth to rapidly establish programs and help in recruiting high-quality junior faculty.

  Progress will be monitored each year in terms of faculty hires (number and percent in areas where externally funded research is expected), research grant submittals, research awards, research expenditures, major research centers, publications, publication citations, invention disclosures, patents filed, company start-ups or spin outs, undergraduate students engaged in research, and doctoral degrees awarded.

  The standards of achievement are well defined among various peer groups, but we plan to benchmark ourselves against a group of relatively small, top-ranked, national research universities, such as those listed in Table 1.

**Research Priorities**

  DED: redo this section, make it punchier. Have two sections: (1) existing research priorities (Bruce Gnade to give me a list) upon which we will build, and (2) new areas of emphasis (again, Bruce to draft a list) such as bioengineering, EMAC, mechanical engineering, etc.

  The 2007 UT Dallas Strategic Plan outlined the areas of priority, which have not changed. They may be summarized as follows (Note: needs more work. See Murray Leaf’s comments, for instance, noting need for more emphasis on BBS):

  1. **Tomorrow’s Inventions.** “UT Dallas must invest heavily in research in areas of great opportunity for discovery and impact, especially the natural sciences, health and medical sciences, engineering, and supporting areas.”

     a. Research Enterprise Initiative – The $300 M joint project between Texas Instruments, the State of Texas, the UT System, and UT Dallas to advance UT Dallas’ School of Engineering and Computer Science to national competitiveness.

     b. The BioWorld. Research discoveries in biology and medicine have enormous promise to be transformative for mankind.
c. **Nanotechnology.** UT Dallas will invest in increasing its research capacity in nanotechnology across multiple schools, and will provide regional leadership in transfer of this knowledge to business entrepreneurship.

2. **Managing Change: Innovative Centers and Institutes.** The University will invest in its outstanding existing centers and institutes and will invest to select “grand challenge” programs with potential for major impact.

3. **Safety of the Future.**
   a. **National and Global Security.** Strengthen existing program and build new programs that address critical security issues, such as cyber security and bio-threats.
   b. **Energy and the Environment.** Contribute to addressing the region’s critical energy needs and ameliorating environmental impacts related to energy production and use.

**Allocation of Resources**

The projected new income and expenses 10 years hence, expressed in 2009 dollars, are summarized in Tables 6 and 7. It is assumed that the current level of general revenue appropriations and tuition rates remain unchanged.

**Table 6. Projected Additional Annual Income from New Revenue Sources in 10 Years.**

<table>
<thead>
<tr>
<th>Source of Additional Income</th>
<th>Amount</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Enrollment</td>
<td>$55 M</td>
<td>Assumes current $11,000 per student per year (general revenue appropriation plus tuition and required academic fees) times 5,000 new students; does not include tuition dedicated to financial aid set-aside or income dedicated to student services, athletics, housing, and other non-academic or research related functions</td>
</tr>
<tr>
<td>Expanded Executive Education</td>
<td>$5 M</td>
<td>Mostly in business school</td>
</tr>
<tr>
<td>Additional Indirect Cost Income from Increased Research</td>
<td>$17 M</td>
<td>Assumes $33 M of additional restricted research expenditures per year</td>
</tr>
<tr>
<td>National Research University Fund</td>
<td>$10</td>
<td>A rough estimate of potential income</td>
</tr>
<tr>
<td>Start-up (STARS) Funds from UT System</td>
<td>$3</td>
<td>Assumes that this program will continue</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$90 M</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 8. Projected New Annual Expenses in 10 Years.

<table>
<thead>
<tr>
<th>New Expense</th>
<th>Amount</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>191 Net New Faculty Members, Support Staff, and Operating Costs to Support Them</td>
<td>$62 M</td>
<td>Assumes growth from 419 (current) to 610 (in 10 years) tenured and tenure-track faculty members; assumes cost of $325,000 per faculty member, which is below current cost of $390,000 to reflect economies of scale</td>
</tr>
<tr>
<td>Research Support Staff</td>
<td>$3 M</td>
<td>25 new individuals such as instrument technicians, research computer support staff, and research scientists, at average per-person cost of $120,000 (salaries, benefits, equipment, and supporting expenses)</td>
</tr>
<tr>
<td>Start-up Costs for New Faculty</td>
<td>$8 M</td>
<td>Average of $400,000 per faculty member actively engaged in external research, estimated to be up to 20 faculty members</td>
</tr>
<tr>
<td>Debt Service for New Buildings</td>
<td>$10 M</td>
<td>Assumes one or two new buildings totaling $160 M paid from debt service; three additional academic and research buildings are needed over the next 10 years, and it is assumed that one would be paid by the State of Texas (tuition revenue bond, or TRB), and two by the UT System from the Permanent University Fund (PUF)</td>
</tr>
</tbody>
</table>

**TOTAL** $83 M

The principal source of new income is the result of enrollment growth. It is assumed that the inflation-adjusted per-student income derived from the combination of general revenue appropriations and tuition/required fees remains unchanged over the next 10 years. The $55 M figure in Table 7 does not include student service fees, athletic fees, room and board, and other auxiliaries. UT Dallas assumes that all these services will scale up as more students enroll, and be paid from these fees. Thus, they are not part of the essential business model for faculty growth, but they do provide an essential mechanism for the university to grow in all elements, including residential housing and student services.
Currently, UT Dallas spends about $390,000 per tenured/tenure track faculty member to operate the university. This includes not just the faculty member’s salary and fringe benefits, but all the support staff (teaching assistants, graders, instructors, secretaries, bookkeepers, information technology support staff, maintenance personnel, police force, etc.) and all operating expenses (computers, printers, supplies, postage, phone, utilities, etc.). As UT Dallas scales, it will enjoy economies of scale – it will still need just one president, one provost, no additional deans, etc.). Analysis of costs indicates that hires in new faculty positions can be implemented at an average aggregate cost of about $325,000 per faculty member. It is reasonably assumed that the salary and support costs of “replacement faculty” remain the same as those of the departing individual. Note, however, that there will be start-up costs even for replacement faculty.

(DED needs to think about this more – add sq ft justification per earlier strategic plan). Expansion will require new buildings, which may be the limiting factor. Some new buildings can be funded internally by UT Dallas, but not much. A new capital program funded by the State of Texas, plus funding from UT System PUF dollars, will be essential to meeting these needs. Also, UT Dallas is in the unique position of having a lot of buildings immediately adjacent to campus available for lease or rent. For instance, Hewlett-Packard has a 300,000 sq ft facility across the street from UT Dallas that is now vacant because of HP’s purchase of EDS and consolidation of facilities. In total, there are at least 500,000 sq ft of reasonable-quality, low-cost space available within 1 mile of UT Dallas campus. This space can be leased to allow expansion as growth occurs, if necessary.

Student Participation

UT Dallas already has extensive participation in research, as exemplified by:

• The undergraduate research program. (shorten this by 50%) UT Dallas started an undergraduate research scholarship program three years ago. The goal of the program is to provide an opportunity for and encouragement to undergraduate students to participate in a research project in a faculty member’s laboratory. The program is open to all undergraduate students, with projects ranging from literature to mechanical engineering. The application process is a one page description of the proposed research project, with acknowledgment from the faculty member that they approve of the project and will mentor the student in their laboratory. Requests for funding are invited early in fall semester, and the supported projects run fall and spring semesters. The scholarship consists of $500 for the student and $300 for the faculty member to cover project expenses. Near the end of spring semester the students are required to present the results of their projects in a poster competition, with small monetary awards given to the top three projects. In addition, the student who wins first prize is sent to the national Sigma Xi meeting to present their poster. The student that won the poster competition the first year also won the chemistry division poster competition at the Sigma Xi meeting. The program has grown from approximately 40 applications and 20 awards in the first year to over 100 applications and 50 awards this year. The program is partially funded by corporate sponsorship. In return for providing support for the program, the corporate sponsors help judge the poster competition, providing them exposure to outstanding
undergraduates. The program is expected to expand in future years and be even more effective in involving undergraduate students actively in research.

- Degree programs that require or encourage a senior thesis (Provost’s office to draft)
- Graduate student participation will increase significantly as more research-activity faculty members are hired and research is expanded. (All PhD’s do research. Some masters. Provost’s office to draft.)
- Others?

**PLAN TO IMPROVE UNDERGRADUATE EDUCATION**

Institution’s Plan to Improve the Quality of Undergraduate Education

(Provost’s office to draft)

**PLAN FOR DOCTORAL PROGRAMS**

Existing Doctoral Programs

Summary of Existing Programs. Table 8 lists UT Dallas’ existing doctoral programs, their implementation date, average three-year graduation numbers, and their growth potential as determined by job market and student demand.

<table>
<thead>
<tr>
<th>School</th>
<th>Program Name</th>
<th>Date Implemented</th>
<th>Three-year avg. graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;H</td>
<td>Humanities</td>
<td>1975</td>
<td>3</td>
</tr>
<tr>
<td>A&amp;H</td>
<td>Humanities - Aesthetic Studies</td>
<td>1983</td>
<td>4.3</td>
</tr>
<tr>
<td>A&amp;H</td>
<td>Humanities - History of Ideas</td>
<td>1983</td>
<td>1</td>
</tr>
<tr>
<td>A&amp;H</td>
<td>Humanities - Studies in Literature</td>
<td>1983</td>
<td>4.3</td>
</tr>
<tr>
<td>BBS</td>
<td>Audiology (Au.D.)</td>
<td>2001</td>
<td>8</td>
</tr>
<tr>
<td>BBS</td>
<td>Cognition and Neuroscience</td>
<td>2004</td>
<td>5.7</td>
</tr>
<tr>
<td>BBS</td>
<td>Communication Sciences and Disorders</td>
<td>2004</td>
<td>5</td>
</tr>
<tr>
<td>BBS</td>
<td>Psychological Sciences</td>
<td>2004</td>
<td>1.3</td>
</tr>
<tr>
<td>EPPS</td>
<td>Criminology</td>
<td>2007</td>
<td>1</td>
</tr>
<tr>
<td>EPPS</td>
<td>Economics</td>
<td>2003</td>
<td>2</td>
</tr>
<tr>
<td>EPPS</td>
<td>Geospatial Information Sciences</td>
<td>2005</td>
<td>0</td>
</tr>
<tr>
<td>EPPS</td>
<td>Political Science</td>
<td>2003</td>
<td>2.3</td>
</tr>
<tr>
<td>EPPS</td>
<td>Public Affairs</td>
<td>2004</td>
<td>11.7</td>
</tr>
<tr>
<td>EPPS</td>
<td>Public Policy and Political Economy</td>
<td>1975</td>
<td>9</td>
</tr>
</tbody>
</table>
UT Dallas has breadth in strong doctoral programs – the top five graduate-producing programs span three schools. The two most productive programs in terms of degrees awarded are in Computer Science, in the Erik Jonsson School of Engineering and Computer Science, and Management Science in the School of Management. Nearly 71% of first-year doctoral students in Computer Science graduate within ten years, 71% of full-time students receive financial support, and core faculty secured more than $3M in grants for FY08.

Electrical Engineering boasts high graduate output as well, averaging 10.67 graduates annually the last three years. Faculty productivity in the two programs is also high--faculty published 125 journal articles (or 2 per year/per tenure/tenure-track faculty member) in FY 2007 [need to update these with more recent data], during which they also received over $17M in external funding. Meanwhile, Management Science financially supports 98% of its full-time students and boasts a 100% employment percentage of all graduates since 2004, a time-to-degree rate of just 4.28 years, and an annual average of 21 student-presentations at major conferences.

The Coordinating Board’s responses to three-year and annual progress reports of UT Dallas’ doctoral programs regularly commend persistence rates, student performance, overall faculty productivity, and financial support; however, a common weakness that has been identified across many doctoral programs is ethnic diversity. UT Dallas has made an institutional-wide commitment to increase student and faculty diversity with the recent establishment of the Office of Diversity and Community Engagement. Programs at all levels are expanding recruitment efforts of underrepresented students in collaboration with the Vice President for Enrollment Management and are also engaging in post-enrollment retention support programs with the Vice President of Diversity.

Quality Control. The Coordinating Board’s standard for productivity for doctoral programs is currently three graduates per the most recent three academic years. As illustrated by Table 7, UT Dallas has only three programs that do not meet this current productivity standard:
Geospatial Information Sciences, Materials Science and Engineering, and Software Engineering. Both Geospatial Information Sciences and Materials Science and Engineering are new programs, established in 2005 and 2006 respectively. As noted by the Coordinating Board staff in letters regarding our third-year progress reports, both of these programs are doing well and exceeding initial enrollment projections. Software Engineering, on the other hand, has struggled recently with graduate output. One reason is that this program, which has a current enrollment of 14 students, is predominantly taken by part-time students and only 5% of its students are full-time. The Erik Jonsson School of Computer Science and Engineering is acutely aware of the program’s low productivity. The school is taking measures to increase overall faculty research, which should attract more full-time students. In addition, a current member of the school’s Industrial Advisory Board is a doctoral student in the program. The school plans to develop additional industry partnerships to enhance the program.

Serenity to develop bullet points for each program with degree production below 2 per year to justify why we’ll continue with that program. Larry R. to provide data on enrollment in these programs (if needed – maybe provost’s office has the data readily) so we can document those programs with increasing enrollment (hence, expectations for increasing graduation numbers).

Quality Enhancement. UT Dallas acknowledges that in order to sustain a program with the potential of national prominence, faculty members supporting the program must be engaged in research, actively publishing, or contributing other creative or scholarly works. Scale also is a major factor in building stronger programs, and as UT Dallas hires more faculty who in turn perform more and better research, the overall strength of doctoral programs will improve.

Faculty members submit annual reports to the Office of the Executive Vice President and Provost detailing, among other achievements, their research productivity and publications. The reports are used by department heads, deans, and the provost to identify faculty whose performance level does not match that of the program’s general performance level, and any such faculty members are offered mentoring and other support services. In addition, the Office of Sponsored Projects offers faculty assistance in writing grant proposals.

In addition to faculty productivity that promotes student involvement in on-going research projects, UT Dallas will also benchmark its programs against national peers as discussed later. Finally, as discussed in more detail in a later section, UT Dallas will regularly evaluate the overall effectiveness of each doctoral program using both a formalized external review process and an internal dynamic assessment process.

Comparison with National Peers. Later – Redlinger

New Doctoral Programs

Areas of Emphasis. Table 9 identifies the future doctoral degrees UT Dallas plans to request over the next 5 years for implementation over the next 10 years. These new degree programs are expected to lead to 15 new doctorate degrees per year in 10 years.
Table 9. Future Doctoral Programs at UT Dallas.

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Year</th>
<th>Bureau of Labor Statistics Projections</th>
<th>Projected Annual Graduates in 7 -10 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Technology</td>
<td>2010</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Speech Pathology</td>
<td>2013</td>
<td>19%; faster than average</td>
<td>10</td>
</tr>
<tr>
<td>Psychology</td>
<td>2012</td>
<td>12%; as fast as average</td>
<td>15</td>
</tr>
<tr>
<td>Educational Administration</td>
<td>2011</td>
<td>8%; as fast as average</td>
<td>20</td>
</tr>
<tr>
<td>Urban and Regional Planning</td>
<td>2012</td>
<td>19%; faster than average</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>2011</td>
<td>6%; slower than average</td>
<td>10</td>
</tr>
<tr>
<td>Systems Engineering and Management</td>
<td>2012</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>2013</td>
<td>(-2%)</td>
<td>5</td>
</tr>
<tr>
<td>Environmental and Civil Engineering</td>
<td>2015</td>
<td>31%/24%; much faster than avg</td>
<td>5</td>
</tr>
<tr>
<td>Information Science</td>
<td>2013</td>
<td>17%; faster than average</td>
<td>7</td>
</tr>
<tr>
<td>Science/Math Education</td>
<td>2010</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Actuarial Sciences</td>
<td>2012</td>
<td>21%; faster than average</td>
<td>2</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>2011</td>
<td>~13%, as fast as average</td>
<td>5</td>
</tr>
<tr>
<td>Biophysics</td>
<td>2013</td>
<td>~21%; faster than average</td>
<td>4</td>
</tr>
<tr>
<td>Atmospheric Science</td>
<td>2014</td>
<td>15%; faster than average</td>
<td>2</td>
</tr>
</tbody>
</table>

When determining which degree programs to develop, UT Dallas considers local, regional, state, and national student and job market demand. The Bureau of Labor Statistics’ job outlook projections for 2008 are reviewed as is student enrollment at the state and national levels. Although national job market demand is not terribly strong for mechanical and chemical engineering, a shortfall in doctoral graduates exists in the Metroplex and in Texas. As illustrated by Table 8, UT Dallas plans to increase its doctoral programs predominantly in its School of Natural Science and Mathematics, home to many of the university’s founding programs, and the Erik Jonsson School of Engineering and Computer Science, the nation’s second-fastest growing Engineering School [still true?? – need a reference]. Many of the planned doctoral programs will be undergirded by strong undergraduate and master’s programs.

When considering new doctoral programs, UT Dallas gives heavy emphasis to programs that are natural extensions of existing programs. UT Dallas, for example, does not plan to create any new schools but, rather, to add missing programs to current schools. Chemical engineering, for example, is relatively easy to add given current strengths in chemistry and rapidly expanding capabilities in materials science and engineering as well as developing expertise in biomedical engineering. All of the programs in Table 8 have these types of natural connections to existing faculty members and programs.

Note: a logical question is whether we can really add 15 new programs. Note that this is an increase of 50% over the number of current programs. I think we had 20 programs 9 years ago, which means we’ve grown 50% over the past decade. Thus, the planned growth rate is the
same as the past growth rate. (If so, adds realism to our plan). Larry or Serenety, can you include this?

Assessment. All UT Dallas academic programs are reviewed approximately every five years by internal and external reviewers. UT Dallas’ Policy Memorandum 94-III.24-63, Academic Program Review, governs this periodic review of all academic programs and charges the review team to provide an “assessment of the goals, plans, staffing, resources, existing and potential strengths…and those areas needing improvement” to determine the program’s viability. The process includes a review team that typically is composed of at least three individuals from other institutions that have programs similar to those of the unit under review, at least two members from the UT Dallas faculty, and a member of the program review committee who is not affiliated with the program to be reviewed. The review team evaluates the unit as requested by a written charge that instructs the review team to “[e]valuate the quality, the effectiveness, and the efficiency of the undergraduate and graduate curricula and the delivery of instruction,” as well as to evaluate the appropriateness of its assessment plans and student learning outcomes.

In accordance with the guidelines and instructions issued by the provost, the unit undergoing review prepares a comprehensive self-study document that is sent to the review team prior to its on-campus visit. Before leaving the campus, the team holds exit interviews with the unit’s faculty and administration, the provost, the president, and other appropriate senior administrators. The review team summarizes its immediate impressions and provides a forecast of its eventual written report. After the chair provides the provost with the finalized report, the unit under review provides its written response to the review team’s recommendations and conclusions. The provost then prepares final recommendations to the president to complete the review. In the years between reviews of the unit, the results of the program review are used when making decisions on budget, staffing, curricular and degree changes, and allocation of special resources.

In addition to the rigorous external periodic review of all doctoral programs, UT Dallas regularly assesses each doctoral program using our institutional-wide online assessment tool. This assessment report includes program mission statements, program-specific student learning objectives, measures to achieve those objectives, findings that evaluate the criteria of success, and future action plans to improve upon the findings. Faculty, program heads, and deans use the assessment report to identify areas that need improvement and to make necessary adjustments. Finally, UT Dallas uses the Coordinating Board’s 18 Characteristics of Texas Public Doctoral Programs as a guide to assess the quality of its doctoral programs.

Regional Impact. UT Dallas’ strategic plan includes initiatives that reflect a substantial responsibility to interface with the Metroplex. To attain this goal, UT Dallas is committed to establishing collaborative programs with UT Southwestern and UT Arlington. The recently-approved Biomedical Engineering degree is an example in such collaborative efforts of the schools to transform the Metroplex into a global leader in biomedical research. Likewise, the proposed PhD program in Mechanical Engineering will complement the existing program at UT Arlington and will offer teams of researchers from both campuses the opportunity to collaborate on proposals that will provide the region with a broader base of expertise.
The Dallas-Fort Worth Metroplex is one of the world’s leaders in technology delivery businesses, including aerospace, defense systems, information technology, micro and nano electronics, telecommunications, and many others. There is a tremendous appetite for leading academic research to produce discoveries and to provide the human talent needed. This appetite extends across nearly all areas of physical sciences and engineering.

Additionally, the Metroplex is a fast growing center for biotechnology, bioinformatics, medical devices, and the life sciences and has 38 basic chemical manufacturing facilities, 32 pharmaceutical and medical facilities, 215 medical equipment and supply facilities, and 170 scientific R&D firms. With the selection of its future doctoral degree programs and research, UT Dallas is well poised to meet the Metroplex’s needs and to help the entire region to advance. The impact of this will be monitored not only internally by the Office of Research and the schools but also externally through industrial advisory boards and other such local partnerships.

**PLAN FOR FACULTY AND STUDENT DEVELOPMENT**

**Faculty Research**

how to assist faculty in becoming more productive, innovative and effective in their work – don’t need too much here – we’re already pretty productive on a per-faculty basis – need to accomplish our goals by hiring more faculty and replacing people who leave with more research-active faculty in fields that have significant extramural funding opportunities – DED to draft

**Faculty Recognition**

More needed but to start …

In terms of hiring established, successful faculty members, UT Dallas has benefited from endowed professor and chair positions, many of which have existed for many years. Currently xxx UT Dallas faculty members hold such positions. They are listed in Table 10.

**Table 10. UT Dallas Faculty Currently Holding Named Faculty Positions. (from Provost)**

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Research Area</th>
<th>Title of Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandra Chapman</td>
<td>Neoroscience</td>
<td>Dee Wyly Distinguished Chair</td>
</tr>
<tr>
<td>Denise Park</td>
<td>Cognitive Psy.</td>
<td>University Distinguished Chair</td>
</tr>
<tr>
<td><strong>Etc. (alpha by last name)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Collaborations and Partnerships

UTSW and UTA – DED or Bruce Gnade to draft but Bruce to provide bullet points. There are some others, too.

New faculty

discussed earlier – repeat her or maybe more here – DED draft

Student Awards

“student research awards” – not sure what they want here – provost’s office or Bruce?

Student Diversity

(I wonder who can draft this. Larry Redlinger, you want to take a shot? We should definitely mention closing the gaps goals.)

Information on diversity of recent doctoral recipients is summarized in Table xxx.

Table xxx. Summary of Diversity of Recent Doctoral Recipients.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>33</td>
<td>6 %</td>
</tr>
<tr>
<td>African American</td>
<td>21</td>
<td>4 %</td>
</tr>
<tr>
<td>Hispanic</td>
<td>19</td>
<td>4%</td>
</tr>
<tr>
<td>International</td>
<td>330</td>
<td>61%</td>
</tr>
<tr>
<td>White</td>
<td>181</td>
<td>33 %</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>541</td>
<td>100 %</td>
</tr>
</tbody>
</table>

OTHER RESOURCES

Research Facilities

Bruce or Serenity, do we already have something written for this, such as SACS? If so, let’s insert that as a draft. If not, I’ll pull something from the Strategic Plan

Library Resources

Senerity to pull something from SACS. Need to address directly ARL and our intentions.

Graduate Student Support
competitive financial support – Bruce, can Rafael help here? Maybe engage Austin Cunningham as I know this has been the subject of discussion at System, and a report, too, I think, on graduate student support, including health insurance. Serenity, can you track that down?

NATIONAL VISIBILITY

How to increase the national visibility and research reputation of your institution. — I think you get this done by doing good work, and things will fall into place. Bruce and Susan Rogers, could use your help, though. Susan, you want to think about this and draft something?

SUMMARY

Not required, but brief closing remarks and maybe a summary table might be good. I think I might want to close with a table of metrics that we’ll monitor, e.g., enrollment, faculty headcount, federal research, doctorates awarded, etc., etc. I think closing with a clear summary showing that we’re going to monitor progress in a meaningful way might be the best way to end this.
RISK INSURANCE FOR CAMPS AND CLINICS
IN Volving Minors Policy

The University of Texas System Board of Regents’ Rule 80601 states that “…the terms of any insurance policies and surety bonds, other than life, disability and health insurance policies, for any UT System institution shall be negotiated by The University of Texas System Director of Risk Management.”

The University of Texas at Dallas considers all camps and clinics that involve minors, no matter the activity, to be high risk activities and require that the event coordinator purchase special risk accident and liability insurance via the UT System Camp Insurance Program. The insurance rates are very affordable and can be included in the participants’ registration fees, if applicable.

The Tenants and Users' Liability Insurance Policy (TULIP) will be used for approved third parties to use UT Dallas facilities for camps/clinics if the third party is unable to provide its own liability policy naming UT System and UT Dallas as additional insured. The TULIP protects the third party facility user, UT System and UT Dallas against claims by additional third parties who may be injured or suffer property loss as a result of participating in a covered event. A UT Dallas employee must serve as event coordinator for any third party.

When planning a camp or clinic, the event coordinator must complete the following steps:

1. Complete the Special Events Risk Assessment form.
2. Obtain the required signature approvals.
3. Submit the Special Events Risk Assessment form to the UTD Office of Risk Management. If the event involves a third party, the appropriate certificate of insurance must accompany the Special Events Risk Assessment form.
4. Complete and submit the Camp Insurance Application (sports or education) to the UT System contact. See Camp Insurance Enrollment Instructions. The application should include a best estimate of the anticipated number of participants.
5. Ensure that the appropriate procedures are followed to complete the payment process.
6. The UT System contact will inform the UT Dallas Office of Risk Management that the required insurance purchase has been made. Subsequently, the Special Events Risk Assessment form will be approved by the UT Dallas Office or Risk Management and returned to the event coordinator. Note: The Special Events Risk Assessment form will not be approved if the insurance requirement is not met.
7. Conduct a criminal background check for each camp/clinic staff member who is not employed by UT Dallas through the University Police Department. This requirement includes all volunteers. Note: Persons whose background checks present questionable findings are not permitted to be associated with the camp.
8. Prior to the camp/clinic, obtain a completed copy of the applicable Release and Indemnification Agreement, for Minors or Adults and the Medical Information and Release form from all camp participants and staff members, including volunteers, who are not employed by UT Dallas. Copies of these forms are to be maintained by the camp/clinic event coordinator for two years subsequent to the final day of the camp.
9. If security and/or special parking are/is desired, then the event coordinator should contact the University Police Department and/or the Parking & Traffic Office.

Visit [http://www.utdallas.edu/businessaffairs/risk/](http://www.utdallas.edu/businessaffairs/risk/) to access the following information:

- *Special Events Risk Assessment Form* that includes the *Request for Permission to Serve Alcohol*
- *Special Events Risk Assessment Guidelines* that includes the *Release and Indemnification Agreements (Minor and Adults)*
- *Medical Information and Release form*
- *Sports Camp Insurance Application*
- *Education Camp Insurance Application*
- *Camp Insurance Enrollment Instructions*
- *Frequently Asked Questions for Camps*
Request to: Create a new Camps and Clinics Policy to require sponsors to purchase liability insurance for camps/clinics that involve minors as participants. In addition to the insurance requirement, camp sponsors should also require all participants to complete the Medical Information and Release and the appropriate Release and Indemnification Agreement. Further, the responsible University sponsor/event coordinator is required to conduct a criminal background check on all persons who are not official UT Dallas employees who will be working with minors in a volunteer or paid status during the camp/clinic.

Person/group making request: Keshia Campbell, Director of Special Projects, Lean Initiatives and Risk Management

Responsible University Official: Dr. Calvin D. Jamison, Sr., Vice President for Business Affairs

Suggested Stakeholder Review Plan: Academic Affairs, Student Affairs and Business Affairs

Background Information/Rationale for request: UT Dallas is very vulnerable when certain camps and clinics involving minors take place on campus. UT System does an exceptional job vetting affordable liability coverage for camps and clinics. The University representative who makes decisions pertaining to risk issues associated with these events finds it very challenging to enforce sponsors of high risk events to purchase the additional liability insurance without having a policy in place to support the recommendation. Implementing a policy would assist the University with protecting its assets through the avoidance of potentially expensive legal issues that could arise in the event of an unfortunate incident.

With the growth of the University, there will be an increased amount of activities involving minors held on the campus. There is a need to screen the individuals who do not serve the University in an official capacity in an effort to protect the youth from possible harm.

Relevant documents:

- Special Events Risk Assessment Form including the Request for Permission to Serve Alcohol Form
- Special Events Risk Assessment Guidelines that includes the Release and Indemnification Agreements (Minor and Adults)
- Medical Information and Release form
- Sports Camp Insurance Application
- Education Camp Insurance Application
- Camp Insurance Enrollment Instructions
- Frequently Asked Questions for Camps
ALCOHOLIC BEVERAGES POLICY

The Regents’ *Rules and Regulations* provide that, with respect to the possession and consumption of alcoholic beverages, State law will be strictly enforced at all times on property controlled by The University of Texas System. Further, the rules prohibit the possession or consumption of alcoholic beverages in classroom buildings, laboratories, auditoriums, libraries, museums, faculty and administrative offices, intercollegiate and intramural athletic facilities and all other University property or buildings. However, the Regents’ *Rules and Regulations* provide that regental rules (but not State law) may be waived at an event sponsored by the University with the prior consent of the institutional head for special occasions. See Regents’ *Rules and Regulations*, Series 80102, Alcoholic Beverages.

The guidelines for the type of events for which an exception may be approved are defined as activities having a broad developmental focus; some examples are an advisory council dinner or a reception for a donor, an opening of a building or an art/museum exhibit, an alumni gathering, a community outreach function, or other developmental outreach-related event. Receptions held in conjunction with invited regional/national conferences and symposia hosted by the University, as well as events hosted in private homes with alcoholic beverages provided by the University, fall under these guidelines. The homeowner should possess liability insurance that will cover injuries that may be suffered by guests attending approved events.

A written request for waiver of the Regents’ *Rules and Regulations* concerning consumption of alcoholic beverages must be forwarded to the President’s Designee, using the “Special Events Risk Assessment” form at http://www.utdallas.edu/forms/documents/SpecialEventsRiskAssessment.doc. All requests must be initiated by a Dean, Director or above. The written request must be delivered to the President’s Designee no later than 10 business days prior to the scheduled event. A Responsible University Official (RUO) must sponsor or co-sponsor the event and must agree to attend the entire function in order to receive approval for permission to serve alcohol at a special occasion. The RUO must be an employee who serves in a leadership capacity (e.g. Vice President, Director, Dean, Program Head, Faculty, etc.). State law, the Regents’ *Rules and Regulations* (See Regents’ *Rules and Regulations*, Series 80105, Joint Sponsorships), and this policy will be enforced with regard to the possession and/or consumption of alcoholic beverages on campus. The alcohol must be served by a server/bartender holding a valid TABC license. No exceptions to these criteria will be made.
ALCOHOLIC BEVERAGES GUIDELINES AND LIMITATIONS

1. An event is University-sponsored if a budgeted office, department, or division of the University is responsible for organizing the event, inviting attendees, and paying expenses related to the event, except that such an event is considered to be sponsored even if an outside entity pays for the food and beverages at the event.

2. Food must be available at all functions where alcoholic beverages are served.

3. The *Special Events Risk Assessment form* (Parts 1 and 2) must be completed. The approved form must accompany the *Purchase Voucher form* for reimbursement of alcohol purchases.

4. Monitoring of compliance with this policy is the responsibility of the RUO.
FITNESS FOR DUTY (Faculty)

A. Policy Statement
The University of Texas at Dallas is committed to providing a safe workplace for the benefit of the University community. Faculty who are not fit for duty may present a safety hazard to themselves, to other members of the University community, or to the public. Denial of university privileges to a faculty member is a serious matter and should only take place when there is a perceived danger to the faculty member, coworkers, students, or to university property. In such cases, arrangements must be made for the safe transport of the affected faculty member to his or her home or an appropriate care giver or medical facility.

B. Scope
This policy applies to all members of the University faculty.

C. Purpose
The purpose of this policy is to establish the procedures by which the University evaluates faculty members’ fitness for duty when a faculty member is:

1. Having observable difficulty performing work duties in a manner that is safe for the faculty member, for the other faculty, staff, or students, for the University, or for the public, as determined by the supervisor; or

2. Posing an imminent and serious safety threat to self or others.

D. Definitions

Faculty includes both tenure/tenure track faculty and other nonstudent instructional staff such as clinical faculty, senior lecturers, and adjunct faculty.

Fit for duty means able to perform the duties of the job in a safe, secure, productive, and effective manner as determined by the supervisor.

Health service provider is a doctor of medicine or osteopathy, dentist, podiatrist, clinical psychologist, optometrist, nurse practitioner, nurse-midwife, or a licensed clinical social worker that is authorized to practice in the state of Texas or in the state the employee resides for employees who reside outside the state of Texas.

The Provost’s role in the operation of this policy may be designated at his/her discretion to other’s within the Provost’s office.
Supervisor means the Dean of the faculty member’s School or his/her designee, such as an associate dean or a program head.

E. Employee Responsibilities

1. Faculty are responsible for managing their health in a manner that allows them to safely perform their job responsibilities.

2. Faculty must report to work fit for duty and must perform their job responsibilities in a safe, secure, productive, and effective manner during the entire time they are working.

3. Faculty are responsible for notifying their supervisors when they are not fit for duty.

4. Faculty are responsible for notifying the supervisor when they observe a coworker acting in a manner that indicates the coworker may be unfit for duty. If the supervisor’s behavior is the focus of concern, faculty may inform the Provost or his/her designee. Human Resources Management (HRM) may also be consulted for additional guidance.

F. Employer Responsibilities

1. Supervisors are responsible for observing the attendance, performance, and behavior of the faculty they supervise.

2. Supervisors/managers are responsible for following this policy’s procedures when presented with circumstances or knowledge that indicate that a faculty member may be unfit for duty.

3. Confidentiality of medical records: Any document containing medical information about a faculty member is considered a medical record and is regarded as confidential. If a department has any medical information about a faculty member, that information should be maintained in a file separate from all other records, including those used in consideration for tenure and promotion.

G. Procedures

1. The supervisor who receives reliable information that a faculty member may be unfit for duty, or through personal observation believes a faculty member to be unfit for duty, will validate and document the information or observations as soon as is practicable. Actions that may trigger the need to evaluate fitness for duty include, but are not limited to, problems with concentration, memory, alertness, vision, speech, inappropriate interactions with coworkers or students, inappropriate reactions to criticism, or suicidal or threatening statements.

2. The supervisor will present the information or observations to the faculty member at the earliest possible time in order to validate them; and will allow the faculty member to explain his or her actions, or to correct any mistakes of fact contained in the description of those actions.
The supervisor will then determine whether the faculty member should leave the workplace immediately for safety reasons.

3. In situations where there is a basis to think that a crime may have been committed and/or the faculty member is making threats to harm himself or herself or others, or is acting in a manner that is immediately dangerous to himself or herself or others, the supervisor must contact The University of Texas at Dallas Police Department. The Provost’s office should be contacted regarding the fitness for duty procedure after the immediate safety issue has been addressed.

4. In circumstances not involving immediate safety issues, possible illegal activities, or threats to others or the faculty member himself or herself, the supervisor shall take appropriate action by determining whether the faculty member should be sent home. The supervisor should arrange to contact the Provost as soon as possible, and no later than the next business day.

5. Based on the descriptions provided by the supervisor, the Provost, in consultation with HRM, will assist the supervisor in determining whether a fitness for duty evaluation is required and, if so, the type of evaluation needed and the type of health service provider to make the evaluation. The supervisor will prepare a written advisory report that will be provided to the faculty member and the Provost.

6. HRM will provide a form for the designated health service provider to complete to certify whether the faculty member is fit to return to work. The form will include a behavioral description of the circumstances leading to the request for evaluation, and a list of the faculty member’s relevant duties. HRM may communicate with the health service provider as necessary.

7. In most cases, the faculty member will be responsible for the cost of the fitness for duty evaluation, if not covered by his/her health plan.

8. Based on information provided by the health service provider, HRM will advise the supervisor whether the faculty member should return to work and, if so, the conditions of return, including whether the faculty member must attend a reentry conference with the supervisor and HRM, and whether additional follow-up meetings are necessary. The final decision on whether a provider’s certification will be accepted lies with the Provost. A second independent health service provider certification may be requested in some cases. The University will be responsible for the cost of the second independent provider’s certification.

9. At any stage of the process described in this policy, the faculty member may submit a grievance to the Committee on Faculty Standing and Conduct. Such grievance will follow the standard grievance procedures as stated in the Faculty Handbook.

10. The faculty member must comply with all aspects of the fitness for duty and evaluation procedures, including furnishing necessary consent and release forms to the health service
provider. Noncompliance may be grounds for disciplinary action up to and including termination. Any recommendation for termination shall be automatically reviewed by the Committee on Faculty Standing and Conduct. Information will be requested from the health service provider regarding work restrictions that may be required upon the faculty member’s return to work.

11. Application of this policy is not intended as a substitute for other University policies or procedures related to performance. Nor is it intended as a substitute for disciplinary action. Situations involving violations of University policies or practices may result in disciplinary action being taken.

For Assistance: Questions regarding faculty fitness for duty should be directed to Human Resources Management and/or the Office of the Provost.
The University

The University of Texas at Dallas serves the Metroplex and the State of Texas as a global leader in innovative, high quality science, engineering, and business education and research.

The University is committed to (1) producing engaged graduates, prepared for life, work, and leadership in a constantly changing world, (2) advancing excellent educational and research programs in the natural and social sciences, engineering and technology, management, and the liberal, creative, and practical arts, and (3) transforming ideas into actions that directly benefit the personal, economic, social, and cultural lives of the citizens of Texas.

History of the University of Texas at Dallas

Prior to World War II, Eugene McDermott, Cecil Green and J. Erik Jonsson, the founders of Geophysical Services, Inc., were in the business of searching for natural resources. The war changed the focus of the company from searching for natural resources to creating instruments that aided in finding enemy planes and submarines. GSI spawned Texas Instruments and in 1958, TI employee Jack Kilby invented the integrated circuit that launched a new era for the company, for North Texas, and for the world.

During the expansion of Texas Instruments, the Founders were forced to import engineering talent from outside the state, while the region’s bright young adults pursued education elsewhere. McDermott, Green and Jonsson saw that Texas needed highly educated minds if the state were to remain competitive in the decades to come. They noted that, in 1959 alone, Columbia University conferred 560 doctoral degrees - more than the entire Southwest region. They wrote at the time, “To grow industrially, the region must grow academically; it must provide the intellectual atmosphere, which will allow it to compete in the new industries dependent on highly trained and creative minds.”

Therefore, they established the Graduate Research Center of the Southwest (later renamed the Southwest Center for Advanced Studies) in 1961. The center recruited some of the best scientific talent in the nation. The Texas Legislature concurred with the vision of the Founders and mandated in 1967 that science and technology educational opportunities needed to exist in North Texas. McDermott, Green and Jonsson decided to donate SCAS and its lands to The University of Texas System, and on June 13, 1969, Governor Preston Smith signed the bill creating The University of Texas at Dallas. The SCAS scientists formed the core of U.T. Dallas’s educational infrastructure.

By terms of its enabling legislation, U.T. Dallas offered only graduate degrees until 1975 when the addition of juniors and seniors increased enrollment from 408 in 1974 to more than 3,300 students. By the fall of 1977, the enrollment reached over 5,300. In 1986, U.T. Dallas established the Erik Jonsson School of Engineering and Computer Science. Today, the Jonsson School plays a critical role in providing a highly educated work force for the advanced technology industry.

In 1990, the Texas Legislature authorized U.T. Dallas to admit lower division students. U.T. Dallas’s first freshman class consisted of only 100 students. Despite its small size, this cohort’s achievements set the standard for future classes. Since then, freshman classes have grown in size while the university has maintained high enrollment standards. Nationally published data indicate that U.T. Dallas’s freshman class compares extremely well with those from many prominent national universities.

The Rise to National Prominence

The university’s ability to attract and retain these students has propelled U.T. Dallas into national prominence within a few short years. US News and World Report ranks U.T. Dallas as one of the three best public universities in the state along with U.T. Austin and Texas A&M. Kiplinger’s Personal Finance Magazine, in its October 2000 article “100 Best Values in Public Colleges”, ranked U.T. Dallas 60th among all public universities nationally. The quality of the students who attend U.T. Dallas has remained consistently high. Over forty percent of the incoming freshmen are in the top 10% of their
high school graduating class and their average SAT scores place them in the top twenty percent of all college-bound students.

The addition of freshmen has accelerated the rise in the percentage of full-time undergraduates from 31% in 1986 to nearly 70% in 2006. Masters, doctoral and post-baccalaureate students currently comprise 36% of the student body. Given its location and mission, U.T. Dallas will continue to have significant numbers of professionals attending undergraduate or master’s courses part time.

The transition of the university from a part-time upper division school to a four-year university with an emphasis on engineering, mathematics, the sciences, and the management of new technologies has been greatly facilitated by the university’s faculty. By retaining key faculty members and attracting more nationally and internationally prominent researchers and instructors, U.T. Dallas has enabled its faculty to provide quality instruction to an increasingly diverse student population while sustaining the university's longstanding research tradition. In the past decade, the faculty has increased the level of external research funds substantially. During this same period, the university expanded its teaching mission, became a full-fledged institution, enhanced its areas of focused excellence, and became independently recognized as one of the top public universities in the nation.

**University Library**

The Eugene McDermott Library and Callier Library support the research, instruction, and community service programs of the University by providing access to information in print, microform and electronic formats.

The Libraries consist of over two million items, including more than 1,000,000 books, over 45,000 current periodical titles, 445,000 electronic books, as well as over 7.8 million government documents, microforms, and maps. The McDermott Library is a U.S. and Texas state depository. Special Collections include the Wineburgh Philatelic Research Library, the Belsterling Collection, and the History of Aviation Collection. The Libraries provide an ever-expanding digital collection that is available to distance learners. Users connect to these resources through the library portal at [http://www.utdallas.edu/library](http://www.utdallas.edu/library). Current students have unlimited access to the digital library.

The librarians and staff provide competent and cordial interactions with the people they serve. Librarians provide classroom and individual instruction on the use of the library. The library collections are enhanced by the Interlibrary Loan Service, which provides students with books or articles from a network of major libraries. Student research is facilitated by copiers available to duplicate from paper, microfilm, or microfiche. The Libraries offer students with disabilities a range of services to encourage their independent research.

**Facilities for Study and Instruction**

**Computing Services**

Information Resources provides computing facilities for student, faculty, and staff use in instruction and research. General Access computer labs are located on the first and third floor of the McDermott Library and the ground floor of the Jonsson Building. The Labs provide a modern, networked computing environment with Windows-based and Macintosh computers, scanners and more.

Dedicated systems are also available to support such functions as campus information services, programming, research-related activities, and computationally intensive applications. A sophisticated campus-wide network permits offices and laboratories direct access to extensive computing resources both on and off campus. The university maintains high bandwidth connections to the commodity internet as well as appropriate research and education networks, such as Internet 2.

Primary remote services access is through the Galaxy portal ([http://galaxy.utdallas.edu](http://galaxy.utdallas.edu)). Additional remote access to the campus network is provided through VPN (Virtual Private Networking) services. The university provides wireless LAN access to the campus community areas across most of the
institution. All holders of a UTD NetID may utilize the campus network using devices with the appropriate wireless LAN 802.11b/a/g network interface. Guest wireless access is also provided on request (http://www.utdallas.edu/ir/).

Many of the schools, programs, and research centers operate their own computing facilities that are also available to students as appropriate. Details of these facilities can be found in the individual school/program sections of this catalog. The latest information regarding computing facilities can be found at the campus web site at http://www.utdallas.edu/ir/.

Help Desk and Other Services

The university Help Desk is located in the Jonsson building and offers walk-in, telephone, email and web chat support for a wide range of technology problems. Contact info: 972-883-2911 or assist@utdallas.edu

Callier Center for Communication Disorders

The Callier Center is an internationally recognized institution that offers services to people who suffer from any type of communication disorder. Acknowledged for meeting the assessment, treatment, education, and social service needs of individuals with communication disorders, the center has programs in preschool deaf education, parent education, and child development. Its clinical services include audiology, speech pathology, language development, and adult deaf services; its research activities include psycho-acoustics, auditory neurophysiology, speech science, and audiology. Graduate classes are also conducted at the Callier Center.

Carolyn Lipshy Galerstein Women’s Center

The Carolyn Lipshy Galerstein Women’s Center was founded to foster an inclusive, safe, and open environment for the U.T. Dallas community, to promote a broad understanding of gender as a multi-faceted aspect of human existence, and to provide leadership in developing programs that facilitate institutional change. Named for a former Dean of the School of General Studies, it affirms the University’s commitment to advancing the status and success of women on campus. The Women’s Center offers confidential counseling, guidance, and support to students, faculty, and staff, with particular emphasis on gender-related issues. It also sponsors a series of speakers and seminars throughout the year and houses a resource library that includes materials on justice-related topics, self-help, and women’s studies. The Center maintains a computerized database for access to a broad range of community resources and is available for campus groups to meet, or just relax and study. The Women’s Center is located on the first floor, McDermott Library in room MC 1.204, (972) 883-6557.

Media Services

The Media Services office is responsible for classroom support, which includes the following:

- Supplying A/V equipment needed for classes and special events;
- Maintaining integrated A/V equipment in several rooms across campus.

Note: The UTD Library is responsible for maintaining the film, video, and audio collections. Some schools have their own media services staff and will utilize the central staff only as needed. You may check with the Dean’s Office in each school for more details.

University Housing Information

The University of Texas at Dallas offers several affordable on-campus housing choices for students. On campus housing is reserved for students attending UT Dallas. A variety of floor plans and prices are available to students who are seeking not only the advantage of walking from their residence to class but the more intrinsic benefits of “community” as well.
Graduate students living on-campus must enroll in and complete a minimum of 3 hours each fall and spring semester. For more information please visit www.utdallas.edu/housing Or Contact:

University Village
2800 Waterview Parkway
Suite #200
Richardson, TX 75080
972-792-9100

Waterview Park Apartments
2800 Waterview Parkway
Suite #100
Richardson, TX 75080
972-454-5000

Residential Life
UT Dallas’s Residential Life Office works with students to build a community and to provide assistance with concerns or issues related to living on campus at University Village. Residential Life staff members are also available to assist students with personal and academic concerns. For more information please call 972-883-6391 or visit www.utdallas.edu/housing.
Admission Requirements for Graduate Study

Each program has specific admission requirements listed at http://www.utdallas.edu/admissions/graduate/degrees/

At a minimum, all applicants must provide the following documentation:

Master's Programs

- An earned U.T. Dallas baccalaureate degree or its equivalent from an accredited institution with a grade average of B or better is in upper-division (junior and senior level) work in the student’s major field and related fields is the minimum requirement for admission to any master’s degree program.
- Applicants in their final year of undergraduate study may be admitted on the condition that their bachelor’s degree is awarded before enrollment at U.T. Dallas.

Doctoral Programs

- An appropriate earned U.T. Dallas master's degree or its equivalent, with an average of at least B+ or demonstrated comparable research competence. Applicants currently enrolled in post baccalaureate study may be admitted on the condition that their master’s degree is awarded before enrollment at U.T. Dallas.
- Some departments admit directly to the doctoral program from a bachelor's degree for highly qualified candidates

Non-Degree Students

- Must hold a bachelor's degree from a recognized university

International Students

Applicants educated at non-U.S. institutions should note that their educational background will be assessed for equivalency with a U.T. Dallas degree as described above. Applicants whose primary language is not English and who graduated from a non-US university where the language of instruction and examination was not English, must demonstrate facility in English using one of the following methods:
  - Test of English as a Foreign Language (TOEFL)
  - International English Language Testing System (IELTS)
  - Pearson Test of English (PTE Academic)
  - Successful completion ELS Level 112

This requirement should be met at the time the admission application is submitted.

Visiting and Exchange students

Applicants wishing to attend U.T. Dallas as a visiting graduate research student or as an exchange student from one of our partner schools should contact the U.T. Dallas Office of International Education at http://www.utdallas.edu/oie/.

Application

U.T Dallas uses a web-based application form that can be accessed using the “apply now” link for each degree listing at http://www.utdallas.edu/admissions/graduate/degrees/

There is a $50.00 nonrefundable application fee.

Applicants are advised to carefully review the program information and the semester specific deadlines for domestic and international applications. Supporting documentation requirements for each of the admissions category are as follows.
Specific Admission Documentation Requirements

As a Degree-Seeking Graduate Student

Official Transcripts
Admission to a master’s degree requires that an official transcript demonstrating the completion of a bachelor’s degree with a grade average of B or better in upper-division (junior and senior level) work in the student’s major field and related fields from U.T. Dallas or another, equivalent, recognized university be submitted at the time of enrollment.

An official transcript demonstrating the completion of a master’s degree, submitted at the time of enrollment, is required for admission to a doctoral degree. Some departments admit directly to the doctoral program from a bachelor’s degree for highly qualified candidates.

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 Examinations General Test (GRE) 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/.

English Language Proficiency Test Scores (TOEFL, IELTS, PTE)
International applicants whose first language is not English must submit satisfactory test scores from one of the following testing agencies: the Test of English as a Foreign Language (TOEFL), the academic modules of the International English Language Testing System (IELTS), or the Pearson Test of English Academic (PTE academic). U.T.Dallas will also accept a passing grade in level 112 of English from the ELS Language Centers, www.els.edu.

Applicants with an earned baccalaureate degree from a college or university where the language of instruction and examination was in English are excused from this requirement. Scores must not be more than two years old, and an official copy must be sent from the testing agency to
Office of Enrollment Services, HH10
The University of Texas at Dallas
800 W Campbell Rd
Richardson, TX 75080-3021
U.T. Dallas requires a minimum TOEFL iBT (internet-based test) score of 80, a minimum IELTS score of 6.5 or a minimum PTE score of 67 for automatic regular admission as a degree-seeking student. Higher scores may be required if the applicant is to succeed in the competition for teaching assistant openings.

Narrative
A narrative from the applicant outlining academic interests, current or long-range interests in research, teaching or other professional objectives; describing publications or other scholarly endeavors; listing of academic and professional organizations and fellowships, scholarships, or other honors received (for additional information see http://www.utdallas.edu/admissions/graduate/degrees/).

Request for Recommendation Forms
Completed forms from 3 individuals (employers, community leaders, teachers, etc) able to judge your probable success in graduate school. Letters of recommendation may be sent directly to the contact listed for the degree program.

http://www.utdallas.edu/admissions/graduate/documents/GradReqRecommendation.pdf
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.

In accord with Chapter 51, of the Texas Education Code, decisions on admission to degree-granting graduate programs at U.T. Dallas are based on holistic considerations of all submitted information regarding the academic, career and personal histories of the applicants. Standardized test scores and coursework GPA levels cited in the catalog descriptions of some degree programs are listed for advisory purposes only, to indicate the typical achievement levels of students enrolled and succeeding in the various programs. No single quantitative or qualitative measure or any specific combination thereof, constitutes a definitive standard for admission. Rather, each application will be considered individually and each applicant’s complete profile of strengths and prospects for successful completion of the program will be evaluated by the admissions committee. Applicants are encouraged to contact the graduate advisor in the degree program in which they expect to enroll to discuss specific admission requirements.

Applicants who satisfy all of the above criteria qualify for regular admission to the degree program. Students denied this admission status may qualify for admission under one of the following categories:

**as a Conditional Degree-Seeking Graduate Student**

Upon review of the credentials of an applicant seeking regular admission to a U.T. Dallas degree program, the graduate studies committee of that degree program may recommend, and seek concurrence of the Dean of Graduate Studies, that the applicant be admitted subject to specific conditions being satisfied over a specified time period. Such conditions might include requiring additional semester hours to be taken, and/or a specific grade point average to be maintained. A student satisfying the conditional requirements within the specified time period will then qualify for regular admission. The graduate advisor in the academic program will monitor compliance with the admissions conditions. A student who does not fulfill the specified conditions within the time period specified at the time of admission will be barred from continued registration in the degree program.

Normally a student cannot remain in conditional status for more than one calendar year. Exceptions to the one-year limitation can be granted only by the Dean of Graduate Studies upon recommendation of the graduate program. Under no circumstances will the student be allowed to remain enrolled under Conditional Status for more than 15 semester credit hours or two consecutive years, whichever comes first. Within these limits, specified graduate level coursework taken as a conditionally admitted student can be applied to the degree program.

**as a Non-Degree-Seeking Graduate Student**

A student wishing to take graduate level coursework without becoming a candidate for a graduate degree may apply for admission to U.T. Dallas as a non-degree-seeking graduate student. The applicant must satisfy the condition for admission to a master’s degree program at U.T. Dallas, but is not required to submit GRE or GMAT scores or letters of recommendation. Enrollment as a non-degree-seeking graduate student is subject to annual review and approval by the Associate Dean of Graduate Studies in the school. Students admitted as non-degree-seeking may not be eligible for financial aid and should consult the U.T. Dallas Financial Aid office regarding their status prior to submission of their application for admission.

A non-degree-seeking graduate student in good academic standing who wishes to apply for admission to a degree program must submit a new application. No more than 15 semester credit hours taken as a non-degree-seeking student at U.T. Dallas may be transferred to satisfy the coursework requirements of a graduate degree program, except with the permission of the Dean of Graduate
Studies. A student not officially enrolled in a degree program requires the consent of the graduate advisor to enroll in graduate classes offered by that degree program. 

NOTE: A student in the United States on an F1 or J1 Visa may only be admitted to a degree program at U.T. Dallas and is not eligible for Non-Degree-Seeking Student status.

**as a Graduate Student Taking Only Undergraduate Courses**

Students holding a bachelor’s degree from an accredited college or university may elect to take, or, based on their academic background be restricted to taking, only undergraduate leveling courses. The applicant need only provide an official transcript demonstrating the completion of a bachelor’s degree level and be in good academic standing. These students will be required to maintain the same scholastic standards as regularly admitted undergraduates and will receive academic guidance from the academic advisor in the school. Students restricted to taking undergraduate courses may not take graduate courses in a degree program. Students admitted to take only undergraduate level courses may not be eligible for financial aid and should consult the U.T. Dallas Financial Aid office regarding their status prior to submission of their application for admission.

**Application Deadline Dates**

Domestic and international applicants are urged to plan ahead and apply as early as possible and to allow adequate time for review by the admissions committees. To ensure consideration for financial assistantships students are urged to submit a completed application nine months prior to anticipated enrollment. Applicants are advised to refer to http://www.utdallas.edu/admissions/graduate/degrees/ for additional information on specific admission deadlines for each degree program.

Domestic applicants should have all necessary application materials to the Office of Enrollment Services prior to the following dates:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Date</th>
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<tbody>
<tr>
<td>Fall semester</td>
<td>July 1</td>
</tr>
<tr>
<td>Spring semester</td>
<td>November 1</td>
</tr>
<tr>
<td>Summer semester</td>
<td>April 1</td>
</tr>
</tbody>
</table>

Applicants who are not citizens or permanent US residents should submit all necessary application materials to the Office of Enrollment Services by the following dates:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall semester</td>
<td>May 1</td>
</tr>
<tr>
<td>Spring semester</td>
<td>September 1</td>
</tr>
<tr>
<td>Summer semester</td>
<td>March 1</td>
</tr>
</tbody>
</table>

Students seeking appointments as Teaching Assistants or Research Assistants should contact the academic advisor for the degree program and plan for earlier application submissions.

**Official Transcripts**

The term “Official Transcript” is understood to refer to the official recorded results of the student’s academic work in a sealed envelope signed and stamped by the registrar or by an authorized official of the issuing college or university. English translations of transcripts and documents that are in a language other than English are also required and should be sent to:

Office of Enrollment Services, HH10
The University of Texas at Dallas
800 W Campbell Rd
Richardson, TX 75080-3021

A $50.00 nonrefundable international document evaluation fee applies.

All materials submitted in the process of applying to the University become the property of the University and will not be returned to the applicant.
Section 4.29, Texas Education Code provides legal penalties for any alteration of academic records or transcripts with the intent to use such a document fraudulently or permit the fraudulent use of such a document. Falsifying or omitting information may result in withdrawal of any offer of acceptance, cancellation of enrollment, and/or disciplinary actions.

**Office of Enrollment Services**

The Office of Office of Enrollment Services, located in Hoblitzelle Hall, can assist prospective students in exploring the possibility of graduate study at U.T. Dallas. For detailed admissions or academic advice, please contact the specific academic program http://www.utdallas.edu/admissions/graduate/degrees/.

**Graduate Admission Examinations**

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 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, New Jersey 08541-6000; by phone (609) 771-7670, via e-mail at gre-info@ets.org; or on the World Wide Web at http://www.gre.org/. Applicants should specify by both institution and code that the test score be sent to The University of Texas at Dallas, Code 6897.

**Graduate Management Admission Test (GMAT)**

The GMAT is offered on a year-round basis at regional testing centers in a computer-based testing (CBT) format. Information on regional CBT testing sites may be obtained directly from Graduate Management Admission Test, Educational Testing Service, P.O. Box 6103, Princeton, New Jersey 08541-6103; by phone (609) 771-7330; via e-mail at gmat@ets.org; or on the World Wide Web at http://www.gmat.org/. Applicants should specify by both institution and code that the test score be sent to The University of Texas at Dallas, Code 6897.

**English Proficiency Test Scores**

Automatic regular admission as a degree-seeking student U.T. Dallas requires a minimum TOEFL iBT (internet-based test) score of 80, a minimum IELTS score of 6.5 or a minimum PTE score of 67. Applicants with lower scores will be considered but are advised to improve their test scores and reapply. U.T.Dallas will also accept a passing grade in level 112 of English from the ELS Language Centers, www.els.edu.

**English Requirements for Teaching Assistants**

Students are required to be able to speak and write English clearly and well. State law and regulations of the Texas Higher Education Coordinating Board require that international students appointed as Teaching Assistants (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.
Students' Degree Program

Graduate Policies

Detailed information on graduate policies can be found in the policy memorandum “Policy on Procedures for Completing a Graduate Degree.” Faculty and students should be familiar with the policies contained in this memorandum. Copies are on file in the Office of the Dean of Graduate Studies and in the academic department and program offices.

Program of Studies

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 that program, except in those Schools with standard degree plans. A complete Program of Studies Form will be filed in and approved by the Office of the Dean of Graduate Studies prior to the student’s registration for his/her 19th semester credit hour to be counted toward a master’s degree, or 50th semester credit hour taken beyond the bachelor’s degree to be counted toward a doctoral degree.

Change of Program

A student must be in good academic standing to change from his/her admitted graduate program to another one within the same graduate department. A student wishing to change programs within their same UTD School must see their advisor prior to registration and no later than the first day of classes of a semester/term. If the change of program 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 student and advisor will prepare a new degree plan.

Transfer of Credit

A degree-seeking student may petition to have graduate coursework taken at another institution be counted towards satisfying the master’s or doctoral degree requirements. To qualify for transfer of credit the student had to be enrolled in a graduate degree program at an accredited college or university and the grade earned in the course must be a B or better. Grades of B- are not transferrable and the course must not be a correspondence or extension course. Courses delivered in a distance learning format will be considered by the Graduate Dean on a case-by-case basis. An official transcript and an official explanation of the course numbering system at the school where the credit was earned should accompany the transfer request that must be prepared by the student’s Graduate Program and submitted to the Dean of Graduate Studies for approval. Transfer of credit petitions are subject to the following limitations:

• No more than 25% of the total requirement of a masters degree may be transfer credits. Some degree programs have more restrictive transfer of credit requirements.
• Transfer of master’s level credit into a doctoral program is limited to a maximum of 36 hours.
• No more than 15 semester credit hours taken as a non-degree student at U.T. Dallas can be subsequently applied to a degree program at U.T. Dallas.

Exceptions to these transfer policies may be granted only on petition to the Dean of Graduate Studies.

All petitions for transfer of credit for coursework taken prior to enrolling at U.T. Dallas should be submitted to the student’s Program Graduate Advisor by the student prior to filing a Program of Studies; however, acceptance of transfer of credit hours will not occur until after the student has completed 9 semester credit hours at U.T. Dallas with a grade point average of at least 3.0. All petitions must be processed and approved no later than the semester prior to anticipated graduation. Accordingly,
requests to take courses at another institution during the semester a student plans to graduate cannot be approved because the grades may not be received in time to certify the student for graduation.

General Degree Requirements

The student will be deemed to have completed the course work degree requirements when he or she completes the previously filed program of studies with acceptable grades.

Required Semester Credit Hours

The minimum semester credit hours required for the degree in a Program of Studies will be those shown in the catalog applicable to the student at the time of his or her admission or readmission to the program. In no case will a student be allowed to graduate with less than 30 approved graduate semester credit hours (including approved graduate transfer credit hours) for the master’s degree. Enrollment in doctoral study at U.T. Dallas for a minimum of three, consecutive long terms and for a minimum of 18 doctoral semester hours are required for graduation with a doctoral degree. Additional requirements for the doctoral degree may be specified by the faculty of each program as described in the individual degree program sections of this catalog.

Required Grade Point Average

In order to qualify for graduation, students must maintain a minimum 3.0 grade point average in their degree program’s core courses. However, individual programs may have more stringent grade point requirements in selected courses, which must be satisfied for graduation.

The minimum acceptable University grade point average for graduation is 3.0 for all graduate courses taken in the student’s degree program at U.T. Dallas.

Registration Requirements

Examinations or Proposal Presentation

A student must be registered for at least three semester credit hours of graduate course work during the semester in which any major degree examination, such as the Qualifying Examination, Final Written Examination, or Final Oral Examination, is taken. A student must also be registered for at least three semester credit hours of graduate course work during the semester in which the Dissertation Proposal is submitted for approval.

Time Limits

All requirements for a graduate degree, including transfer credit, must be completed within the specified time period. Students exceeding the specified 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.

All requirements for the master’s degree must be completed within one six-year period. All requirements for the doctoral degree must be completed within one ten-year period. Students whose master’s degrees are accepted for full credit toward a Ph.D. must complete all requirements for the doctoral degree within one eight-year period. Work exceeding these limits, whether done at this university or elsewhere, will not count towards the degree.

Individual programs may set shorter time limits. Exceptions to time limit specifications must be approved by the Dean of Graduate Studies.

Additional Master’s Degrees

Students are encouraged to pursue additional master’s degrees at The University of Texas at Dallas. To the extent that the requirements of some master’s degrees overlap, some of the credit hours taken in pursuit of previously earned master’s degrees at U.T. Dallas may be counted toward an
additional master’s degree. The only limitation is that one-half of the credit hours for any master’s degree earned at U.T. Dallas must be satisfied by new course work. A student is required to develop an approved plan of studies through the department or program offering the master’s degree prior to enrolling in that degree. Similarly, a student wishing to earn two master’s degrees concurrently must develop an approved plan of studies through both relevant departments or programs. All coursework for any degree must meet the academic standards of that degree.

**Supervising Committee for Thesis and Dissertation**

A supervising committee will be appointed to approve a research topic, provide advice, and periodically assess progress and accomplishments for students pursuing degree options requiring a written master’s thesis, a doctoral dissertation or a research practicum report. The composition of the Supervising Committee must follow the guidelines contained in the U.T. Dallas policy memorandum, *Policy on Procedures for Completing a Graduate Degree (87-III.25-48)*, and must be submitted by the appropriate committee or administrator of the degree program to the Dean of Graduate Studies for approval. A student may obtain copies of this policy from their department or program office.

The Supervising Committee must meet at least once annually to assess the student’s progress, and send a written report to the Dean of Graduate Studies. This report should describe any problems which could delay the student’s research beyond its anticipated completion date. A copy of this report must also be sent to the student.

The student may request a meeting of the Supervising Committee through a written request to the appropriate committee or administrator of the degree program.

**Admission to Doctoral Candidacy**

The research potential and ability of each doctoral student to both understand and integrate previous coursework will be evaluated before a student can be formally admitted to doctoral candidacy. The format of this evaluation, hereafter referred to as a qualifying examination, varies amongst the degree programs and can be obtained from the student’s Graduate Program office. A student failing the Qualifying Examination is terminated as a doctoral student in that Graduate Program unless a two-thirds majority of the examining committee votes that a second examination be permitted. All committee members should have all evidence of the student’s academic record and Qualifying Examination performance prior to this vote. The second examination typically would be taken no sooner than six months after the first examination, and no later than one year. A student failing the second examination will not be allowed to pursue a doctoral degree in that program. Under no circumstances will a third examination be allowed. The student will have advanced to candidacy when she or he has:

- Passed the Qualifying Examination;
- Been assigned an approved Supervising Committee;
- Satisfied any other program or school candidacy requirements.

Candidacy must be achieved before a student is eligible to enroll in dissertation or in the chemistry internship practicum courses.

**Doctoral Dissertation**

Each doctoral candidate must prepare and submit for examination a written Dissertation meeting the guidelines specified in the “Guide for the Preparation of Master’s Theses and Doctoral Dissertations.” A copy of the guide can be obtained from the office of the Dean of Graduate Studies or visit [http://www.utdallas.edu/dept/graddean/](http://www.utdallas.edu/dept/graddean/).

The dissertation manuscript for the Doctor of Philosophy degree must demonstrate an independent research competence on the part of the candidate that substantially adds to knowledge in the candidate’s field with respect either to its intellectual substance or professional practice.
Final Oral Examination for Doctoral Candidates

The presentation and defense of the Dissertation will constitute the Final Oral Examination for the doctoral candidate. Specifics on the scheduling and conduct of the examination are contained in the “Guide for the Preparation of Master’s Theses and Doctoral Dissertations.” The initial phase of the examination will be open to the public. Following the public presentation, the candidate will be examined by the members of the examining committee. This part of the examination is not open to the public. Depending upon the school’s policy, other members of the faculty may also attend that part of the examination. This portion of the examination will be chaired by the representative of the Dean of Graduate Studies. The examination will focus primarily on the candidate’s research contribution, although aspects of the general field in which the candidate’s research was conducted may also be covered.

One of five possible results of the examination will be reported: (1) passed the oral examination and manuscript accepted, (2) passed the oral examination and manuscript accepted pending specified revisions, (3) second oral examination required, but manuscript accepted or accepted with specified revisions, (4) major revisions of the manuscript and a second oral examination required, or (5) oral examination failed, manuscript not accepted and the committee recommends dismissal from the program.

If a recommendation for re-examination is made, the second Final Oral Examination must be taken between six months and one year after the first examination. In no cases will a third Final Oral Examination be given. See also Policy on Procedures for Completing a Graduate Degree (87-III.25-48), in the University’s Handbook of Operating Procedures and/or the “Guide for the Preparation of Master’s Theses and Doctoral Dissertations” or visit http://www.utdallas.edu/dept/graddean/.

Required Copies of Dissertation and Thesis

Three final, approved hard copies and one disk copy are required. After final, approved hard copies have been bound:

- one hard copy will be available to the public in the university library
- one hard copy will be sent to the Supervising Professor
- one hard copy will be sent to the program office
- one electronic copy will be sent to UMI

UMI will publish and make the dissertation/thesis available to the public for purchase both on the web and in hard copy.

Intellectual Property Rights

In order to protect patent or other intellectual property rights, the Dean of Graduate Studies may, upon request, delay for a period of up to one year the binding, distribution, and/or publication in microform of the thesis, dissertation, or research practicum report. This request must be supported by a written recommendation of the Supervising Professor.
Registration and Enrollment Requirements

Registration Required

A graduate student:
- must be registered for any session during which they are taking courses, or taking examinations, required in his/her degree program.
- requiring guidance in the preparation of a thesis or dissertation must be registered for a minimum of three semester hours in his/her degree program.
- must be enrolled in at least 3 credit hour in the semester in which they graduate.
- must be registered and have paid all required fees in the semester in which he/she plan to graduate.

Doctoral students:
- must be enrolled in at least 1 credit hour in the semester in which they graduate.
- enrollment for 1 semester credit hour in the final semester is only allowed once.

A continuing student in good academic standing may register in one of three ways:
- online, with the department or program office,
- with the Office of the Registrar during registration.
- early to increase the probability of enrollment in available courses.

The Office of the Registrar informs the instructor of the names of all students who are officially registered and have paid all required tuition and fees in each class. It is recommended that the student confirm with the instructor that his/her registration has been properly recorded within the first week of classes. It is the student's responsibility during his/her enrolled semester that he/she is attending the correct courses for which he/she registered. A student may not attend classes in which he/she is not registered in the above manner unless the student has been approved to audit the course.

Continuous Enrollment Requirement

Unless on an approved leave of absence, a graduate student in a degree program is expected to maintain continuous enrollment during the fall and spring (long session) semesters of each academic year. A students 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. A thesis/dissertation student must enroll in at least three thesis or dissertation hours some time prior to graduating. Once a student has enrolled in thesis or dissertation, that student must maintain continuous enrollment (not necessarily in thesis or dissertation) of at least three semester hours during consecutive long semesters unless granted a leave of absence. Some programs may require additional semester hours.

Leave of Absence

A student who formally requests and is granted a leave of absence will be exempt from the readmission requirements. A request for a leave of absence must be made through the department or program to the Dean of Graduate Studies and is recorded on the student’s academic record by the Office of the Registrar. The leave of absence does not alter the time limits placed on graduate degrees.

Readmission

A student, in good academic standing who finds it necessary to suspend his/her academic activities or transfer to another institution for the duration of three long semesters (not including a summer session) must reapply to the program of intended degree. In that circumstance, a new review will be made to determine eligibility of enrollment under current standards for admission. An official transcript mailed directly by each institution attended after leaving The University of Texas at Dallas...
must be sent to the Office of Enrollment Services, including any transcript of attendance at another university during a summer session. If accepted, the readmitted student will be bound by the catalog in force at the time of readmission.

In Absentia Registration for Graduation

In absentia registration for graduation (i.e., registration for no course work) may be arranged for candidates who have completed all degree requirements except for the submission of final approved copies of thesis or dissertation. A graduate student may not register in absentia with grades of Incomplete on his/her transcript (see related, nonrefundable fee).

Dates of Early, Regular and Late Registration

Registration dates and procedures are listed in the online Comet Calendar and the Academic Calendar. This online resource contains important dates and information that will be useful throughout the semester. Failure to consult and be aware of these dates and procedures does not excuse a student from information or regulations contained therein. The University reserves the right to make changes to both calendars at any time.

Paying Fees as a Part of Registration

A student is not registered or eligible to attend classes until all tuition and fees have been paid in full or until the student has arranged installment payments with the Bursar. If a student’s registration has been canceled for nonpayment, a reinstatement fee and a late fee will be charged (see online course schedule for current fees). A student who does not pay in full or arrange for installment payments by the payment deadline in the online Comet Calendar or the Academic Calendar may have his/her registration canceled. A student who has not completed the payment of all tuition and fees by the end of the semester will be subject to one or more of the following actions at the university’s option:

- bar against readmission at this institution
- withholding of grades, degree and official transcript
- all penalties and actions authorized by law.

Auditing Courses

Auditing allows a student to observe the instruction of a course without earning credit. Computer Science and Engineering courses, Geoscience courses, Physical Education courses, Foreign Language courses, online courses, and any courses that charge a lab fee may not be audited. Participation and discussion is at the discretion of the instructor. Auditing grants only the privilege of hearing and observing and does not grant credit or access to online course tools.

A student may pick up an Audit Form in the Office of the Registrar beginning the first day of classes through census day. Students may audit courses only by obtaining permission of the instructor and by completing audit registration procedures. Please consult http://www.utdallas.edu/student/registrar/ for more detailed audit procedures and associated fees.

All applicants for auditing graduate courses should have documentation indicating the completion of a baccalaureate degree. Exceptions to this policy may be granted only upon application to the Dean of Graduate Studies. Under no circumstances will a student be allowed to audit Studio/Ensemble courses.

Orientation

Orientation is designed to assist new students with an understanding of university rules and regulations and to provide information about registration procedures, academic programs, and student life. Attendance at Orientation is required for all F and J status international students and is strongly recommended for all new students as a means of efficient matriculation into the University.
International students with F or J status will not be allowed to register without an authorized International Student Orientation form. All newly appointed TA's are required to attend TA Orientation held immediately prior to the start of the fall and spring semesters.

**Undergraduate Registration for Graduate Courses**

An advanced undergraduate who is within 30 hours of completing the baccalaureate degree may petition his/her Undergraduate Associate Dean to take graduate courses. Approvals will be subject to the conditions outlined in the following sections.

**Graduate Courses Applied Toward an Undergraduate Degree**

With the approval of the student’s Undergraduate Associate Dean, up to 12 semester hours of graduate work taken as an undergraduate may be used only for completing any baccalaureate degree at UT Dallas. Pass/fail grading will be permitted in this category but must be approved by the instructor prior to the start of class. The student must declare at the time of registration for the course, on a form provided by the Undergraduate Associate Dean, how each approved course is to be applied and may not change option once declared.

**Graduate Courses for Possible Future Use as Graduate Credit**

Pass/fail grading options are not permitted in this category. An undergraduate may take up to 12 semester hours of graduate courses to reserve for possible application toward a graduate degree. To register, an undergraduate student must obtain permission from the instructor, from the graduate advisor of the program in which the course is offered and from the Dean of Graduate Studies. Such courses with an earned grade of B or better will be eligible for application to the student's graduate record when the student is admitted to a graduate program. Courses so taken will not apply to the student's undergraduate record and will not affect the student's undergraduate GPA. The student must declare at the time of registration for the course, on a form provided by the Undergraduate Associate Dean, how each approved course is to be applied and may not change option once declared.

**Graduate Courses Taken in Fast Track Options**

Pass/fail grading options are not permitted in this category. A number of programs at UT Dallas offer an accelerated Fast Track option that allows students to take graduate level classes while still undergraduates. Specific admission requirements for Fast Track programs can be found within descriptions of majors. Undergraduate students at UT Dallas who have been admitted to Fast Track programs at UT Dallas leading to baccalaureate/master's degrees may, with the permission of the student’s Undergraduate Associate Dean and graduate advisor, take a maximum of 15 specified semester hours of graduate work as an undergraduate. The graduate hours may be used to complete the bachelor’s degree and also to satisfy requirements for the master’s degree. When this option is chosen, credit for the fast track hours used for an undergraduate degree will not be computed in the graduate GPA. However, they reduce the total number of graduate hours required to earn the respective degree. The student must declare at the time of registration for the course, on a form provided by the Undergraduate Associate Dean, how each approved course is to be applied and may not change option once declared. Exceptions to the 15-hour maximum may be granted by petition to the Deans of Graduate and Undergraduate Education submitted through the relevant program's director of graduate studies.

Graduate programs at UT Dallas will accept admission to a Fast Track program as satisfying Graduate Record Exam (GRE) criteria for admission to the graduate program. The School of Management requires students to meet its graduate admission requirements including completion of the Graduate Management Admissions Test (GMAT) prior to receiving the baccalaureate degree.
Course Numbering System

All courses are identified by a four-digit number preceded by the name (or abbreviation) of the program. Courses beginning with a number 5 or greater are graduate courses. The second digit of the course number identifies the credit hour value. Courses with a V in the second position are variable credit hour courses.

The number of lecture hours per week and the number of laboratory hours are given in brackets following the course description: (2-4) means two hours of lecture and four hours of laboratory each week.

Frequency of Course Offerings

One of the following Frequency of Course Offering codes is found at the end of each course description in this catalog:

- S = at least once each long semester
- Y = at least once a year
- T = at least once every two years
- R = based on student interest and instructor availability

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities, including examinations, for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment.

The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.
Grades and Grade Point Average

The following grade scale is used in graduate course work at the university:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Grade Points per Semester Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>A+</td>
<td></td>
<td>4.33</td>
</tr>
<tr>
<td>A-</td>
<td></td>
<td>3.67</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>3.00</td>
</tr>
<tr>
<td>B+</td>
<td></td>
<td>3.33</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>2.67</td>
</tr>
<tr>
<td>C+</td>
<td></td>
<td>2.33</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0.00</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>*</td>
</tr>
</tbody>
</table>

*The grades P and I do not produce grade points.

Grade of I: Incomplete

An Incomplete grade of I may be assigned, at the discretion of the instructor, for work unavoidably missed at the semester’s end. The student must obtain a Grade of Incomplete/Documentation Form in the office of the student’s degree program. The instructor assigning an incomplete grade must furnish a description of work required to complete the course. An incomplete must be completed eight (8) weeks from the first day of the subsequent long semester. The completed form must be signed by both the student and the instructor, and the appropriate Associate Dean, Graduate Advisor, or Department/Program Head, and must be retained with the student’s academic record. If the required work to complete the course and to remove the grade of I is not submitted by the specified deadline, the grade of I is changed automatically to an F. Extension beyond the specified limit can be made only with the permission of the Dean of Graduate Studies. A student may not re-enroll in a course in which an I has already been assigned.

The instructor alone will be responsible for determining whether the requirements for completion are met and for assigning the grade in the course. If the instructor who assigned the incomplete is no longer associated with the University when the work is completed, the head of the department or program may assign a committee of appropriate faculty to evaluate the material and/or obtain any other information that may be required to assign the grade in the course. Upon completion of the evaluation of the required work, the symbol I must be converted into a letter grade (A through F or P) by the instructor, head of the department or program, or Graduate Advisor as indicated above.

Grade Changes

After a final grade has been recorded by the Registrar, the grade can be changed only to correct a clerical error or replace a grade of "incomplete". Changing a final grade requires the written approval of the instructor, the department or program head, and the Graduate Dean.

Pass/Fail Grading

The pass/fail option is intended to encourage a student to take courses in topics outside his/her major area where the student would be competing with a significant number of students who are majoring in these outside areas. Subject to the constraints stated below, a student may elect to take certain courses either by letter grade (A, B, C, F) or pass/fail grade (P/F). The pass/fail option should be exercised at the time of registration. In any courses in which letter grades are given to one or more students, any student wishing to take the course on a pass/fail basis must obtain the approval of the instructor and his/her graduate advisor on the Pass/Fail form. This completed form must be submitted
to the Office of the Registrar no later than Census Day. No change of grade designation from grade to pass/fail or pass/fail to grade can be made after the Census Day designated in the online Comet Calendar and the Academic Calendar.

A student may not elect to take the following types of courses on a pass/fail basis:
- core courses and their prerequisites required for the student's degree
- elective courses in the student's major area
- more than 20 percent of the hours earned at UT Dallas for any master's degree (excluding casebook, internship, practicum, independent study, research, reading, thesis or dissertation requirements)

Only pass/fail grades are given for independent study, research and reading courses, and for thesis and dissertation.

**Final Examinations**

If a final examination is given in a course, it must be given at the time scheduled by the Registrar’s office during the final examination period. A final examination must not last more than 2 hours and 45 minutes. Students for whom more than three final examinations are scheduled in one day may petition to take the additional final examinations on different days.

**Academic Good Standing**

Registration in the graduate programs beyond the first semester (or summer session) is contingent on the student's being in good academic standing based on three main factors:
- Satisfactory progress in meeting admission conditions that were imposed at the time of admission.
- Maintenance of a 3.0 cumulative grade point average in graduate courses in the degree program.
- Satisfactory progress in meeting program degree requirements.

If, at the end of a semester, a student's cumulative grade point average is below 3.0, the student will be placed on academic probation. The student must earn sufficient grade points during the next two semesters of registration to raise the cumulative grade point average to at least 3.0 exclusive of incomplete (I) grades. Failure to achieve this 3.0 cumulative grade point average will result in immediate dismissal from the University.

**Course Load**

The normal course load for a full-time graduate student during the long session is 12 semester hours. The minimum course load for a graduate student to be considered full time during long session is 9 semester hours; the maximum is 15 semester hours. The normal course load for a graduate student during the summer session is 9 semester hours. The minimum course load for a graduate student to be considered full time during the summer session is 6 semester hours; the maximum is 12 semester hours. Registration in excess of these maxima must have the recommendation of the graduate advisor and approval of the Dean of Graduate Studies and will be permitted only under exceptional circumstances. Students who are employed should consult with the graduate advisor about their combined course and work load. Course load requirements for graduate assistants are discussed in the section, Teaching and Research Assistantships.

**Schedule Changes: Dropping, Adding and Withdrawing From Courses**

Dates and time limits for schedule changes can be found in the online Comet Calendar and the Academic Calendar.
A new student seeking to drop or add courses to his/her schedule must obtain permission from his/her graduate advisor in the degree program. Drop/Add forms may be obtained from advising offices. Drop/Adds may not be processed after Census Day. Any drops prior to and including Census Day will not show on the student’s transcript. Withdrawals after Census Day will show as a W (withdraw) on the transcript.

After the last day indicated in the online Comet Calendar and the Academic Calendar for a graduate student to withdraw, the course withdrawal will be approved only on a documented emergency basis for reasons extrinsic to curricula matters. To secure such approval, the student must complete a Drop/Add form and obtain the signature of the instructor certifying that the student was passing at the time of the proposed withdrawal. The student should then submit the Drop/Add form and a written petition detailing the nature of the emergency with written documentation from employer or doctor, as appropriate, to the graduate advisor and then to the Dean of Graduate Studies. If the petition is approved, the grade assigned by the instructor on the Drop/Add form will determine the grade which will appear on the student’s transcript: a passing grade will appear as a W on the transcript; a failing grade will appear as an F. Students who cease to attend classes without securing approval in the manner prescribed above will receive the grade of F for that course. Courses may not be dropped after the last day of classes in the semester.

A student who habitually withdraws from a significant fraction of his/her schedules may lose the right to withdraw or may be dismissed from the university for failure to make adequate academic progress.

Any student on a Teaching/Research Assistantship wishing to drop a course at any time during the semester must secure the signature of the Dean of Graduate Studies.

The Office of the Registrar, upon recommendation of the instructor and with the approval of the Dean of Graduate Studies, may require a student to drop a course for which the student has not satisfied the prerequisite.

UTD operates multiple sessions with different academic calendar and Census dates. If a student registers in a shorter session, it is the student’s responsibility to review the online Comet Calendar and deadlines that affect the drop/add/withdrawal procedures. The same holds true for the summer session.

**Military Service Activation Interruption of Education**

Under certain circumstances, a student who is required to participate in active military services is excused from scheduled classes or other required activities and will be allowed to complete an assignment or exam within a reasonable time after the absence. The excused absence is permitted only if the student will miss not more than 25% of the total number of class meetings or the contact hour equivalent (not including the final examination period) for the specific course or courses in which the student is enrolled at the beginning of the period of active military service.

A student who withdraws from The University of Texas at Dallas because the student has been called to active military service has three options for the treatment of his/her transcript and tuition and fees. U.S. At the student’s request:

1. the Bursar’s office shall refund the tuition and fees paid by the student for the semester in which the student withdraws and records “withdrawn-military” (WM) on the student’s transcript; or
2. the Registrar’s office may grant the student who is eligible under The University of Texas at Dallas’ guidelines (see “Incomplete Grades” section of the catalog for eligibility) an incomplete grade in all courses by designating “incomplete-military” (XM) on the student’s transcript. (Please note: resolution of the XM grade(s) must occur within one year from “release from active duty” date on military orders); or
3. the student may petition the instructor to assign an appropriate final grade or credit for a course if the student has, in the instructor’s judgment, successfully completed a substantial amount of course work and demonstrated sufficient mastery of the course material.

NOTE: There are no provisions for refunds for active duty service members who are deployed as a result of military orders or for individuals who chose to enter into the service. The provisions listed above apply only to reservists or members of the National Guard called into active military service.

Readmission

If otherwise eligible to register for classes at the University, a student called to active duty in the United States Armed Forces or the Texas National Guard (not including routine Texas National Guard training) may shall be readmitted without reapplication or payment of additional application fees within one year of the “release from active duty” date on the student’s military orders. An eligible student will retain prior academic standing, course credits awarded and financial eligibility if the student meets current eligibility requirements other than continuous enrollment or other timing requirements.

Withdrawal (Resignation) from the University

A student who wishes to withdraw entirely from the University must complete the proper withdrawal form and procedures in the Office of the Registrar. The grade assigned by the instructor on the withdrawal form will determine the grade which will appear on the student’s transcript:

- a passing grade will appear as a W on the transcript
- a failing grade will appear as an F.

Withdrawal after the final drop date requires the same procedures as listed in the previous paragraphs on Schedule Changes.

Repeated Course Work

A student who wishes to repeat a course must complete a Repeated Course Adjustment form in the Office of the Registrar.

Up to three graduate courses may be repeated. However, no graduate course may be repeated more than once. When a course is repeated, the earlier both grades will remain in the student’s record and will be included in any transcript. The second higher grade will be used in computing the grade point average or credit hours for purposes of graduation or determination of probationary status. A notation beside the first lower grade will indicate that the course has been repeated.

Change of Address, Email, or Name

For a name change, a student must fill out the name change form in the Office of the Registrar.

A student must also bring a copy of his/her driver’s license or marriage certificate for proof of name. Change of address and email may be completed online.

Electronic communication is the preferred means of communicating important academic information. A student is encouraged to set up a U.T. Dallas email account upon registration in his/her first term, and ensure the U.T. Dallas email account is kept current.

Most university administrative offices send all electronic correspondence only to a student’s UTD email address and require that all official electronic correspondence be transmitted from the student’s UTD email account. This requirement allows university personnel to maintain a high degree of confidence in the identity of the individual corresponding with a university official and in the security of the transmitted information.
Graduation

Graduation under a Particular Catalog

General and specific requirements for degrees in graduate programs may be altered in successive catalogs. Provided the requisite courses continue to be offered, the student is bound by the course work requirements of the catalog in force at the time of admission. With the approval of:

- relevant Department Head
- Associate Dean
- Director of Graduate Studies
- Dean of Graduate Studies,

The student may instead elect to be bound by a subsequent catalog. This regulation applies only to the specific course work and the number of semester credit hours required for the academic degree.

Administrative requirements such as minimum grade point requirements for core courses can change for all students with the issuance of a new catalog.

The student should be aware that operating regulations, procedures, tuition and fees can be changed at any time. These are not bound by any catalog.

Application for Graduation

A student must apply for graduation through his/her Department or Program Office by the date specified in the Comet Calendar and the Academic Calendar in order to graduate at the end of a given semester. The student must complete a separate application for graduation for each semester in which an attempt to graduate is made. A student who expects to receive more than one degree in a single semester must complete a separate application for each degree. A late applicant for graduation will incur an additional fee. (refer to the Comet Calendar)

In order to receive a diploma, a student must pay all accounts due the university.

Graduation under In Absentia Registration

In absentia registration for graduation (i.e., registration for no course work) may be arranged for the candidate who has completed all degree requirements including final oral examination, but has not yet submitted final approved copies of thesis, dissertation or other required reports. Such a candidate may, for a nominal fee and with the approval of his/her graduate advisor, the Dean of Graduate Studies, and submission of the approved in absentia registration form, register during the semester or summer session in which the degree will be received. If the final copies of the dissertation or thesis have not been approved by the supervisory committee and received and approved by the Dean of Graduate Studies before the Census day in a given semester, in absentia registration is not acceptable for that semester. This arrangement is not permissible for a candidate who is removing an incomplete (X) grade. All in absentia registration requests must be submitted for approval of the Graduate Dean prior to the Census Day in the semester for which it will apply and the degree will be received.

Graduation Ceremonies

Graduation ceremonies are held at the conclusion of each long semester.
General Property Deposit

Every student must make a general property deposit of $10.00. This deposit is subject to charges for property loss, damage or breakage, or violation of rules in any University Library or laboratory; for failure to return keys furnished by the University; or for damage to, or loss of, any other University property. A student having charges in excess of the deposit must pay the excess immediately upon notice. Pending payment, the student will be subject to a bar against readmission; withholding of grades, degree, and official transcript; and all penalties and actions authorized by law.

This deposit, less charges, will be returned upon written request at the end of the student’s career at The University of Texas at Dallas. A general property deposit that remains without call for refund for a period of four years from the date of last attendance at the university shall be forfeited, and the deposit shall become part of the Student Property Deposit Scholarship Fund.

Tuition and Required Fees

As a state-supported institution of higher education, The University of Texas at Dallas is required to comply with all state laws in the assessment and collection of tuition, fees, and deposits. The tuition, fees, and deposits listed herein are subject to change by state law. Pursuant to Chapter 54, Texas Education Code, each student who registers is required to pay tuition and fees appropriate to the student’s residence classification and according to the number of semester hours for which he or she has registered. It is the student’s responsibility to establish, prior to census day, the correct residence classification through the Office of the Registrar. Likewise, any student wishing to request a change of residence status for tuition purposes should do so through the Office of the Registrar. This will require completion of a residency questionnaire and the provision of documents to support the claim of Texas residency prior to the census day. Rules and regulations for determining residency are found in Appendix III of this catalog. Final authority of appeal for review of residence decisions rests with the Registrar and Assistant Vice President of Academic Records.

In accordance with state laws, a student is not entitled to enter a class or laboratory until registered and all tuition, fees, and deposits have been paid. The University cannot accept personal checks for amounts in excess of the total registration cost.

The University of Texas at Dallas utilizes a consolidated tuition rate, which is capped at 12 semester credit hours for resident graduate students. The consolidated tuition and fee rates cover all academic program costs; including tuition, mandatory fees, and most of the college and course incidental fees. Additional fees that will be charged separately are: field trip fees, supplemental designated tuition fees and distance education fees. The Tuition and Fee Tables can be found on the Bursar Office website.

There are other fees which may be required depending on classes taken and services used. (See “Other User Fees for Courses and Services”.)

Tuition for Excessive Doctoral Hours

For a doctoral student enrolling for the first time in Fall 1999, Section 54.012, Texas Education Code, establishes a maximum number of doctoral hours that a doctoral student may attempt while paying tuition at the rate provided for Texas residents. Attempted hours include all doctoral hours taken at a Texas institution of higher education for which a student was registered as of Census Day, including, but not limited to, courses that have been repeated, failed, and courses from which the student withdrew. The maximum is 99 doctoral hours. A student who exceeds the maximum hours may be charged tuition at the rate charged nonresident doctoral students. The higher tuition rate applies only to those doctoral semester credit hours that exceed 99 hours.

Tuition Installment Payments
A student may elect to pay tuition and fees for the fall and spring semesters and 12-week summer session under the installment payment plan (Section 54.007, Texas Education Code). A $25.00 fee per semester will be assessed each student who elects to pay by installments. Additionally, a late payment fee of $30.00 for delinquent payment will be assessed each time an installment is not paid by the date it is due. In the event of non-payment, the total amount due shall accrue interest from the third payment deadline at the rate of ten percent (10%) per year until the Note is paid in full.

Cooperative Arrangements

The University of Texas System

Concurrent Enrollment

A concurrent enrollment agreement is in place between The University of Texas at Dallas, The University of Texas at Arlington, and The University of Texas Southwestern Medical Branch. This agreement allows any student enrolled concurrently between these institutions to receive a waiver of certain fees (Sec. 54.503(g), Texas Education Code). The student must apply for concurrent enrollment with the Office of the Registrar.

Visiting Student Program

The U.T. System Visiting Student Program is designed to allow a graduate or professional student enrolled in an institution of the U.T. System to take courses or engage in research at another institution within the System during a regular semester or summer session. A U.T. Dallas graduate student, who has been admitted to a degree program at U.T. Dallas, must have completed a minimum of 15 semester credit hours at U.T. Dallas and be in academic good standing in order to be eligible to participate in the visiting student program. Courses to be taken under this visiting student program must have prior approval of the student’s degree program advisor. An approved Leave of Absence also is required. A Visiting student registers and pays tuition and required fees at his/her home institution and is given normal privileges associated with available student services at the exchange institution. A visiting student is subject to the rules and regulations of both institutions. Each U.T. System institution has designated an individual to coordinate and approve graduate or professional visiting students. Interested U.T. Dallas students should contact the Office of the Dean of Graduate Studies for additional information (Phone 972-883-2234; World Wide Web http://www.utdallas.edu/dept/gradsede/). A student at other U.T. System schools wishing to take courses at U.T. Dallas under this visiting student program should contact and work through the graduate dean at the home institution.

Texas A&M University System

A cooperative arrangement between The University of Texas System and the Texas A&M University System allows a graduate student at one institution to use unique facilities or courses at the other institution with a minimum of administrative paperwork. The graduate student registers and pays tuition and fees at the home institution.

Partial Tuition and Fee Exemptions

As a state sponsored institution of higher education in Texas, U.T. Dallas is authorized to award partial tuition and fee exemptions to a student who qualifies based on statutory criteria. Exemptions are available to certain students who have been in foster or other residential care in the State of Texas; certain students who received Aid for Dependent Children benefits during their last year of high school; children of prisoners of war or persons missing in action; certain students who are suffering economic hardship; certain Texas residents who graduate from a public high school within 36 months of original enrollment and completed all years of high school in Texas; residents of Texas who have served in the armed forces of the United States; Texas residents classified by the U.S. Department of Defense as prisoners of war on or after January 1, 1999; children of POW/MIA, students from other nations of the
western hemisphere; blind or deaf students; military personnel and dependents; children of disabled/deceased firefighters and peace officers; fireman enrolled in Fire Science classes, children of Texas veterans; children of professional nursing faculty, preceptors for professional nursing education programs, surviving spouse and minor children of certain police, security or emergency personnel killed in the line of duty; and certified educational aides. Senior citizens who are age 65 or older as of Census Day may be exempted from tuition for up to six semester credit hours each semester or summer term if space is available. Individuals who feel they may qualify under this section are requested to contact the Financial Aid (972) 883 2941.

Nonpayment of Debt

A student who fails to provide full payment of loans, tuition, and fees, including late fees assessed, to the university when the payments are due is subject to one or more of the following actions at the university’s option:

- Bar against registration and/or readmission to the institution;
- Withholding of grades, degree, and official transcript; and
- All penalties and actions authorized by law.

Refund of Tuition and Fees

For the Long Term (Fall and Spring Semesters) and 12-Week Summer Session

- Prior to the first day of a given semester, 100 percent
- During the first five class days, 80 percent of the applicable portion of the tuition and applicable fees
- During the second five class days, 70 percent
- During the third five class days, 50 percent
- During the fourth five class days, 25 percent
- After the fourth five class days and thereafter, nothing

For the 6- and 8-Week Summer Sessions

- Prior to the first day of a given session, 100 percent
- During the first, second, and third class day, 80 percent
- During the fourth, fifth, and sixth class day, 50 percent
- Seventh class day and thereafter, nothing

Separate withdrawal refund schedules may be established for other fees and charges. Refer to the Other User Fees section for refund information.

Cash refunds will not be made to students who request refunds; instead, refund checks will be available at the Bursar Office two business days after the refund is requested unless the student has opted for direct deposit. Direct deposits are normally available 5 to 6 business days fro the day they were requested. Refund checks which are not picked up will be mailed to the current local address on file approximately four weeks after the day the refund was requested.

A student who registers before receiving grades from the previous semester, and who is required to withdraw because of failure in the work of the previous semester, will have all fees for the current semester refunded.

No refunds will be granted unless application is made within one year after official withdrawal.

All policies regarding the payment or refunding of tuition, fees, and charges are approved by the Board of Regents of The University of Texas System and comply with applicable state statutes. If a
person desires clarification of any matter relating to payment or refund of such charges, he or she should contact the office or administrative unit from which the charge or refund originated.

**Refunding for Students in Title IV Programs**

As an institution participating in programs under Title IV of the Higher Education Act of 1965 as amended ("Act"), U.T. Dallas is required to refund unearned tuition, fees, room and board, and other charges to certain students attending the institution for the first time who have received a grant, a loan, or work assistance under Title IV of the Act or whose parents have received a loan on their behalf under 20 U.S.C. Section 1087-2. The refund is required if the student does not register for, withdraws from, or otherwise fails to complete the period of enrollment for which the financial assistance was intended. No refund is required if the student withdraws after a point in time that is sixty percent of the period of enrollment for which the charges were assessed. A student who withdraws prior to that time is entitled to a refund of tuition, fees, room and board, and other charges that is the larger of the amount provided for in Section 54.006, Texas Education Code, or a pro rata refund calculated pursuant to Section 484B of the Act, reduced by the amount of any unpaid charges and a reasonable administrative fee not to exceed the lesser of five percent of the tuition, fees, room and board, and other charges that were assessed for the enrollment period, or one hundred dollars. If the student’s charges were paid by Title IV funds, a portion or all of the refund will be returned to these programs.
Academic Common Market

Texas is one of fifteen states participating in the Academic Common Market, an interstate agreement for sharing state-supported graduate programs. Residents of member states who are accepted for admission into selected out-of-state graduate programs may enroll on an in-state rather than out-of-state tuition basis. Programs are selected by the states annually. Information about U.T. Dallas graduate programs selected for the ACM by other states is available from the Office of the Dean of Graduate Studies. After acceptance into an ACM program, it is necessary to obtain certification of residency from the Texas Coordinator for the Academic Common Market: Assistant Commissioner, Universities Division, Texas Higher Education Coordinating Board, P. O. Box 12788, Capitol Station, Austin, Texas 78711.

For residents of Texas, a number of programs are available at in-state tuition rates (those in-state rates applicable to the state where the graduate program is offered). For a listing of these programs, or for more information, write to the Texas Higher Education Coordinating Board, P. O. Box 12788, Capitol Station; Austin, Texas 78711 or visit its web site at http://www.thecb.state.tx.us/.

Internship/Cooperative Education Program

For Graduate Students, the Internship/Cooperative Education Program (Internships) provides an opportunity to gain professional work experience related to a particular field of study. An internship is meant to be educational in nature. Internships can be paid or unpaid, and in many cases can be completed for academic credit to be used toward a degree requirement. Completing an internship to add to a resume is a strong way to improve options for full-time employment after graduation.

The UT Dallas Career Center Internship Program provides students with the information and tools necessary to successfully navigate the internship process, from orientation to the program itself to evaluation at the end of the semester. Internship program staff members provide information about eligibility, preparation, and academic credit options, and assistance with the internship search. Students can also get information about the possibility of completing an internship at their current place of full-time employment.

To get registered with the internship program, a student must:

- register for a UTD CareerWorks account
- attend an Internship or CPT (international students only) Information Session
- schedule an individual appointment with an Internship Coordinator at the Career Center.

The Career Center recommends that a student begin searching for an internship one semester or more in advance of the desired starting semester. The Career Center also recommends that the student take advantage of other services, including resume critiques and mock interviews, to be most successful in the internship search. For more information about the program, contact the Career Center in McDermott Library 1.312. (Phone: 972-883-2943, Web: www.utdallas.edu/career, Email: careercenter@utdallas.edu).

Learning Resources

The Learning Resource Center offers assistance to students in the areas of reading, writing, mathematics, and study skills. These services are available through individual appointments, group workshops, short courses, and audio and video tapes. The Writing Lab offers one-to-one assistance with writing assignments and general writing skills. Appointments are required. The Math Lab gives short-term and semester-long support for a variety of mathematics courses. Students may drop in or visit these labs on a regular basis. The Supplemental Instruction program offers facilitated group study sessions as a supplement to many U.T. Dallas courses. Students should check with the center for availability of individual tutoring in specific subjects. The Learning Resource Center also offers
developmental math, reading, and writing classes. These classes are for credit, but they do not count toward graduation.

Assistance is also available in study skills, notetaking, writing, test taking, algebra, and preparation for the TASP (required for teacher certification), GRE, GMAT, and LSAT. In addition, students can receive help with time management, basic mathematics improvement, test-anxiety reduction, and various other study techniques and strategies. All students enrolled at the university are eligible for these services.

The center may be contacted at 972-883-6707.

**Fee Schedule**

Tuition tables for current semesters may be found on the [Bursar Office website](#) or on the [Course Lookup](#) page.

Tuition and fees are subject to change by legislative or regental action. The Texas Legislature does not set the specific amount for any particular fee. The student fees assessed to students are authorized by state statute; however, the specific fee amounts and the determination to increase fees are made by the university administration and The University of Texas System Board of Regents.

Changes in tuition and fees will be effective upon date of enactment and will be reflected in fees and tuition charged. Specific tuition and fees for each term can be found on the [Bursar Office](#) website. Students taking courses in the School of Behavioral and Brain Sciences may be required to purchase professional liability insurance if they are in certain clinical experiences.

For residents of Oklahoma, tuition is the Texas resident rate shown for "Each Additional Hour" plus thirty dollars ($30.00) per semester credit hour. Oklahoma residents must apply for this tuition waiver each semester through the Office of [Financial Aid](#).
Other User Fees for Courses and Services*

* The following information is not intended to be comprehensive and is subject to change. Tuition and fees are subject to change by legislative or regental action, and changes become effective on the date of enactment. The Texas Legislature does not set the specific amount for any particular student fee. The student fees assessed below are authorized by state statute; however, the specific fee amounts and the determination to increase fees are made by the University administration and The University of Texas System Board of Regents. Fees can be found on the Bursar Office website for each term.

Application Fee: A nonrefundable application fee of $50.00 is required of all students applying for admission to The University of Texas at Dallas during the regular application period. If a student submits an application after the application deadline but prior to the documentation deadline, the application fee is $125.00 in order to process the application for decision in time to register for classes. An additional $50.00 international document evaluation fee is required for those who have educational documents from countries other than the United States. Please refer to the Enrollment Services website for application deadlines.

Audit Fee: Students at The University of Texas at Dallas may, with the approval of the instructor and of the Office of the Registrar, audit courses. Auditing grants only the privilege of hearing and observing and does not grant credit. When approval has been granted, the applicant pays a fee of $100.00 per course. A student may withdraw from an audit course, but the fee will not be refunded. Persons 65 or over are permitted to audit without paying a fee. They must, however, qualify otherwise (see "Auditing"), complete the audit form, and have the consent of the instructor. Audit registration is permitted only during the late registration period of each semester or term.

Change of Major Fee: There is a $50.00 fee for a student changing majors more than two times in an academic year.

Practical Training Fee: A $100.00 per semester fee is charged to assist in funding the administrative and clerical expenses required to review records and process the forms required by the United States Citizenship and Immigration Service to certify international students for placement in curricular or optional practical training assignments.

Diploma Replacement or Duplicate Fee: A $10.00 fee is required to defray the cost of preparing a replacement or duplicate diploma. An additional $25.00 will be charged to mail a diploma to a foreign address.

Distance Learning Fee: A fee is assessed per semester credit hour to enroll in distance education courses offered over the Internet. A resident or non-resident student taking courses offered by the School of Management is charged $80.00 per semester credit hour. A student enrolled in courses offered through the U.T. TeleCampus by the School of Engineering and Computer Science is assessed $50.00 per semester credit hour. A student enrolled in Teacher Education TeleCampus courses will be charged $25.00 per semester credit hour.

Field Trip Fee: This fee is assessed to cover the costs of transportation, food, and/or lodging associated with a field trip. The amount of the fee varies depending on the destination and duration of the field trip. Every effort will be made to advise students of the field trip costs associated with a particular course at the time of registration, and the appropriate fee will be assessed at that time. Refund provisions do not apply to this fee.

Health Insurance Fee: A variable fee to pay the student’s premium for the approved U.T. Dallas student health insurance plan available to all students and required for an international students (students who are not US Citizens, US Permanent Residents, Asylees, Refugees of undocumented aliens). In Absentia Registration: A student who registers in absentia shall pay a nonrefundable/nontransferable registration fee of $100.00.
Installment Plan Handling Fee: A $25.00 fee to cover costs of providing a payment option for a student in full term fall or spring semester courses will be assessed. The plan is also available for a student enrolled in the 12-week summer semester.

Installment Plan Late Fee: A late payment fee of $30.00 for delinquent payment will be assessed if the second or third tuition installment is not paid by the date it is due. In the event of non-payment, the total amount due shall accrue interest from the third payment deadline at the rate of ten percent (10%) per year until the note is paid in full.

Institutional Loan Delinquency Fee: A late charge of $30.00 per month ($90.00 maximum per note) will be assessed to a student who does not repay his/her loan in accordance with the terms of the note.

International Student Special Services Fee: A $100.00 per semester fee will be assessed for on-going review and certification of a student with non-immigrant visa status in accord with federal regulations.

Late Course Add Fee: A $100.00 per course fee is assessed when a registered student adds a course after Census Day.

Late Graduation Fee: A $100.00 non-refundable, non-transferable fee is assessed when an approved application for graduation is received after the deadline.

Late Registration/Late Payment Fee: A nonrefundable charge of $100.00 with additional increments of $50.00 based on the number of days past the regular registration/payment deadline is required to defray costs associated with extending registration times.

Library Fines and Charges: Fines and fees for overdue library items are as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Fee</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Stacks</td>
<td>$0.50/day</td>
<td>$30.00</td>
</tr>
<tr>
<td>Recalled items</td>
<td>$1.00/day</td>
<td>$50.00</td>
</tr>
<tr>
<td>Reserves/Reserves</td>
<td>$0.10/day</td>
<td>$50.00</td>
</tr>
<tr>
<td>Media</td>
<td>$1.00/day</td>
<td>$7.00</td>
</tr>
<tr>
<td>Information Commons</td>
<td>$0.10/minute</td>
<td>$50.00</td>
</tr>
<tr>
<td>Laptop</td>
<td>$0.10/minute</td>
<td>$50.00</td>
</tr>
<tr>
<td>Lost items</td>
<td>replacement cost of the item, $25.00 processing fee, and any overdue fines.</td>
<td></td>
</tr>
</tbody>
</table>

*Copies of the fine schedule can be obtained at the McDermott Library Circulation/Reserve Desk. Individuals who fail to return overdue library materials may be subject to criminal action for theft.

Parking Fees: A parking decal is required to park any motorized vehicle on campus. Any vehicle parked on campus that does not display a current parking decal will be subject to a parking citation. Decal fees may be found on the other fees schedule at http://finance.utdallas.edu/bursar/schedule-introduction.html. Students may purchase the following hang tags at the Bursar Office:

- Green: Allows students to park in campus green spaces
- Gold: Allows students to park in campus gold or green spaces
- Evening Orange: Allows students to park in orange marked spaces after 5pm or gold and green spaces anytime.

Waterview parking – A parking decal is required for all residents of the Waterview apartments. The following options are available:

- Waterview Only: Allows students to park in Waterview parking ONLY.
- Waterview Green: Allows students to park in Waterview parking or in greecampus spaces.
- Waterview Gold: Allows students to park in Waterview parking or in campus gold or green spaces.

Note: Only one hang tag may be sold per student residing in the Waterview Apartments.
Parking hang tags are refundable on a prorated basis with the exception of the Waterview Only hang tag.

The Dallas Area Rapid Transit System (DART) provides bus service to the campus from the Richardson transfer terminal. Contact DART for schedule information. Students are eligible for free transit passes from DART which are available through the Info Depot, located on the second floor of the Student Union.

**Recreational Sports Group Exercise/Non-credit Course Fees:** A $50.00 per course fee will be assessed for each group exercise class or non-credit course a student chooses to participate in.

**Recreational Sports Locker Rental Fee:** An optional locker rental fee of $5.00 - $15.00 (based on the size of the locker rented) per semester is required.

**Recreational Sports Towel Service Fee:** An optional towel service of $10.00 per semester is required.

**Reinstatement Fee (Prior to Census Day):** After the payment deadline for each semester, all registration for which tuition and fee payments have not been received may be canceled. If a student requests that the courses be reinstated before Census Day, a $25.00 reinstatement fee will be charged in addition to a graduated late registration fee. No student will be reinstated into a class that has been closed.

**Reinstatement Fee (After Census Day):** A $300.00 fee will be assessed, in addition to tuition and required fees, to enroll a student after Census Day.

**Returned Check Fee:** A student will be assessed a $25.00 fee for each returned check unless his/her bank provides written notification it was at fault. If a student writes bad checks to the university for tuition and fees the student’s registration will be canceled unless full payment is made by the census day listed in the Academic Calendar online.

**Student Identification Card Replacement Fee:** A $20.00 fee is required to defray the costs of reissuing a student ID card.

**Student Teaching Supervisory Fee:** A $250.00 per field experience fee is required to defray costs of providing university supervisors and travel of university supervisors of student teachers.

**Supplemental Designated Tuition:** A $40.00 per semester credit hour fee will be assessed for students enrolled in any School of Management, School of Engineering and Computer Science, School of Arts and Humanities ATEC course or School of Behavioral and Brain Sciences graduate Speech Language or Audiology (COMD or AUD) course. These fees are assessed to defray the higher costs associated with instruction in these schools.

**Universities Center at Dallas Fee:** A $15.00 per semester credit hour fee is required to defray the costs of courses taken at the Universities Center at Dallas.
Student Financial Aid

Teaching and Research Assistantships

Teaching Assistantships are available on a limited basis in most graduate programs. Also, many faculty members have research projects which provide Research Assistantships. These Teaching and Research Assistantships normally involve half-time employment and are awarded on the basis of merit. Students holding these assistantships must be enrolled for a minimum of nine semester hours for each regular semester in which the assistantship is awarded. The Dean of each school designates the minimum semester hours for a summer session. A student on a Teaching/Research Assistantship who is enrolled in the minimum number of hours and wishes to drop a course must obtain the signature of the Dean of Graduate Studies. Students on probation will not be supported on an assistantship. Applications should be made to the appropriate Graduate Program office at least 60 days prior to the date of registration.

Prior to their appointment as Teaching Assistants, international students must meet the English requirements described in the “English Requirements for Teaching Assistants” section. All TA’s are required to attend TA Orientation held immediately prior to fall and spring semesters.

Student Financial Aid Office

The Student Financial Aid Office is available to assist students in obtaining funds to attend the university. Aid is available in the form of loans, grants, and part-time employment or any combination of those programs. Limited numbers of scholarships are available. The total amount of aid the student receives depends on the level of financial need, submission of appropriate financial information and applications, academic records, and the availability of funds.

Students are encouraged to contact the Financial Aid Office to obtain appropriate application materials and to determine eligibility for the various forms of aid available. The Financial Aid Office is located in the lower level of McDermott Library.

Students may also apply for financial aid, check the status of their application, or contact the Financial Aid Office.

Eligibility for Financial Aid

Most of the aid listed in this catalog is awarded on the basis of financial need. Students are encouraged to determine the amount of resources that they can provide toward their education and to compare it with the average cost of attending the University. Student budgets are reviewed annually in accordance with federally accepted guidelines. Federal guidelines outline what can be included in student budgets. The costs of tuition, fees, books, supplies, room and board, in-city transportation, and a limited amount for other personal expenses are the basic components of student budgets. Unusual expenses, such as childcare costs or the student’s medical disability, will be considered when they have been properly documented.

Financial need is defined as the difference between the cost of attending the university and the amount a student and family can reasonably provide. The amount of the expected family contribution is based on federal guidelines reflecting total family income, assets, and number of dependent children currently attending post-secondary educational institutions. Family contribution is expected unless it is clearly established that the student is independent of any family support.

In determining whether a student is considered independent or self-supporting, the Financial Aid Office adheres to the standards set by the Department of Education to establish an applicant’s dependency status. Students 24 years or older are considered financially independent. Students under the age of 24 are considered financially dependent unless they are orphans, wards of the court, veterans, graduate students, married, or unmarried but with legal dependents. Both self-supporting and
dependent students must submit a Free Application for Federal Student Aid (FAFSA) form in order that a
determination can be made of the expected resources available to the applicants.

Selective Service

Male students between the ages of 18 and 26 must be registered with Selective Service to
qualify for Federal student loans or grant programs. This includes College Work Study, Federal Stafford
Student/Plus Loans, and Federal Perkins Student Loans. The Selective Service requirement also applies
to Texas student loans or grant programs. Students may register with Selective Service by visiting their
local postal office or online. Graduate students wanting to verify their Selective Service registration may
do so online by visiting the Selective Service site.

Students subject to selective service registration will be required to file a statement that the
student has registered or is exempt from selective service registration in order to be eligible to apply for
federal financial aid. In addition, effective January 1, 1998, the selective service requirement is also
applicable to students applying for financial assistance funded by State revenue.

Required Course Load

The course load requirement for students receiving each type of aid is at least one-half the
normal course load. Graduate students must be enrolled in no less than 5 credit hours during any term
of enrollment. Teaching Assistants and Research Assistants, however, must maintain a course load
designated by the Dean in the school to which they have been assigned. Aid recipients should not
reduce their course loads below the qualifying minimum hours as it may affect receiving financial
assistance at a later date.

Basis for the Type of Financial Aid

The aid package awarded to a student may consist of a loan, grant, scholarship, part-time job, or
any combination of these programs. The total amount of aid the student receives depends on the level
of financial need, submission of appropriate financial information and applications, academic records,
and the availability of funds.

Satisfactory Academic Progress Policy for Federal Financial Aid

The University of Texas at Dallas has a “Satisfactory Academic Progress” policy for a student
receiving federal student financial assistance.

Generally, the student is expected to remain in good standing by the satisfactory completion of
a minimum number of credit hours, based on a percentage of the credit hours attempted and
completed. This completion rate may vary depending on the student’s academic level and credit hour
load. In addition, graduate students must maintain a GPA of 3.0 or above. For online information on the
Satisfactory Academic Progress policy, visit the financial aid site and link to “ELIGIBILITY”. For more
detailed information the student should contact the Financial Aid office. A copy of the Satisfactory
Academic Progress policy is made available to all recipients of financial aid and is available online on our
web site.

Renewal of Financial Aid

For a student to be considered for a renewal of financial aid, a new Free Application for Federal
Student Aid (FAFSA) and supporting documents must be submitted for each academic year. The
awarding of renewal aid is subject to the same considerations used in awarding all previous financial
assistance.

Revocation of Aid

Financial aid packages are reviewed by the Financial Aid Office and canceled if the student fails
to maintain a satisfactory record of academic progress or to enroll for and maintain the minimum
number of course load hours. Aid packages may also be revoked because of changes in financial status. Partial or full repayment of awards may be required. In some instances, immediate repayment may be required.

Any change in a recipient’s financial situation, such as additional scholarships, loans, or change in employment status, must be reported to the Financial Aid Office, because compliance with federal regulations may require a revision of awards.

Types of Financial Aid

Following is a summary of the types of assistance that are available to graduate students at The University of Texas at Dallas. The student should be aware that many of the programs are subject to change without notice by the state or federal government. Information on all programs may be obtained from the Financial Aid office unless otherwise noted.

Texas Public Education Grant

An act of the 64th Texas Legislature established a grant program to provide financial assistance to students. This program is funded through appropriation of a portion of the tuition charge for resident and nonresident students. Graduate students receiving Teaching Assistantships or Research Assistantship appointments may apply for a Texas Public Education Grant through their academic program. Texas Public Education Grants may be awarded through the Financial Aid Office.

Educational Assistance Grant

Funds through this program are made available through a set-aside of Designated Tuition. Graduate students demonstrating financial aid need through a completed FAFSA will be considered for aid. Amount of award will vary each year based on availability of funds.

International Education Fund Scholarship

Through the proceeds from the International Education fee, scholarships are available for study-abroad programs. These scholarships are open to both graduate and undergraduate students enrolled at least one-half time (six hours or more). Graduate students should be admitted to a degree program and have a GPA of 3.0. While abroad, the recipient of this scholarship must be enrolled in a full-time course of study. Course work undertaken must apply to the student’s degree program.

Hazlewood Veteran Tuition Exemption

Certain veterans who have served on active military duty, who were residents of Texas at the time of entry into the service, who have resided in Texas for the last 12 months prior to the date of registration, and whose entitlement to educational benefits under federal legislation has been exhausted, are eligible for exemption from the payment of tuition, general fee and laboratory fees. However, an individual who has “exhausted his/her federal education benefit” as a result of a default on a federal or state loan may NOT receive the Hazlewood benefit. These exemptions also apply to children of those members of the Armed Forces killed in action, missing in action, who became totally disabled for purposes of employability as a result of a service related injury or who died while in service, or whose death is documented to be directly caused by illness or injury connected with service in the armed forces, and to children of those members of the Texas National Guard killed since January 1, 1946 while on active duty. This exemption can be used if a students federal veterans benefits are less than the hazlewood exemption value, the student may receive a hazlewood exemption that equals the difference between total tuition and fees and the federal veteran benefits for a state funded program. Effective Fall 1995, there will be a maximum of 150 credit hours (including remedial courses) of work for which a person may receive benefit under the Act. This accrual will begin with the Fall 1995 semester. Applications are available in the Financial Aid office or online at http://financial-aid.utdallas.edu.
Federal Perkins Loan Program

This loan program provides a combination of federal and institutional funds to students who qualify on the basis of financial need. High priority is given to those students who demonstrate exceptional need.

A graduate student may borrow up to a maximum amount of $30,000 which includes all undergraduate Federal Perkins loans.

A Federal Perkins loan bears a modest interest rate. Borrowers are required to begin repayment of principal and interest six months after they cease to be at least half-time students. Repayment may extend over a ten-year period; however, there is a minimum rate of repayment.

Hinson-Hazlewood College Student Loan Program

Texas residents who meet eligibility requirements may borrow funds to meet a portion of their school expenses. The loan carries a modest interest rate. Repayment begins six months after graduation or withdrawal from the university.

Federal Stafford Student Loan Program

Funds from this program are made available to the student from lending institutions such as banks, savings and loan associations, and credit unions. Students must qualify for a Stafford Student Loan on the basis of financial need.

The loans are made at a modest interest rate and there exists a maximum amount which can be borrowed for a given academic year. See the Financial Aid office concerning the maximum loan amount. The borrower will be required to begin repayment of principal and interest upon graduation or after he or she ceases to be at least a half-time student. Repayment may extend over ten years, but the program requires a minimum monthly payment.

Graduate students admitted to graduate studies as Non-degree students because they lack prerequisite coursework or need to take the appropriate test(s) (GMAT or GRE) before being admitted to a UTD degree program are limited to the following conditions:

- May receive financial aid for no more than 12 consecutive months under the Non-degree status. At the end of the 12 months, the student must be admitted to a degree program to continue their eligibility for financial aid.
- May borrow through the Federal Stafford Loan program at the 5th year, undergraduate level maximums.

Short-Term Emergency Loans

Students needing emergency help with educational expenses may borrow from the short-term loan fund. Loans must be repaid within 60 days from the date of issuance or one week prior to the end of the term for which the student applied for the short term loan, whichever comes first. A late fee of $30.00 per month will be charged, up to a maximum of $90.00 per loan. Contributions to these funds have been made by Mrs. Lloyd V. Berkner, Mr. and Mrs. Louis Castelli, the Kiwanis Club of Richardson, Rotary Club of Richardson, Richardson Savings and Loan Association, the First Texas Savings and Loan Association of Dallas, Richardson Altrusa Club, Chaparral Steel Company, and funds set aside out of student tuition.

Federal College Work Study Program

College work study employment is available to students on the basis of demonstrated financial need. The acceptance of employment reduces the amount of loan assistance a student will be permitted to accept in order to meet financial need to cover educational expenses.
Compensation depends on the type of job, qualifications, and classification. The number of hours and work schedule will vary depending on the position. For information on job availability, students need to contact the Career Center at (972) 883-2943.

**Other On-Campus Employment**

Various programs and schools of the university employ students in positions that are not work-study positions and are not based on need. In accordance with appropriate guidelines, pay scales depend on the type of job, qualifications, and classification. Normally, students will be employed for a maximum of 19.5 hours per week. Students interested in these positions should contact the Career Center at (972) 883-2943.

Information concerning student financial aid is accurate at the time of printing. Changes in regulations or policy on a federal, state, university, private lending, or donor level could affect the type and amount of programs available and/or program requirements. The Financial Aid Office has detailed information available upon request.

**Scholarship Programs**

Information about a variety of scholarships awarded on the basis of academic merit and achievement is available from the Office of Financial Aid. The University of Texas at Dallas also offers a number of endowed scholarships that are administered by a school, department, or program. Students are encouraged to contact their school dean or program office to obtain information about eligibility criteria and scholarships awarded in the student’s area of study.

In accord with Chapter 51, of the Texas Education Code, all applications for competitive academic scholarships for graduate study are reviewed by the Committee on Student Scholarships and/or the Graduate Scholarship Committee in the appropriate academic unit. Please visit [UT Dallas Scholarships](#) for more information.

Graduate Scholarships Selection Criteria:
- Good academic standing
- Show academic promise
- Full or part-time
- Pursuing a program of study leading to a degree
- May show financial need but not required
The Career Center offers services to help students prepare for their careers. The staff assists students with career counseling and editing assistance for all job search documents. In-depth information is available, including webinars and podcasts, on the Career Center’s website. The Career Center provides pre-employment preparation assistance through mock interviews and a variety of seminars on such topics as resume writing, business letter writing, identifying marketable skills, interviewing skills, and conducting an effective job search. The Career Center offers a credential file service to assist PhD students applying for academic positions after graduation.

Representatives of business, government, industry, education, and social agencies recruit UT-Dallas students and alumni at career expos and on-campus interviews. The Career Center manages the Internship/Cooperative Education program for all majors, except EE/CS majors. On-campus employment is also managed by the Career Center, with the exception of TA and RA positions.

Part-time jobs, both on-campus and off-campus, full-time jobs, and on-campus interview schedules are posted through an online database called UTD CareerWorks. All students register for UTD CareerWorks by accessing the Career Center website. Students upload a résumé into the system in order to apply for qualified positions or to make it available for employer referrals. Employers may have access to candidate résumés via various web résumé books set up in the UTD CareerWorks system.

For more information, contact the Career Center in the McDermott Library, RM 1.312 (Phone: (972)883-2943), Web: http://www.utdallas.edu/career/, Email: careercenter@utdallas.edu.
**Student Affairs**

The Division of Student Affairs, under the direction of the Vice President for Student Affairs, offers a variety of student services and programs to enhance the educational experience of all enrolled students.

**Career Center**

The Career Center offers services to help students prepare for their careers and internships, including career counseling, career and job search workshops, job and internship fairs and electronic job listings and resume referrals. For additional information call (972) 883-2943 or go to www.utdallas.edu/careers.

**Center for Student Involvement**

The Center for Student Involvement (CSI) helps UT Dallas students become more connected to campus life. CSI provides programming and services for student organizations and for students interested in participating in many activities at UT Dallas. Visit us in the Student Union (SU2.506) or on the web at www.utdallas.edu/csi.

**Child Care Center**

The Dallas International School (DIS) and UT Dallas jointly provide evening child care. Parents who attend classes are eligible for child care services during their class hours for children ages 4 to 11. Child care hours are from 4:30 p.m. to 10:30 p.m., Monday-Thursday. To register your child/children for the child care program please complete each of the forms in the enrollment packet. Call 972-883-6391 to have a packet sent to you, or pick one up in the Student Union (SU), Room 1.602.

**Comet Card**

The Comet Card is the official University identification card for all students, faculty, and staff. The Comet Card allows the use of campus facilities and services and offers an optional campus account for on-campus purchases and payments. The card can also be linked to a Wells Fargo checking account and used as an ATM/PIN-debit card. Cards are issued through the Comet Center located in the Student Union. Call (972) 883-2495 or go to www.utdallas.edu/cometcard for information.

**Comet Center**

The Comet Center, located on the second floor of the Student Union, is the UT Dallas information hub. Students can pick up Comet Cards and DART passes or purchase postage stamps and discount tickets to movies, museums and other local attractions. See www.utdallas.edu/cometcenter for more information.

**Dean of Students**

The Dean of Students provides leadership in the development, overall management and supervision of student services programs and serves as in information/referral source for students needing assistance in any situation. The Dean of Students Office is in the Student Union (SU1.602) and can be contacted at 972-883-6391 or on the web at www.utdallas.edu/deanofstudents.

**Disability Services**

Disability Services ensures that qualified students with documented disabilities have an equal opportunity to participate in educational, recreational and social opportunities at UT Dallas. Students with disabilities are urged to contact Disability Services as soon as they are admitted to the University. Disability Services is located in the Student Union (SU1.610) and can be contacted at 972-883-2098 or on the web at www.utdallas.edu/disability.
Fraternity and Sorority Life
UT Dallas is home to 15 national Greek fraternities and sororities that provide students with opportunities for friendship, guidance, service and leadership. For more information call 972-883-6158 or go to www.utdallas.edu/porgreek.

Intercollegiate Athletics
UT Dallas is a member of the NCAA Division III American Southwest Conference. The UT Dallas athletic program includes men’s and women’s soccer, golf, basketball, tennis, and cross country, men’s baseball, women’s softball, and women’s volleyball teams. Graduate students are able to participate only if their undergraduate degree is from UT Dallas and they still have NCAA eligibility remaining. Administrative offices are located in the Activity Center. For additional information call (972) 883-4490 or go to cometsports.utdallas.edu.

International Student Services
The International Student Services Office houses the International Student Programs, International Student Advising, and Student Health Insurance services for the international student population at UT Dallas. The Office organizes on- and off-campus programs which allow international students to be a part of a variety of US cultural experiences, as well as educational events for US students wanting to participate in multicultural activities. The ISS Office provides immigration information for F and J students through seminars, individual student appointments, and outreach to provide students with UT Dallas and Immigration Service information affecting their status. The UT Dallas Student Health Insurance Program provides information to international and domestic students on the University approved health insurance plan, and helps students using this plan to effectively navigate the US Health Care system. The International Student Services office may be contacted by calling (972) 883-4189 and more information can be found at www.utdallas.edu/international.

Judicial Affairs
A part of the Dean of Students Office, the Office of Judicial Affairs promotes academic integrity and is responsible for investigating allegations of scholastic dishonesty and implementing the discipline process. More information can be found at www.utdallas.edu/judicialaffairs or by calling 972-883-6333.

Leadership Education and Development
Offered through the Dean of Students Office, non-credit leadership classes help students to develop and enhance competence and self-knowledge as it pertains to leadership in a global society. For more information call 972-883-6391 or go to www.utdallas.edu/leadership.

Living Learning Communities
Living Learning communities allow small groups of select freshmen who share common academic objectives, goals, and interests to develop a support network with other students, peer advisors and faculty/staff members. Communities are built around academic interests with a faculty or staff advisor who facilitates distinctive academic and social opportunities that help students extend their learning beyond the classroom. For more information call 972-883-6395 or go to www.utdallas.edu/livinglearning.

New Student Programs
New Student Programs offers orientations, counseling, peer support and other resources to get new students off to a strong start at UT Dallas. For more information call 972-883-6171 or go to www.utdallas.edu/newstudentprograms.

Parent and Family Association
The Parent and Family Association is an avenue for family members and parents of UT Dallas students to get information about the campus and be involved in their student’s campus experience. For more information call 972-883-6171 or go to www.utdallas.edu/pfa.

Recreational Sports
Recreational Sports provides UT Dallas students with diverse recreational programs to enhance their overall educational experience. Recreational facilities include a state-of-the-art fitness center, racquetball courts, squash courts, basketball courts, a multi-purpose room, an indoor swimming pool, sand volleyball courts, soccer fields, tennis courts, softball fields and baseball fields. Recreational Sports offers students opportunity to participate in a variety of intramural and club sports, group exercise and non-credit courses. For additional information call (972) 883-2096 or go to www.utdallas.edu/recsports.

Residential Life
Residential Life and its student-support team of Peer Advisors are committed to seeing that every resident student has a safe, comfortable and welcoming environment in which to live and learn. For more information call 972-883-5361 or go to www.utdallas.edu/housing.

Spirit Squads
Temoc is the official mascot of UT Dallas and works with the UT Dallas cheerleaders and power dancers to build school spirit, promote community and cheer the Comets on to victory (www.utdallas.edu/spirit).

Student Counseling Services
The Student Counseling Center is staffed by psychologists and counselors who are available to help students with personal and interpersonal problems. Services include individual counseling for personal or educational concerns, marital/family counseling, group counseling, crisis counseling and stress reduction, and special workshops/programs relevant to student needs. In addition, a personal development book and tape library is available and materials may be checked out.
All counseling services and records are held confidential to the extent permitted by law and are governed by the Family Educational Rights and Privacy Act, the Texas Open Records Act, and Article 5561(h), Vernon’s Annotated Texas Civil Statutes. The Student Counseling Center is located in the Student Union (SU1.608). For more information call (972) 883-2575 or go to www.utdallas.edu/counseling.

Student Government
Student Government is the official representative body and voice of UT Dallas students. Students have the opportunity to participate through serving on committees, running for office, or voting in elections. Student Government provides many free services for students, including legal counsel, an online book exchange, and the Comet Discount Program. Further information may be obtained from the Student Government Offices in the Student Union (SU2.604), by calling (972) 883-2284, or by going to www.utdallas.edu/student/sg.

Student Health Center
The Student Health Center offers routine medical treatment to all currently enrolled students who have paid their tuition and are attending classes. Services include diagnosis and treatment of acute illnesses and injuries, general medical problems, gynecological problems, health education and counseling, and limited immunizations. Care providers include Nurse Practitioners and a Staff Physician. While there is no cost for most services, there are charges for laboratory services, medication and specific procedures provided at the Health Center. All services or treatment obtained from facilities
other than the campus health center are the responsibility of the individual student. The staff at the Health Center can make referrals as indicated.

Information about bacterial meningitis is available upon request at the Student Health Center and is also distributed in Orientation packets, on the graduate and undergraduate applications for admission to the University, and in the *UTD Mercury*, at the beginning of each semester.

All medical services and records are held confidential to the extent permitted by law and are governed by the Family Educational Rights and Privacy Act, the Texas Open Records Act, and Article 5561(h), Vernon’s Annotated Texas Civil Statutes. The Student Health Center is located in the Student Union (SU1.606). Call (972)883-2747 for more information or go to www.utdallas.edu/healthcenter.

The Health Education office is also part of the Student Health Center. Health Education programming is presented to students throughout the year on many health topics such as HIV, STD’s, nutrition, alcohol/drug abuse. Call (972) 883-4275 or go to www.utdallas.edu/healthed for more information.

**Student Health Insurance**

The University of Texas at Dallas Student Health Insurance Office provides unique and confidential health insurance advising services for UT Dallas students. Health insurance is available to all students at UT Dallas and is required of all international students (students who are not US Citizens, US Permanent Residents, Asylees, Refugees or undocumented aliens). Effective Spring 2009, all international students will be assessed the Student Health Insurance (SHI) fee at the time of registration for classes. Contact the International Student Services Office for more information at 972-883-4189 or on the web at www.utdallas.edu/insurance.

**Student Media**

The award-winning student newspaper of UT Dallas, *The UTD Mercury*, publishes bi-weekly on Mondays throughout the school year. The newspaper offers paid positions for writers, editors, page designers and photographers (mercury.utdallas.edu).

Radio UTD, the student-run internet radio station, features an eclectic and freeform mix of music and original programming including talk, poetry and live coverage of UT Dallas sports. *College Music Journal* nominated Radio UTD as one of the best internet radio stations in the United States (radio.utdallas.edu).

*A Modest Proposal*, a student publication that focuses on student life, global politics, arts, events, and social commentary, publishes eight editions during the fall and spring semesters each year (amp.utdallas.edu).

UTD TV, a web-based television station, was launched in 2009. It provides a new medium for broadcasting news, entertainment shows and other content produced by students, staff and faculty (tv.utdallas.edu).

**Student Organizations**

Registered student organizations provide the major means by which students can contribute to campus life while developing friendships, interests, talents, and leadership skills. These groups include academic and honor groups, service clubs, religious groups, ethnic groups, and special interest groups.

Detailed information on current groups and guidelines for forming new organizations are available on the web at www.utdallas.edu/csi, in the Center for Student Involvement in the Student Union (SU2.506), or by calling (972) 883-6223.

**Student Union**

The Student Union is a place for students to hang out, grab a bite to eat and just relax. Open seven days a week, it includes a TV lounge, study lounges, pool tables, ping-pong tables, a video arcade,
the Comet Café, The Pub and a number of meeting rooms that can be reserved for organization
meetings (www.utdallas.edu/union).

**Student Union and Activities Advisory Board (SUAAB)**

SUAAB is a student leadership group that offers a variety of events including the annual
Homecoming Dance, Casino Night, Springapalooza, movies, comedians, concerts, pep rallies and more
(www.utdallas.edu/suaab).

**Student Volunteerism**

The Student Volunteerism Program offers students a variety of opportunities to lend their time
and talents in service to the communities of UT Dallas, North Central Texas and beyond. Programs
include Alternative Spring Break, Service Saturdays and Viva Volunteer among others. The Office of
Student Volunteerism is located in the Student Union (SU1.610) and can be contacted at (972) 883-6393
or on the web at www.utdallas.edu/volunteer.

**Transfer Student Services**

The Transfer Student Services Office provides support to new and returning transfer students to
effect their successful transition into UT Dallas. The Transfer Student Services Office is located in the
Student Union (SU1.610) and can be contacted at (972) 883-6204 or on the web at
www.utdallas.edu/transferservices.

**Nondiscrimination Policy**

The University is committed to a policy of nondiscrimination 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 at (972) 883-6391.

**UT TeleCampus**

Many online courses listed in this catalog are offered from the University of Texas at Dallas via
the UT TeleCampus. The UT TeleCampus is the centralized support center for online education
throughout The University of Texas System. In the website you will find: online classrooms, a digital
library, free online tutorial services, 24/7 technical support, links to various admissions and registrar
offices throughout the UT System and full program descriptions for the online courses and degrees the
UT TeleCampus facilitates. Designated contacts at each campus are available to assist you as are the
student services support staff of the UT TeleCampus. With questions please call toll-free: 1-888-TEXAS-
16 (1-888-839-2716).
# Doctor of Philosophy in Criminology

[http://epps.utdallas.edu/crim/](http://epps.utdallas.edu/crim/)

## Faculty

**Professors:** James W. Marquart (Director), Bruce Jacobs, John Worrall  
**Associate Professors:** Thomislav Kovandzic, Lynne Vieraitis  
**Assistant Professors:** Denise Paquette-Boots (Graduate Director), Karen Hayslett-McCall, Robert Morris,  
**Clinical Professor:** Elmer Polk  
**Clinical Assistant Professors:** Timothy Bray, Sarah Maxwell

## 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 Doctor of Philosophy degree in Criminology is an interdisciplinary, research-oriented program that provides students with a coherent and intellectually challenging degree that prepares them for an academic, analytical or administrative appointment as a university professor competent in the oversight of research and development within criminal justice organizations, policy institutions or 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 E-Views, R, Rats, PASW, STATA, Lexis Nexis Database, and West Law for student use. The University’s Computing Center 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/](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 1200 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 90 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: 90 credit hours of graduate study (minus transferred or masters hours)
- Analytical Paper Writing Requirement
- Comprehensive Examination
- Doctoral Dissertation

A grade of "C+" or worse in any graduate class requires that the class be retaken with only one retake will per course. If the retake results in a final grade of "C+" 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: 9 hours
- Non-Criminology Electives (in EPPS or any another school): 9 hours
- **Total Tier II Hours: 36**

**Tier III**
- Dissertation/Three-Paper Option Research (minimum of 18 hours)
- **Total Tier III Hours: 18**

**Total Program Hours: 90 total credit hours minimum beyond BA/BS**

| 27 Hours | Core Criminology Courses |
| 6 Hours  | Analytical Writing |
| 6 Hours  | Additional EPPS Methods/Stats Classes |
| 18 Hours | Criminology Electives |
| 15 Hours | Electives outside CRIM (EPPS or any other School) |
| 18 Hours | Dissertation |
| **90 Hours** | TOTAL |

Deleted: The Doctor of Philosophy in Criminology Program seeks applications from individuals with a baccalaureate, masters of Art or Masters of Science degree in Criminology, Sociology, or a relevant discipline. A GPA of at least 3.2 GPA or better and a minimum combined verbal and quantitative GRE score of 1200 are required to enter the program. A score of at least 4.5 in analytical writing is desirable. Students who marginally fail these requirements may be admitted at the Graduate Committee’s discretion. Students must also submit all transcripts, three letters of recommendation (preferably academic...
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 in Criminology
- **CRIM 6311** Crime and Justice Policy
- **EPPS 7313** Descriptive and Inferential Statistics
- **EPPS 7316** Regression and Multivariate Analysis
- **CRIM 7300** Advanced in Criminology Theory
- **CRIM 7301** Seminar in Criminology Research

CRIM 6V98 Analytical Writing (6 hours)
CRIM 8V99 Dissertation hours (18 hours)

Criminology Electives

- **CRIM 6305** Law and Social Control
- **CRIM 6308** Victimology
- **CRIM 6309** Communities and Crime
- **CRIM 6310** Delinquency and Juvenile Justice
- **CRIM 6311** Crime and Justice Policy
- **CRIM 6313** Corrections
- **CRIM 6314** Policing
- **CRIM 6315** Violent Crime
- **CRIM 6317** Courts
- **CRIM 6322** Crime Prevention
- **CRIM 6324** Correlates of Crime and Justice
- **CRIM 6332** GIS Applications in Criminology
- **CRIM 6334** Advanced Criminological Theory
- **CRIM 7302** Special Topics in Criminology
- **CRIM 8V01** Independent Study in Criminology
- **CRIM 8V92** Independent Advanced Research

Sample of Additional Methods/Stats Classes

- **EPPS 6342** Research Design II
- **EPPS 6346** Qualitative Research Methods
- **EPPS 6352** Evaluation Research Methods
- **EPPS 7318** Structural Equation and Multilevel (Hierarchical) Modeling
- **EPPS 7344** Categorical and Limited Dependent Variables
- **EPPS 7368** Spatial Epidemiology
- **EPPS 7370** Time Series Analysis
- **EPPS 7370** Applied Multivariate Analysis
- **EPPS 7386** Survey Research

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**(U.S.)**
The Doctor of Philosophy degree in Criminology is an interdisciplinary, research-oriented program that provides students with a coherent and intellectually challenging research degree that prepares them for an academic appointment as a university professor or an administrative appointment with oversight of research and development within criminal justice organizations. Graduates of the Ph.D. program will be competent to teach and conduct interdisciplinary research at both graduate and undergraduate levels in aspects of criminology and/or criminal justice depending on their specific areas of specialty. They also will be well prepared for analytical and administrative posts in international and domestic research and policy institutions and in the private sector.

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which house over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, RATS, SPSS, and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University's Computing Center provides 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 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 Criminology journals.

Graduate teaching and research assistantships are available to the most outstanding new applicants. Prospective students interested in receiving assistantships must submit materials including application forms are due February 1. Applications may be obtained from the program director's office.

The Doctor of Philosophy in Criminology Program seeks applications from individuals with a baccalaureate, masters of Art or Masters of Science degree in Criminology, Sociology, or a relevant discipline. A GPA of least 3.2 GPA or better and a minimum combined verbal and quantitative GRE score of 1200 are required to enter the program. A score of at least 4.5 in analytical writing is desirable. Students who marginally fail these requirements may be admitted at the Graduate Committee’s discretion. Students must also submit all transcripts, three letters of recommendation (preferably academic references), and a one-page essay describing their background, education, and professional objectives. All applications will be reviewed by the Criminology Graduate Studies Committee. For more information about what should be included in the application package, please visit our web site.

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.
On admission to the Ph.D. in Criminology, a student must complete a minimum of 90 semester credit hours of graduate coursework and requirements (including a writing requirement, qualifying exam, and doctoral dissertation). Specifically, students will be required to take graduate classes across three tiers of coursework. Tier 1, or the Core Curriculum, involves 36 hours, including 9 hours of research methods and statistics, 21 hours in various aspects of criminology (i.e., contemporary criminological theory, pro-seminar in criminology, law and social control), and six hours of independent research to satisfy a writing requirement.

Upon successful completion of these 36 hours the students must pass a qualifying examination which tests a student’s knowledge in key areas of criminology (i.e., historical and contemporary criminological theory, research methods, policy). Students who successfully complete the examination are admitted into candidacy and form a dissertation committee, and move into Tier 2 graduate coursework, which consists of 18 hours: 6 hours of Criminology electives (e.g., Victimology, Communities and Crime) and 12 hours of advanced methods and statistics. Students, who fail the qualifying examination or seek to leave the program for some reason, including transfer to another program, may complete the M.S. degree by writing a thesis or analytical paper.

The remaining 36 credits (to arrive at U.T.Dallas’s requirement of 90 hours for the Ph.D.) will consist of (a) 6 hours of a criminology research seminar; (b) no less than 18 hours of dissertation credit; and (c) up to 12 hours of electives (which can include courses in other disciplines as well as independent studies) or 12 more hours of dissertation credit.

Students would be required to defend a dissertation proposal and complete and defend a dissertation. Upon Committee approval, the student does further work on the doctoral dissertation while enrolling continuously for credit in research seminars and in dissertation.

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 development conclusion.
Core Courses in Criminological Theory and Methodology | 30
Freely chosen electives in Criminology | 12
Elective Credit in EPPS Methods and Statistics | 12
Other Electives in Criminology and EPPS | 12
Dissertation and analytic writing or thesis | 24-30
Total (Minimum) | 90

EPPS Electives

POEC 6304 Advanced Analytic Techniques
POEC 6316 Proseminar in Quantitative Methods
POEC 6318 Structural Equation and Multilevel (Hierarchical) Modeling
POEC 6342 Research Design II
POEC 6344 Categorical and Limited Dependent Variables
PSCI 5360 Data Collection and Analysis in Political and Social Science
PSCI 5362 Multivariate Models for Analyzing Political and Social Science Data
PSCI 5364 Mathematical Models in Political and Social Science
PSCI 5366 Statistics in Law
ECON 5309 Mathematical Economics
ECON 5311 Applied Econometrics
ECON 6309 Econometrics I
ECON 6310 Econometrics II
ECON 6311 Statistics for Economists
ECON 6315 Time Series Econometrics
ECON 6316 Spatial Econometrics
GISC 7361 Spatial Statistics

Other Courses

CRIM 7301 Seminar in Criminology Research
CRIM 7302 Seminar in Criminology Research
Dissertation hours
Biomedical Engineering

http://ecs.utdallas.edu/BME/

Faculty

Professors: John H. L. Hansen, Philipos Loizou, Raimund Ober, Mathukumalli Vidyasagar, Li Zhang
Associate Professors: Dinesh Bhatia, Jinming Gao
Assistant Professors: Leonidas Bleris, Walter Hu, Hyun-Joo Nam

Adjunct Faculty (UT Southwestern and UT Dallas)

Objectives

The Biomedical Engineering Program is jointly offered by The University of Texas at Dallas, The University of Texas at Arlington, and The University of Texas Southwestern Medical Center at Dallas. The program coordinates research and teaching activities of many departments on all three campuses.

The objective of the Ph.D. Program in Biomedical Engineering is to train exceptional persons to become 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 allow the graduates of this program to tackle complex life sciences-related problems in novel ways and to create solutions for the future.

The objective of the MS degree program in Biomedical Engineering is to produce 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 School.

Master of Science in Biomedical Engineering

Admission Requirements

The University's general admission requirements are discussed here.
The Joint Graduate Studies Committee in Biomedical Engineering (UT Southwestern/UT Arlington/UT Dallas) constitutes the admissions committee for the program.

A student lacking undergraduate prerequisites for graduate courses in biomedical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor. An entrance examination may be required. Specific admission requirements follow.

The student entering the M.S.B.M.E. program should meet the following guidelines:

• An 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 3.0 or better on a 4-point scale, and
• 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 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.

Degree Requirements

The University’s general degree requirements are discussed here.

The M.S.B.M.E. requires the completion of a minimum of 33 semester hours. All students must have an academic advisor and an approved degree plan.

For the M.S.B.M.E program, all students must pass the following courses with a grade of B- or better:

• BMEN 6376 Lecture Course in Biomedical Engineering Applications
• BMEN 6373 Anatomy and Human Physiology for Engineers
• BMEN 6374 Genes, Proteins and Cell Biology for Engineers

The M.S.B.M.E. program has both a thesis and a non-thesis option. All part-time M.S.B.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. Research and thesis hours cannot be counted in a M.S.B.M.E. 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 MSBME classes, and a grade of B- or better in all their core MSBME classes in order to satisfy their degree requirements.

All full-time, supported students are required to participate in the thesis option.

Doctor of Philosophy in Biomedical Engineering

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 sciences 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 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 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 biomedical 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 adviser 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 18 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. A student entering the Ph.D. program with a M.S.B.M.E. must pass this exam within 3 long semesters, and a student entering without an M.S.B.M.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.

Note: In degree plan descriptions, course numbers followed by a D are offered at U.T. Southwestern.
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, Stephen D. Levene, Betty S. Pace, Lawrence J. Reitzer, C. S. Rupert (emeritus), Li Zhang, Michael Zhang

Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Dennis L. Miller, Stephen Spiro

Assistant Professors: Tianbing Xia, Zhenyu Xuan


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 (required for Ph.D.-track students).
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
Juan E. González, Cell-cell interactions, role of exopolysaccharides in nodulation of legumes by rhizobia; molecular genetics of plant-microbe interactions.
Donald M. Gray, Study of nucleic acids and single-strand DNA binding proteins.
Ernest M. Hannig, Control of protein synthesis; genetic and biochemical analysis of translation initiation factors; protein-protein interactions.
Stephen D. Levene, Structure and dynamics of nucleic acids and nucleic acid-protein complexes in solution.
Dennis L. Miller, Structure and organization of mitochondrial DNA; mitochondrial gene expression; RNA editing; mitochondrial biogenesis.
Betty S. Pace, Gene therapy, sickle cell disease.
Lawrence J. Reitzer, Regulation of gene expression and metabolism in prokaryotes.
Stephan Spiro, Regulation of bacterial gene expression by environmental signals; genetic and physiological adaptation to stress.
Tianbing Xia, Molecular recognition; RNA structure and RNA-protein interaction; conformational dynamics; femtochemistry
Zhenyu Xuan, Computational biology and bioinformatics
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 Phospholmagers, BioRad real-time polymerase chain reaction instruments, Beckman scintillation counters and Optima ultracentrifuges, and a Jasco J-715 spectropolarimeter. 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 1000 (verbal plus quantitative) 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**

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, BIOL 5420, BIOL 5430, and BIOL 5440.

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, BIOL 8398, 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 Adviser, 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 Mathematical Sciences and Molecular and Cell Biology. This program combines coursework from the disciplines of biology, computer science, and mathematical sciences. Faculty from both Mathematical Sciences (MMS) and Molecular and Cell Biology (MCB) participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments participate in advising students.

See the Department of Mathematical Sciences for more information on this degree program.

**Doctor of Philosophy**
All Ph.D. students must satisfactorily complete a total of at least 90 credit hours beyond the bachelor’s degree. Generally, all core courses are mandatory. In special cases the requirement for a core course can be substituted, but only with the permission of the instructor and the graduate adviser, and usually only after examination. 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, BIOL 5420, BIOL 5430 and BIOL 5440 [and, in addition, two laboratory rotations, BIOL 6V02 –(The Art of Scientific Presentation) and BIOL 6193] 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.
Doctor of Philosophy in Geospatial Information Sciences

http://www.gis.utdallas.edu

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), Daniel Griffith (Economic, Political and Policy Sciences), Paul Jargowsky (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Edwin Sha (Computer Science), Robert Stern (Geosciences)

**Associate Professors:** Tom Brikowski (Geosciences), John Ferguson (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorf (Economic, Political and Policy Sciences)

**Assistant Professors:** Yongwan Chun (Economic, Political and Policy Sciences), Karen Hayslett-McCall (Economic, Political and Policy Sciences), Weili Wu (Computer Science)

**Clinical Assistant Professors:** Stuart Murchison (Economic, Political and Policy Science)

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. UT Dallas Doctoral graduates will find employment in research departments of public and private organizations and in major academic institutions. 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, 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 an Oracle Center of Excellence for Spatial Data Management and 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 on the GRE are desirable. An analytical writing score of at least 4.5 in the GRE is considered desirable.

Students must submit transcripts from all higher education institutions attended, three letters of recommendation, and a one-page essay outlining the applicant's background, education, and personal 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, CS 6301 and CS 6311 Computer Science I & II, MIS 6322 Developing Business Applications with Visual Basic, MIS 6323 Object Oriented Systems, or their equivalents, and (iii) at least one course in inferential statistics through to regression analysis equivalent to GISC 6301 Geospatial Data Analysis Fundamentals, EPPS 7313 Descriptive and Inferential Statistics, or GEOS 6313 Data Analysis for Geoscientists. Graduate courses taken at UT Dallas to meet these prerequisites may be counted as electives toward the 90 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 before they complete 20 credits after admission.

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 90 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 GIS Fundamentals
- GISC 6382 Applied GIS
- GISC 6384 Spatial Analysis and Modeling
- GISC 6385 GIS Theories, Models and Issues
- GISC 7310 Regression Analysis with Spatial 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 Neural Nets and Machine Learning
CS 6V80 Spatial Data Management
CS 6381 Combinatorics and Graph Algorithms
CS 6384 Computer Vision
GISC 6317 Computer Programming for GIS
GISC 6388 GIS Application Software Development
GISC 7363 Internet Mapping and Information Management
*MISC 6326 Database Management Systems

II. Spatial Analysis and Modeling

CS 6312 Data Structures
*ECON 6309 Econometrics I
*ECON 6310 Econometrics II
*ECON 6314 Structural Equation and Multilevel (Hierarchical) Modeling
*ECON 6315 (POEC 7370) Time Series Econometrics
*ECON 6316 Spatial Econometrics
EPPS 7364 Demographic Analysis and Modeling
EPPS 7388 Spatial Epidemiology
*GEOS 6313 Data Analysis for Geoscientists
*GISC 6311 (ECON 6311) Statistics for Economists
GISC 7360 GIS Pattern Analysis
GISC 7361 Spatial Statistics
*EPPS 7313 Descriptive and Inferential Statistics
*EPPS 7316 Advanced Regression Analysis

III. Remote Sensing and Satellite Technologies

GEOS 7322 GPS Surveying Techniques
GEOS 7324 3-D GIS Data Capture and Ground Lidar
GISC 6325 (GEOS 6325) Introduction to Remote Sensing
GISC 7366 (GEOS 7366) Applied Remote Sensing
GISC 7365 (GEOS 7365) Remote Sensing Digital Image Processing
GISC 7367 (GEOS 7327) Remote Sensing Workshop
EE 6360 Digital Signal Processing
EE 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.  
* may not be used in conjunction with certain other courses. Consult GIS Doctoral Program Director.

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 masters 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 in that area.

Application area examples: planning, public affairs, criminal justice, health and epidemiology, geoscience, forestry, hydrology, marketing, real estate, economics, civil engineering.

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 PhD Research Project Qualifier

In addition, students must complete sufficient additional research and dissertation credit hours to bring the total number of SCHs they have earned within the UTDallas doctoral program (or transferred into the UTDallas 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:

GEOS 8V29 Research in GIS  
GISC 6387 GIS Workshop  
GISC 6389 GIS Masters Project  
GISC 7367/GEOS 7327 Remote Sensing Workshop  
GISC 8V29 Research in GIS  
*EPPS 6310 & 6342 Research Design I & 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 with consent of their advisor or the GIS Doctoral Program Director.
Exams and Qualifiers

- **Ph.D. Research Project Qualifying Class**
  
  Doctoral students must complete **GISC 7389 Geospatial Information Sciences PhD Research Project Qualifier** according to uniform guidelines established by the GIS program.

- **Qualifying Examination and Defense of Proposal**
  
  After meeting the Research Project Qualifier, doctoral students must (1) demonstrate through a general exam his/her competency in the area chosen for their dissertation, and (2) 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 Ph.D. Qualifier, 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.
GISC 7364 Demographic Analysis and Modeling
GISC 7368 Spatial Epidemiology

GISC 7384 Advanced Raster Modeling
Master of Arts in International Management Studies

Degree Requirements

The University's general degree requirements are discussed here.

The M.A. degree is obtained by completing satisfactorily a 36-hour program beyond prerequisite courses for 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.

The School of Management encourages all students studying for the M.A. degree to master one foreign language. However, equally important is direct experience of business practices in a foreign country. In the past, U.T. Dallas has organized study abroad opportunities in Russia, China, Hong Kong, Singapore, Vietnam, Thailand, Indonesia, and India. 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.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the M.A. degree.

Business Core Courses (8 hours)

AIM 6201 Financial Accounting  
MKT 6301 Introduction to Marketing Management  
FIN 6301 Financial Management

International Management Core Courses (17 hours)

The following 4 courses:

IMS 5200 Global Business  
IMS 6310 International Marketing Management  
IMS 6360 International Strategic Management  
IMS 6365 Cross Cultural Communications and Management

Plus 6 hours from the following:

IMS 6202 International Business Transactions  
IMS 6220 International Corporate Finance or FIN6366 International Financial Management  
BPS 6332 Strategic Leadership  
IMS6312 International Advertising  
IMS6314 Global E-Business Marketing

Electives (11 hours)
An additional eleven semester hours of elective courses in the School of Management are required. Four hours from Area Studies (IMS 7250-55) are recommended. International courses from other Schools may be taken with permission of the appropriate Program Director.

Students seeking the M.A. degree are encouraged to complete the Business Core courses by the end of the fall semester before beginning the International Management Core courses. Students are strongly advised to start with the first course in the sequence, Global Economy, and to continue through to the last course, International Business Management, which serves as a capstone for the International Management curriculum.
DATE: October 15, 2009  
TO: GRADUATE DEAN  
FROM: Dean Hasan Pirkul  

SCHOOL Management  
DEPARTMENT Management  

BASIS FOR CATALOG CHANGES:

1. **New Executive Education Catalog Section** – we decided this year to separate out all executive programs and their electives into a new section to avoid confusion with our conventional programs. We hope to reduce inquiries from students in our regular programs about the availability of executive electives. The format of this new section also allowed us to more clearly describe the different level requirements within the Project Management, Health Management and Coaching areas, from certificate level coursework through the requirements for obtaining the MS or MBA. Thus we also eliminated some of these separate sections that were too small to stand alone effectively.

2. **MS-MAS Degree Changes** – we changed this degree description to allow students to choose curricula beyond the required courses in all of the concentrations offered by the areas in the School. The more flexible format allows students to choose combinations of concentrations, thus making it attractive to students who are looking for breadth unlike the more focused MS courses that we offer.

3. **Course Changes** – new courses below are a result of evolving programs such as the executive MBA, healthcare management, entrepreneurship, finance, supply chain, and now marketing areas. The series of special topics courses provides an area-specific alternative to proliferating, and confusing, MAS courses that now must all appear in course lookup under Orion. Other course changes are the usual updating of cross-listings, frequency, course descriptions and textual error corrections.

NEW and DELETED PROGRAMS/DEGREES/CERTIFICATES

None

NEW COURSES ADDED

AIM 6371 - Securities Law  
AIM 6381 – Accounting Theory  
AIM 6387 – Executive Compensation and Shareholder Returns

BPS 6321 – Contemporary Business Issues and Strategy  
BPS 7303 - Doctoral Teaching and Writing Seminar

ENTP 6350 – SIFE Entrepreneurial Practice  
ENTP 6382 – Professional Salesmanship  
ENTP 6387 – Forecasting Industry and Technology Futures  
ENTP 6392 – Entrepreneurship in the Social Sector

FIN 6352 – Financial Modeling  
FIN 6356 – Mergers and Acquisitions  
FIN 6357 – Corporate Restructuring and Turnarounds
HMGT 6332 – Quality Improvement in Healthcare: Six Sigma and Beyond
HMGT 6333 – Ethics in Healthcare Management

HMGT 6v15 – Self-Directed Field Study

AIM 6v99 - Special Topic in Accounting & Information Management
BPS 6v99 - Special Topic in Business Policy & Strategy
ENTP 6v99 - Special Topic in Entrepreneurship
FIN 6v99 - Special Topic in Finance
HMGT 6v99 - Special Topic in Healthcare Management
MECO 6v99 - Special Topic in Managerial Economics
MIS 6v99 - Special Topic in Management Information Systems
MKT 6v99 - Special Topic in Marketing Management
OB 6v99 - Special Topic in Organizational Behavior
OPRE 6v99 - Special Topic in Operations Research

BPS 6250 - Business Transformation Project I (EMBA)
BPS 6351 - Business Transformation Project II (EMBA)
FIN 6251 – Strategic Financial Management and Valuation I (EMBA)
FIN 6351 – Strategic Financial Management and Valuation II (EMBA)
FIN 6150 – The Financial Crisis (EMBA)

MIS 6344 – Web Analytics
MIS 6362 – Web Services and Service Oriented Architecture
MIS 6372 – Managing Outsourced IT-Enabled Services

MKT 6337 – Marketing Analytics using SAS
MKT 6338 – Customer Relationship Management
MKT 6339 – Capstone Marketing Decision Making

OPRE 6378 – Information Enabled Supply Chains

OB 6336 – Individual Difference, Self-Motivation, and Employee Development
OB 6337 – Motivational Leadership in Organizations
OB 6338 – Coaching as a Leadership Style

COURSES DELETED

BPS 6350 – Enterprise Transformation Management
ENTP 6360 - Entrepreneurial Ventures

OTHER COURSE COMPONENT CHANGES

AIM 5300 – Accounting and Information Management Internship (Number Change to 6300)
AIM 6334 – Auditing (Copy change)
AIM 6335 – Ethics for Professional Accountants (Y to S)
AIM 6338 – Accounting Systems Integration and Configuration (Y to R)
AIM 6342 – Strategic Cost Management (Y to R)
AIM 6343 – Accounting Information Systems (R to S)
AIM 6346 – Financial Dimensions of Mergers and Acquisitions (Y to R)
AIM 6347 – Current Topics in Advanced Cost Management (Y to R)
AIM 6349 – Information Technology Strategy and Management (Y to R)
AIM 6356 – Tax Research (S to Y)
AIM 6377 Corporate Governance and Accounting (Drop prerequisites)
AIM 6383 – change name to Fraud Examination
AIM 6385 – Managerial Accounting in Enterprise Systems (Y to R)
AIM 6386 - Risk Management, Compliance and Regulation (Name Change, remove prerequisite)

BPS 6301 – The Environment of Business (Changed from 2 credit hours to 3)
BPS 6260 – Readings in Management (Drop 6210 as prerequisite)
BPS 6385 (ENTP 6385) - Entrepreneurial Business Strategies (Copy change)

ENTP 6375 – Technology and New Product Development (Name and Copy Change to remove 6360 as prereq.)
ENTP 6388 – Managing Innovation within the Corporation (Name and Copy Change to remove 6360 as prereq.)
ENTP 6390 – Business Plan Development (Name and copy change to Business Model Development etc.)
ENTP 6398 – The Entrepreneurial Experience (Copy Change)

FIN 6314 – Fixed Income Securities (Change prerequisite to 6310)
FIN 6320 - Financial Markets and Institutions (drop MECO 6201 and OPRE 6301 as prerequisites)
FIN 6330 - Behavioral Finance (Add as prerequisite FIN 6301 or consent of instructor)
FIN 6340 - Management of Financial Institutions (Drop as prerequisite FIN 6310 and add consent of instructor)
FIN 6350 - Advanced Financial Management (Change to just FIN 6301 as prerequisite)
FIN 6360 - Options and Futures Markets (Drop both MECO prerequisites)
FIN 6370 - The Theory of Finance and Its Applications (Drop FIN 6301 as one of the prerequisites)
FIN 6380 - Practicum in Investment Management (Change name from Practicum in Finance to Practicum in Investment Management)
FIN 7330 - Topics in Theoretical Asset Pricing (Drop FIN 6312 and 6364 from list of prerequisites)
FIN 7340 - Topics in Theoretical Corporate Finance (Drop FIN 6380 from list of prerequisites)

HMGT 6325 - Healthcare Operations Management (Change name to operations from supply chain)
HMGT 6329 - Special Topics in Healthcare Management (Change name to Seminar)

IMS 5200 – Global Business (Number Change to 6204)
IMS 6302 – Legal Aspects of International Business Transactions (Changes to name and from 2 credit hours to 3)

MIS 6308 (AIM 6340) - Systems Analysis and Project Management (Description change)
MIS 6309 - Business Data Warehousing (Name Change)
MIS 6317 (HMGT 6323) - Healthcare Informatics (Copy and prerequisite change)
MIS 6319 – Enterprise Resource Planning (Catalog Copy Change)
MIS 6324 - Business Intelligence Software and Techniques (Copy change)
MIS 6330 - Information Technology Security (Copy change, drop prerequisite)
MIS 6334 - Advanced Business Intelligence (Copy change, add prerequisite)
MIS 6352 - Web Systems Design and Development(Copy change, drop prerequisite)
MIS 6360 - Software Project Management (Copy change, drop prerequisite)
MIS 7320 - Colloquium in Management Information Systems (Change from 3 hour to 2 hour course)

OPRE 6367 – Capstone Projects in Supply Chain Management (Prerequisite Changes: drop 6366)
OPRE 6369 – Supply Chain Software (Prerequisite Changes: add OPRE 6301 or 6302, drop 6366)

OB 6354 – Organizations and Environments (Changed from 2 credit hours to 3)
Department of Chemistry

http://www.utdallas.edu/dept/chemistry/

Faculty

Robert A. Welch Chair in Chemistry; Professor of Chemistry: Ray H. Baughman
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 (Electrical Engineering), Inga H. Musselman.
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
Affiliated Professors: Lee A. Bulla (Biology), Anvar A. Zakhidov (Physics)
Research Professors: Garry E. Kiefer, Duck Joo Yang
Emeritus Professors: Richard A. Caldwell
Senior Lecturers: Sergio Cortes, Sandhya R. Gavva, Claudia Taenzler

Objectives

The Ph.D. program is designed to produce graduates with a focus on innovation and problem solving in current materials, biotechnology, and industrial process research and development. 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), and 500 MHz multi-nuclear FT-NMR spectrometers; a powder x-ray diffractometer; assorted spectrophotometers utilizing fluorescence, phosphorescence and absorption; three protein 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 beginning on page 24. 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

A minimum of 30 total graduate semester hours is required. The M.S. degree can be pursued on a full- or part-time basis.

Other Course Requirements

The remaining requirements beyond the 12-hour core listed above may be satisfied in one of the two ways listed below.

1. Presentation and defense of a written master's thesis. The student must complete, as a minimum, 15 credit hours of research or other graduate electives plus CHEM 8398. A Supervising Committee will be appointed to guide the student's thesis work and to assess the completed thesis.

2. Completion of an approved internship in an industrial or governmental laboratory. The student must complete, as a minimum, 18 credit hours of research, chemistry internship or other graduate electives.

Three of the graduate semester hours beyond the core may be fulfilled by taking an approved graduate elective course.

A Supervising Committee must approve an internship in advance. The final written report must be defended before this committee and filed in the Chemistry department office.

Doctor of Philosophy

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, small protein domains to study membrane fusion; DNA recognition and modification; metalloproteins function); biochemistry/ enzymology (study of oxidative stress; oxidative metabolism of signaling molecules; enzymology of monooxygenation, molecular modeling; and catalysis).
BMEN 6373 Anatomy and Human Physiology for Engineers (3 semester hours) This course provides an introduction to anatomy and human physiology for engineers and other non-life-scientists. Topics include nervous system, muscle and cardiac function, digestive system, immune system. (3-0) Y

BMEN 6374 Genes, Proteins and Cell Biology for Engineers (3 semester hours) This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life-scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y

BMEN 6375 Techniques in Cell and Molecular Biology (3 semester hours) Introduction to various cell and molecular laboratory techniques including DNA recombinant technology, protein biochemistry, structural biology, and molecular biology. Intended for engineers and other non-life-scientists. Prerequisite: BMEN 6374 or instructor permission. (3-0) Y

BMEN 6376 Lecture Course in Biomedical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y

BMEN 6377 Introduction to Protein Engineering (3 semester hours) Development of proteins with practical utility will be discussed using examples and case studies taken from the current literature. Prerequisites: BMEN 6374 or by instructor permission. (3-0) Y

BMEN 6380 Introduction to Cellular Microscopy (3 semester hours) Image formation, diffraction, labeling techniques, fluorescence and image processing techniques will be introduced. (3-0) Y

BMEN 6381 Advanced Concepts in Microscopy (3 semester hours) Continuation of BMEN 6380, with emphasis on advanced approaches such as vectorial diffraction, stochastic aspects of image formation and analysis. Prerequisites: BMEN 6380 or by instructor permission. (3-0) Y

BMEN 6382 Systems Biology (3 semester hours) An interdisciplinary approach to biology. It explores experimental, theoretical, and computational approaches from mathematics, physics, and engineering for the understanding and analysis of biological problems. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y

BMEN 6383 Biological Networks (3 semester hours) This course will examine the fundamental principles and associated structure of a range of biological networks at the molecular, cellular, and population levels. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y

BMEN 6384 Stochastic Methods in Biomedical Engineering (3 semester hours) This course will examine stochastic approaches to several problems in genomics and proteomics, such as sequence similarity detection, gene and protein classification, and structure prediction. Techniques such as Markov and hidden Markov models will be introduced in the course and applied to these problems. (3-0) Y

BMEN 6V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

BMEN 6V71 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-9]-0) R

BMEN 6V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S

BMEN 6V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

BMEN 6V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

BMEN 7390 Works in Progress (1 semester hours) Presentation of research results obtained during dissertation research. (May be repeated for credit.) (2-0) Y

BMEN 7391 Journal Club (2 semester hours) Presentation and discussion of scientific literature in biomedical engineering. (May be repeated for credit.) (2-0) Y

BMEN 7V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit) ([1-9]-0) S

BMEN 7V88 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R
BMEN 8V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

BMEN 8V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

BMEN 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S
Admission Requirements for Graduate Study

Listed below are the minimum admission requirements for graduate studies at U.T. Dallas. Some programs require higher standards. Additional details on specific admission requirements for each degree can be found at http://www.utdallas.edu/admissions/graduate/degrees/

**Master's Programs**
- An earned U.T.-Dallas baccalaureate degree or its equivalent from an accredited institution with a grade average of B or better in upper-division (junior and senior level) work in the student’s major field and related fields is the minimum requirement for admission to any master’s degree program.
- Applicants in their final year of undergraduate study may be admitted on the condition that their bachelor's degree is awarded before enrollment at U.T. Dallas.

**Doctoral Programs**
- An appropriate earned U.T.-Dallas master's degree or its equivalent, with a grade average for Master's work of at least B+, or demonstrated comparable research competence. Applicants currently enrolled in post-baccalaureate study may be admitted on the condition that their master's degree is awarded before enrollment at U.T. Dallas.
- Some departments admit highly qualified candidates directly from a bachelor's degree to the doctoral program.
Non-Degree Students

- must hold a bachelor's degree from a recognized university.

International Students

Applicants educated at non-U.S. institutions should note that their educational background will be assessed for equivalency with a U.T. Dallas degree as described above. Applicants whose primary language is not English and who graduated from a non-U.S. university where the language of instruction and examination was not English, must demonstrate facility in English using one of the following methods:

Test of English as a Foreign Language (TOEFL)

International English Language Testing System (IELTS)

Pearson Test of English (PTE Academic)

This requirement should be met at the time the admission application is submitted.

Visiting and Exchange Students

Applicants wishing to attend U.T. Dallas as a visiting graduate research student or as an exchange student from one of our partner schools should contact the U.T. Dallas Office of International Education at http://www.utdallas.edu/oie/.

Application

U.T Dallas uses a web-based application form that can be accessed using the “apply now” link for each degree listing at http://www.utdallas.edu/admissions/graduate/degrees/

There is a $50.00 nonrefundable application fee.
Applicants are advised to carefully review the program information and the semester specific deadlines for domestic and international applications. Supporting documentation requirements for each of the admissions category are as follows.

Specific Admission Documentation Requirements

As a Degree-Seeking Graduate Student

- **Official Transcripts**
  Admission to a master’s degree requires that an official transcript demonstrating the completion of a bachelor’s degree and with a grade average of B or better in upper-division (junior and senior level) work in the student’s major field and related fields from U.T. Dallas or its equivalent anothera recognized university be submitted at the time of enrollment. An official transcript demonstrating the completion of a master’s degree, submitted at the time of enrollment, is required for admission to a doctoral degree. Some departments admit highly qualified candidates directly from a bachelor's degree to the a doctoral program from a bachelor's degree for highly qualified candidates.

- **Test Scores** (GMAT, GRE, 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 Examinations General Test (GRE) 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/](http://www.utdallas.edu/admissions/graduate/degrees/).

- **English Language Proficiency Test Scores** (TOEFL, IELTS, PTE)
International applicants whose first language is not English must submit satisfactory test scores from one of the following testing agencies: the Test of English as a Foreign Language (TOEFL), the academic modules of the International English Language Testing System (IELTS), or the Pearson Test of English Academic (PTE academic). U.T. Dallas will also accept a passing grade in level 112 of English from the ELS Language Centers, www.els.edu.

Applicants with an earned baccalaureate degree from a college or university where the language of instruction and examination was in English are excused from this requirement. Scores must not be more than two years old, and an official copy must be sent from the testing agency to the following:

Office of Admission and Enrollment Services, HH10
The University of Texas at Dallas
800 W. Campbell Road
Richardson, TX 75080-3021

U.T. Dallas requires a minimum TOEFL iBT (internet-based test) score of 80, a minimum IELTS score of 6.5 or a minimum PTE score of 67 for automatic regular admission as a degree-seeking student. Higher scores may be required if the applicant is to succeed in the competition for teaching assistant openings.

Narrative

- A narrative from the applicant outlining academic interests, current or long-range interests in research, teaching or other professional objectives; describing publications or other scholarly endeavors; listing of academic and professional organizations and fellowships,
scholarships, or other honors received (for additional information see http://www.utdallas.edu/admissions/graduate/degrees/).

**Request for Recommendation Forms**

- Completed forms from 3 individuals (employers, community leaders, teachers, etc) able to judge your probable success in graduate school. Letters of recommendation may be sent directly to the contact listed for the degree program at the URL http://www.utdallas.edu/admissions/graduate/documents/GradReqRe commendation.pdf

Recommendations may be requested from within the online application for graduate study.

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.

In accord with Chapter 51, of the Texas Education Code, decisions on admission to degree-granting graduate programs at U. T. Dallas are based on holistic considerations of all submitted information regarding the academic, career and personal histories of the applicants. Standardized test scores and coursework GPA levels cited in the catalog descriptions of some degree programs are listed for advisory purposes only, to indicate the typical achievement levels of students enrolled and succeeding in the various programs. No single quantitative or qualitative measure or any specific combination thereof, constitutes a definitive standard for admission. Rather, each application will be considered individually and each applicant’s complete profile of strengths and prospects for successful completion of the program will be evaluated by the admissions committee. The graduate advisor in the degree program in which the student expects to enroll will be able to discuss specific admission requirements.

Applicants who satisfy all of the above criteria qualify for regular admission to the degree program. Students denied regular admission status may qualify for admission:
as a Conditional Degree-Seeking Graduate Student

Upon review of the credentials of an applicant seeking regular admission to a U.T. Dallas degree program, the graduate studies committee of that degree program may recommend, and seek concurrence of the Dean of Graduate Studies, that the applicant be admitted subject to specific conditions being satisfied over a specified time period. Such conditions might include requiring additional semester hours to be taken, and/or a specific grade point average to be maintained. A student satisfying the conditional requirements within the specified time period will then qualify for regular admission. The graduate advisor in the academic program will monitor compliance with the admissions conditions. A student who does not fulfill the specified conditions within the time period specified at the time of admission will be barred from continued registration in the degree program.

Normally a student cannot remain in conditional status for more than one calendar year. Exceptions to the one-year limitation can be granted only by the Dean of Graduate Studies upon recommendation of the graduate program. Under no circumstances will the student be allowed to remain enrolled under Conditional Status for more than 15 semester credit hours or two consecutive years, whichever comes first. Within these limits, specified graduate level coursework taken as a conditionally admitted student can be applied to the degree program.

as a Non-Degree-Seeking Graduate Student

A student wishing to take graduate level coursework without becoming a candidate for a graduate degree may apply for admission to U.T. Dallas as a non-degree-seeking graduate student. The applicant must satisfy the conditions for admission to a master's degree program at U.T. Dallas, but is not required to submit GRE or GMAT scores or letters of recommendation. Enrollment as a non-degree-seeking graduate student is subject to annual review and approval by the Associate Dean of Graduate Studies in the school. Students admitted as non-degree-seeking may not be eligible for financial aid and should consult the U.T. Dallas Financial Aid office regarding their status prior to submission of their application for admission.
A non-degree-seeking graduate student in good academic standing who wishes to apply for admission to a degree program must submit a new application. No more than 15 semester credit hours taken as a non-degree-seeking student at U.T. Dallas may be transferred to satisfy the coursework requirements of a graduate degree program, except with the permission of the Dean of Graduate Studies. A student not officially enrolled in a degree program requires the consent of the graduate advisor to enroll in graduate classes offered by that degree program.

NOTE: A student in the United States on an F1 or J1 Visa may only be admitted to a degree program at U.T. Dallas and is not eligible for Non-Degree-Seeking Student status.

as a Graduate Student Taking Only Undergraduate Courses

Students holding a bachelor’s degree from an accredited college or university may elect to take, or, based on their academic background, be restricted to taking, only undergraduate leveling courses. The applicant need only provide an official transcript demonstrating the completion of a bachelor’s degree level and be in good academic standing. These students will be required to maintain the same scholastic standards as regularly admitted undergraduates and will receive academic guidance from the academic advisor in the school. Students restricted to taking undergraduate courses may not take graduate courses in a degree program. Students admitted to take only undergraduate level courses may not be eligible for financial aid and should consult the U.T. Dallas Financial Aid office regarding their status prior to submission of their application for admission.

Application Deadline Dates

Domestic and international applicants are urged to plan ahead and apply as early as possible and to allow adequate time for review by the admissions committees. For admission to the specified semester the specified deadline applies.
Domestic applicants should have all necessary application materials to the Office of Admission and Enrollment Services prior to the following dates:

- **Fall semester**: July 1
- **Spring semester**: November 1
- **Summer semester**: April 1

Applicants who are not citizens or permanent US residents should submit all necessary application materials to the Office of Admission and Enrollment Services by the following dates:

- **Fall semester**: May 1
- **Spring semester**: September 1
- **Summer semester**: March 1

Students seeking appointments as Teaching Assistants or Research Assistants should contact the academic advisor for the degree program and plan for earlier application submissions.

**Official Transcripts**

The term “Official Transcript” is understood to refer to the official recorded results of the student's academic work in a sealed envelope signed and stamped by the registrar or by an authorized official of the issuing college or university. English translations of transcripts and documents that are in a language other than English are also required and should be sent to

Office of Admission and Enrollment Services, HH10
The University of Texas at Dallas,
800 W. Campbell Road;
Richardson, TX 75080-3021.

A $50.00 nonrefundable international document evaluation fee applies.

All materials submitted in the process of applying to the University become the property of the University and will not be returned to the applicant.

Section 4.29, Texas Education Code provides legal penalties for any alteration of academic records or transcripts with the intent to use such a document fraudulently or permit the fraudulent use of such a document. Falsifying or omitting information may result in withdrawal of any offer of acceptance, cancellation of enrollment, and/or disciplinary actions.

Office of Admission and Enrollment Services

The Office of Office of Admission and Enrollment Services, located in Hoblitzelle Hall, can assist prospective students in exploring the possibility of graduate study at U.T. Dallas. For detailed admissions or academic advice, please contact the specific academic program listed at the URL

http://www.utdallas.edu/admissions/graduate/degrees/.

Graduate Admission Examinations

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 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, New Jersey 08541-6000; by phone (609) 771-7670, via e-mail at gre-info@ets.org; or on the World Wide Web at http://www.gre.org/. Applicants should specify by both
institution and code that the test score be sent to The University of Texas at Dallas, Code R6897.

**Graduate Management Admission Test (GMAT)**

The GMAT is offered on a year-round basis at regional testing centers in a computer-based testing (CBT) format. Information on regional CBT testing sites may be obtained directly from Graduate Management Admission Test, Educational Testing Service, Box 6103, Princeton, New Jersey 08541-6103; by phone (609) 771-7330; via e-mail at gmat@ets.org; or on the World Wide Web at [http://www.gmat.org/](http://www.gmat.org/). Applicants should specify by both institution and code that the test score be sent to The University of Texas at Dallas, Code 6897.

**English Proficiency Test Scores**

Automatic regular admission as a degree-seeking student U.T. Dallas requires a minimum TOEFL iBT (internet-based test) score of 80, a minimum IELTS score of 6.5 or a minimum PTE score of 67. Applicants with lower scores will be considered but are advised to improve their test scores and reapply. U.T. Dallas will also accept a passing grade in level 112 of English from the ELS Language Centers, [www.els.edu](http://www.els.edu).

**English Requirements for Teaching Assistants**

Students are required to be able to speak and write English clearly and well. State law and regulations of the Texas Higher Education Coordinating Board require that international students appointed as Teaching Assistants (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 an 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.
School of Management

- Preface/Degrees Offered
- Graduate Programs
- Master of Business Administration
- Master of Arts in International Management Studies
- Master of Science in Accounting and Information Management
- Master of Science in Finance
- Master of Science in Healthcare Management
- Master of Science in Information Technology & Management
- Master of Science in Management and Administrative Sciences
- Master of Science in Supply Chain Management
- Combination of Management and Engineering Graduate Degrees
- Doctor of Philosophy
- Certificate in Business Intelligence and Data Mining

- Course Descriptions
- Executive Education Programs and Course Descriptions
  - Executive MBA (EMBA)
  - Global Leadership Executive MBA (GLEMBA)
  - Healthcare Management
    - Executive MBA for physicians and senior healthcare administrators
    - Master of Science in Healthcare Management for physicians and senior healthcare administrators
    - Certificate in Healthcare Management for physicians and senior healthcare administrators
  - Organizational Behavior and Coaching
    - Master of Science in Management and Administrative Sciences with an emphasis in Organizational Behavior and Coaching
    - Certificate in Organizational Behavior and Coaching
  - Project Management
    - Executive MBA with an emphasis in Project Management
    - Master of Science in Management and Administrative Sciences with an emphasis in Project Management
    - Certificate in Project Management
Department of Mechanical Engineering

http://ecs.utdallas.edu/ME/

Faculty


Associate Professors: Gerald O. Burnham, Kyeongjae Cho, Jiyoung Kim, Jeong-Bong Lee.

Assistant Professors: Fatemeh Hassanipour, Walter Hu

Visiting Assistant Professors: Greg Lee.

Objectives

The program leading to the M.S.M.E. degree prepares both recent baccalaureate graduates and experienced mechanical engineers for advanced micro-scale and nano-scale mechanical and thermal design and development. 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 Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for research on micro-scale and nano-scale systems. 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 U.T. Dallas graduate engineering students.

Master of Science in Mechanical Engineering

Admission Requirements

The University’s general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in mechanical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.M.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in mechanical 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 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 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.M.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 (Microelectromechanical Systems or Mechanical Systems Engineering). Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of an approved course of studies 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 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 adviser 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.

M.S.M.E.

One of the two concentrations listed below, subject to approval by a graduate adviser, should be used to fulfill the requirements of this program. Only grades of B or better are acceptable in the five required core courses, MECH 6305, MECH 6340, MECH 6301, MECH 6310, and MECH 6331.

Microelectromechanical Systems

This concentration emphasizes the mechanical and thermal design, fabrication and testing of micro-scale and nano-scale microelectromechanical systems.

Each student electing this concentration must take four prescribed elective courses and two free electives to make a total of 33 hours.

The prescribed elective courses for this concentration are MECH 6382, MECH 6302, MECH 6315, MECH 6320, MECH 6321, MECH 6322, MECH 6381, MECH 6385, MSEN 5300, MECH 6310, MSEN 5340,
MSEN 5353, MSEN 6310, MSEN 6361, and PHYS 6377.

Mechanical Systems Engineering

This concentration is focused on the fundamental principles, design, fabrication and analysis of complex mechanical systems.

Each student electing this concentration must take four prescribed elective courses and two free electives to make a total of 33 hours.

The prescribed elective courses for this concentration are MECH 6302, MECH 6315, MECH 6320, MECH 6321, MECH 6332, MECH 6336, MECH 6381, MECH 6385, MSEN 6310, MSEN 6361, and PHYS 6377.
Graduate Program in Human Development and Early Childhood Disorders

http://bbs.utdallas.edu/

Faculty

Professors: Thomas G.R. Bower, Duane Buhrmester, Bert S. Moore, Margaret Tresch Owen, John W. Santrock, Melanie J. Spence, Robert D. Stillman, Marion K. Underwood, Deborah Wiebe

Associate Professors: Pamela Rollins

Assistant Professors: Shayla Holub, Mandy Maguire, Candice Mills

Clinical Faculty: Cherryl Bryant

Senior Lecturers: 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 their families. This program provides training to those who desire to work with infants and young children and their families in early childhood intervention programs and other professional settings, including schools, hospitals, 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. They also qualify for Level 2 Infant Mental Health Endorsement by the Texas Association for Infant Mental Health.

Facilities

The principal sites for the academic and research activities of the 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 at the main campus include research and observational laboratories, and laboratories dedicated to infant assessment. On-campus fieldwork opportunities with preschool-age children with special needs are available in the Preschool Language Development Program held at Callier-Richardson. The Callier Center on the UT Southwestern Medical Center campus operates a laboratory preschool, and the Callier Center on both the main campus in Richardson and the medical center campus offer a number of other educational and clinical programs serving young children. These facilities, and various community programs and settings throughout the Metroplex, provide essential educational, clinical, and research environments for training in Human Development and Early Childhood Disorders. Practicum and Internship placements 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. In general, a combined Verbal and Quantitative score on the GRE of at least 1000 is advisable based on our experience with student success in the program. However, there is no minimum cut-off score for admission nor does a score of at least 1000 assure admission to the program.

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 48 semester hours. Specific degree requirements follow.

Required Core Courses (24 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDCD 6319</td>
<td>The Developing Child: Infants and Toddlers</td>
</tr>
<tr>
<td>HDCD 6312</td>
<td>Atypical Development</td>
</tr>
<tr>
<td>HDCD 6315</td>
<td>Assessment Theory</td>
</tr>
<tr>
<td>HDCD 6316</td>
<td>Developmental Assessment</td>
</tr>
<tr>
<td>HDCD 6335</td>
<td>Intervention Paradigms</td>
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<tr>
<td>HDCD 6310</td>
<td>Parent Education</td>
</tr>
<tr>
<td>HDCD 6320</td>
<td>The Developing Child: Preschool Years</td>
</tr>
<tr>
<td>HDCD 6370</td>
<td>Intervention with Young Children</td>
</tr>
</tbody>
</table>

Practicum (3 hours)

HDCD 7V20 Practicum in Disorders of Young Children

Internship (6 hours)

HDCD 7V20 Internship in Disorders of Young Children

Electives (15 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>HDCD 6325</td>
<td>Service Coordination of Community Resources</td>
</tr>
<tr>
<td>HDCD 6395</td>
<td>Medical and Biobehavioral Factors in ECD</td>
</tr>
<tr>
<td>HDCD 6330</td>
<td>Families and Culture</td>
</tr>
<tr>
<td>HDCD 6345</td>
<td>Child Psychopathology</td>
</tr>
<tr>
<td>HDCD 6355</td>
<td>Family Outreach and Assessment</td>
</tr>
<tr>
<td>HDCD 6390</td>
<td>Infant Mental Health</td>
</tr>
<tr>
<td>HDCD 6V81</td>
<td>Special Topics in Early Childhood Disorders</td>
</tr>
<tr>
<td>HCS 6360</td>
<td>Behavior Management</td>
</tr>
<tr>
<td>HCS 6350</td>
<td>Social Development</td>
</tr>
<tr>
<td>HCS 6331</td>
<td>Cognitive Development</td>
</tr>
</tbody>
</table>
HCS 7382 Health Psychology
COMD 6307 Language Acquisition or HCS 8368 Language Development
COMD 7V82 Seminar in Autism
HDCD 7V88 Independent Study
HDCD 7V80 Independent Research
HCS 7376 Child Psychopathology

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- HDCD 6V85 Medical and Biobehavioral Factors in ECD
- HDCD 6V81 Special Topics in Early Childhood Disorders
- HDCD 7V80 Family Outreach Assessment

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Master of Science in Criminology

http://epps.utdallas.edu/crim/ms.html

Faculty

Professors: James W. Marquart (Director), Bruce Jacobs, John Worrall

Associate Professors: Thomislav Kovandzic, Lynne Vieraitis

Assistant Professors: Denise Boots, Karen Hayslett-McCall, Robert Morris

Clinical Professors: Elmer Polk

Clinical Assistant Professors: Timothy Bray, Sarah Maxwell

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.

Objectives

The Master of Science in Criminology provides students with a coherent and intellectually challenging degree that prepares them to conduct interdisciplinary research on various aspects of criminology and/or criminal justice, depending on their specific areas of specialty. Students will be well prepared for analytical and administrative posts in international and domestic 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 Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STAATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University’s Computing Center provides 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.

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:
- EPPS 6310 Research Design I
- EPPS 6313 Descriptive and Inferential Statistics *
- CRIM 6300 Proseminar in Criminology
- CRIM 6303 Etiology of Crime and Criminality
- CRIM 6311 Crime and Justice Policy

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 6V96 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

* Doctoral-track or doctoral students are advised to take EPPS 7313 Descriptive and Inferential Statistics instead of EPPS 6313 and EPPS 7316 Regression and Multivariate Analysis directly following to ensure continuity and success with the increased rigor in the doctoral level statistics/methods sequence.
http://epps.utdallas.edu/crim/ms.html

Master of Science in Criminology

Faculty

Professors: Bruce Jacobs, James W. Marquart, John Worrall
Associate Professors: Thomislav Kovandzic, Lynne Vieraitis
Assistant Professors: Karen Hayslett-McCall, Robert Morris, Denise Paquette-Boots
Clinical Assistant Professors: Timothy Bray, Danielle Lavin-Loucks

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Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University’s Computing Center provides 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 are available to the most outstanding new applicants.
Prerequisites

For the Master of Science in Criminology, students with a Bachelor of Arts in Criminology will have the necessary foundation in criminology. Students who lack this foundation should complete the following undergraduate courses at U.T.Dallas or their equivalents at another institution: CRIM 3303 Advanced Criminology, CRIM 3303 Advanced Criminal Justice, CRIM 3304 Research Methods in Crime and Justice Studies, SOC 3305 Introduction to Social Statistics. Prospective students with concerns about their preparation for the Criminology program are encouraged to consult with the program coordinator.

Degree Requirements

The University’s general degree requirements are discussed here.

Students seeking a Master of Science in Criminology degree must complete 36 semester credit hours of coursework in the program. The Core curriculum involves 36 hours, including 9 hours of research methods and statistics, 21 hours in various aspects of criminology (i.e., contemporary criminological theory, proseminar in criminology, law and social control), and six hours of independent research to satisfy a writing requirement. Students must achieve at least a 3.0 grade point average in the Criminology core courses and an overall grade point average of 3.0 to graduate.

Core Courses

CRIM 5310 Research Design I
CRIM 5313 Descriptive and Inferential Statistics
CRIM 5316 Advanced Regression Analysis
CRIM 6300 Proseminar in Criminology
CRIM 6303 Etiology of Crime and Criminality
CRIM 6305 Law and Social Control
CRIM 6307 Extent of Crime and Measurement Problems in Criminology
CRIM 6311 Crime and Justice Policy
CRIM 6324 Correlates of Crime and Justice
CRIM 7300 Advances in Criminology Theory

Research Project Requirement (6 credit hours)

CRIM 6996 Master Thesis Research
Graduate Program in Computer Engineering

http://www.ce.utdallas.edu

Faculty


Research Professor: Vojin Oklobdzija


Assistant Professors: Roozbeh Jafari, Nathan Dodge

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.)

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 4 required courses:

- CE 6302 Microprocessor Systems
- CE 6304 Computer Architecture
- CE 6325 VLSI Design
- CE 6378 Advanced Operating Systems

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

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 adviser 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 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 must pass the QE within five long semesters from the date of
admission into the Ph.D. program. 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.
Course Descriptions

Proseminars

HCS 6302 Issues in Behavioral and Brain Sciences - Part I (3 semester hours) Doctoral proseminar on current theory and research in Cognition and Neuroscience, Communication Sciences and Disorders, and Psychological Sciences. Pass/Fail only. (Open only to HCS doctoral students) (3-0) Y

HCS 6303 Issues in Behavioral and Brain Sciences - Part II (3 semester hours) Continuation of the doctoral proseminar on current theory and research in Cognition and Neuroscience, Communication Sciences and Disorders, and Psychological Sciences. Pass/Fail only. (Open only to HCS doctoral students) (3-0) Y

Research Methods Courses

HCS 6312 (ACN 6312, PSYC 6312) Research Methods in Behavioral and Brain Sciences - Part I (3 semester hours) Applying, understanding, and interpreting various statistical techniques in behavioral science context. Participants have the opportunity to learn appropriate statistical details for basic descriptive and inferential statistics, the interrelationships among techniques, and computer skills required for data analyses. Students without the necessary background knowledge of basic statistics and experimental design will be required to take PSY 3392 before registering for HCS 6312. (3-0) Y

HCS 6313 (ACN 6313, PSYC 6313) Research Methods in Behavioral and Brain Sciences - Part II (3 semester hours) Topics in general linear modeling including regression analysis, correlation, simple analysis of variance, factorial analysis of variance, analysis of covariance, between and within subject designs, and multiple regression. Prerequisite: HCS 6312 or consent of instructor. (3-0) Y

HCS 6314 Instrumentation (3 semester hours) Basic principles of electricity, signal processing, instrumentation, and laboratory safety. (3-0) R

HCS 6316 (ACN 6316, PSYC 6316) Research Methods in Behavioral and Brain Sciences—Part III (3 semester hours) Applying, understanding, and interpreting various advanced multivariate statistical techniques in brain and behavioral science contexts. Includes principle component analyses, simple and multiple correspondence analyses, partial least square regression, discriminant analyses, and structural equation modeling. (3-0) R

HCS 6319 (ACN 6319, PSYC 6319) Scientific Writing (3 semester hours) Scientific writing of articles for publication. (3-0) Y

HCS 6399 (ACN 6399, PSYC 6399) Research Ethics and Scientific Integrity (3 semester hours) An interactive, intensive course designed to cover critical issues related to human subjects, animal welfare, research design, accountability of scientific actions and fraud. Course designed for individuals intending research careers in academia or industry. (3-0) Y

HCS 7310 Advanced Research Methods (3 semester hours) Advanced methods of inquiry and analysis unique to Cognition and Neuroscience, Communication Sciences and Disorders, or Psychological Sciences. Prerequisite: HCS 6313. (May be repeated for credit.) (3-0) Y

HCS 7312 Applied Research Design: Growth Modeling (3 semester hours) Practical application and interpretation of individual growth modeling, an analytic strategy for analyzing longitudinal data. Introduction of basic concepts underlying the models, describing computer programs for conducting analyses, and interpreting results. Students will be required to complete weekly assignments. Permission of the instructor is required. (3-0) R

HCS 7315 Grant Writing for Researchers (3 semester hours) Identifying funding sources appropriate to research needs, formulating a research plan, generating specific aims and a methodological design to address those aims, presentation of preliminary results to show the feasibility of the proposed work, and use of appropriate reference citations. Prerequisite: Permission of instructor. (3-0) Y

Cognition and Neuroscience

Deleted:

HCS 6315 Grant Writing for Researchers (3 semester hours) Identifying funding sources appropriate to research needs, formulating a research plan, generating specific aims and a methodological design to address those aims, presentation of preliminary results to show the feasibility of the proposed work, and use of appropriate reference citations. Prerequisite: Permission of instructor. (3-0) Y

Deleted:

HCS 7314 (ACN 6314) Research Methods in Behavioral and Brain Sciences—Part III (3 semester hours) Applying, understanding, and interpreting various advanced multivariate statistical techniques in brain and behavioral science contexts. Includes principle component analyses, simple and multiple correspondence analyses, partial least square regression, discriminant analyses, and structural equation modeling. (3-0) R
HCS 5314 (ACN 5314) Cognitive and Neural Modeling Lab (3 semester hours) Auto-associative, associative, competitive learning, recurrent, and back-propagation artificial neural network architectures in a "hands-on" micro-computer laboratory environment using special simulation software. Applications to perceptual, cognitive, computational, and neuroscience modeling problems. Prerequisites: Linear Algebra and Computer Programming Experience is recommended but not required. (3-0) T

HCS 6310 (ACN 6310) Fundamentals of Functional Brain Imaging (3 semester hours) This course covers topics such as principles of tracer techniques, neuroimaging instrumentation, fundamentals of SPECT, PET, and fMRI, brain physiology (perfusion, metabolism, and receptor function), image processing and analysis, critical evaluation of the functional neuroimaging literature and safety issues. (3-0) Y

HCS 6322 (ACN 6322) Computational Models of Language Understanding (3 semester hours) Probabilistic methods for natural language understanding. Use of the MATLAB computer language for instantiating specific knowledge-based computational theories of natural language understanding. Prerequisites: Computer programming experience is recommended but not required. (3-0) T

HCS 6330 (ACN 6330, PSYC 6330) Cognitive Science (3 semester hours) Cognitive, computational, and neural processing approaches to understanding perception, memory, thought, language and emotion. (3-0) Y

HCS 6332 (ACN 6332, PSYC 6332) Perception (3 semester hours) Psychophysical, neurophysiological, and computational foundations of sensation and perception. Basic senses of vision, audition, chemoreception, and tactile processing, with emphasis on understanding the processes that take us from neurons to perception and action. (3-0) T

HCS 6333 (ACN 6333, PSYC 6333) Memory (3 semester hours) Research and theory on the acquisition, representation and retrieval of information by the mind/brain. Includes information processing and neuropsychological perspectives. (3-0) T

HCS 6334 (ACN 6334) Attention (3 semester hours) Theory and evidence on the study of attention especially in human vision and audition. Includes perceptual learning, information processing, and neuropsychological approaches. (3-0) R

HCS 6336 Principles of Developmental Neuroscience (3 semester hours) Molecular and cellular events underlying neuronal differentiation, axon guidance, synapse formation, neurotrophic factors, and neural death, with special emphasis on activity-dependent plasticity and its role in generating and maintaining the extraordinary precision of connections found in the nervous system. Prerequisites: Consent of Instructor or two of the following: HCS 6340, HCS 6346, HCS 6344 (3-0) T

HCS 6340 (ACN 6340) Cellular Neuroscience (3 semester hours) Basic neural biology and physiology and principles of synaptic transmission. (3-0) Y

HCS 6343 Neurobiology of Learning and Memory (3 semester hours) Current research and theory on modifications in the central nervous system that contribute to the processes of learning and memory. Includes an overview of different forms of learning as assessed in model systems, with extensive review of anatomical, cellular, and molecular changes underlying neuronal and behavioral plasticity. Prerequisite: HCS 6346 (3-0) T

HCS 6344 (ACN 6344, PSYC 6344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T

HCS 6346 (ACN 6346, PSYC 6346) Systems Neuroscience (3 semester hours) Integrative systems level study of the nervous system. Aspects of neural mechanisms and circuitry underlying regulation of motor behaviors, sensory and perceptual processing, biological homeostasis, and higher cognitive functions. (3-0) Y

HCS 6347 (ACN 6347) Intelligent Systems Analysis (3 semester hours) Mathematical tools for investigating the asymptotic behavior of both deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include: artificial neural network architectures, Lyapunov stability theory, nonlinear optimization theory, stochastic approximation theory, and the Gibbs Sampler. Prerequisites: HCS 6348 (or equivalent) or consent of instructor. (3-0) T

HCS 6348 (ACN 6348) 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 HCS 6347 and HCS 6349. Prerequisites: (1) Linear algebra, multivariable
HCS 6349 (ACN 6349) Intelligent Systems Design (3 semester hours) 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 Markov Random Field probability representations and asymptotic mathematical statistical theory for parameter estimation, model selection, and hypothesis testing.

Prerequisites: HCS 6347 or consent of instructor. (3-0) T

HCS 6351 (ACN 6351) Quantitative Methods in Neuroscience (3 semester hours) Data analysis techniques relevant to neuroscience. Topics may include: fourier/wavelet analysis, differential equations, and statistical data analysis methods. May be repeated for credit with permission of the instructor.

HCS 6355 (ACN 6355, PSYC 6355) Judgment and Decision Making (3 semester hours) This course examines human inferences, judgments, decisions, and the processes by which we arrive at them. It will focus on the fact that our social judgments are not based on the laws of probability and chance, but on other cognitive processes that may have serious shortcomings in important inferential and decision-making tasks. We will also see that these processes, while ecologically efficient, systematic and often predictable, are imperfect in today's data-rich environment. (3-0) T

HCS 6363 (ACN 6363) Text Comprehension Seminar (3 semester hours) Current readings in the field of text comprehension and memory. May be repeated for credit with instructor’s permission. (3-0) T

HCS 6372 (ACN 6372) The Neuroscience of Pain (3 semester hours) A systems-oriented course covering the anatomical and physiologic basis of pain. The course emphasizes the similarities and differences between the different forms of pain and describes the basic features of neural processing of pain signals in the spinal cord and brain, the anatomy and the function of the descending systems that can control transmission of pain signals, and peripheral and central sensitization. The physiological and molecular basis for treatment of pain is discussed. (3-0) Y

HCS 6373 (ACN 6373) Intraoperative Neurophysiologic Monitoring I (3 semester hours) The anatomical and physiological basis for the use of electrophysiologic techniques in intraoperative neurophysiologic monitoring and in diagnosis of disorders affecting the nervous system. (3-0) Y

HCS 6374 (ACN 6374) Intraoperative Neurophysiologic Monitoring II (3 semester hours) The use of recordings of neuro-electric brain potentials and their interpretation for diagnostic purposes and for intraoperative monitoring. Prerequisite: HCS 6373 (ACN 6373) (3-0) Y

HCS 7315 Statistical Analysis of Brain Imaging Data (3 semester hours) Covers analysis of brain imaging data obtained from diverse techniques such as PET, SPECT, fMRI, or EEG. Includes "standard analyses" with packages such as SPM02 or AFNI as well as pattern analyses approaches (e.g., partial least squares regression, correspondence, discriminant, and principal component analyses). (3-0) R

HCS 7329 Functional Brain Imaging Practica (3 semester hours) Application of learned skills to short research projects in a small group format. Projects include: 1) acquisition of new data in SPECT, PET or fMRI in association with ongoing funded research; 2) mentored analysis of existing data sets; and 3) experimental design projects with a full experimental protocol, including informed consent procedures, acquisition parameters and data analysis plans. All projects are reviewed in a biweekly group meeting to facilitate learning across groups. (3-0) R

HCS 7333 (ACN 7335) Computational Neuroscience (3 semester hours) Construction of biologically realistic simulations of neurons and small neural circuits using state-of-the-art simulation software. Students will construct simulations that shed light on the neural basis of higher functions such as visual
contrast enhancement, perceptual oscillation, sensory localization, and motor pattern generation. (3-0) R

HCS 7334 Affective Neuroscience (3 semester hours) The current state of studies and theories of the biological basis of emotion and affective behaviors. The interactions of emotional processes with other brain functions will be discussed. Topics covered may include anxiety, depression, stress, and fear as well as hedonically positive emotional states. Prerequisite: ACN/HCS 6346. (3-0) R

HCS 7337 Advanced Neuroscience Lab Methods (3 semester hours) An intensive hands on focus upon widely used neuroscience laboratory methods, with particular emphases on neurophysiological, neurochemical, and biobehavioral approaches. Prerequisites: HCS 6346 and HCS 7343 or instructor's permission. (3-0) R

HCS 7343 (ACN 7343) Neuropharmacology (3 semester hours) Biology of neurotransmission in the central nervous system. Includes ionotropic and metabotropic coupling of all known classes of receptors to both their cellular and systemic effects. Clinical efficacy, side effects, and other issues related to drug use and abuse are covered. Prerequisite: Consent of Instructor or either: HCS 6340 or HCS 6346. (3-0) T

HCS 7351 Aging and the Nervous System (3 semester hours) Critical evaluation of research and theory concerning the impact of aging on neuronal function. Cognitive dysfunctions, dementia, and underlying neuropathologies, as well as neurophysiological and biochemical changes that accompany normal aging. (3-0) R

HCS 7355 Seminar in Auditory Cortical Processing (3 semester hours) Basic principles of neural information processing with special emphasis on the central nervous system processes underlying hearing and speech perception. May be repeated for credit. (3-0) T

HCS 7372 Seminar in Cognition and Neuroscience (3 semester hours) Selected topics and current research in cognition and neuroscience. (May be repeated for credit.) (3-0) R

Communication Sciences and Disorders

HCS 6339 (ACN 6339, PSYC 6339) Psycholinguistics (3 semester hours) Classic and current research in psycholinguistics. Includes concepts from linguistics, the biological bases of speech and language processing, and child language acquisition. Hands-on exercises include labs on speech perception, language acquisition, and language comprehension. (3-0) R

HCS 6367 (ACN 6367, PSYC 6367) Speech Perception (3 semester hours) Current topics and theories in speech perception. Topics include the acoustic correlates of speech sounds and the problem of invariance, the perception of speech under adverse conditions, the effects of hearing impairment, and models of speech perception. (3-0) T

HCS 6368 (ACN 6368, PSYC 6368) Language Development (3 semester hours) Advanced study of normal oral language development. Focus on research in child language and recent theories of language acquisition. Prerequisite: Consent of instructor. (3-0) Y

HCS 6379 Neurological Basis of Language Development (3 semester hours) Study of the developing brain and how it relates to the acquisition and development of language throughout the lifespan. (3-0) R

HCS 6391 Seminar on Preliteracy Development (3 semester hours) Selected topics and current research in preliteracy development (May be repeated for credit). (3-0) R

HCS 6392 Seminar in Theories of Language Acquisition (3 semester hours) A survey and critical exploration of current theories of language acquisition and more general theories of cognitive development that have been applied to language development. (3-0) R

HCS 7352 Seminar in Language Impairments in Children (3 semester hours) Advanced study of language impairments in children emphasizing research issues related to these diverse clinical populations. Topics may include SLI, SCI, SELD, hearing loss, and Autism Spectrum Disorders among others. May be repeated for credit. Prerequisites: COMD 6307 or HCS 6368 and COMD 7378 or consent of instructor. (3-0) T

HCS 7367 (ACN 7367) Speech Perception Laboratory (3 semester hours) Introduction to the field of speech processing by computer, with primary application to research techniques in the study of speech perception. (0-9) T

HCS 7379 (COMD 7379) Current Research in Autism (3 semester hours) Exploration of research and theories related to Autism Spectrum Disorders (ASD) and the implications the disability has on an individual's learning, behavior and ability to process information. Topics may include: diagnostic
classification, the evaluation process, current theoretical models, intervention models, research on potential causes and treatments, provisions for service delivery and areas of impairment. (3-0) Y

HCS 7V71 Seminar in Communication Sciences and Disorders (1-6 semester hours) Selected topics and current research in communication sciences and disorders. (May be repeated for credit.) ([1-6]-0) R

**Psychological Sciences**

| HCS 6327 (PSYC 6327) Personality (3 semester hours) Survey of cognitive, analytic, and learning theory approaches to study of personality. Emphasis on intensive exploration of selected concepts and related research (3-0) R |
| HCS 6331 (ACN 6331, PSYC 6331) Cognitive Development (3 semester hours) Survey of cognitive development theories and research in a variety of domains including perception, memory, language, and intelligence. (3-0) Y |
| HCS 6350 (PSYC 6350) Social Development (3 semester hours) Foundations of social and personality development. Includes survey of psychodynamic, social learning, behavior genetic, family systems, and social-cognitive approaches to the study of attachment, parenting, aggression, peer relationships, sex typing, and other contemporary issues. (3-0) Y |
| HCS 6357 (PSYC 6357, HDCD 6319) The Developing Child: Infants and Toddlers (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perception, cognitive, and social domains from the prenatal period through two years of age. (3-0) Y |
| HCS 6359 (PSYC 6320, HDCD 6320) The Developing Child: Toddler and Preschool Years (Two to Five Years) (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive, and social domains from 2 to 5 years. Prerequisite: HCDC 5311 or HCS 6357 (3-0) Y |
| HCS 6376 (PSYC 6376) Social Psychology (3 semester hours) Overview of the social bases of behavior. Topics may include social cognition and self justification, biases in judgment, attitudes and persuasion, conformity, compliance, group dynamics, prejudice and stereotyping, interpersonal attraction and relationships, aggression and altruism, cultural diversity, and applications relevant to these aspects of the human experience. Special attention to research paradigms of interest to students developing their own empirical work. (3-0) Y |
| HCS 6395 (ACN 6395, PSYC 6395) Cognitive Psychology (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. Prerequisites: CGS 3361 (PSY 3361) or consent of instructor. (3-0) Y |
| HCS 7311 Family Psychology (3 semester hours) Theory and research on family systems, including topics related to family interactions and relationships within the family. (3-0) R |
| HCS 7355 Seminar in Psychological Sciences (1-6 semester hours) Selected topics of current research in social or cognitive development. (May be repeated for credit.) (3-0) R |
| HCS 7376 (HDCD 6385, PSYC 6335) Child Psychopathology (3 semester hours) Major classes of childhood psychopathology manifested during infancy through adolescence. Normal personality development as a basis for identifying psychopathology. Issues of etiology, diagnosis, prognosis and social policy. (3-0) R |
| HCS 7382 Health Psychology (3 semester hours) This course examines current theory and research concerning the social, cognitive, behavioral, and biological processes that shape our experiences of physical health. The importance of these concepts for health behaviors, psychosomatics, and psychological adjustment to illness will be discussed. (3-0) T |

**Other Courses**

| HCS 7380 Practicum in Communication Sciences (3 semester hours) Supervised research or practice-based activities in applied contexts or evaluation and therapeutic management of communication disorders. Weekly conference may be required. Pass/Fail only. (May be repeated for credit) (3-0) S |
| HCS 7V98 Directed Individual Study in Behavioral and Brain Sciences (1-9 semester hours) Individualized program of study which may include reading, research, implementation of clinical strategies, and/or other designated activities. (May be repeated for credit) ([1-9]-0) S |
| PSYC 7V50 Internship in Psychological Sciences (1-6 semester hours) Applied placement in community agency or other approved site. (May be repeated for credit) ([1-6]-0) S |
HCS 8V50 Doctoral Readings and Research Seminar (1-6 semester hours) Seminar for advanced doctoral students on current issues and research in Behavioral and Brain Sciences. (May be repeated for credit) ([1-6]-0) S
HCS 8V80 Research in Behavioral and Brain Sciences (1-9 semester hours) Supervised research experience. (May be repeated for credit.) ([1-9]-0) S
HCS 8V99 Dissertation (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S
Department of Mathematical Sciences

http://www.utdallas.edu/nsm/math/

Faculty

Professors: Larry P. Ammann, Michael Baron, Sam Efromovich, M. Ali Hooshyar, Wieslaw Krawcewicz, Patrick L. Odell (Emeritus), Istvan Ozsvath, Viswanath Ramakrishna, Ivor Robinson (Emeritus), Robert Serfling, Janos Turi, John W. Van Ness (Emeritus), John Wiorkowski
Associate Professors: Pankaj Choudhary, Mieczyslaw Dabkowski
Assistant Professors: Yan Cao, Tobias Hagge
Adjunct Professors: Jose Carlos Gomez Larranage, Adolfo Sanchez Valenzuela
Affiliated Faculty: Herve Abdi (BBS), Raimund J. Ober (EE), Alain Bensoussan (SOM), Thomas Butts and Titu Andreescu (SME)

Objectives

The Mathematical Sciences Department at The University of Texas at Dallas offers graduate study in five majors: 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, bioinformatics and computational biology.

The Master of Science degree is available also for those who plan to teach mathematical sciences 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, financial or industrial careers.

Facilities

The faculty, staff and students have access to a large network of Sun workstations and servers on campus. In addition, the Department has a classroom equipped with a cluster of 20 high-end Linux PCs that are used for instruction and special research purposes.
**Admission Requirements**

The University's general admission requirements are discussed [here](#).

Specific additional admission requirements for students in Mathematical Sciences follow. Students lacking undergraduate prerequisites for graduate courses in their area must complete these prerequisites or receive approval from the graduate adviser 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. However, a student with at least a Graduate Record Examination (GRE) combined score of 1050 with at least 550 on the math portion would have a reasonable probability of admission as a Master's student, assuming that the student’s other credentials were in order. Similarly, a student with a GRE score of 1200 (with at least 650 in the quantitative portion) would have a reasonable probability of admission as a Ph.D. student, assuming that all other credentials were in order. Higher standards prevail for students seeking Teaching Assistantships.

**Degree Requirements**

**Master of Science**

The University's general degree requirements are discussed [here](#).

Students seeking a Master of Science in Mathematical Sciences 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 Major**

MATH 5301-5302 Elementary Analysis I and 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 6319-6320 Principles and Techniques in Applied Mathematics I and II
MATH 6308 Inverse Problems and their Applications
MATH 6321 Optimization

Plus two guided electives.
Engineering Mathematics Major

MATH 5301-5302 Elementary Analysis I and 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 6319-6320 Principles and Techniques in Applied Mathematics I and II
MATH 6331 Systems, Signals and Control
MATH 6305 Mathematics of Signal Processing
plus two guided electives.

Mathematics Major

MATH 5301-5302 Elementary Analysis I and 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 Major

Students seeking a Master of Science in Mathematical Sciences with a major in Statistics must complete the following core courses:
STAT 6331 Statistical Inference I
STAT 6337-38 Statistical Methods I, 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) 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 from among the following electives:
MATH 6301, MATH 6302, MATH 6313, MATH 6331 or any 6300- or 7300-level statistics courses. Also, a maximum of two of the following prerequisite 5000-level courses may be counted as electives: MATH 5301, 5302, Elementary Analysis I, II and STAT 5351, 5352 Probability and Statistics I, II.
Other Requirements

Electives must be approved by the graduate adviser. Typically, electives are 6000- and 7000-level mathematical sciences courses. Courses from other disciplines may also be used upon approval.

Substitutions for required courses may be made if approved by the graduate adviser. Instructors may substitute stated prerequisites for students with equivalent experience.

Master of Science in Bioinformatics and Computational Biology

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 mathematical Sciences. The BCBM program seeks 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 both Mathematical Sciences (MMS) and Molecular and Cell Biology (MCB) participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments 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:

BIO 5410 Biochemistry
BIO 5420 Molecular Biology
BIO 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 & Biology

Additional core courses for the Bioinformatics track:

CS 5333 Discrete Structures
CS 5343 Algorithms Analysis and Data Structures
CS 6360 Database Design
**Elective**: A minimum of 7 semester credit hours of elective, approved by the student's adviser. 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.

**Doctor of Philosophy**

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 adviser. Adjustments can be made as the student's interests develop and a specific dissertation topic is chosen. A minimum of 90 semester hours beyond the bachelor's degree is required.

**Applied Mathematics Major**

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 6319-6320 Principles and Techniques in Applied Mathematics I and II  
MATH 7313 Partial Differential and Integral Equations I  
MATH 7319 Functional Analysis

**Statistics Major**

MATH 6301 Real Analysis  
MATH 6302 Real and Functional Analysis  
STAT 6331-6332 Statistical Inference I, II  
STAT 6337-6338 Statistical Methods I, II  
STAT 6339 Linear Statistical Models  
STAT 6344 Probability Theory I  
STAT 7330 Decision Theory  
STAT 7331 Multivariate Analysis  
STAT 7334 Nonparametric Statistics  
STAT 7338 Time Series Modeling and Filtering  
STAT 7345 Stochastic Processes  
MATH 6303 Theory of Complex Functions I, or MATH 6313 Numerical Analysis, or MATH 6315 Ordinary Differential Equations I, or MATH 7319 Functional Analysis
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 adviser. 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:

- **Applied Mathematics**: applied analysis, biomathematics, differential equations, relativity, scattering theory, systems theory, signal processing.
- **Statistics**: statistical inference, applied statistics, statistical computing, probability, stochastic processes, linear models, time series, statistical classification, multivariate analysis, nonparametric and robust statistics, asymptotic theory.

Other specializations are possible, including interdisciplinary topics. There must be available a dissertation research adviser or group of dissertation advisers willing to supervise and guide the student. A dissertation Supervising Committee should be formed in accordance with the U.T. Dallas policy memorandum (87-III.25-48). The dissertation may be in Mathematical Sciences exclusively or it may involve considerable work in an area of application.

Research

Within the Mathematical Sciences programs 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. Special topics within research areas 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 and computational biology with applications in cardiovascular physiology, neurobiology and cell biology; probability theory, applied probability, stochastic processes, mathematical statistics, statistical inference, asymptotic theory, statistical time series, Bayesian analysis, robust multivariate statistical methods, robust linear models, robust and nonparametric methods, sequential analysis, statistical computing, signal processing, remote sensing, change-point problems, forecasting and applications in their respective areas such as energy finance, semiconductor manufacturing, psychology, actuarial sciences, physical and medical sciences.

For a complete list of faculty and their areas of research, visit the website [www.utdallas.edu/nsm/math/faculty](http://www.utdallas.edu/nsm/math/faculty).
### Mechanical Engineering Course Descriptions

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6301</td>
<td><strong>(Same As MSEN 6310)</strong> Mechanical Properties of Materials</td>
<td>3</td>
<td>Phenomenology of mechanical behavior of materials at the macroscopic level and the relationship of mechanical behavior to material structure and mechanisms of deformation and failure. Topics covered include elasticity, viscoelasticity, plasticity, creep, fracture, and fatigue. Prerequisite: MECH 3301 or equivalent. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6302</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
<td>Design, development, manufacturing and analysis of large, complex mechanical systems. Prerequisite: MECH 3302 or equivalent. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6305</td>
<td>CAD Technology</td>
<td>3</td>
<td>Introduction to computer-aided design. Principles of geometrical modeling. Curve and surface fitting in an automated environment. CAD/CAM simulation of manufacturing. Computer-aided solid modeling. Prerequisites: MECH 3305 or equivalent. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6310</td>
<td>Intermediate Fluid Mechanics</td>
<td>3</td>
<td>Ideal fluid flow including potential flow theory. Computer solutions in ideal fluid flow. Viscous flow and boundary layer theory. Introduction to turbulence. Prerequisite: MECH 3310 or equivalent. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6315</td>
<td>Advanced Fluid Mechanics</td>
<td>3</td>
<td>A mechanically and mathematically sophisticated introduction to the fundamentals of fluid mechanics. This course is intended to provide the beginning graduate student with a broad background in the fundamentals of fluid mechanics and an introduction to the various flow regimes. After completing this course, the student should be prepared to take subsequent courses in a broad range of engineering disciplines, such as mechanical, bioengineering, aerospace, and civil engineering. Derivation of the governing equations of motion. An introduction to viscous, inviscid, turbulent, and boundary-layer flows. Prerequisite: MECH 3310 or equivalent. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6320</td>
<td>Conductive Heat Transfer</td>
<td>3</td>
<td>Introduction to fundamentals of conductive heat transfer with an emphasis on numerical and analytical solutions. Steady and transient one- and multi-dimensional thermal conduction. Emphasis on analytical methods, numerical techniques and approximate solutions. Prerequisite: MECH 3320 or equivalent. (3-0) T</td>
</tr>
<tr>
<td>MECH 6321</td>
<td>Convective Heat Transfer</td>
<td>3</td>
<td>A rigorous and advanced development of the fundamentals of convective heat transfer and its applications. Convection (forced and free) in laminar and turbulent, internal and external flows. Analogy between momentum and heat transfer. Scaling laws and modeling. Prerequisite: MECH 3320 or equivalent. (3-0) T</td>
</tr>
<tr>
<td>MECH 6322</td>
<td>Semiconductor Processing Technology</td>
<td>3</td>
<td>Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T</td>
</tr>
<tr>
<td>MECH 6331</td>
<td>Systems and Control Theory</td>
<td>3</td>
<td>Systems and control theory: state space, convolution integrals, transfer functions, stability, controllability, observability, and feedback. Prerequisites: MECH 2300 and MECH 4310 or equivalents. (3-0) Y</td>
</tr>
<tr>
<td>MECH 6332</td>
<td>Advanced Control</td>
<td>3</td>
<td>Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: MECH/EE 6331. (3-0) R</td>
</tr>
<tr>
<td>MECH 6336</td>
<td>Nonlinear Control Systems</td>
<td>3</td>
<td>Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: MECH/EE 6331. (3-0) R</td>
</tr>
<tr>
<td>MECH 6361</td>
<td>Deformation Mechanisms in Solid Materials</td>
<td>3</td>
<td>Linear elastic fracture mechanics, elastic-plastic fracture mechanics, time dependent failure, creep and fatigue, experimental analysis of fracture, fracture and failure of metals, ceramics, polymers and composites. Failure analysis related to material, product design, manufacturing and product application. Prerequisite: MECH 6301. (3-0) T</td>
</tr>
</tbody>
</table>
MECH 6381 (EEGR 6381) Numerical Methods In Engineering (3 semester hours) Numerical techniques in engineering and their applications, with an emphasis on practical implementation. Topics will include some or all of the following: numerical methods of linear algebra, interpolation, solution of nonlinear equations, numerical integration, Monte Carlo methods, numerical solution of ordinary and partial differential equations, and numerical solution of integral equations. Prerequisites: CE/EE/MECH 2300 and CE/EE/MECH 3300 or equivalents, and knowledge of a scientific programming language. (3-0) T

MECH 6382 (EEMF 6382) Introduction to MEMS (3 semester hours) Study of micro-electro-mechanical devices and systems and their applications. Microfabrication techniques and other emerging fabrication processes for MEMS are studied along with their process physics. Principles of operations of various MEMS devices such as mechanical, optical, thermal, magnetic, chemical/biological sensors/actuators are studied. Topics include: bulk/surface micromachining, LIGA, microsensors and microactuators in multi-physics domain. (3-0) T

MECH 6385 Computational Modeling of Mechanical Systems (3 semester hours) Modeling of mechanisms, thermal systems and fluid flow using the finite-element method. Prerequisite: MECH 6381 or equivalent. (3-0) T

MECH 6V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

MECH 7V80 Special Topics In Mechanical Engineering (1-6 semester hours) (May be repeated to a maximum of 9 hours.) For letter grade credit only. ([1-6]-0) S

MECH 8V70 Research In Mechanical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

Deleted:
MECH 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S
M.S. in Psychological Sciences Course Descriptions

Major Field Core Courses

Developmental Psychology

PSYC 6331 (HCS 6331, ACN 6331) Cognitive Development (3 semester hours) Survey of cognitive development theories and research in a variety of domains including perception, memory, language, and problem solving. (3-0) Y

PSYC 6350 (HCS 6350) Social Development (3 semester hours) Foundations of social and personality development. Includes survey of psychodynamic, social learning, behavior genetic, family systems, and social-cognitive approaches to the study of attachment, parenting, aggression, peer relationships, sex typing, and other contemporary issues. (3-0) Y

PSYC 6368 (HCS 6368, ACN 6368) Language Development (3 semester hours) Advanced study of normal oral language development. Focus on research in child language and recent theories of language acquisition. Prerequisite: Consent of instructor. (3-0) Y

Cognition

PSYC 6330 (HCS 6330, ACN 6330) Cognitive Science (3 semester hours) Cognitive, computational, and neural processing approaches to understanding perception, memory, thought, language and emotion. (3-0) Y

PSYC 6333 (HCS 6333, ACN 6333) Memory (3 semester hours) Research and theory on the acquisition, representation and retrieval of information by the mind/brain. Includes information processing and neuropsychological perspectives. (3-0) T

PSYC 6395 (HCS 6395, ACN 6395) Cognitive Psychology (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. Prerequisites: CGS 3361 (PSY 3361) or consent of instructor. (3-0) Y

Social/Personality Psychology

PSYC 6327 (HCS 6327) Personality (3 semester hours) Survey of cognitive, analytic, and learning theory approaches to study of personality. Emphasis on intensive exploration of selected concepts and related research (3-0) R

PSYC 6376 (HCS 6376) Social Psychology (3 semester hours) Overview of the social bases of behavior. Topics may include social cognition and self justification, biases in judgment, attitudes and persuasion, conformity, compliance, group dynamics, prejudice and stereotyping, interpersonal attraction and relationships, aggression and altruism, cultural diversity, and applications relevant to these aspects of the human experience. Special attention to research paradigms of interest to students developing their own empirical work. (3-0) Y

Neuroscience

PSYC 6344 (HCS 6344, ACN 6344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T

PSYC 6346 (HCS 6346, ACN 6346) Systems Neuroscience (3 semester hours) Integrative systems level study of the nervous system. Aspects of neural mechanisms and circuitry underlying regulation of motor behaviors, sensory and perceptual processing, biological homeostasis, and higher cognitive functions. (3-0) Y

Research Methods Courses

Deleted: and current research in cognition and neuroscience. (May be repeated for credit.) (3-0) R

Deleted: PSYC 7344 (HCS 7344, ACN 7344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T
PSYC 6312 (HCS 6312, ACN 6312) Research Methods in Behavioral and Brain Sciences - Part I (3 semester hours) Applying, understanding, and interpreting various statistical techniques in behavioral science context. Participants have the opportunity to learn appropriate statistical details for basic descriptive and inferential statistics, the interrelationships among techniques, and computer skills required for data analyses. Students without the necessary background knowledge of basic statistics and experimental design will be required to take PSY 3392 before registering for PSYC 6312. (3-0) Y

PSYC 6313 (HCS 6313, ACN 6313) Research Methods in Behavioral and Brain Sciences - Part II (3 semester hours) Topics in general linear modeling including regression analysis correlation, simple analysis of variance, factorial analysis of variance, analysis of covariance, between and within subject designs, and multiple regression. Prerequisite: PSYC 6312 or consent of instructor. (3-0) Y

PSYC 6316 (HCS 6316, ACN 6316) Research Methods in Behavioral and Brain Sciences—Part III (3 semester hours) Applying, understanding, and interpreting various advanced multivariate statistical techniques in brain and behavioral science contexts. Includes principle component analyses, simple and multiple correspondence analyses, partial least square regression, discriminant analyses, and structural equation modeling. (3-0) R

PSYC 6319 (HCS 6319, ACN 6319) Scientific Writing (3 semester hours) Scientific writing of articles for publication. (3-0) Y

PSYC 6399 (HCS 6399, ACN 6399) Research Ethics and Scientific Integrity (3 semester hours) An interactive, intensive course designed to cover critical issues related to human subjects, animal welfare, research design, accountability of scientific actions and fraud. Course designed for individuals intending research careers in academia or industry. (3-0) Y

Other Courses

PSYC 6320 (HCS 6359, HDCD 6320) The Developing Child: Toddler and Preschool Years (Two to Five Years) (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive, and social domains from 2 to 5 years. Prerequisite: HCDC 5311 or HCS 6357 (3-0) Y

PSYC 6332 (HCS 6332, ACN 6332) Perception (3 semester hours) Psychophysical, neurophysiological, and computational foundations of sensation and perception. Basic senses of vision, audition, chemoreception, and tactile processing, with emphasis on understanding the processes that take us from neurons to perception and action. (3-0) T

PSYC 6335 (HCS 6356, HDCD 6385) Child Psychopathology (3 semester hours) Major classes of childhood psychopathology manifested during infancy through adolescence. Normal personality development as a basis for identifying psychopathology. Issues of etiology, diagnosis, prognosis and social policy. (3-0) R

PSYC 6339 (HCS 6339, ACN 6339) Psycholinguistics (3 semester hours) Classic and current research in psycholinguistics. Includes concepts from linguistics, the biological bases of speech and language processing, and child language acquisition. Hands-on exercises include labs on speech perception, language acquisition, and language comprehension. (3-0) R

PSYC 6355 (HCS 6355, ACN 6355) Judgment and Decision Making (3 semester hours) This course examines human inferences, judgments, decisions, and the processes by which we arrive at them. It will focus on the fact that our social judgments are not based on the laws of probability and chance, but on other cognitive processes that may have serious shortcomings in important inferential and decision-making tasks. We will also see that these processes, while ecologically efficient, systematic and often predictable, are imperfect in today’s data-rich environment. (3-0) T

PSYC 6357 (HCS 6357, HDCD 6319) The Developing Child: Infants and Toddlers (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perception, cognitive, and social domains from the prenatal period through two years of age. (3-0) Y

PSYC 6367 (HCS 6367, ACN 6367) Speech Perception (3 semester hours) Current topics and theories in speech perception. Topics include the acoustic correlates of speech sounds and the problem of invariance, the perception of speech under adverse conditions, the effects of hearing impairment, and models of speech perception. (3-0) T
PSYC 7318 Special Topics in Psychological Sciences (3 semester hours) Selected topics of current research in psychological sciences. (May be repeated for credit.) (3-0) R
PSYC 7V50 Internship in Psychological Sciences (1-6 semester hours) Applied placement in community agency or other approved site. (May be repeated for credit) [(1-6)-0] S
PSYC 8V80 Research in Behavioral and Brain Sciences (1-9 semester hours) Supervised research experience. (May be repeated for credit) [(1-9)-0] S

Deleted: (HCS 8V80)
Master of Science in Economics

http://www.utdallas.edu/epps/eco/

Faculty

**Professors:** Daniel G. Arce M., Kurt J. Beron, Rachel Croson, Catherine Eckel, James Murdoch, Todd Sandler, Barry J. Seldon, Dongyu Sul

**Associate Professors:** Nathan Berg, Susan Williams McElroy, Kevin Siqueira

**Assistant Professors:** Rodney Andrews, Chetan Dave, Xin (Sherry) Li

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.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R. Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database and WestLaw are also available for student use. The University’s Computing Center provides 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.

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 U.T.Dallas or their equivalents at another institution: ECON 3310 Intermediate Microeconomics, ECON 3311 Intermediate Macroeconomics, ECON 4351 Mathematical Economics, ECON 4355 Econometrics, and EPPS 3303 Introduction to Social Statistics, 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 instead of ECON 5321 and ECON 6302 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 Microeconomic Theory II and ECON 7302 Macroeconomic Theory II as electives.
Certificate in Evaluation Research

A graduate-level certificate program in Evaluation Research is offered jointly by the School 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 Social Sciences or Behavioral and Brain Sciences, or may be taken on its own by nondegree 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 four required courses and one guided elective, complete an evaluation research project including a final report, and participate in a weekly evaluation research seminar. The courses in the School of Social Sciences leading to the Certificate in Evaluation Research are POEC 5313 Descriptive and Inferential Statistics for the Social Sciences, POEC 6352 Evaluation Research Methods in the Social Sciences, POEC 6V91 Evaluation Research (six credit hours), and an additional course to be chosen from a list of guided electives available from the Social Sciences graduate advising office, 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. Students interested in applying for admission to the Certificate in Evaluation Research program should consult the graduate advising office in the School of Social Sciences or the School of Behavioral and Brain Sciences.
Course Descriptions

- **HDCD 6310 Parent Education** (3 semester hours) Skills needed by professionals to assess parents' strengths, resources and needs as well as to assist parents in understanding and promoting their children's development and adjustment. Includes effective communication techniques, basic counseling skills, and strategies to enhance parental effectiveness within the family and community. (3-0) Y

- **HDCD 6312 Atypical Development** (3 semester hours) Disorders of development from conception to age five, emphasizing etiology, diagnosis and treatment. Impact of delays in the acquisition and integration of various developmental skills as they relate to specific disorders of personality and socialization, sensory and motor skills, and language and cognition. (3-0) Y

- **HDCD 6315 Assessment Theory** (3 semester hours) Latest developments in the field of assessment with young children, including behavioral observation, contextual multi-faceted assessment, and inclusion of the family. Training in traditional psychometrics and assessment tools/techniques. Pre- or corequisite: HDCD 6319, (3-0) Y

- **HDCD 6316 Developmental Assessment** (3 semester hours) Play-based and family assessment protocols. Consider diagnostic classification through differential diagnosis decision-making. Emphasis on clinical judgment, interpretation and integration of diagnostic information. Prerequisites: HDCD 6319, 5315, (3-0) Y

- **HDCD 6319 (HCS 6357, PSYC 6357) The Developing Child: Infants and Toddlers** (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive, and social domains from the prenatal period through two years of age. (3-0) Y

- **HDCD 6320 (HCS 6359, PSYC 6329) The Developing Child: Toddler and Preschool Years (Two to Five Years)** (3 semester hours) Relevant developmental theories and processes as well as skills acquired in motor, sensory-perceptual, cognitive, and social domains from 2 to 5 years. Prerequisite: HDCD 5311, (3-0) Y

- **HDCD 6325 Service Coordination of Community Resources** (3 semester hours) Policies and procedures pertinent to service coordination of community resources in early intervention and family-centered practices that help families become more independent. (3-0) Y

- **HDCD 6330 Families and Culture** (3 semester hours) Child growth and development in the context of diverse families and cultures. Respect for cultural variations in family and cultural values and practices. Emphasizes the impact of the students' own culture, attitudes, and beliefs in working with families from diverse backgrounds.

- **HDCD 6335 Intervention Paradigms** (3 semester hours) Historical, theoretical, political, and research bases for principles of approaches to early intervention with at-risk and handicapped infants, toddlers, and preschoolers and their families. Emphasis on evidence-based practice and methods of program evaluation. (3-0) Y

- **HDCD 6355 Advanced Seminar: Family Outreach and Assessment** (3 semester hours) This practicum is designed to provide students, as part of a 2-3 person team, supervised experiences with children from diverse backgrounds, at selected off-campus sites. Emphasis is on assessment, professional report writing, the referral process, and working together in 2-3 student teams. Pass/Fail only. (3-0) Y

- **HDCD 6360 Behavior Management** (3 semester hours) Observational methodology in behavioral assessment and review of principles and procedures of behavior change from social learning and applied behavior analysis perspectives. Particular attention will be given to the design, implementation, and evaluation of behavioral interventions with children and families. (3-0) Y

- **HDCD 6365 (COMD 7336) Social Communication in Early Childhood Disorders** (3 semester hours) Development of infant and toddler social, communication and language skills including major milestones of typical development in the areas of cognitive, social and language development; Assessment, and treatment of social communication disorders in the prelinguistic and emerging language stages. (3-0) Y

- **HDCD 6370 Intervention with Young Children** (3 semester hours) Emphasis on methods and procedures for facilitating development of high-risk, delayed or handicapped young children through relationship-based intervention. Reviews the contributions and perspectives of various early intervention disciplines. Students design and implement individualized intervention programs. (3-0) Y
**HDCD 6385** (HCS 7376, PSYC 6335) *Child Psychopathology* (3 semester hours) Major classes of childhood psychopathology manifested during infancy through adolescence. Normal personality development as a basis for identifying psychopathology. Issues of etiology, diagnosis, prognosis and social policy. (3-0) R

**HDCD 6390** *Infant Mental Health* (3 semester hours) Theoretical foundations of infant mental health. The attachment-separation process in healthy development. The impact of illness, disability, maltreatment, deprivation, trauma, foster-care, and adoption on infant mental health. Overview of intervention programs that address relationship disruptions or disorders. (3-0) Y

**HDCD 6395** *Medical and Biobehavioral Factors in Early Childhood Disorders* (3 semester hours) The normal functioning of organ systems and the most common malformations, dysfunctions, and diseases affecting early developmental disorders. Effects of these disorders on the child and family are studied. (3-0) Y

**HDCD 6V81** *Special Topics in Human Development and Early Childhood Disorders* (1-9 semester hours) Topics vary from semester to semester. May be repeated for credit as topics vary. ([1-9]-0) R

**HDCD 7V20** *Practicum/Internship in Disorders of Young Children* (3 or 6 semester hours)(P/F grading) Supervised participation in on-site, early intervention and private therapy settings. Includes professional activities such as assessment, intervention, service coordination and interdisciplinary teaming. Weekly seminars address reflective practice as a tool for professional growth, ethical decision making in real situations, and professional use of self. Taken for 3 hours credit coincident with practicum placement and for 6 hours credit coincident with internship placement. Prerequisite: Consent of instructor. May be repeated for credit. ([3-6]-0) S

**HDCD 7V80** *Independent Research* (1-6 semester hours) Individualized program of study which includes research and/or other designated activities. ([1-6]-0) S

**HDCD 7V98** *Independent Study* (1-6 semester hours) Individualized program of study which may include reading, research, and/or other designated activities. May be repeated for credit. ([1-6]-0) S
Please indicate with an X if your department catalog copy has no changes: 

SCHOOL: Economic, Political and Policy Sciences

DEPARTMENT: ECONOMICS

BASIS FOR CATALOG CHANGES:

Changes reflect course renumbering at the direction of the University.

NEW PROGRAMS/DEGREES/CERTIFICATES:

Course numbering and changes in credit hour changes should be reflected in the two categories below.

NEW COURSES ADDED:

- ECON 6301 Microeconomics Theory I (Renumbered from ECON 5301)
- ECON 6302 Macroeconomics Theory I (Renumbered from ECON 5302)
- ECON 6303 Microeconomic Theory for Applications (Renumbered from ECON 5321)
- ECON 6304 Macroeconomic Theory for Applications (Renumbered from ECON 5322)
- ECON 6305 Mathematical Economics (Renumbered from ECON 5309)
- ECON 6306 Applied Econometrics (Renumbered from ECON 5311)
- ECON 6320 Game Theory for the Social Sciences (Renumbered from ECON 5325)
- ECON 7301 Microeconomics Theory II (Renumbered from ECON 6307)
- ECON 7302 Macroeconomics Theory II (Renumbered from ECON 6308)
- ECON 7309 Econometrics II (Renumbered from ECON 6319)
- ECON 7316 Game Theory (Renumbered from ECON 6366)
- ECON 7363 Public Economics II (Renumbered from ECON 6365)
- ECON 8301 Microeconomics III (Renumbered from ECON 6312)
- ECON 8309 Econometrics III (Renumbered from ECON 6319)

COURSES DELETED:

- ECON 5301 Microeconomics Theory I (Changed to ECON 6301)
- ECON 5302 Macroeconomics Theory I (Changed to Econ 6302)
- ECON 5309 Mathematical Economics (Changed to Econ 6305)
- ECON 5311 Applied Econometrics (Changed to Econ 6306)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Change To</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 5321</td>
<td>Microeconomic Theory for Applications</td>
<td>Changed to Econ 6303</td>
</tr>
<tr>
<td>ECON 5322</td>
<td>Macroeconomic Theory for Applications</td>
<td>Changed to Econ 6304</td>
</tr>
<tr>
<td>ECON 5325</td>
<td>Game Theory for the Social Sciences</td>
<td>Changed to Econ 6320</td>
</tr>
<tr>
<td>ECON 6307</td>
<td>Microeconomics Theory II</td>
<td>Changed to Econ 7301</td>
</tr>
<tr>
<td>ECON 6308</td>
<td>Macroeconomics Theory II</td>
<td>Changed to Econ 7302</td>
</tr>
<tr>
<td>ECON 6312</td>
<td>Econometrics III</td>
<td>Changed to Econ 8309</td>
</tr>
<tr>
<td>ECON 6314</td>
<td>Structural Equation &amp; Multilevel Modeling</td>
<td>Changed to EPPS 7318</td>
</tr>
<tr>
<td>ECON 6316</td>
<td>Spatial Econometrics</td>
<td>Changed to EPPS 7368</td>
</tr>
<tr>
<td>ECON 6319</td>
<td>Microeconomics Theory III</td>
<td>Changed to Econ 8301</td>
</tr>
<tr>
<td>ECON 6325</td>
<td>Cost Benefit Analysis</td>
<td>Changed to Econ 7304</td>
</tr>
<tr>
<td>ECON 6345</td>
<td>Innovation Dynamics &amp; Economic Change</td>
<td>Changed to POEC 7327</td>
</tr>
<tr>
<td>ECON 6365</td>
<td>International Trade</td>
<td>Changed to ECON 6355</td>
</tr>
<tr>
<td>ECON 6366</td>
<td>Game Theory</td>
<td>Changed to ECON 7316</td>
</tr>
<tr>
<td>ECON 7380</td>
<td>Applied Multivariate Analysis</td>
<td>Changed to EPPS 7380</td>
</tr>
</tbody>
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Graduate Programs in Management

http://som.utdallas.edu/

Faculty


Assistant Professors: Jayatirtha Asundi, Nina Baranchuk, Octavian Carare, Huseyin Cavusoglu, Zhonglan Dai, Kutsoi Dogan, Rebecca Files, Jianjun Geng, Umit Gurun, Todd Kravel, Xu Li, Elisabeth Najah-King Lim, Xiaohui Liu, Volkan Muslu, Valery Polkovnichenko, Roberto Ragozzino, Gonca Soysal, Andrei Strijnev, Upender Subramanian, Mark Vargus, Minhua Wan, Yu Wang, Kelsey Wei, Yuanping Ying, Wei Yue, Alejandro Zentner, Jun Zhang, Qin Zhang, Feng Zhao, Yibin Zhou.

Senior Lecturers: Joachim Adler, Art Agulnek, Shawn Alborz, Frank Anderson, John Barden, George Barnes, Abhijit Biswas, Ron Blair, Daniel Bochsler, Tiffany Bortz, LeeAnn Butler, Mary Chaffin, Mary Beth Goodrich, Maria Hassenhuttl, Jonathon Hochberg, Jennifer Johnson, Marilyn Kaplan, Jackie Kimsey, Chris Linsteadt, Diane S. McNulty, Radha Mookerjee, Madison Pedigo, Joseph Picken, Nataliya Polkovnichenko, Matt Polze, Carolyn Reichert, Robert Robb, Tracey Rockett, Mark Salamasick, Phil Sanchez, Michael Savoie, Avanti Sethi, Jeanne Sluder, Charles Solcher, Lou Thompson, Mark Thouin, Amy Troutman, John Watson, Habte Woldu, Laurie Ziegler

Clinical Faculty: David Cordell, Tefvik Dalgic, Forney Fleming, Charlie Hazzard, Rob Hicks, Peter Lewin, Holly Lutze, John McCracken, Kumar Nair, Divakar Rajamani, Rajiv Shah, Fang Wu

Visiting Faculty: Usman Ghani, Francisco Szekely

Objectives

The Master of Business Administration 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. U.T. Dallas offers several distinct approaches to obtaining an MBA. These include (1) 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, (2) the Professional MBA Program for students attending school part-time, with classes largely meeting in the evening, and (3) the Global MBA Online with all core and elective courses available by distance learning, 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 Global MBA Online use audio streaming lectures supported by downloadable presentations, online text-based conferences, bulletin board and e-mail exchanges, and teleconferences.

The M.A. in International Management Studies degree provides knowledge of and training in international management, which includes trade across national boundaries, management practices within foreign nations, and management on a global basis. 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. In the past, the School has organized study abroad opportunities in Russia, China, Hong Kong, Singapore, Vietnam, Thailand, Indonesia, and India. 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. Many classes for this degree must be taken via distance learning.

The M.S. in Accounting and Information Management 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 life-long learning. The Accounting and Information Management Program is a leader in developing the professional skills that are needed for the core services identified by the Institute of Certified Public Accountants as being fundamental to the future of the profession. Students are offered a choice among seven concentrations that relate to these core services including financial analysis, audit and professional services, taxation services, information management services, international services, management consulting, and internal audit. Upon completion of the M.S. in Accounting and Information Management, students may sit for the Uniform CPA Examination, provided they meet the educational requirements.

The M.S. in Information Technology and Management 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. 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’, ‘Healthcare Systems’, and ‘Information Security’ depending on their interests and goals.

The M.S. in Management and Administrative Sciences 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, organizations, strategy and international topics. The classes for this degree are largely offered in the evenings.

The M.S. 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 and senior level healthcare executives.

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 University of Texas at Dallas School of Management and the University of Texas Southwestern Medical Center. The Executive program is entirely supported by participant fees and special admission requirements apply. For information, contact the program office at (972) 883-6252.
The M.S. in Finance is designed for students with or without previous educational background in finance. Candidates in the M.S. in Finance choose one of four concentrations: Financial Analysis, Financial Management, Financial Risk Management, and Financial Engineering. The Financial Analysis concentration is designed for students interested in pursuing a career as a financial analyst and completing the Chartered Financial Analyst (CFA) examinations. The Financial Management concentration allows students to tailor their course work for careers in a range of activities: e.g., corporate finance, investment banking, venture capital, private equity, commercial banking, insurance, etc. The Financial Risk Management concentration is designed for students interested in a career in financial risk management and one of the financial risk management certifications. The Financial Engineering concentration is designed for students with the quantitative ability to pursue a career applying quantitative methods to investment and risk management problems. Because several of these concentrations designed to best prepare students for certain certifications, students are required to complete all the course work in a particular concentration to graduate with that concentration.

The M.S. in Supply Chain Management (SCM) will explore the key issues associated with the design and management of industrial supply chains. It will entail concepts dealing with the improvement of supply chain operations towards lower costs, faster delivery, higher quality and bigger variety. The ultimate objective is using SCM to mold traditional business operations into competitive weapons for today's global economy. Students will acquire not only fundamental 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 School of Management also offers Executive Education degree programs. Executive Education MBA programs are offered for students with several years of experience. These include (1) the Executive MBA Program with classes meeting for two days (Friday and Saturday) every other week, (2) the Executive MBA with emphasis in Project Management that highlights managing complex projects, (3) the Healthcare Management Executive MBA for physicians and senior level healthcare executives interested in learning how to improve the leadership and management of their organizations, and (4) Global Leadership Executive MBA primarily delivered 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 M.S.E.E. degree from the Jonsson School of Engineering and Computer Science in combination with an MBA, an M.S. or an M.A. degree from the 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 M.S.E.E. and MBA degrees can be earned by completing a minimum of 68 graduate hours, compared to 68 hours if completing the two degrees separately. 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, compared to 69 hours if completing the two degrees separately. See page XX in the Electrical Engineering section for details.

The Ph.D. 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 Ph.D. 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 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, and places emphasis on science and is not constrained by the culture of individual disciplines. It is this 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 School of Management is located in a new facility at the corner of University Parkway and Drive A. This 200,000 square foot building opened in the Fall of 2003. The three wings, arranged around a courtyard, provide classrooms, meeting rooms, and office space. State-of-the-art wireless access to the internet will be available throughout the facility.

Admission Requirements to Master's Programs

The University's general admission requirements are discussed here.

Evening and Online programs (MBA, Global MBA Online, M.A., M.S)

Admissions to the evening programs are based on a consideration of the applicants’ entire record. 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 550 on the paper test (or 215 on the computerized test) that is less than two years old,
- undergraduate GPA, calculated on the last 60 hours of academic course work,
- honors and achievements,
- personal essay outlining academic interests and goals
- letters of recommendations (3),
- work experience,
- competitive GMAT performance based on a score that is less than seven years old
- personal characteristics that add to the diversity of the class, such as country of citizenship, gender, multilingual skills, involvement in extracurricular and community activities and socioeconomic history.

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 3 times per year and can start their studies during any one of the three semesters.

Students may apply for the Dean’s Excellence Award which provides financial support in the form of scholarships.
The Global MBA Online has the same admission requirements and tuition as the traditional MBA. And the Online program follows the same academic calendar as the rest of the University. These students receive priority registration for online courses.

**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 May 1 will be considered for financial support. International applications are due June 1 and domestic applications by July 1. Students are admitted each fall.

**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 ability to use a DOS-based personal computer, with Windows, for word processing and spreadsheets (possession of a laptop computer with modern and Internet access is required), and corporate endorsement and support in the case of employed participants. The GMAT is encouraged, but not required. Applications are due June 30, and students are admitted each fall.

**Master of Science in Healthcare Management:** The M.S. in Healthcare Management 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 and senior level healthcare executives. The admission requirements for the Professional Track are the same as those listed above for all other School of Management evening and online degree programs.

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 medical school and undergraduate transcripts. The requirements include seven or more years of senior management experience in a U.S. healthcare organization; a baccalaureate degree with an undergraduate GPA of 3.0 or higher; the ability to successfully perform graduate level work as evidenced by either a Master's degree or higher from a U.S. accredited college or university or by providing an acceptable GMAT score; two confidential letters of reference from professional colleagues; a written statement of professional objectives; and a personal or telephone interview at the option of the program director.

**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.

Conditional acceptance to the School may be granted with the recommendation of the Admissions Committee and the concurrence of the Dean of Graduate Studies. At the time of their acceptance, the students will be informed of the conditions they need to satisfy to become regular students. The students can be in conditional status for only one semester and need to fulfill the stipulated conditions by the end of the semester. Conditionally accepted students will be restricted to:

- taking at most six credits during the semester,
- enrolling in courses from a pre-specified list.

**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 twelve hours toward the M.A. and M.S. degree, and fifteen hours toward the MBA degree.

Applications for approval of substitutions and transfers of credit may be obtained in and submitted to the School of Management Advising Office.

Prerequisites for Graduate Programs

Knowledge of calculus and competence in personal computing are requirements for the programs. Students who have not completed an undergraduate calculus course at the level of MATH 1325 or higher may satisfy the prerequisite by completing MATH 5304 Applied Mathematical Analysis for Non-majors. Competence in personal computing may be demonstrated in one of three ways: having completed BA 3351 with a grade of B or better, having completed an equivalent course at another university with a grade of B or better, or passing an exam. A modest fee is required to take the exam. 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 M.A. in International Management Studies, FIN 6301 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.
GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: 10/21/2009
TO:    GRADUATE DEAN
FROM:  Bob Stillman

Please indicate with an X if your department catalog copy has no changes

SCHOOL BBS

DEPARTMENT HDCD

BASIS FOR CATALOG CHANGES:
Reduce 7000 level courses to 6000 level courses and raise 5000 level courses to 6000 level courses

NEW PROGRAMS/DEGREES/CERTIFICATES

Course numbering and changes in credit hour changes should be reflected in the two categories below.
NEW COURSES ADDED:   HDCD 6330, HDCD 6360, HDCD 6365, HDCD 6385, HDCD 6390
CHANGES IN COURSE NUMBERING: HDCD 6312, HDCD 6315, HDCD 6316, HDCD 6319, HDCD 6325, HDCD 6335, HDCD 6355, HDCD 7V80

COURSES DELETED:
CHANGES IN COURSE NUMBERING: HDCD 5312 (TO HDCD 6312), HDCD 5315 (to HDCD 6315), HDCD 5316 (to HDCD 6316), HDCD 5311 (to HDCD 6319), HDCD 5320 (to HDCD 6325), HDCD 5330 (to HDCD 6335), HDCD 7350 (to HDCD 6355), HDCD 8V80 (to HDCD 7V80)
Criminology Course Descriptions

CRIM 6300 Proseminar in Criminology. (3 semester hours) Introduction to graduate study in criminology through exposure to issues surrounding concepts of crime, criminals and societal response. Students learn to examine critically the theoretical, methodological and policy issues in criminology and criminal justice. (3-0) Y

CRIM 6303 Etiology of Crime and Criminality. (3 semester hours) Examines the history of criminological thought incorporating the major works of such theorists as Bentham, Beccaria, Marx, Durkheim, Lombroso, Shaw and McKay, Sutherland, Becker, and Merton. (3-0) Y

CRIM 6305 Law and Social Control. (3 semester hours) Addresses the legal and theoretical basis of social control and the use of criminal sanctions to deter and punish criminal conduct. Students will learn to critically assess alternative punishment and sentencing models. (3-0) Y

CRIM 6307 Extent of Crime and Measurement. (3 semester hours) Problems in Criminology. Examines the major data sources on crimes and criminals and the limitations of such data. Topics also include measurement issues and problems concerning research on the nature and extent of criminal behavior. (3-0) Y

CRIM 6308 Victimology (3 semester hours) Examines risks and consequences of crime for its victims. Issues considered include victim-offender relationships, characteristics of victims, the nature of the injuries they experience, and criminal justice procedures that involve them. (3-0) Y

CRIM 6309 Communities and Crime (3 semester hours) Examines the trends and sources of crime and social disorder across communities. The course emphasizes relationships among crime, fear of crime, neighborhood change, neighborhood responses to crime, and public policies. (3-0) Y

CRIM 6310 Delinquency and Juvenile Justice (3 semester hours) Examines youth crime, child victimization, and juvenile justice. Students learn the processes by which specific behaviors are identified as delinquent, the historical evolution of juvenile justice, and current policies and practices. (3-0) Y

CRIM 6311 Crime and Justice Policy. (3 semester hours) An introduction to crime and the efforts to control crime through public policy. (3-0) Y

CRIM 6313 Corrections (3 semester hours) Examines the history, forms, and functions of correctional philosophies, institutions, programs, and policies. Topics include the structure and functions of prisons and jails, community corrections, intermediate sanctions, and the growth of correctional control in modern society. (3-0) Y

CRIM 6314 Policing (3 semester hours) Provides historical, social and political analysis of the roles and functions of policing in America. (3-0) Y

CRIM 6315 Violent Crime (3 semester hours) Examines the sources and patterns of violent offending across time and space. Topics include conceptions and typologies of violent crimes and offenders, victim-offender relationships, and efforts to predict and control violent offending. (3-0) Y

CRIM 6317 Courts (3 semester hours) Examines the objectives, institutions and processes involved in the adjudication of offenders. Topics address the structure and function of the judicial system and principal court actors. (3-0) Y
CRIM 6322 Crime Prevention (3 semester hours) Examines situational, social, and legislative approaches to the prevention of crime and delinquency. Emphasis on theories, protective factors, implementation and consequences of these approaches. (3-0) R

CRIM 6324 Correlates of Crime and Justice. Examines the nature of relationships among attributes and indices at the situational and aggregate levels to various forms of crime and systems of justice. (3-0)

CRIM 6332 GIS Applications in Criminology (3 semester hours) Examines spatial distributions of crime, criminals, and criminal justice interventions. Students conduct spatial analysis of point patterns and area-based data in studies of the locations of crime events and rates, offenders, police patrolling practices, judicial districts and community corrections and how they relate to physical and social characteristics of neighborhoods. (3-0) R

CRIM 6348 Drugs and Crime (3 semester hours) This course provides students with a survey of the historical context of the legislative initiatives that have been attempted to combat the use of drugs, the relationship between drug use/abuse and crime, and the public policy problems surrounding the control of drugs. (3-0) R

CRIM 6V98 Analytical Writing Research (CRIM 7300 Advances in Criminology Theory. (1-9 semester hours) Examines contemporary criminological theories and the degree to which research has provided empirical support for explanations of crime and criminality. (May be repeated for credit).

CRIM 7301 Seminar in Criminology Research and Analysis. (3 semester hours) Examines a variety of quantitative methods and procedures used in criminological research. Students will plan and execute an independent advanced research project. (3-0) R

CRIM 7342 Qualitative Criminology (3 semester hours) Examines ethnography and other qualitative approaches to studying crime, criminals, and criminal justice, particularly participant observation and informant and respondent interviewing. Topics include phenomenology, case study, in-depth interviewing, ethnomethodology, conversation analysis, historical methods, gaining access, sampling, data collection and analysis, and legal and ethical concerns. (3-0) R

CRIM 7351 Advanced Criminological Theory Seminar (3 semester hours) Topics will vary from semester to semester on various criminological theories. May be repeated for credit up to a maximum of 9 elective hours. Students must complete CRIM 6303 and CRIM 7300 prior to enrolling. Consult with advisor to determine appropriateness for degree plan and specialty areas of study.

CRIM 7381 Special Topics in Criminology (3 semester hours) Topics will vary from semester to semester. May be repeated for credit up to a maximum of 9 elective hours. Consult with advisor to determine appropriateness for degree plan and specialty areas of study.

CRIM 8V01 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. Prerequisite: Consent of instructor. (May be repeated for credit.) R

CRIM 8V92 Independent Advanced Research (1-9 semester hours) Provides faculty supervision for student's individual study of a topic agreed upon by the student and faculty supervisor. Consent of instructor required. May be repeated for credit up to a maximum of 9 hours. Student performance is assessed by instructor as pass/fail only.

CRIM 8V99 Dissertation (1-9 semester hours). Provides faculty supervision of a student's dissertation research. Prerequisite: Consent of instructor. May be repeated as necessary for credit. (1-9-0) Y
CRIM 5310 (POEC 5310) Research Design I (3 semester hours) This course is the first in a two-course sequence devoted to the research enterprise and the study of data development strategies and techniques to facilitate effective statistical analysis. Topics generally covered include: (1) issues and techniques in social science research with emphasis on philosophy of science, theory testing, and hypothesis formulation; (2) measurement and data collection strategies, reliability and validity of measures and results, sampling, surveys; and (3) examination of qualitative versus quantitative research techniques, working with observational data, field research issues, and triangulation. (3-0) Y

CRIM 5313 (PA 5313, POEC 5313) Descriptive and Inferential Statistics for the Economic, Political and Policy Sciences (3 semester hours). This course is an introduction to data analysis, statistics, and regression. The only prerequisite is a sound foundation in algebra. The heart of the course is a rigorous introduction to statistical inference: sampling theory, confidence intervals, and hypothesis tests. The final section of the course covers regression analysis, which is developed in a fairly non-technical way, with an emphasis on interpretation of regression results, using examples from recent research. (3-0) Y

CRIM 5316 (POEC 5316) Advanced Regression Analysis for the Economic, Political and Policy Sciences (3 semester hours). This course provides a detailed examination of the bivariate and multiple regression models estimated using Ordinary Least Squares (OLS), with an emphasis on using regression models to test social and economic hypotheses. Also covered are several special topics in regression analysis, including violations of OLS assumptions, the use of dummy variables, fixed effects models, and path analysis. Applications are demonstrated with examples drawn from criminology, Economics, political science, public policy and sociology. (3-0) Y

CRIM 5355 (PA 5355 and POEC 5355) Introduction to Homeland Security (3 semester hours) This course provides a comprehensive overview of the structure of Homeland Security, its origins and developing trends and challenges. Selected material from Congress, FEMA, Department of Justice, local, state, and other government and non-government agencies will be studied. Examines both historical and contemporary Homeland Defense and Security issues. (3-0) Y

CRIM 5356 (PA 5356 and POEC 5356) Pre-emptive Strategies and Tactics (3 semester hours) Provides a comprehensive study of formulating pre-emptive strategies and tactics related to terrorist attacks and certain man-made disasters, such as chemical plant explosions. This course is a field-based application. Explores current published pre-emptive strategies and tactics, means and methods for improving current plans and explores new pre-emptive strategies and tactics driven by new intelligence assessments. (3-0) Y

CRIM 5357 (PA 5357 and POEC 5357) Information Sharing and Communication (3 semester hours) Provides a comprehensive overview of the structure of network, organizational and group information sharing and communication. Focuses include new theories and applications to information sharing and communication and intelligence gathering techniques of state and local fusion centers. (3-0) Y

CRIM 5358 (PA 5358 and POEC 5358) Social Networks and Intelligence Led Policing (3 semester hours) Provides a comprehensive study of concepts and methods for adopting intelligence as a foundation of law enforcement business operations for sound decision-making. Exploiting social networks is a primary means for preventing terrorism and crime. The course explores how intelligence-led policing depends on creating strong community social networks to enhance policing of criminal networks. (3-0) Y

CRIM 5359 (PA 5359 and POEC 5359) Protecting Critical Resources and Infrastructure (3 semester hours) Includes a comprehensive study of the current plans and policies in place for protecting critical resources and infrastructure, both public and private. The class will consist of a thorough review of the current literature pertaining to critical infrastructure protection policies, methods, plans, and identify new technology driven critical infrastructures. (3-0) Y
Qualitative Criminology (3 semester hours) Examines ethnography and other qualitative approaches to studying crime, criminals, and criminal justice, particularly participant observation and informant and respondent interviewing. Topics include phenomenology, case study, in-depth interviewing, ethnomethodology, conversation analysis, historical methods, gaining access, sampling, data collection and analysis, and legal and ethical concerns. (3-0) R

CRIM 6346 Qualitative Research Methods (3 semester hours) This course provides an overview of qualitative research in the social sciences. Students will investigate the assumptions underlying qualitative research approaches and critically assess the strengths and weaknesses of such approaches. Possible topics may include participant observation, ethnographic interviewing, ethnomethodology, conversation analysis, case study, and the analysis of historical documents. (3-0) T

CRIM 6V96 Master Thesis Research (1-6 semester hours). Students conduct masters level research project under the supervision of faculty. (1-6) Y

1-6 semester hours). Students perform independent research under the supervision of faculty. (1-6) Y
SOC 6312 Social-Economic Theories. (3 semester hours) A critical analysis of theories of society and economy. These include class, culture, solidarity, rational choice, transaction cost theory, principal agent theory, ideology and hegemony, network theory, collective action, bureaucracy, and American exceptionalism.  

CRIM 7302 Seminar in Criminology Research (3 semester hours) Continuation of CRIM 7301. (3-0) R
GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: 10/21/2009
TO: GRADUATE DEAN
FROM: Bob Stillman
Please indicate with an X if your department catalog copy has no changes ______

SCHOOL_BBS_____________________

DEPARTMENT_COMD_______________

BASIS FOR CATALOG CHANGES:
__________________________________________________________________________

NEW PROGRAMS/DEGREES/CERTIFICATES
__________________________________________________________________________

Course numbering and changes in credit hour changes should be reflected in the two categories below.
NEW COURSES ADDED: COMD 7309
CHANGES IN CREDIT HOUR: COMD 7V68

COURSES DELETED: COMD 7367
CHANGES IN CREDIT HOUR: COMD 7368 (to COMD 7V68)

OTHER_____________________________________________________________________

Approved:___________________________________________

School/Department
Master of Science Program in Communication Disorders

http://bbs.utdallas.edu/

Faculty

Professors: Thomas Campbell, Sandra Chapman, Christine DOLLAGHAN, William F. Katz, Robert D. STILLMAN, Linda Thibodeau, Emily TOBEY, Hanna Ulatowska, Anne van Kleeck
Associate Professor: Pamela Rollins
Assistant Professor: Mandy Maguire
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 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 U.T. 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 Assessment and Treatment of Adult Neurogenic Disorders, COMD 7303 Dysphagia, and COMD 7379 Assessment and Treatment of Language Disorders 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 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 U.T. Dallas in conjunction with graduate coursework or may be taken at another university.
Electrical Engineering Course Descriptions

- **EEMF 5283 (PHYS 5283) Plasma Technology Laboratory** (2 semester hours) Laboratory will provide a hands-on experience to accompany EE 5383. Topics to include: Vacuum technology [pumps, gauges, gas feed], plasma uses [etch, deposition, lighting and plasma thrusters] and introductory diagnostics. Co-requisite: EEMF 5383. Recommended Co-requisite: EEMF 7171. (0-2) R

- **EEGR 5300 Advanced Engineering Mathematics** (3 semester hours) Advanced mathematical topics needed in the study of engineering. Topics may include advanced differential equations, linear algebra, vector calculus, complex analysis, and numerical methods. Credit does not apply to the 33 hour M.S.E.E. requirement. (3-0) R

- **EEGR 5301 (CS 5301) Professional and Technical Communication** (3 semester hours) EE 5301 utilizes an integrated approach to writing and speaking for the technical professions. The advanced writing components of the course focus on writing professional quality technical documents such as proposals, memos, abstracts, reports, letters, emails, etc. The advanced oral communication components of the course focus on planning, developing, and delivering dynamic, informative and persuasive presentations. Advanced skills in effective teamwork, leadership, listening, multimedia and computer generated visual aids are also emphasized. Graduate students will have a successful communication experience working in a functional team environment using a real time, online learning environment. (3-0) Y

- **EERE 5305 Radio Frequency Engineering** (3 semester hours) Introduction to generation, transmission, and radiation of electromagnetic waves. Microwave-frequency measurement techniques. Characteristics of guided-wave structures and impedance matching. Fundamentals of antennas and propagation. Prerequisite: EE 4301 or equivalent. (3-0) Y

- **EEMF 5320 Introduction to Devices and Circuits** (3 semester hours) This course provides a background in Electrical Engineering for students entering the M.S.E.E. program from other fields of science and engineering. Topics include circuit analysis and simulation, semiconductor device fundamentals and operation, and basic transistor circuits. Credit does not apply to the 33 hour M.S.E.E. requirement. Prerequisite: differential equations. (3-0) R

- **EECT 5321 Introduction to Circuits and Systems** (3 semester hours) Continuation of EE 5320. Topics include analog circuits, digital circuits, digital systems and communication systems. Credit does not apply to the 33 hour M.S.E.E. requirement. (3-0) R

- **EEDG 5325 (CE 5325) Hardware Modeling Using HDL** (3 semester hours) This course introduces students to hardware description languages (HDL) beginning with simple examples and describing tools and methodologies. It covers the language, dwelling on fundamental simulation concepts. Students are also exposed to the subset of HDL that may be used for synthesis of custom logic. HDL simulation and synthesis labs and projects are performed using commercial and/or academic VLSI CAD tools. Prerequisite: EE 3320 or equivalent. (3-0) T

- **EESC 5350 Signals, Systems, and Digital Communications** (3 semester hours) Advanced methods of analysis of electrical networks and linear systems. Laplace transforms, Fourier series, and Fourier transforms. Response of linear systems to step, impulse, and sinusoidal inputs. Convolution, system functions, and frequency response. Z transforms and digital systems. Fundamentals of digital communication systems such as information, digital transmission, channel capacity, modulation and demodulation techniques are introduced. Signaling schemes and performance of binary as well as M-ary modulated digital communication systems are introduced. Overall design considerations and performance evaluation of various digital communication systems are discussed. Prerequisite: EE 3300 or equivalent. (3-0) R

- **EESC 5360 Introduction to Communications and Signal Processing** (3 semester hours) This course is designed to provide the necessary background for someone with a technical degree to enter the M.S.E.E. program in the Communications and Signal Processing concentration. It will focus on linear systems theory, to include Fourier series, Fourier and Laplace transforms, transfer functions, frequency response, and convolution. It will also include introductions to the solution of ordinary differential equations and to communications systems. Credit does not apply to the 33 hour M.S.E.E. requirement. Prerequisites: One year of calculus and one semester of probability theory. (3-0) R

- **EEGR 5365 Engineering Leadership** (3 semester hours) Interpersonal influence and organizational
influence in leading engineering organizations. Leadership is addressed from the point of view of the
technical manager as well as from that of the technical professional. Topics include staffing, motivation,
performance evaluation, communication, project selection and planning, intellectual property and
professional ethics. (3-0) R

| EEGR 5381 Curriculum Practical Training in Electrical Engineering | (3 semester hours) This course is required of students who need additional training in engineering practice. Credit does not apply to the 33 hour M.S.E.E. requirement. Consent of Graduate Adviser required. (May be repeated to a maximum of 9 hours) | (3-0) R |
| EEGR 5381 Curriculum Practical Training in Electrical Engineering | (3 semester hours) This course is required of students who need additional training in engineering practice. Credit does not apply to the 33 hour M.S.E.E. requirement. Consent of Graduate Adviser required. (May be repeated to a maximum of 9 hours) | (3-0) R |
| EEMF 5383 (PHYS 5383) Plasma Technology | (3 semester hours) Hardware oriented study of useful laboratory plasmas. Topics will include vacuum technology, gas kinetic theory, basic plasma theory and an introduction to the uses of plasmas in various industries. | (3-0) Y |
| EECT 5385 Analog Filters | (3 semester hours) This course aims at bridging the intermediate-level and the advanced-level knowledge in analog filter design. It moves from basic theory of analog passive filters to theoretical and practical aspects of active, switched-capacitor, and continuous time filters. For active solutions the focus is on integrated implementations on silicon. Prerequisites: EE 3301 and EE 3111. | (3-0) Y |
| EEMF 5V80 Special Topics In Electrical Engineering | (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) | (1-6)-0 S |
| EEMF 6283 (PHYS 6283) Plasma Science Laboratory | (2 semester hours) Laboratory will provide a hands on experience to accompany EE 6383. Experiments will include measurements of fundamental plasma properties and understanding of important plasma diagnostics. Co-requisite: EEMF 6383, recommended co-requisite: EEMF 7171. | (2-0) T |
| EEDG 6301 (CE 6301) Advanced Digital Logic | (3 semester hours) Modern design techniques for digital logic. Logic synthesis and design methodology. Link between front-end and back-end design flows. Field programmable gate arrays and reconfigurable digital systems. Introduction to testing, simulation, fault diagnosis and design for testability. Prerequisites: EE 3320 or equivalent and background in VHD/L/Verilog. | (3-0) T |
| EEDG 6302 (CE 6302) Microprocessor Systems | (3 semester hours) Design of microprocessor based systems including I/O and interface devices. Microprocessor architectures. Use of emulators and other sophisticated test equipment. Extensive laboratory work. Prerequisite: EE 4304 or equivalent and background in VHDL/Verilog. | (2-3) Y |
| EEDG 6303 (CE 6303) Testing and Testable Design | (3 semester hours) Techniques for detection of failures in digital circuits and systems. Fault modeling and detection. Functional testing and algorithms for automatic test pattern generation (ATPG). Design of easily testable digital systems. Techniques for introducing built-in self test (BIST) capability. Test of various digital modules, such as PLA’s, memory circuits, datapath, etc. Prerequisite: EE 3320 or equivalent and background in VHDL/Verilog. | (3-0) Y |
| EEDG 6304 (CE 6304, CS 6304) Computer Architecture | (3 semester hours) Trends in processor, memory, I/O and system design. Techniques for quantitative analysis and evaluation of computer systems to understand design choices in system design. Components in high performance processors and computers: pipelining, instruction level parallelism, memory hierarchies, and input/output. Students will undertake a major computing system analysis and design project. Prerequisite: EE 4304 and C/C++. | (3-0) Y |
| EEDG 6306 (CE 6306) Application Specific Integrated Circuit Design | (3 semester hours) This course discusses the design of application specific integrated circuits (ASIC). Specific topics include: VLSI system design specification, ASIC circuit structures, synthesis, and implementation of an ASIC digital signal processing (DSP) chip. Prerequisites: EE 3320 (3-0) Y |
| EEDG 6307 (CE 6307) Fault-Tolerant Digital Systems | (3 semester hours) Concepts in hardware and software fault tolerance. Topics include fault models, coding in computer systems, fault diagnosis and fault-tolerant routing, clock synchronization, system reconfiguration, etc. Survey of practical fault-tolerant systems. Prerequisite: EE 6301, EE 3341 or equivalent. | (3-0) R |
| EEDG 6308 (CE 6308, CS 6396) Real-Time Systems | (3 semester hours) Introduction to real-time
applications and concepts. Real-time operating systems and resource management. Specification and
design methods for real-time systems. System performance analysis and optimization techniques. Project
to specify, analyze, design, implement and test small real-time system. Prerequisite: CS 5348. (3-0) R

**EEOP 6309** (PHYS 5361) **Fourier Optics** (3 semester hours) Description of coherent optics using a
linear systems approach. The concepts of impulse response and transfer functions for unbounded wave
propagation, diffraction, and image formation. Introduction to holography and optical data processing.
Prerequisites: EE 3302 and EE 4301 or equivalents. (3-0) R

**EEOP 6310** Optical Communication Systems (3 semester hours) Operating principles of optical
communications systems and fiber optic communication technology. Characteristics of optical fibers, laser
diodes, laser modulation, laser and fiber amplifiers, detection, demodulation, dispersion compensation,
and network topologies. System topology, star network, bus networks, layered architectures, all-optical
networks. Prerequisite: EE 3350 or equivalent. (3-0) T

**EERF 6311** RF and Microwave Circuits (3 semester hours) Analysis and design of RF and microwave
circuits. Topics include impedance matching, network theory, S-parameters, transmission line media
(waveguide, coax, microstrip, stripline, coplanar waveguide, etc.) and passive component design (power
dividers, couplers, switches, attenuators, phase shifters, etc.). Industry-standard microwave CAD tools
will be used. Prerequisite: EE 4306 or equivalent. (3-0) R

**EEOP 6312** Laser and Modern Optics (3 semester hours) Theory and applications of lasers, including
ray and beam optics. Design issues include power maximization, noise properties, spectral purity and
high-speed modulation. Particular emphasis on semiconductor lasers and their relevance to optical
communications. Prerequisite: EE 4301 or equivalent. (3-0) Y

**EEOP 6313** Semiconductor Opto-Electronic Devices (3 semester hours) Physical principles of
semiconductor optoelectronic devices: optical properties of semiconductors, optical gain and absorption,
wave guiding, laser oscillation in semiconductors, LEDs, physics of detectors, applications. Prerequisite:
EE 3310 or equivalent. (3-0) T

**EEOP 6314** Principles of Fiber and Integrated Optics (3 semester hours) Theory of dielectric
waveguides, modes of planar waveguides, strip waveguides, optical fibers, coupled-mode formalism,
directional couplers, diffractive elements, switches, wavelength-tunable filters, polarization properties
of devices and fibers, step and graded-index fibers, devices for fiber measurements, fiber splices,
polarization properties, and fiber systems. Prerequisites: EE 3300 and EE 4301 or equivalents. (3-0) T

**EEOP 6315** Engineering Optics (3 semester hours) Fundamental concepts of geometrical optics, first-
order optical system design and analysis, paraxial ray tracing, aperture and field stops. Optical materials
and properties; third order aberration theory. Prerequisite: PHYS 2326 or equivalent. (3-0) T

**EEGR 6316** Fields and Waves (3 semester hours) Study of electromagnetic wave propagation beginning
with Maxwell’s equations; reflection and refraction at plane boundaries; guided wave propagation;
radiation from dipole antennas and arrays; reciprocity theory; basics of transmission line theory and
waveguides. Prerequisite: EE 4301 or equivalent. (3-0) Y

**EEOP 6317** Physical Optics (3 semester hours) Study of optical phenomena based primarily on the
electromagnetic nature of light; mathematical description of polarized light; Jones and Mueller matrices;
interference of polarized waves; interferometers, diffractive phenomena based on scalar formalisms;
diffraction gratings; and diffraction in optical instruments. Prerequisite: EE 4301 or equivalent. (3-0) T

**EEMF 6319** Quantum Physical Electronics (3 semester hours) Quantum-mechanical foundation for
study of nanometer-scale electronic devices. Principles of quantum physics, stationary-state
eigenfunctions and eigenvalues for one-dimensional potentials, interaction with the electromagnetic field,
electron conduction in solids, applications of quantum structures. Prerequisite: EE 3300 or equivalent. (3-0) Y

**EEMF 6320 (MSEN 6320)** Fundamentals of Semiconductor Devices (3 semester hours)
Semiconductor material properties, band structure, equilibrium carrier distributions, non-equilibrium
current-transport processes, and recombination-generation processes. Prerequisite: EEMF 6319 or
equivalent. (3-0) Y

**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. Active two-terminal devices and optoelectronic devices will be
presented. Recommended co-requisite: EEMF 6320. (3-0) Y

**EEMF 6322 (MECH 6322, MSEN 6322)** Semiconductor Processing Technology (3 semester hours)
Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both
silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

**EEMF 6323 Circuit Modeling of Solid-State Devices** (3 semester hours) Provide physical insight into the operation of MOSFETs and BJTs, with particular emphasis on new physical effects in advanced devices. Compact (SPICE-level) transistor models will be derived from basic semiconductor physics; common simplifications made in the derivations of model equations will be detailed to provide an appreciation for the limits of model capabilities. Prerequisites: EEMF 6320 and EEMF 6321. (3-0) R

**EEMF 6324 (MSEN 6324) Electronic, Optical and Magnetic Materials** (3 semester hours) Foundations of materials properties for electronic, optical and magnetic applications. Electrical and Thermal Conduction, Elementary Quantum Physics, Modern Theory of Solids, Semiconductors and Devices, Dielectrics, Magnetic and Optical Materials properties. Prerequisite: MSEN 5300 or equivalent. (3-0) T

**EECT 6325 (CE 6325) VLSI Design** (3 semester hours) Introduction to MOS transistors. Analysis of the CMOS inverter. Combinational and sequential design techniques in VLSI; issues in static, transmission gate and dynamic logic design. Design and layout of complex gates, latches and flip-flops, arithmetic circuits, memory structures. Low power digital design. The method of logical effort. CMOS technology. Use of CAD tools to design, layout, check, extract and simulate a small project. Prerequisites: EE 3320, EE 3301 or equivalent. (3-0) Y

**EECT 6326 Analog Integrated Circuit Design** (3 semester hours) Introduction to MOS transistor, CMOS technology and analog circuit modeling. Basic analog circuits: MOS switches, active resistors, current sources, current mirrors, current amplifiers, inverting amplifier, differential amplifier, cascade amplifier and the output amplifier. Complex circuits: comparators and operational amplifiers. Use of CAD tools to layout and simulate analog circuits. Prerequisite: EE 4340 (3-0) Y

**EEOP 6328 Nonlinear Optics** (3 semester hours) Survey of nonlinear optical effects; origins of optical nonlinearity; laser-pulse propagation equations in bulk media and optical fibers; the nonlinear optical susceptibility tensor; second-order nonlinear optical effects (second harmonic generation, optical rectification, parametric mixing and amplification); third-order nonlinear optical effects in fiber optic communication systems (self-phase modulation, cross-phase modulation, stimulated Brillouin scattering, stimulated Raman scattering, four-wave mixing, nonlinear polarization mode dispersion); self-focusing and self-defocusing in bulk media; computational methods for nonlinear optics. Prerequisite: EE 4301 or equivalent; EEOP 6310 recommended. (3-0) R

**EEOP 6329 Optical Signal Conditioning** (3 semester hours) Engineering principles and applications of laser beam modulation and deflection (acousto-optics and electro-optics), harmonic generation and optical parametric processes, optical pulse compression and shaping. Prerequisites: EE 4301 or equivalent and EEOP 6317 recommended. (3-0) R

**EERF 6330 RF Integrated Circuit Design** (3 semester hours) Introduction to RF and Wireless systems: Basic Concepts of RF Design: Linearity, Distortion, (P1dB, IIP3), Sensitivity, Noise Figure, RF Passives; Q-factors, Impedance Transformation, Matching Network, Transceiver Architectures: Receivers – Heterodyne, Direct downconversion, Image Reject Receivers, Direct conversion transmitter, two-step transmitter; Low Noise Amplifier Design; Mixer Design; Oscillator Design; Basic architectures of Power Amplifiers. Use of Agilent ADS for Design Projects. Prerequisite EE 4340. (3-0). Y

**EEESC 6331 Linear Systems and Signals** (3 semester hours) Systems and control theory: state space, convolution integrals, transfer functions, stability, controllability, observability, and feedback. Prerequisites: EE 2300 and EE 4310. (3-0) Y

**EEGR 6332 (MECH 6332) Advanced Control** (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: EEESC 6331. (3-0) R

**EEOP 6334 Advanced Geometrical and Physical Optics** (3 semester hours) Geometrical optics as a limiting case of the propagation of electromagnetic waves; geometrical theory of optical aberrations; the diffraction theory of aberrations; image formation with partially coherent and partially polarized light; computational methods for physical optics. Other topics may be selected from the following: diffraction theory of vector electromagnetic fields, diffraction of light by ultrasonic waves, optics of metals, Lorenz-Mie theory of the scattering of light by small particles, and optics of crystals. Prerequisite: EEOP 6317. (3-0) Y

**EEOP 6335 Engineering of Infrared Imaging Systems** (3 semester hours) Thermal optics, review of Fourier optics, review of information theory, embedded system design principles, and system modeling.
**Prerequisites:** EEOP 6309 or 6315 or equivalents. (3-0) T

**EEGR 6336 (MECH 6336) Nonlinear Control Systems** (3 semester hours) Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: EEOP 6331. (3-0) R


**EESC 6340 Introduction to Telecommunications Networks** (3 semester hours) Circuit, message and packet switching. The hierarchy of the ISO-OSI Layers. The physical layer: channel characteristics, coding, and error detection. The data link control layer: retransmission strategies, framing, multiaccess protocols, e.g., Aloha, slotted Aloha, CSMA, and CSMA/CD. The network layer: routing, broadcasting, multicasting, flow control schemes. Co-requisite: EESC 6349. (3-0) Y

**EESC 6341 Information Theory I** (3 semester hours) Self information, mutual information, discrete memoryless sources, entropy, source coding for discrete memoryless channels, homogeneous Markov sources, discrete memoryless channels, channel capacity, converse to the coding theorem, noisy channel coding theorem, random coding exponent, Shannon limit. Prerequisite: EESC 6352. (3-0) R


**EESC 6344 Coding Theory** (3 semester hours) Groups, fields, construction and properties of Galois fields, error detection and correction, Hamming distance, linear block codes, syndrome decoding of linear block codes, cyclic codes, BCH codes, error trapping decoding and majority logic decoding of cyclic codes, non-binary codes, Reed Solomon codes, burst error correcting codes, convolutional codes, Viterbi decoding of convolutional codes. Prerequisite: EESC 6352. (3-0) R

**EEDG 6345 (CE 6345) Engineering of Packet-Switched Networks** (3 semester hours) Detailed coverage, from the point of view of engineering design, of the physical, data-link, network and transport layers of IP (Internet Protocol) networks. This course is a masters-level introduction to packet networks. Prior knowledge of digital communication systems is strongly recommended. Prerequisite: EE 3350 or equivalent. (3-0) Y

**EEMF 6348 (MSEN 6348) Lithography and Nanofabrication** (3 semester hours) Study of the principles, practical considerations, and instrumentation of major lithography technologies for nanofabrication of devices and materials. Advanced photolithography, electron beam lithography, nanoimprint lithography, x-ray lithography, ion beam lithography, soft lithography, and scanning probe lithography, basic resist and polymer science, applications in nanoelectronics and biomaterials. (3-0) Y

**EESC 6349 Random Processes** (3 semester hours) Random processes concept. Stationarity and independence. Auto-correlation and cross-correlation functions, spectral characteristics. Linear systems with random inputs. Special topics and applications. Prerequisite: EE 3302 and EE 3341 or equivalent. (3-0) Y

**EESC 6350 Signal Theory** (3 semester hours) Signal processing applications and signal spaces, vector spaces, matrix inverses and orthogonal projections, four fundamental subspaces, least squares and minimum norm solutions, the SVD and principal component analysis, subspace approximation, infinite dimensional spaces, linear operators, norms, inner products and Hilbert spaces, projection theorems, spectral properties of Hermitian operators, Hilbert spaces of random variables, linear minimum variance estimation and the Levinson-Durbin algorithm, general optimization over Hilbert spaces, methods and applications of optimization. Prerequisite: EE 3302 or equivalent. (3-0) Y

**EERC 6351 Computational Electromagnetics** (3 semester hours) Review of Maxwell’s equations; numerical propagation of scalar waves; finite-difference time-domain solutions of Maxwell’s equations; numerical implementations of boundary conditions; numerical stability; numerical dispersion; absorbing boundary conditions for free space and waveguides; selected applications in telecommunications, antennas, microelectronics and digital systems. Prerequisite: EE 4301 or equivalent. (3-0) R
**EESC 6352 Digital Communication Systems** (3 semester hours) Digital communication systems are discussed. Source coding and channel coding techniques are introduced. Signaling schemes and performance of binary and M-ary modulated digital communication systems. The overall design considerations and performance evaluations of various digital communication systems are emphasized. Prerequisite: EESC 6349 or equivalent. (3-0) Y

**EESC 6353 Broadband Digital Communication** (3 semester hours) Characterization of broadband wireline and wireless channels. MAP and ML detection. Intersymbol Interference (ISI) effects. Equalization methods to mitigate ISI including single-carrier and multi-carrier techniques. Equalization techniques and structures including linear, decision-feedback, precoding, zero forcing, mean square-error, FIR versus IIR. Multi-Input Multi-Output (MIMO) Equalization. Implementation issues including complexity, channel estimation, error propagation, etc. Real-world case studies from Digital Subscriber Lines (DSL) and wireless systems. Students work individually or in small teams on project and present their findings to class. Prerequisite: EE 4360 and knowledge of MATLAB. (3-0) T

**EERF 6355 RF and Microwave Amplifier Design** (3 semester hours) Design of high-frequency active circuits. Review of transmission line theory. RF and microwave matching circuits using discrete and guided wave structures. Detailed study of S-parameters. Design of narrow band, broadband and low noise amplifiers. Detailed study of noise figure, noise parameters and stability of RF and microwave circuits using S-parameters. Prerequisite: EE 4368 or equivalent. (3-0) R

**EESC 6360 Digital Signal Processing I** (3 semester hours) Analysis of discrete time signals and systems, Z-transform, discrete Fourier transform, fast Fourier transform, analysis and design of digital filters. Prerequisite: EE 3302 or EE 4361 or equivalent. (3-0) Y

**EESC 6361 Digital Signal Processing II** (3 semester hours) Continuation of EE 6360. Includes advanced topics in signal processing such as: Digital filter structures and finite-word-length effects, digital filter design and implementation methods, multirate digital signal processing, linear prediction and optimum filtering, spectral analysis and estimation methods. Prerequisite: EESC 6360. (3-0) T

**EESC 6362 Introduction to Speech Processing** (3 semester hours) Introduction to the fundamentals of speech signal processing and speech applications. Speech analysis and speech synthesis techniques, speech enhancement and speech coding techniques including ADPCM and linear-predictive based methods such as CELP. Prerequisite: EESC 6360. (3-0) Y

**EESC 6363 Digital Image Processing** (3 semester hours) Image formation, image sampling, 2D Fourier transform and properties, image wavelet transform, image enhancement in spatial and frequency domains, image restoration, color image processing, image segmentation, edge detection, morphological operations, object representation and description, introduction to image compression. Prerequisites: EE 4361 or equivalent and knowledge of C or MATLAB. (3-0) T

**EESC 6364 Pattern Recognition** (3 semester hours) Pattern recognition system, Bayes decision theory, maximum likelihood and Bayesian parametric classifiers, linear discriminant functions and decision boundaries, density estimation and nonparametric classifiers, unsupervised classification and clustering, multilayer neural networks, decision trees, classifier comparison. Prerequisite: Knowledge of C or MATLAB. Co-requisite: EESC 6349. (3-0) T

**EESC 6365 Adaptive Signal Processing** (3 semester hours) Adaptive signal processing algorithms learn the properties of their environments. Transversal and lattice versions of the Least Mean Squares (LMS) and Recursive Least Squares (RLS) adaptive filter algorithms and other modern algorithms will be studied. These algorithms will be applied to network and acoustic echo cancellations, speech enhancement, channel equalization, interference rejection, beam forming, direction finding, active noise control, wireless systems, and others. Prerequisites: EESC 6349, EESC 6360 and knowledge of matrix algebra. (3-0) T

**EESC 6366 Speech and Speaker Recognition** (3 semester hours) Introduction to concepts in automatic recognition methods for speech applications; the primary emphasis is for automatic speech recognition and speaker identification techniques. Topics include speech features for recognition, hidden Markov models for acoustic and language applications, Gaussian mixture models for speaker characterization, robustness issues to address noise and channel conditions for automatic recognition. Co-requisite: EESC 6349. (3-0) Y

**EESC 6367 Applied Digital Signal Processing** (3 semester hours) Implementation of signal processing algorithms, combination of textual and graphical programming of DSP systems, fixed-point versus floating-point, FPGA/DSP chip architecture, FPGA/DSP software development tools, code optimization, application project. Prerequisites: EE 4361 or equivalent and knowledge of C or MATLAB. (2-3) Y
| **EEDG 6370 (CE 6370)** Design and Analysis of Reconfigurable Systems (3 semester hours) | Introduction to reconfigurable computing, programmable logic: FPGAS, CPLDs, CAD issues with FPGA based design, reconfigurable systems: emulation, custom computing, and embedded application based computing, static and dynamic hardware, evolutionary design, software environments for reconfigurable systems. Prerequisite: EE 3320 or equivalent. (3-0) R |
| **EEMF 6372 Semiconductor Process Integration** (3 semester hours) | The integration of semiconductor processing technology to yield integrated circuits. The course will emphasize MOSFET design based upon process integration, in particular as it applies to short channel devices of current interest. Process simulation will be used to study diffusion, oxidation, and ion implantation. (3-0) R |
| **EEBM 6373 Anatomy and Human Physiology for Engineers** (3 semester hours) | This course provides an introduction to anatomy and human physiology for engineers and other non-life-scientists. Topics include nervous system, muscle and cardiac function, digestive system, immune system. (3-0) Y |
| **EEBM 6374 Genes, Proteins and Cell Biology for Engineers** (3 semester hours) | This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life-scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y |
| **EEDG 6375 (CE 6375)** Design Automation of VLSI Systems (3 semester hours) | This course deals with various topics related to the development of CAD tools for VLSI systems design. Algorithms, data structures, heuristics and design methodologies behind CAD tools. Design and analysis of algorithms for layout, circuit partitioning, placement, routing, chip floor planning, and design rule checking (DRC). Introduction to CAD algorithms for RTL and behavior level synthesis, module generators, and silicon compilation. Prerequisite: CS 5343. Co-requisite: **EECT 6325**. (3-0) Y |
| **EEBM 6376 Lecture Course in Biomedical Applications of Electrical Engineering** (3 semester hours) | This course provides an introduction to different areas of biomedical applications of electrical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y |
| **EECT 6378 Power Management Circuits** (3 semester hours): | Operating principles of rectifiers and different dc-dc converters: switched-mode power converters, charge pumps and linear regulators. Design and analysis of voltage references and frequency compensation techniques for two-stage and three-stage amplifiers. Use of CAD tools to simulate power management circuits. Prerequisite: **EECT 6326** or equivalent (3-0) Y |
| **EEGR 6381 (MECH 6381)** Numerical Methods In Engineering (3 semester hours) | Numerical techniques in engineering and their applications, with an emphasis on practical implementation. Topics will include some or all of the following: numerical methods of linear algebra, interpolation, solution of nonlinear equations, numerical integration, Monte Carlo methods, numerical solution of ordinary and partial differential equations, and numerical solution of integral equations. Prerequisites: CE/EE/MECH 2300 and CE/EE/MECH 3300 or equivalents, and knowledge of a scientific programming language. (3-0) T |
| **EEMF 6382 (MECH 6382)** Introduction to MEMS (3 semester hours) | Study of micro-electro-mechanical devices and systems and their applications. Microfabrication techniques and other emerging fabrication processes for MEMS are studied along with their process physics. Principles of operations of various MEMS devices such as mechanical, optical, thermal, magnetic, chemical/biological sensors/actuators are studied. Topics include: bulk/surface micromachining, LIGA, microsensors and microactuators in multi-physics domain. (3-0) T |
| **EEMF 6383 (PHYS 6383)** Plasma Science (3 semester hours) | Theoretically oriented study of plasmas. Topics to include: fundamental properties of plasmas, fundamental equations (kinetic and fluid theory, electromagnetic waves, plasma waves, plasma sheaths) plasma chemistry and plasma diagnostics. Prerequisite: **EEMF 6316** or equivalent. (3-0) Y |
| **EESC 6390 Introduction to Wireless Communication Systems** (3 semester hours) | Principles, practice, and system overview of mobile systems. Modulation, demodulation, coding, encoding, and multiple-access techniques. Performance characterization of mobile systems. Prerequisite: EE 3350 or equivalent. (3-0) Y |
| **EESC 6391 Signaling and Coding for Wireless Communication Systems** (3 semester hours) | Study of signaling and coding for wireless communication systems. Topics which will be covered include digital modulation schemes, digital multiple access technologies, their performance under wireless channel impairments, equalization, channel coding, interleaving, and diversity schemes. Prerequisites: **EESC**
6352 and EESC 6390. (3-0) T

**EESC 6392 Propagation and Devices for Wireless Communications** (3 semester hours) Mobile communication fundamentals, models of wave propagation, simulation of electromagnetic waves in the cellular environment, multipath propagation, compensation for fading, mobile and cell antenna designs, problems of interference and incompatibility, design of active and passive cellular components, comparison of analog and digital cellular designs. Prerequisites: EE 4301 or equivalent; EESC 6390. (3-0) R

**EESC 6393 Imaging Radar Systems Design and Analysis** (3 semester hours) Radar systems, antenna systems, the radar equation, electromagnetic waves scattering from targets, radar signal and noise, detection and extraction of signal from noise or clutter, range and Doppler profiles, radar image formation, real aperture radar imaging, SAR imaging, ISAR imaging, image distortion, super resolution radar imaging techniques, and advanced holographic radar imaging techniques. Prerequisites: EE 3350 and EE 4301 or equivalents. (3-0) T

**EERE 6394 Antenna Engineering and Wave Propagation** (3 semester hours) Operating principles for microwave antennas used in modern wireless communications and radar systems. Prerequisite: EE 6316 or equivalent. (3-0) T

**EERE 6395 Radiofrequency and Microwave Systems Engineering** (3 semester hours) Review of RF and microwave systems, such as cellular, point-to-point radio, satellite, RFID and RADAR. Topics include: system architectures, noise & distortion, antennas & propagation, transmission lines & network analysis, active & passive components, modulation techniques and specification flowdown. Prerequisite: EE 4368 or equivalent. (3-0) T

**EERE 6396 Microwave Design and Measurement** (3 semester hours) This lecture and lab course covers the fundamentals of microwave component design and measurements, including vector impedance (scattering parameters), scalar measurements and spectrum analysis. Microwave components, such as filters, directional couplers, switches, amplifiers, and oscillators, will be designed and simulated with various CAD tools and then built and measured to compare performance with theory. Prerequisite: EE 4368 or equivalent. (2-1) R

**EEDG 6398 (CE 6398, CS 6398) DSP Architectures** (3 semester hours) Typical DSP algorithms, representation of DSP algorithms, data-graph, FIR filters, convolutions, Fast Fourier Transform, Discrete Cosine Transform, low power design, VLSI implementation of DSP algorithms, implementation of DSP algorithms on DSP processors, DSP applications including wireless communication and multimedia. Prerequisite: CS 5343. (3-0) Y

**EEGR 6V98 Thesis** (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. (3-9-0) Y

**EEMF 7171 Current Topics in Plasma Processing** (1 semester hour) Discussion of current literature on plasma processing; applications, diagnostics, sources, chemistry and technology. May be repeated for credit. Prerequisite: Knowledge of plasma processing technology (EEMF 5383 or EEMF 6383 preferred) or consent of instructor. (1-0) Y

**EEDG 7304 (CE 7304) Advanced Computer Architecture** (3 semester hours) Advanced research topics in multi-processor, network and reconfigurable architectures. Focuses on current research in the area of computer system architecture to prepare students for a career in computer architecture research. Course will use articles from current technical literature to discuss relevant topics, such as digital signal processors and VLIW processors. Prerequisites: EEDG 6304, CS 5348, EE 3341 and knowledge of C/C++. (3-0) Y

**EEMF 7320 (MSEN 7320) Advanced Semiconductor Device Theory** (3 semester hours) Quantum mechanical description of fundamental semiconductor devices; carrier transport on the submicron scale; heterostructure devices; quantum-effect devices. Prerequisites: EEMF 6320 and EEMF 6321. (3-0) R

**EECT 7325 (CE 7325) Advanced VLSI Design** (3 semester hours) Advanced topics in VLSI design covering topics beyond the first course (EE 6325). Topics include: use of high-level design, synthesis, and simulation tools, clock distribution and routing problems, asynchronous circuits, low-power design techniques, study of various VLSI-based computations, systolic arrays, etc. Discussions on current research topics in VLSI design. Prerequisite: EECT 6325 or equivalent. (3-0) R

**EECT 7326 Analog Integrated Systems Design** (3 semester hours) Introduction to the types of systems environment in which analog integrated circuit design is employed. The topics are A/D and D/A converters, including over-sampled S-D A/D converters, switched capacitor amplifiers, multipliers, wave-shaping circuits, oscillators, PLLs, and the design of filters. Prerequisite: EECT 6326 (3-0) Y

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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECT 7327</td>
<td>Analog to Digital and Digital to Analog Converters</td>
<td>3 (semester hours)</td>
<td>This course provides the basic and the specific knowledge for the design and the use of data converters. Topics include fundamentals on sampling and quantization, Nyquist-rate and oversampled techniques, circuit design issues, testing, digital calibration and correction. Prerequisite: EECT 6326 and EECT 6325. (3-0) T</td>
</tr>
<tr>
<td>EEDG 7328</td>
<td>Physical Design of High-Speed VLSI Circuits</td>
<td>3 (semester hours)</td>
<td>Techniques for the physical design of high-speed VLSI circuits. Topics related to interconnection circuit modeling, performance-driven routing, buffer and wire sizing, placement and floor planning, technology mapping and performance evaluation issues encountered in high-speed VLSI circuit designs. Discussion of state-of-the-art practical industrial design examples. A project related to the development of a prototype CAD tool. Prerequisites: EECT 6325 and knowledge of programming in C. (3-0) T</td>
</tr>
<tr>
<td>EECT 7329</td>
<td>Advanced Analog Integrated Circuit Design</td>
<td>3 (semester hours)</td>
<td>The course will cover, but not be limited to, advanced architectures for voltage references, current references, operational amplifiers (including voltage, current, transconducance, and transresistance), comparators, linear regulators, etc. Emphasis will be on why one topology might be better than another for a given set of specifications or applications. Prerequisite: EECT 6326 (3-0) T</td>
</tr>
<tr>
<td>EEOP 7330</td>
<td>Advanced RF Integrated Circuit Design</td>
<td>3 (semester hours)</td>
<td>Power Amplifiers, different classes of linear (A, B, AB, C) and switching power amplifiers (E, G, H), CMOS Integrated power amplifiers, High Efficiency Power Amplifiers (Doherty Power Amplifier); Phase Locked Loops; Basic concepts of PLL; Charge pumps, Type-I and Type-II PLLs, Noise in PLLs, Phase Noise, Frequency multiplication, RF Synthesizer Architectures, Frequency Dividers, Fractional-N PLLs, Delta-Sigma based PLLs, ADPLL; Advanced RF transceivers; Wideband and multiband radio design; Complete link budget analysis for wireless systems. Design project will focus on design of the entire transmitter using Agilent ADS. Prerequisite: RF Integrated Circuit Design. (3-0) T</td>
</tr>
<tr>
<td>EECT 7331</td>
<td>Physics of Noise</td>
<td>3 (semester hours)</td>
<td>The physics of fluctuation phenomena, generically called Noise. The class will cover the fundamental physical principles underlying generation-recombination, thermal, shot, 1/f noise and other, related fluctuation phenomena. The statistical nature of these physical processes will be developed. The physics of noise in resistors, diodes, bipolar, JFETS, and MOSFETs will be discussed and how to model it in circuits. Approximately two thirds of the class will be devoted to the physics of noise and the rest will cover how to use this knowledge to design low-noise integrated circuits. Prerequisite: EECT 6326. Y</td>
</tr>
<tr>
<td>EEEF 7V81</td>
<td>Special Topics in Digital Systems</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EEMP 7V82</td>
<td>Special Topics in Microelectronics</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EEOG 7V83</td>
<td>Special Topics in Optics and Fields</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EESC 7V84</td>
<td>Special Topics in Telecommunications</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] R</td>
</tr>
<tr>
<td>EESC 7V85</td>
<td>Special Topics in Signal Processing</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EESC 7V86</td>
<td>Special Topics in Wireless Communications</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EEjb 7V87</td>
<td>Special Topics in Biomedical Applications of Electrical Engineering</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EECT 7V88</td>
<td>Special Topics in Circuits and Systems</td>
<td>1-6 (semester hours)</td>
<td>For letter grade credit only. (May be repeated to a maximum of 9 hours.) [(1-6)-0] S</td>
</tr>
<tr>
<td>EEGR 8V40</td>
<td>Individual Instruction in Electrical Engineering</td>
<td>1-6 (semester hours)</td>
<td>(May be repeated for credit.) For pass/fail credit only. [(1-6)-0] R</td>
</tr>
<tr>
<td>EEGR 8V70</td>
<td>Research In Electrical Engineering</td>
<td>3-9 (semester hours)</td>
<td>(May be repeated for credit.) For pass/fail credit only. [(3-9)-0] R</td>
</tr>
</tbody>
</table>
EEGR 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

Deleted: EEGR 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S
The School of Management was established in 1975 as the academic unit responsible for (1) the Master of Science (M.S.) degree in Management and Administrative Sciences; (2) the Master of Arts (M.A.) degree in International Management Studies; (3) the Doctor of Philosophy (Ph.D.) 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 U.T. Dallas’s expansion to include a full undergraduate program, lower-division instruction was initiated. The Master of Science in Accounting started in 1994 and the name changed to Master of Science in Accounting and Information Management in 2001. 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 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 M.S. in Finance and the M.S. in Supply Chain Management.

Since its inception, the 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 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.

With over 35 years of operating history and with the rapid development in the “Telecom Corridor” area surrounding the campus, U.T. Dallas’s School of Management has become a major provider of management education to many global corporations.

The 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.

The School creates enduring knowledge for a changing world. Grounded in research and experience, our educational programs provide the managerial and technical skills to address evolving business challenges.
DEGREES OFFERED

Master of Arts in International Management Studies (M.A.)
Master of Business Administration (MBA)
Master of Science in Accounting and Information Management (M.S.)
Master of Science in Information Technology and Management (M.S.)
Master of Science in Management and Administrative Sciences (M.S.)
Master of Science in Healthcare Management – Executive Track (M.S.)
Master of Science in Healthcare Management – Professional Track (M.S.)
Master of Science in Finance (M.S.)
Master of Science in Supply Chain Management (M.S.)

Doctor of Philosophy in International Management Studies (Ph.D.)
Doctor of Philosophy in Management Science (Ph.D.)

Project Management (Certificate)
Organizational Behavior and Coaching (Certificate)
Supply Chain Management (Certificate)
Sourcing (Certificate)
Product Lifecycle Management (Certificate)
Lean 6 Sigma (Certificate)
Business Intelligence and Data Mining (Certificate)
Healthcare Management (Certificate)
**Master of Science Program in Psychological Sciences**

http://bbs.utdallas.edu/

**Faculty**


**Associate Professors:** Pamela R. Rollins, Bart Rypma, L. Tres Thompson

**Assistant Professors:** Shayla C. Holub, Mandy J. Maguire, Christa McIntyre, Candice M. Mills

**Objectives**

The Master of Science (M.S.) in Psychological Sciences program provides advanced training in psychological sciences. The program is designed for the student scholar who wishes 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 Behavior and Brain Sciences: the Callier Center for Communication Disorders, the Center for BrainHealth, the joint Center for Brain Imaging with UT Southwestern, and the Center for Children and Families. 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](#).

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 or Practical Internship courses. A grade of “B” is the required passing grade for coursework used to fulfill the core course and research methods course requirements of the degree. Independent Study/Research or Practical Internship coursework must be taken pass/fail.

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 6344 Functional Human 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.

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.
Independent Study/Research or Practical Internship (6 SCH)

Students will complete either a Research Project or a Practical Internship to fulfill this requirement. The research requirement will be fulfilled by completion of a focused research project to be submitted and presented in poster format. The Internship requirement will be fulfilled by participating in applied placements through the currently existing School of Behavioral and Brain Sciences internship program for undergraduates.
Geospatial Information Sciences Course Descriptions

**GISC 6301 Geospatial Data Analysis Fundamentals** (3 semester hours) 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 SOCS 2405) is strongly recommended. (3-0) Y

**GISC 6311 Statistics for Geospatial Science** (3 semester hours) Introduces calculus-based statistical analysis and probability theory, providing background for econometric and spatial modeling of simple stochastic processes. Covers standard probability distributions including Bernoulli, binomial, negative binomial, hypergeometric, Poisson, normal, gamma, beta, t and F distributions; estimation and hypothesis testing; introductory asymptomatic theory, including the Law(s) of Large Numbers and the Central Limit Theorem; real-world applications of probability theory, as time permits. (3-0) Y

**GISC 6325 (GEOS 6325) Introduction to Remote Sensing** (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, infrared, and radar. Laboratory course. (2-3) Y

**GISC 6326 Geovisualization** (3 semester hours) 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 6381 or equivalent knowledge. (3-0) R

**GISC 6332 GIS Applications in Criminology** (3 semester hours) Examines spatial distribution of crime, criminals, and criminal justice interventions. Students conduct spatial analysis of point patterns and areal-based data in studies of the locations of crime events and rates, offenders, police controlling practices, judicial districts and community corrections and how they relate to physical and social characteristics of neighborhoods. (3-0) R

**GISC 6379 Special Topics in Geographic Information Sciences** (3 semester hours) Topics vary from semester to semester. May be repeated for credit up to a maximum of 9 hours. Consult with adviser to determine appropriateness of topic for degree plan. (3-0) R

**GISC 6380 Spatial Concepts and Organization** (3 semester hours) Examines the recurring patterns of physical and human objects on the Earth’s surface, the flows of circulations among them, and the spatial concepts and theories which have been advanced to help understand and explain these spatial arrangements. Provides a fundamental understanding of spatial processes, concepts, and theories. (3-0) R

**GISC 6381, Geographical Information Systems Fundamentals** (3 semester hours) 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

**GISC 6382 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 6381, or equivalent with instructor’s permission. (3-0) Y
GISC 6383 Geographic Information Systems Management and Implementation (3 semester hours) Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. (3-0) Y

GISC 6384 Spatial Analysis and Modeling (3 semester hours) 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. (3-0) Y

GISC 6386 GIS Theory, Models and Issues (3 semester hours) 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. Prerequisite: GISC 6381 and 6382, or equivalent with instructor’s permission. (3-0) Y

GISC 6387 Geographic Information Systems Workshop (3 semester hours) 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: GISC 6381 and GISC 6382. (3-0) Y

GISC 6388 GIS Application Software Development (3 semester hours) 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: GISC 6381 and GISC 6317, or consent of instructor. (3-0) R

GISC 6389 Geospatial Information Sciences Master’s Project (3 semester hours) Requires completion of an original GIS project by the student working alone or in a team. Team efforts must result in products that can be associated uniquely with each student. Projects normally continue efforts started in GISC 6387 or GISC 6386. (3-0) S

GISC 7310 Regression Analysis with Spatial Applications (3 semester hours) 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. A review of the key concepts of matrix algebra and simulation techniques is given. Practical data analysis for large datasets is exercised by coupling statistical software with GIS environments. Prerequisite: GISC 6301 or GISC/ECON 6311 or equivalent. (3-0) Y

GISC 7360 GIS Pattern Analysis (3 semester hours) 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 spatially dispersed patterns are discussed. Course has particular relevance for local and global spatial analyses of crime, disease, or environmental patterns. Prerequisites: GISC 6381 or GISC 6311 and GISC 6301 or equivalent. (3-0) R

GISC 7361 Spatial Statistics (3 semester hours) The application of statistical techniques to the explicit treatment of space (geography) in social science models. Covers indices of spatial autocorrelation, the specification of autoregressive models (Gaussian, Poisson, binomial/logistic), geostatistical modeling, spatial filtering, Bayesian map analysis, random effects in models, and imputation of missing geocoded data. Prerequisite: GISC 7310 or EPPS 7316 or equivalent; GISC 7360 recommended. (3-0) R

GISC 7362 GIS Network Modeling (3 semester hours) Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. (3-0) T

GISC 7363 Internet Mapping and Information Processing (3 semester hours) Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. (3-0) T

GISC 7364 (PA 6383, SOC 6364) Demographic Analysis and Modeling (3 semester hours). Examines key demographic models for population analysis, their underlying theoretical foundations, and extensions into the spatial domain. Incorporates quantitative estimation and projection techniques and their use within a geographic information systems framework. Provides a solid understanding of spatio-temporal population dynamics, either local or global, which is essential to many disciplines engaged in planning for the public and private service sectors, for transportation networks or for regional development projects. Prerequisites: EPPS 7313 or equivalent. (3-0) R
GISC 7365 (GEOS 7325) 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. (3-0) Y

GISC 7366 (GEOS 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, lane 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 6325/GEOS 6325 (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 appropriate 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. (3-0) Y

GISC 7368 (GEOS 7328) Spatial Epidemiology (3 semester hours) Examines conceptual and analytic tools used to understand how spatial distributions of exposure impact on processes and patterns of disease. Emphasizes the special design, measurement, and analysis issues associated with spatial patterns of diseases. Contemporary diseases of public health importance are addressed, and the statistical and inferential skills are provided that can be used in understanding how spatial patterns arise and their implications for intervention. Prerequisite: POEC 5313 or equivalent. (3-0) R

GISC 7369 GI Sciences 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 7384 Advanced Raster (3 semester hours) Examines the conceptual and analytic tools used to understand how spatial patterns of disease. Emphasizes the special design, measurement, and analysis issues associated with spatial patterns of diseases. Contemporary diseases of public health importance are addressed, and the statistical and inferential skills are provided that can be used in understanding how spatial patterns arise and their implications for intervention. Prerequisite: POEC 5313 or equivalent. (3-0) R
GISC 6386 Urban and Environmental Applications of GIS/Remote Sensing. (3 semester hours) Examines the use of GIS and/or remote sensing techniques for understanding selected social phenomena (such as health, political behavior, poverty, crime) or environmental conditions (such as land use, air quality, hydrology) in urban areas and for implementing potential solutions to associated problems. Requires completion of projects and/or papers that reflect the students’ mastery of theory, research, data, and software. Prerequisites: GISC 6381 or GEOS 5325, or equivalent with instructor’s permission. (3-0) R

GISC 7362 GIS Network Modeling (3 semester hours) Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Prerequisite: GISC 6381 or equivalent knowledge. (3-0) R

GISC 7380 (ECON 7380, POEC 7380) Applied Multivariate Analysis (3 semester hours) Application of multivariate statistical techniques to spatial and economic data. Covers parametric and non-parametric statistical theory and applications including multiple linear and non-linear regression, poisson and binomial regression, principal components and factor analysis, discriminant function analysis, and canonical correlation. Includes an introduction to SAS computing. Prerequisites: GISC 5316 or POEC 5316 or ECON 5311 (3-0) R

GISC 7384 Advanced Raster Modeling (3 semester hours) Examines advanced topics in raster modeling beyond those discussed in GISC 6384 Spatial Analysis. Prerequisite: GISC 6384 or equivalent knowledge. (3-0) R

GISC 8V98 6V98 Masters Thesis (3-9 semester hours) Provides faculty supervision of a student's master's thesis research. Prerequisite: Consent of GIS Program Head and instructor. (May be repeated for credit.) ([3-9]-0) S

Additional Courses

Additional courses relevant to degrees in geospatial information sciences are available in other degree programs in the School of Economic, Political and Policy Sciences, in the Department of Computer Science, and in the Department of Geosciences. See the Geospatial Information Sciences degree requirements for listings of these courses.
Course Descriptions

Core Courses

ACN 6330 (HCS 6330, PSYC 6330) Cognitive Science (3 semester hours) Cognitive and neural processing approaches to understanding perception, attention, memory, thought, and language. (3-0) Y

ACN 6344 (HCS 6344, PSYC 6344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T

ACN 6346 (HCS 6346, PSYC 6346) Systems Neuroscience (3 semester hours) Integrative systems level study of the nervous system. Aspects of neural mechanisms and circuitry underlying regulation of motor behaviors, sensory and perceptual processing, biological homeostasis, and higher cognitive functions. (3-0) Y

ACN 6395 (HCS 6395, PSYC 6395) Cognitive Psychology (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. (3-0) Y

Methods Courses

ACN 5314 (HCS 5314) Cognitive and Neural Modeling Lab (3 semester hours) Auto-associative, associative, competitive learning, recurrent, and back-propagation artificial neural network algorithms in a "hands-on" micro-computer laboratory environment using special simulation software. Applications to perceptual, cognitive, computational, and neuroscience problems. Emphasizes creative applications of these research methodologies. Prerequisites: Linear Algebra and Computer Programming Experience is recommended but not required. (3-0) T

ACN 6312 (HCS 6312, PSYC 6312) Research Methods in Behavioral and Brain Sciences - Part I (3 semester hours) Applying, understanding, and interpreting various statistical techniques in behavioral science context. Participants have the opportunity to learn appropriate statistical details for basic descriptive and inferential statistics, the interrelationships among techniques, and computer skills required for data analyses. (3-0) Y

ACN 6313 (HCS 6313, PSYC 6313) Research Methods in Behavioral and Brain Sciences - Part II (3 semester hours) Topics in general linear modeling including regression analysis correlation, simple analysis of variance, factorial analysis of variance, analysis of covariance, between and within subject designs, and multiple regression. Prerequisite: ACN/HCS 6312 or consent of instructor. (3-0) Y

ACN 6316 (HCS 6316, PSYC 6316) Research Methods in Behavioral and Brain Sciences—Part III (3 semester hours) Applying, understanding, and interpreting various advanced multivariate statistical techniques in brain and behavioral science contexts. Includes principle component analyses, simple and multiple correspondence analyses, partial least square regression, discriminant analyses, and structural equation modeling. (3-0) R

ACN 6319 (HCS 6319, PSYC 6319) Scientific Writing (3 semester hours) Scientific writing of articles for publication. (3-0) Y

ACN 6322 (HCS 6322) Computational Models of Language Understanding (3 semester hours) Probabilistic methods for natural language understanding. Use of the MATLAB computer language for instantiating specific knowledge-based computational theories of natural language understanding. Emphasizes creative applications of these research methodologies. Prerequisites: Computer Programming Experience is recommended but not required. (3-0) T

ACN 6341 Human Computer Interactions I (3 semester hours) Methods and principles of human-computer interaction (HCI), user-centered design (UCD), and useability evaluation. Provides broad overview of HCI and how HCI informs UCD processes throughout product development lifecycle. (3-0) T

ACN 6342 Human Computer Interactions II (3 semester hours) 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. (3-0) T

ACN 6343 Human Computer Interactions Lab (3 semester hours) Provides students with resources to
learn and perform hands-on, lab-based techniques such as usability testing and cognitive walkthroughs. Emphasizes creative applications of these research methodologies as well as the development of critical thinking skills in a usability engineering context. (3-0) T

ACN 6347 (HCS 6347) Intelligent Systems Analysis (3 semester hours). Mathematical tools for investigating the asymptotic behavior of both deterministic and stochastic nonlinear dynamical systems. Topics include: artificial neural network architectures, Lyapunov stability theory, nonlinear optimization theory, stochastic approximation theory, and the Gibbs Sampler. Emphasizes development of advanced analytic skills and mathematical reasoning abilities. Prerequisites: ACN/HCS 6348 (or equivalent) or consent of instructor. (3-0) T

ACN 6348 (HCS 6348) Neural Net Mathematics (3 semester hours). Vector calculus and vector calculus-based probability theory with artificial neural network modeling applications. Emphasizes development of advanced analytic skills and mathematical reasoning abilities. Intended to provide mathematics preparation for ACN/HCS 6347 and ACN/HCS 6349. Prerequisites: Either: (1) Linear algebra, multivariable calculus, STAT 5351, ACN/HCS 5314, or (ii) consent of instructor. (3-0) T

ACN 6349 (HCS 6349) Intelligent Systems Design (3 semester hours) 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 Markov Random Field probabilistic representations and asymptotic mathematical statistical theory for parameter estimation, model selection, and hypothesis testing. Prerequisites: ACN/HCS 6347 or consent of instructor. (3-0) T

ACN 6351 (HCS 6351) Quantitative Methods in Neuroscience (3 semester hours) Data analysis techniques relevant to neuroscience. Topics may include: fourier/wavelet analysis, differential equations, and statistical data analysis methods. May be repeated for credit with permission of the instructor. Prerequisite: ACN/HCS 6312 or consent of instructor (3-0) R

ACN 6372 (HCS 6372) The Neuroscience of Pain (3 semester hours) A systems-oriented course covering the anatomical and physiologic basis of pain. The course emphasizes the similarities and differences between the different forms of pain and describes the basic features of neural processing of pain signals in the spinal cord and brain, the anatomy and the function of the descending systems that can control transmission of pain signals, and peripheral and central sensitization. The physiological and molecular basis for treatment of pain is discussed. (3-0) Y

ACN 6373 (HCS 6373) Intraoperative Neurophysiological Monitoring I (3 semester hours). The anatomical and physiological basis for the use of electrophysiological techniques in intraoperative neurophysiologic monitoring and in diagnosis of disorders affecting the nervous system. (3-0) Y

ACN 6374 (HCS 6374) Intraoperative Neurophysiological Monitoring II (3 semester hours). The use of recordings of neuro-electric brain potentials and their interpretation for diagnostic purposes and for intraoperative monitoring. Prerequisite: One of the following: HCS/ACN 6346 Systems Neuroscience, HCS/ACN 6344 Functional Human Neuroanatomy, or HCS/ACN 6373. (3-0) Y

ACN 6399 (HCS 6399, PSYC 6399) Research Ethics and Scientific Integrity (3 semester hours) An interactive, intensive course designed to cover critical issues related to human subjects, animal welfare, research design, accountability of scientific actions and fraud. Course designed for individuals intending research careers in academia or industry. (3-0) Y

ACN 7322 (HCS 7322) Computational Models of Language Understanding (3 semester hours). Probabilistic methods for natural language understanding. Use of the MATLAB computer language for instantiating specific knowledge-based computational theories of natural language understanding. Emphasizes creative applications of these research methodologies. Prerequisites: Computer Programming Experience is recommended but not required. (3-0) T

ACN 7324 (COMD 7324, AUD 7324) Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments (3 semester hours) Overview of prosthetic alternatives to conventional amplification for individuals with severe-to-profound hearing loss. Topics include candidacy determination, technology, programming/fitting of devices, aural (re)habilitation, and awareness of controversial areas related to cochlear implantation. (3-0) Y

ACN 7333 (HCS 7333) Computational Neuroscience (3 semester hours) Introduction to state-of-the-art computer methods for simulation of biologically realistic neuronal dynamics. Students must demonstrate some degree of computer skills. (3-0) R

ACN 7367 (HCS 7367) Speech Perception Laboratory (3 semester hours) Introduction to the field of speech processing by computer, with primary application to research techniques in the study of speech perception. (0-0-9) T

Elective and Specialization Area Courses
Note that the following list only represents a subset of the possible approved elective and specialization area courses. Students in the Applied Cognition and Neuroscience program should select their elective and specialization area coursework in consultation with their faculty advisor or the ACN Program Head. All courses with an HCS (Human Development and Communication Sciences) prefix area are automatically approved elective courses. Coursework outside the School of Behavioral and Brain Sciences may also be approved as an appropriate elective course if special permission from the ACN Program Head is obtained.

**ACN 6160 Neurobiology** (1 semester hour) A self-paced course providing the neurobiological foundation for the study of speech-language pathology. This course may only be taken pass/fail. (Open to COMD students only) (1-0) R

**ACN 6310 (HCS 6310) Fundamentals of Functional Brain Imaging** (3 semester hours) This course covers topics such as principles of tracer techniques, neuroimaging instrumentation, safety issues, brain physiology (perfusion, metabolism, and receptor function), image processing and analysis, fundamentals of SPECT, PET and fMRI, and critical evaluation of the functional neuroimaging literature. (3-0) Y

**ACN 6331 (HCS 6331, PSYC 6331) Cognitive Development** (3 semester hours) Survey of cognitive development theories and research in a variety of domains including memory, language, and problem solving. (3-0) Y

**ACN 6332 (HCS 6332, PSYC 6332) Perception** (3 semester hours) Psychophysical, neurophysiological, and computational foundations of sensation and perception. Basic senses of vision, audition, chemoreception, and tactile processing, with emphasis on understanding the processes that take us from neurons to perception and action. (3-0) R

**ACN 6333 (HCS 6333, PSYC 6333) Memory** (3 semester hours) Theoretical frameworks for knowledge acquisition and representation. Includes information processing and neuropsychological perspectives. (3-0) T

**ACN 6334 (HCS 6334) Attention** (3 semester hours) Theory and evidence on the study of attention especially in human vision and audition. Includes perceptual learning, information processing, and neuropsychological approaches. (3-0) R

**ACN 6339 (HCS 6339, PSYC 6339) Psycholinguistics** (3 semester hours) Classic and current research in psycholinguistics. Includes concepts from linguistics, the biological bases of speech and language processing, and child language acquisition. Hands-on exercises include labs on speech perception, language acquisition, and language comprehension. (3-0) R

**ACN 6335 (HCS 6355, PSYC 6355) Judgment and Decision Making** (3 semester hours) This course examines human inferences, judgments, decisions, and the processes by which we arrive at them. It will focus on the fact that our social judgments are not based on the laws of probability and chance, but on other cognitive processes that may have serious shortcomings in important inferential and decision-making tasks. We will also see that these processes, while ecologically efficient, systematic and often predictable, are imperfect in today’s data-rich environment. (3-0) T

**ACN 6363 (HCS 6363) Text Comprehension Seminar** (3 semester hours) Current readings in the field of text comprehension and memory. May be repeated for credit with instructor’s permission. (3-0) T

**ACN 6367 (HCS 6367, PSYC 6367) Speech Perception** (3 semester hours) Current topics and theories in speech perception. Topics include the acoustic correlates of speech sounds and the problem of invariance, the perception of speech under adverse conditions, the effects of hearing impairment, and models of speech perception. (3-0) T

**ACN 6366 (HCS 6366, PSYC 6366) Language Development** (3 semester hours) Advanced study of normal oral language development. Focus on research in child language and recent theories of language acquisition. Prerequisite: Consent of instructor. (3-0) T

**ACN 6V81 Special Topics in Applied Cognition and Neuroscience** (1-9 semester hours) Topics vary from semester to semester. May be repeated for credit as topics vary. (1-9-0) S

**ACN 7330 (HCS 7330) Advanced Functional Brain Imaging** (3 semester hours) This course explores more in-depth topics such as neuroimaging detection systems, clinical applications of functional neuroimaging, experimental design, statistical techniques in image analysis and reviews of pertinent literature using functional brain imaging to illuminate various cognitive and perceptual processes, such as language, memory, hearing and vision. (3-0) R
ACN 7343 (HCS 7343) Neuropharmacology (3 semester hours) Biology of neurotransmission in the central nervous system. Includes ionotropic and metabotropic coupling of all known classes of receptors to both their cellular and systemic effects. Clinical efficacy, side effects, and other issues related to drug use and abuse are covered. Prerequisite: Consent of Instructor or either ACN/HCS 6340 or ACN/HCS 6346. (3-0) T

Internship
ACN 7V71 Industry Internship May be repeated for credit. This course may only be taken pass/fail. ([1-6]-0) S
ACN 7V72 Research Internship May be repeated for credit. This course may only be taken pass/fail. ([1-6]-0) S
DATE: 10/21/2009
TO: GRADUATE DEAN
FROM: Bob Stillman
Please indicate with an X if your department catalog copy has no changes _______

SCHOOL_BBS_____________________

DEPARTMENT_HCS_______________

BASIS FOR CATALOG CHANGES:
Reduce 7000 level courses to 6000 level courses

NEW PROGRAMS/DEGREES/CERTIFICATES

NEW COURSES ADDED: HCS 6319, HCS 6351, HCS 7309, HCS 7337

CHANGES IN COURSE NUMBERING: HCS 6316, HCS 7315, HCS 6322, HCS 7335, HCS 6344, HCS 6339

COURSES DELETED: PSYC 7318, PSYC 7V50

CHANGES IN COURSE NUMBERING: HCS 7314 (to HCS 6316), HCS 6315 (to HCS 7315), HCS 7322 (to HCS 6322), HCS 6335 (to HCS 7335), HCS 7344 (to HCS 6344), HCS 7339 (to HCS 6339)

OTHER________________________________________________________

Approved:___________________________________________

School/Department
Graduate Program in Emerging Media and Communication

Master of Arts

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: Introduction to the Study of Emerging Media and Communication

Required Courses (15 hours)
- EMAC 6361: Writing for Interactive Media
- EMAC 6372: Approaches to Emerging Media and Communication
- EMAC 6373: Emerging Media Studio
- EMAC 6374: Digital Textuality
- HUHI 6323: Space, Time, and Culture
- HUSL 6355: Literature, Science, and Culture

Prescribed Electives (12 hours)
- Twelve hours chosen from the following courses:
  - ATEC 6331: Aesthetics of Interactive Media
  - EMAC 6371: Community Media
  - EMAC 6383: Emerging Media Studio II
  - EMAC 6V81: Special Topics in Emerging Media and Communication
  - HUAS 6330: Studies in the Visual Arts
  - HUAS 6381: Image/Text Workshop
  - HUAS 6355: Creating Nonfictions
  - HUHI 6323: Space, Time, and Culture
  - HUSL 6355: Literature, Science, and Culture
  - HUSL 6380: Art & Craft of Translation

Final Project (3 hours)
- EMAC 6V91: Advanced Project Workshop

Having completed at least 30 hours of course work, students will complete and present an advanced multi-media project for evaluation by a master’s committee.
Master of Science in Accounting and Information Management

Degree Requirements

The University’s general degree requirements are discussed here.

At least 36 hours of the management course work beyond prerequisite courses is required, including 12 hours of basic business core courses and 24 hours of graduate accounting and information management courses. The M.S. in Accounting and Information Management degree is designed for students either with or without previous educational background in accounting and business. Within the M.S. in Accounting and Information Management degree program, the candidate may select one of seven concentrations based on their previous experience and future aspirations. Concentrations include (I) Financial Analysis, (II) Audit and Professional, (III) Taxation, (IV) Managerial, (V) Information Management, (VI) International Services, and (VII) Internal Audit. Students must maintain a 3.0 grade point average in both core courses and in aggregate to qualify for the M.S. in Accounting and Information Management degree.

Basic Business Core (12 credit hours)

Each candidate must satisfactorily complete the following three courses.
AIM 6344 Financial Statement Analysis
MECO 6303 Business Economics or FIN 6301 Financial Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business

And complete one of the following two courses
AIM 6343 Accounting Information Systems
OPRE 6302 Operations Management

Accounting Foundation* (9 hours)

Each candidate must satisfactorily complete the following three accounting foundation courses:
AIM 6330 Intermediate Financial Accounting I
AIM 6332 Intermediate Financial Accounting II
AIM 6341 Planning, Control, and Performance Evaluation
* students that have already taken foundation courses (or their undergraduate equivalents) may replace them with AIM electives

(I) Financial Analysis Concentration (15 hours)

AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing
AIM 6345 Business Valuation
AIM 6346 Financial Dimensions of Mergers and Acquisitions
AIM 6351 Individual Taxation

(II) Audit and Professional Concentration (15 hours)

AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing
AIM 6351 Individual Taxation
AIM 6352 Corporate Taxation
AIM 6377 Corporate Governance and Accounting

(III) Taxation Concentration (15 hours)
AIM 6334 Auditing
AIM 6351 Individual Taxation
AIM 6352 Corporate Taxation
AIM 6354 Partnership Taxation
AIM 6356 Tax Research

(IV) Managerial Concentration (15 hours)
AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing
AIM 6342 Strategic Cost Management
AIM 6347 Current Topics in Advanced Cost Management
AIM 6351 Individual Taxation

(V) Information Management Concentration* (15 hours)
AIM 6336 Information Technology Audit and Risk Management or AIM 6338 Integrated Accounting
Information Systems Analysis and Desighn**
AIM 6347 Current Topics in Advanced Cost Management
AIM 6349 Information Technology Strategy and Management
AIM elective
AIM elective
* the IT security and Enterprise System course-sets can be followed in this concentration
** course not chosen may be used as elective

(VI) International Services Concentration (15 hours)
AIM 6342 Strategic Cost Management
AIM 6362 International Accounting
AIM 6377 Corporate Governance and Accounting
AIM elective
AIM elective

(VII) Internal Audit Concentration (15 hours)
AIM 6336 Information Technology Audit and Risk Management
AIM 6380 Internal Audit
AIM 6383 Forensic Accounting Investigations or AIM 6384 Analytical Reviews Using Audit Software
AIM guided elective**
AIM guided elective**
* course not chosen may be used as elective
** to be approved by Director of Endorsed Internal Audit Program

Additional information about courses within each concentration may be obtained in the SOM advising office as well as information about the requirements for the CPA exam.
Course Descriptions

**COMD 5340 Articulation Disorders** (3 semester hours) Etiology, symptomatology, evaluation, and treatment of articulation disorders. (3-0) Y

**COMD 5341 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. (3-0) Y

**COMD 5344 Anatomy and Physiology of Speech and Hearing** (3 semester hours) Study of anatomic and physiologic mechanisms underlying speech: respiration, phonation, and articulation. Overview of the peripheral auditory system. (3-0) Y

**COMD 6221 Voice Disorders** (2 semester hours) Etiology of voice disorders and methods for assessing and modifying vocal behavior. (2-0) Y

**COMD 6222 Stuttering** (2 semester hours) Principles, methods, and procedures for assessment and intervention of stuttering and associated disorders. (2-0) Y

**COMD 6240 Professional Issues in Speech/Language Pathology** (2 semester hours) Insights into the real-world and a means to master objectives as a professional in the field of speech-language pathology. (2-0) R

**COMD 6305 Speech Science** (3 semester hours) Anatomy, physiology, and functional organization of speech. Mechanisms of normal speech production and perception, with applications to the clinical setting. (3-0) Y

**COMD 6307 Language Acquisition** (3 semester hours) Development of the phonological, morphosyntactic, semantic, and pragmatic aspects of language, and consideration of the social, psychological, and cultural influences. (3-0) Y

**COMD 6317 Language in Communication Disorders** (3 semester hours) Basic processes underlying language disruptions in phonology, morphology, syntax, semantics, and pragmatics. Biological and social aspects of language. (3-0) Y

**COMD 6320 Motor Speech Disorders** (3 semester hours) Anatomic and physiologic bases of the motor speech mechanism. Etiology, symptomatology, evaluation, and treatment techniques for a variety of motor speech disorders in children and adults. (3-0) Y

**COMD 6348 Counseling for Communication Disorder Professionals** (3 semester hours) Psychological aspects of communication disorders in the context of the family system. Basic counseling and problem-solving skills to use as an adjunct to roles as communication disorders professionals. Emphasis on helping students to gain comfort and skill in coping with their clients’ emotions and giving their clients constructive feedback. (3-0) Y

**COMD 6377 Neurogenic Communication Disorders I** (3 semester hours) Introduction to adult neurogenic communication disorders including neuropathology, assessment and diagnosis of aphasia, traumatic brain injury, right hemispheric impairment, and dementia. (3-0) Y

**COMD 6378 Neurogenic Communication Disorders II** (3 semester hours) Language and cognitive intervention for individuals with adult neurogenic communication disorders with management of special populations including stroke, traumatic brain injury, and dementia. (3-0) Y

**COMD 6630 Advanced Seminar Internship in Communication Disorders** (6 semester hours) Intensive internship program in a clinical setting. Pass/Fail only. (May be repeated for credit.) Prerequisite: Consent of instructor (6-0) S

**COMD 7172 Laryngectomy** (1 semester hour) Course will describe the laryngectomy process from surgery to rehabilitation, discuss emotional issues, describe alaryngeal devices and discuss TEP, stoma, trach care, and esophageal speech. (1-0) R

**COMD 7173 Methods in Pediatric Aural Habilitation – Part I** (1 semester hour) PAH I focuses on the discussion of topics related to the management of children with hearing loss with specific reference to
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMD 7174</td>
<td>Methods in Pediatric Aural Habilitation – Part II</td>
<td>1</td>
<td>PAH II focuses on speech, language, and learning assessments for students with hearing loss and developing auditory management skills. Troubleshooting with hearing aids, cochlear implants, and assistive technology is reviewed weekly. Development of sign language skills is included through group practice and community service projects. (1-0)</td>
</tr>
<tr>
<td>COMD 7204</td>
<td>Craniofacial Disorders</td>
<td>2</td>
<td>Etiology, symptomatology, evaluation, and treatment of craniofacial disorders emphasizing cleft lip and palate. (2-0)</td>
</tr>
<tr>
<td>COMD 7207</td>
<td>Advanced Topics in Dysphagia</td>
<td>2</td>
<td>Integration and application of dysphagia evaluation and treatment at an advanced level; management of special populations including stroke, traumatic brain injury, and oral/laryngeal cancers; family and patient counseling/education; ethical issues and decision-making. Prerequisite: COMD 7303. (2-0)</td>
</tr>
<tr>
<td>COMD 7209</td>
<td>Pediatric Medical Speech Pathology</td>
<td>2</td>
<td>Terminology and medical diagnoses affecting the practice of speech pathology in the pediatric medical setting. Guest lectures by practicing clinicians will vary from year to year. (2-0)</td>
</tr>
<tr>
<td>COMD 7301</td>
<td>Public School Methods</td>
<td>3</td>
<td>Practices and procedures of implementing clinical skills in the public schools including applying federal and state laws to best practices in assessment and intervention. (3-0)</td>
</tr>
<tr>
<td>COMD 7302</td>
<td>Seminar in Aphasiology</td>
<td>3</td>
<td>Current issues in neurolinguistics. Models of brain and language; classification, symptoms, and etiology of aphasia. Analysis of aphasis language with respect to phonology, morphology, syntax, and semantics. (3-0)</td>
</tr>
<tr>
<td>COMD 7303</td>
<td>Dysphagia</td>
<td>3</td>
<td>Anatomic and physiologic bases of normal swallowing. Etiology, symptomatology, evaluation, and treatment techniques for swallowing disorders in children and adults. (3-0)</td>
</tr>
<tr>
<td>COMD 7305</td>
<td>Communication and the Aging Brain</td>
<td>3</td>
<td>Social and biological factors affecting language and communication in normal aging; pathological changes in aphasia and dementia; assessment and intervention strategies. (3-0)</td>
</tr>
<tr>
<td>COMD 7306</td>
<td>Cultural Issues in Communication</td>
<td>3</td>
<td>The multicultural nature of society, the role of language and communication in cultural identity, and how practice in the field of communicative disorders is tailored to cultural and linguistic diversity. (3-0)</td>
</tr>
<tr>
<td>COMD 7308</td>
<td>Preliteracy Development</td>
<td>3</td>
<td>Historical, cultural, theoretical, developmental, and pedagogical perspectives on the foundation for literacy in early childhood. (3-0)</td>
</tr>
<tr>
<td>COMD 7309</td>
<td>Neural Correlates of Human Cognition; Lesion-Deficit Models</td>
<td>3</td>
<td>A framework of how the correlation of brain lesions with behavioral deficits provides a key map associating cognitive functions with specific brain regions in humans. These findings provide a key model to combine with the findings of functional neuroimaging (fMRI, PET) in understanding how humans think. The areas of cognition to be covered include language, episodic memory, semantic memory, working memory, aspects of visuospatial functions, and higher-order motor planning. Cognitive deficits in patients (e.g., amnesia, aphasia, etc.) will be explained within this framework. (3-0)</td>
</tr>
<tr>
<td>COMD 7323</td>
<td>Auditory-Verbal Methods</td>
<td>3</td>
<td>Comprehensive survey of the auditory-verbal approach to the habilitation of children with hearing losses from infancy through the early elementary years; includes philosophy, research, special problems, and specific methodology. (3-0)</td>
</tr>
<tr>
<td>COMD 7324</td>
<td>Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments</td>
<td>3</td>
<td>Overview of prosthetic alternatives to conventional amplification for individuals with severe-to-profound hearing loss. Topics include candidacy determination, technology, programming/fitting of devices, aural (re)habilitation, and awareness of controversial areas related to cochlear implantation. (3-0)</td>
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</tbody>
</table>
COMD 7325 Hearing and Deafness (3 semester hours) Introduction to issues, assessment, and management of hearing-impaired. Includes principles and prerequisites for intervention, amplification, aural habilitation programs, sign language, and deaf culture. (3-0) Y

COMD 7336 (HDCC 5385) Social Communication in Early Childhood Disorders (3 semester hours) Development of infant and toddler social, communication and language skills including major milestones of typical development in the areas of cognitive, social and language development; assessment, and treatment of social communication disorders in the prelinguistic and emerging language stages. (3-0) Y

COMD 7339 (AUD 7339) Evidence-Based Practice in Communication Disorders (3 semester hours) Origins, strengths and limitations of the evidence-based practice paradigm. Methods for finding, appraising, and incorporating high-quality evidence into clinical decisions about screening, diagnosing and treating speech, language, and hearing disorders. (3-0) Y

COMD 7345 Pediatric Traumatic Brain Injury (3 semester hours) Assessment and management of acquired brain injury in children including linguistic, cognitive, psychosocial, educational, and neurological factors within a brain plasticity framework. (3-0) T

COMD 7376 Assessment and Intervention of Language Impairments in Preschool and School-Age Children (3 semester hours) Assessment and intervention for children with diverse language impairments. Theoretical models, characteristics and correlates of pediatric language disorders; and evidence-based approaches to screening, diagnosis, assessment, treatment, and prevention. (3-0) Y

COMD 7379 (HCS 7379) Current Research in Autism (3 semester hours) Exploration of research and theories related to Autism Spectrum Disorders (ASD) and the implications the disability has on an individual’s learning, behavior and ability to process information. Topics may include: diagnostic classification, the evaluation process, current theoretical models, intervention models, research on potential causes and treatments, provisions for service delivery and areas of impairment. (3-0) Y

COMD 7384 Augmentative Communication (3 semester hours) Components and dimensions of augmentative and alternative communication (AAC) systems. AAC assessment and intervention for individuals with congenital and acquired complex communication needs. Includes hands on AAC equipment labs. (3-0) Y

COMD 7389 Alzheimer’s Disease and Related Disorders (3 semester hours) Clinical characteristics, diagnosis, cognitive-linguistic evaluation, discourse-based assessment, and direct and indirect intervention of adults with different dementias such as Alzheimer’s disease, frontaltemporal dementias, and vascular dementia. (3-0) R

COMD 7392 Language Disorders, Learning Disabilities, and Dyslexia (3 semester hours) Theoretical models and current best evidence concerning the relationships among language disorders, learning disabilities, and dyslexia. Models of typical and atypical language and literacy development, definition and diagnostic issues, and treatment approaches, with special attention to interventions aimed at improving phonological processing, fluency, comprehension and compensatory strategies. (3-0) Y

COMD 7V19 Birth-to-Three (1-3 semester hours) Assessment and treatment of infants and toddlers with a variety of speech, language, feeding, and oral-motor disorders. (1-3-0) Y

COMD 7V56 Bilingual Language (1-3 semester hours) Evaluation procedures and intervention strategies of culturally and linguistically diverse populations. Second language acquisition, acculturation, bilingual education models and differentiating between language difference vs. language disorders will be discussed. (1-3-0) T

COMD 7V62 Seminar in Autism (1-3 semester hours) Issues concerning the diagnosis and theories of Autism. The development of social, communication/language, and cognitive skills in Autism, as well as various therapeutic approaches. (1-3-0) Y

COMD 7V68 Cognitive Rehabilitation (1-3 semester hours) Study of normal and impaired aspects of cognition as it relates to communication, including attention, memory, and executive function with an emphasis on evaluation and treatment theories in the adult rehabilitation setting. (1-3-0) R

COMD 7V73 Seminar in Hearing and Speech Science (1-6 semester hours) Current topics in hearing and speech science. (May be repeated for credit.) (1-6-0) T
COMD 7V82 Special Topics in Communication Disorders (1-6 semester hours) Selected topics and current research in communication disorders. Topics will vary from semester to semester. (May be repeated for credit.) ([1-6]-0) R

COMD 7V86 Special Topics in Child Language (1-6 semester hours) Current issues in child language emphasizing research on intervention practices. Specific topics vary from semester to semester. (May be repeated for credit.) ([1-6]-0) R

COMD 7V90 Special Topics in Hearing and Speech Science (1-6 semester hours) Special topics and current research in hearing and speech science. (May be repeated for credit.) ([1-6]-0) R

COMD 7V91 Methods in Communication Disorders (1-6 semester hours) Issues related to methods of assessment and intervention in communication disorders. (May be repeated for credit.) ([1-6]-0) R

COMD 7V98 Directed Study in Communication Disorders (1-9 semester hours) Individualized program of study which may include reading, research, implementation of clinical strategies and/or other designated activities. Pass/Fail only. (May be repeated for credit.) ([1-9]-0) S

COMD 8V80 Research in Communication Disorders (1-9 semester hours) Supervised research experience in Communication Disorders. (May be repeated for credit.) ([1-9]-0) S

COMD 8V98 Thesis (3-6 semester hours) (May be repeated for credit.) ([3-6]-0) S
Doctor of Audiology Program

http://bbs.utdallas.edu/

Faculty

Professors: Peter F. Assmann, Aage R. Møller, Ross J. Roesor, Robert D. Stillman, Linda Thibodeau, Emily Tobey
Associate Professors: Michael Kilgard
Assistant Professor: Jeffrey Martin
Clinical Assistant Professors: Jackie Clark, Carol Cokely, Lee Wilson

Distinguished Scholar in Residence: James F. Jerger
Faculty Associates: Beth Dorsey, Amanda Lavue, Elizabeth Gill, Anne Howell, Shari Kwan, Jaime Hampton, Holly Whalen, Chinthia MacArthur, Laura Veazey, Michelle Levin, Beth Berenthal, Jennifer Carlock, Beiseida Northrup, Beijn Rodriguez

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 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, Assistive Devices Center, and Pediatric Hearing Aid Clinic.

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 research interests and career goals. The GRE score is included in the evaluation of the applicant’s record. In general, students admitted to the program...
have a combined Verbal and Quantitative score on the GRE of at least 1000. However, there is no
minimum cut-off score for admission nor does a score of at least 1000 assure admission to the program.

Degree Requirements

The University's general degree requirements are discussed here.

The Doctor of Audiology (Au.D.) degree requires 97 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 (97 hours)

Foundation (25 Semester Hours)

AUD 6V20 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 (25 Semester Hours)

AUD 6352 Medical Audiology
AUD 7182 Topics in Patient Counseling and Student Mentoring
AUD 7321 Theories of Amplification
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/Amplification Systems
AUD 7338 Research in Audiology
AUD 7339 Evidence Based Practice in Communication Disorders
AUD 7353 Clinical Electrophysiology

Advanced (21 Semester Hours)

AUD 7310 Professional Issues in Audiology
AUD 7328 Hearing Loss Prevention
AUD 7351 Physiologic Assessment of Vestibular System
AUD 7371 Doctoral Seminar in Audiology\( \text{Elective} \) (taken 2 times)
AUD 7340 Auditory Processing Disorders
HCS 6314 Instrumentation

Experiential (26 Semester Hours)

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HCS 7380 Practicum in Human Development and Communication Sciences (14 semester hours)
AUD 8V80 Individual Research in Audiology
AUD 8V97 Doctoral Internship in Audiology (9 semester hours)

**Out-of-Field Students**

Students entering the program who lack undergraduate preparation in communication disorders are required to take a specified 6-12 semester hour sequence of corequisite courses. These courses may be taken at The University of Texas at Dallas and may be enrolled in concurrently with some graduate courses.

Students are advised that participation in off campus clinical rotations and externship has additional requirements such as a criminal background check and hepatitis shots. Students excluded from off-campus sites for any reason may be unable to complete all degree requirements. Students are responsible for the cost of criminal background checks.
Course Descriptions

Many of the course descriptions in the School of Arts and Humanities are generic in nature. They define an area of inquiry and/or creative activity within the boundaries of which instructors offer courses on specific topics. Each semester the school makes available detailed descriptions of the specific courses to be offered during the next term. Moreover, the specific topics to be covered in generic courses will be listed with the course titles in the class schedules published by the university.

Arts and Technology Core Courses

ATEC 6300 Interdisciplinary Approaches to the Arts and Technology (3 semester hours) Introduction to the interdisciplinary study of mutual interactions between technology and the creative arts. Establishes basic theoretical concepts and principles underlying the graduate program in Arts and Technology. Required of all degree candidates in Arts and Technology. (3-0) Y

ATEC 6331 Aesthetics of Interactive Arts (3 semester hours) Exploration of aesthetic principles underlying the interactive electronic arts, their relation to and divergence from aesthetic principles underlying traditional forms of artistic expression. Topics will include interactive games, animation, and new modes of narrative. Required of all degree candidates in Arts and Technology. (0-3) Y

Arts and Technology Elective Courses

ATEC 6332 Design Principles (3 semester hours) Exploration of advanced design principles and practices common to most design professions. Topics include the language of design, core design concepts, analysis of design, and specialized design practices. (0-3) Y

ATEC 6333 Computational Design (3 semester hours) Exploration of the computational theory of design and the design of products and processes through digital means, such as computer graphics, animation, visualization, simulation, computer-aided design, and image processing. (0-3) Y

ATEC 6334 Information Design for New Media (3 semester hours) This course explores holistic discovery research and practice in the field of new media studies. Students will learn to uncover insights about user desirability, technological potential and possibility, data evaluation, value measures, and how to select ideas that have the greatest potential to ultimately invest, develop, and build new products and services. (0-3) T

ATEC 6335 Research in Sound Design (3 semester hours) Exploration of the relationship between sound, music, and the visual arts. This course covers the history of art and technology as applied to the domain of sound, with a special focus on interactive applications. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6341 Game Design (3 semester hours) Advanced study of the structure and design of digital, analog, narrative, and social game systems. Course focuses on theory, critical analysis, innovation, and prototype creation. (0-3) Y

ATEC 6342 Game Studies (3 semester hours) Advanced study of the computer game as cultural artifact, procedural system, social space, and artistic medium. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6343 Interactive Environments (3 semester hours) Exploration of design principles and practices for the creation of interactive experiential spaces. Course focuses on atmosphere, flow, interactivity, spatial narrative, and user experience. (May be repeated for credit as topic vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6345 Game Production Lab (3 semester hours) Exploration and application of advanced methods and techniques (literary, artistic, conceptual, technical) involved in the development of interactive computer-based games. Includes participation in development team for creation of a complex computer game. (May be repeated to a maximum of 6 credit hours.)

ATEC 6351 Digital Arts (3 semester hours) Exploration and application of advanced methods and techniques for the creation of visual images through the use of digital media. (May be repeated as topics vary to a maximum of 6 credit hours.) (0-3) Y
ATEC 6352 Motion Capture (3 semester hours) Exploration of advanced methods and techniques in motion capture animation. Course culminates in a professional-quality animation project. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) T

ATEC 6353 Visualization Research (3 semester hours) Exploration and application of advanced techniques in animation, visualization, simulation, and interactivity. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6354 Immersive Environments (3 semester hours) Advanced research in the conceptualization, creation, and application of interactive immersive environments, including research in synthetic spaces, interactive game engines, and hybrid physical/virtual worlds. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6355 Animation Production Lab (3 semester hours) Exploration and application of advanced concepts and techniques involved in the development of animated shorts and features. Includes participation in development team for creation of an animated short or feature-length animated film. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6361 Writing for Interactive Media (3 semester hours) Theory, principles and practice of narratives created for distribution via digital media. Will include creation of both linear and nonlinear digital content for electronic distribution. (May be repeated to a maximum of 6 credit hours.) (0-3) Y

ATEC 6371 Community Media (3 semester hours) Students develop local media that gives voice to people and issues in a particular community. Emphasis on personal, expressive media production that displays an authentic, personal voice. Students write and produce projects for Internet distribution using text, audio, video, interactive, and participatory elements. (0-3) T

ATEC 6372 Approaches to Emergent Media and Communications (3 semester hours) Focuses on the study of emergent media from a theoretical frame, exploring the political, technological, cultural and historical forces which inform the way media and communication develop. (3-0) T

ATEC 6373 Emerging Media Studio (3 semester hours) This course explores media production across multiple media. Students work in teams to develop meta-media projects in a variety of content delivery environments. Class will require students to develop a range of rhetorical (text, audio) and visual (image, video) strategies appropriate for emerging media. (May be repeated for credit to a maximum of 9 hours) (3-0) T

ATEC 6374 Digital Textuality (3 semester hours) This course will focus on understanding how representation and specifically writing has changed as mediums of writing have changed, paying special attention to the transformation from the analog to the digital. (3-0) T

ATEC 6375 Cyberpsychology (3 semester hours) Exploration of the underlying psychological issues of users that can be taken into account in the design and assessment of interactive technologies, such as online personas, virtual humans and cultures, brain-computer or human-robotic interfaces, virtual workplaces, and e-behavior. (3-0) T

ATEC 6376 E-Business Environment Design (3 semester hours) Students in this course will analyze underlying changes in societal structures fueled by a web-based economic environment, apply the effect of mass communication to marketing, examine the effect of technology-driven societal structures on the workplace, and explore how the optimization of e-marketing and e-business environment designs can be used to reduce energy consumption. (3-0) T

ATEC 6382 Special Topics in Interactive Media (3 semester hours) Students in this course will explore how interactivity defines the degree to which digital artifacts (such as games, multimedia applications, products of all kind) are brought to life by their users. Topics may include interaction design, interface design, and research in anticipatory systems. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R

ATEC 6383 Special Topics in Sound Design (3 semester hours) Advanced research in digital music and sound design. Topics may include advanced visualization of music and sound, sonification of images, and advanced research in interactive sound applications. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R

ATEC 6384 Special Topics in Game Studies (3 semester hours) An examination of the links between technology, play, and culture. Topics may include the ethics of game development, serious and persuasive games, simulation and training, interactive education, identity and culture in virtual worlds, multilinear narrative, and philosophical origins of games as a medium. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R
ATEC 6385 Special Topics in Animation (3 semester hours) Advanced research in animation, including concept development, character development, advanced techniques and methods in 2D animation, and animation production techniques. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R
ATEC 6390 Special Topics in Arts and Technology (3 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. or M.F.A. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R
ATEC 6397 Independent Readings in Arts and Technology (3 semester hours) (May be repeated for credit) (3-0) R
ATEC 6398 Independent Research in Arts and Technology (3 semester hours) (May be repeated for credit) (3-0) R
ATEC 6V81 Special Topics in Emergent Communication (1-9 semester hours) Explores current theories informing research on and practices in digital media and communication, such as distributed, mobile, time-shifted, interactive and personal media. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-1-9) T
ATEC 6V95 Advanced Project Workshop (3-6 semester hours) Students will engage in the creation of an advanced creative and/or research project exploring the interaction of the arts with digital technology. Required of all degree candidates in Arts and Technology. [(3-6)-0] Y
ATEC 7331 Research Methodology in Arts and Technology (3 semester hours) This course will focus on understanding how representation and specifically writing has historically changed, paying special attention to the transformation from the analog to the digital. (May be repeated for credit to a maximum of 6 hours) (3-0) T

Emerging Media and Communication Core Courses

EMAC 6300 Introduction to the Study of Emerging Media and Communication (3 semester hours) Introduction to interdisciplinary study of the implications of interactive technology for the creation, dissemination and impact of communication. Establishes basic theoretical concepts and principles underlying the graduate program in Emerging Media and Communication. (3-0) Y
EMAC 6374 (ATEC 6374) Digital Textuality (3 semester hours) This course will focus on understanding how representation and specifically writing has historically changed, paying special attention to the transformation from the analog to the digital. (3-0) Y

Emerging Media and Communication Elective Courses

EMAC 6361 (ATEC 6341) Writing for Interactive Media (3 semester hours) Theory, principles, and practice of narratives created for distribution via digital media. Will include creation of both linear and nonlinear digital content for electronic distribution. (May be repeated to a maximum of 6 credit hours.) (0-3) Y
EMAC 6371 (ATEC 6371) Community Media (3 semester hours) Students develop local media that gives voice to people and issues in a particular community. Emphasis on personal, expressive media
production that displays an authentic, personal voice. Students write and produce projects for Internet distribution using text, audio, video, interactive, and participatory elements. (0-3) T

EMAC 6372 (ATEC 6372) Approaches to Emergent Media and Communication (3 semester hours) Focuses on the study of emergent media from a theoretical frame, exploring the political, technological, cultural, and historical forces which inform the way media and communication develop. (3-0) T

EMAC 6373 (ATEC 6373) Emerging Media Studio I (3 semester hours) Explores media production across multiple media. Students work in teams to develop meta-media projects in a variety of content delivery environments. Class will require students to develop a range of rhetorical (text, audio) and visual (image, video) strategies appropriate for emerging media. (May be repeated for credit as topics vary to a maximum of 9 hours) (0-3) T

EMAC 6374 (ATEC 6374) Emerging Media Studio II (3 semester hours) Advanced collaborative workshop devoted to the creation of sophisticated communications employing multiple media platforms. (May be repeated for credit to a maximum of 9 credit hours.) (0-3) T

EMAC 6V81 Special Topics in Emergent Communication (1-9 semester hours), A course dedicated to current issues, research problems, and special projects in emerging media and communication. Topics will vary and may include distributed, mobile, time-shifted, interactive and personal media. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-1-9) T

EMAC 6V81 Advanced Project Workshop (3-6 semester hours) Students propose, develop and execute an advanced creative and/or research project exploring the Emerging Media and Communication. This course is required of all degree candidates in Emerging Media and Communication. ((3-6)-0) Y

History Core Course

HIST 6301 Historiography (3 semester hours) Graduate-level introduction to the practice and forms of written history. Required of all students in the M.A. program in History, this course examines the ways in which historians have conceived of their craft, the centrality of interpretation to the historical process, and the use of a variety of methods and theories in the study of the past. (3-0) Y

History Elective Courses

HIST 6310 Early American History (3 semester hours) The study of specific themes and/or periods in American history through the American Revolution. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6320 America in the Nineteenth Century (3 semester hours) The study of specific themes and/or periods in American history in the nineteenth century. Topics may include the Civil War and Reconstruction. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6324 Gilded Age & Progressive Era (3 semester hours) The study of social, political, and economic life in the period between 1877 and 1919. Special attention to the relationship between government and society. (3-0) T

HIST 6325 America in the Twentieth Century (3 semester hours) The study of specific themes and/or periods of American history in the twentieth century. Topics may include World War I, World War II, and the Civil Rights Era. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6326 U.S. Foreign Relations (3 semester hours) The study of U.S. diplomatic relations with Asia, Africa, Europe, Latin America, the Middle East, and Soviet Russia in the twentieth and twenty-first centuries. (3-0) T

HIST 6327 U.S. Since 1945 (3 semester hours) The study of the political, economic, social, and cultural development of the United States since the end of World War II. (3-0) T

HIST 6330 Regional and Area History in the United States (3 semester hours) The study of themes related to the history of specific regions of the United States, for example the South, the Southwest, and Texas. Topics may vary. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

HIST 6332 Slavery in America (3 semester hours) The study of the origins, evolution, growth and destruction of racial slavery in America from 1619-1865. (3-0) T
HIST 6333 Rise of the Jim Crow South (3 semester hours) The study of the origins of segregation and disfranchisement in the New South. Explores historiographical debates about the nature and meaning of Jim Crow. (3-0) T
HIST 6335 U.S. Women (3 semester hours) The study of recent historiography, current methods, and major themes in U.S. women's and gender history. (3-0) T
HIST 6340 European and World History (3 semester hours) The study of specific themes and/or periods in the history of Europe and the world. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HIST 6350 Asian History (3 semester hours) The study of specific themes and/or periods in the history of Asia. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6360 Latin American History (3 semester hours) The study of specific themes and/or periods in the history of Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6365 Mexican History (3 semester hours) The study of specific themes and/or periods in the history of Mexico. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6390 Topics in History (3 semester hours) The study of specific themes and/or periods in history. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R
HIST 6395 Special Topics in History (3 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R
HIST 6397 Independent Readings in History (3 semester hours) (May be repeated for credit.) (3-0) R
HIST 6398 Independent Research in History (3 semester hours) (May be repeated for credit.) (3-0) R
HIST 6399 Master’s Thesis (3 semester hours) (May be repeated for credit but only 6 hours will be counted toward M.A.) (3-0) R

Humanities Core Courses

HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities (3 semester hours) Introduction to interdisciplinary approaches to the arts and humanities, including concepts of inquiry and interpretation that form the theoretical bases of the graduate programs, seminars, workshops, and studios. Required of all degree candidates for the Master of Arts, Master of Arts in Teaching, and Doctor of Philosophy in Humanities. (3-0) S
HUED 5300 (ED 5300) The Interdisciplinary Teaching of the Arts and Humanities in the Secondary School (3 semester hours) Approaches to the interdisciplinary teaching of the arts and humanities at the secondary level. Each student will design a curriculum unit to be taught from an interdisciplinary perspective. Required of students seeking the Master of Arts in Teaching. (3-0) Y
[moved to Education & General below]

Humanities Elective Courses

Aesthetic Studies

HUAS 6303 Performance Literature, Theory, and Criticism (3 semester hours) Examination of a wide range of performance and theatrical traditions and texts. Using various critical and theoretical perspectives, the focus will be on the interplay between textual analysis, theoretical and critical frames, and performance. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HUAS 6305 Criticism, Interpretation, and Performance (3 semester hours) An investigation of the interrelationship among the activities of criticizing, interpreting, and performing artistic texts. Examples may be drawn from literature, theater, performance art, web and inter-media applications, film/video, music, and the visual arts. The course will include an exploration of the effects of various cultural and theoretical perspectives on our response to specific works. (3-0) T
HUAS 6310 Introduction to Film Studies (3 semester hours) Study of the history and formal and stylistic elements of cinema as a medium of expression, as an industry, and as an art form; and an introduction to the tenets and theoretical basis of the academic discipline known as film studies. (3-0) T

HUAS 6312 Art and Society (3 semester hours) Study of the many forms of interaction between the arts and the society in which they exist. Topics may include the role of the artist in society, the representation of social and religious values in art, or the influence of art and the artist upon society. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6313 The Business of the Arts (3 semester hours) Exploration of effective means to find, create, and manage markets and audiences for works of art. Topics may include digital media, visual or performing arts, museum studies, and arts management. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6315 The Arts in Historical Contexts (3 semester hours) Studies in one or more arts of various places and historical periods. Topics will vary, but may focus on a particular movement (e.g., Surrealism), a specific era (e.g., the Renaissance), or a place (e.g., Paris in the early twentieth century). (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y

HUAS 6317 Art and Authorship (3 semester hours) Study of the role of the maker in the creation of art. Topics vary but may include visual artists, filmmakers, composers, writers, or other artists. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6318 The Arts and Their Institutions (3 semester hours) Studies of the institutions that shape and present the visual and performing arts by providing their physical, administrative, and financial “frames”: art museums, theaters, symphony associations, performance consortiums, or private foundations. The course will focus selectively on these institutions, grouping them for study in various ways depending on the interests and expertise of the instructor. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6320 Studies in Experimental Traditions (3 semester hours) Studies in the works of artists whose experimentation with forms of expression breaks new ground in the arts and demands changes in the aesthetic perception of the public. The course will focus on such experimental movements as modernism, postmodernism and various avant-gardes that form the new tradition of the contemporary arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6324 Spaces of Display and Performance (3 semester hours) Usually art works and performances are encountered in specific ritualized spaces designed for them and exerting strong influence on their character. The course will address such spaces critically from the point of view of architecture, theories of display, and concepts of ritual spectatorship. (3-0) T

HUAS 6330 Studies in the Visual Arts (3 semester hours) Explorations in various forms of the visual arts. The course may focus on a specific form (e.g., painting, sculpture, film, photography) or interrelations among visual forms. Emphasis will be on the understanding of the creative process underlying the finished work. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6331 Studies in Music (3 semester hours) Studies in forms of musical expression. Topics will vary, but the course will emphasize the nature, development, and artistic possibilities of various forms of music. Courses may relate music to developments in other arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6333 Advanced Orchestra/Chamber Music Ensemble (3 semester hours) Workshop in which instrumentalists, singers, dancers, actors, composers, lyricists, visual artists and/or video/performance artists create and perform music for small and larger ensembles, plus multi-media and theater works. (May be repeated for credit to a maximum of 9 credit hours.) Permission of instructor required. (3-0) T

HUAS 6334 Iberian Culture and Music (3 semester hours) Study of the transfer of music and culture between Spain, Portugal, and the countries of the Americas which had close connections to the Iberian countries via language, culture, and commerce. (3-0) T

HUAS 6336 Photography Studio/Seminar (3 semester hours) Workshop-based course designed to foster reflection on the relationship between human perception and the photographic mediation of reality. The course may emphasize photographic processes or conceptual frameworks. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6337 Digital Photography (3 semester hours) Workshop in which students explore digital photography within the context of contemporary art, emphasizing the relationship between digital imaging
processes and color photographic techniques. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

HUAS 6339 Painting/Digital Imaging/Video (3 semester hours) Workshop in which students will pursue creative work in a medium of their preference or expertise (can include painting, drawing, digital imaging, video or hybrid forms). (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6340 Studies in Theater and Dance (3 semester hours) An investigation of theater, performance art, inter-media, and/or dance as forms of art. The course will relate to and incorporate trends in other arts and contemporary intellectual and cultural movements, theories and critical issues. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6345 Shakespeare in Performance (3 semester hours) Studies of Shakespeare’s plays, examining varied artistic and scholarly interpretations in film and performance. The course will blend lectures, discussions, and practical skill-based exercises and may include scholarly and/or creative projects. Meant for aspiring writers, actors, directors, and teachers, with or without experience in performing. Topics may vary. (May be repeated for credit to a maximum of 6 semester hours.) (3-0) T

HUAS 6347 Solo Performance (3 semester hours) Workshop in which students explore aspects of devising, writing and performing solos, with an emphasis on developing work in multiple genres, media, and formats. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6348 Performance Installation (3 semester hours) An exploration of the theory, history, and practice of employing installation and performance art with technology as a means of extending personal artistic practice. Emphasis will be on practical experience in the conceptualization and production of collaborative, experimental, trans-disciplinary artistic expression. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6350 Creating Poetry (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of poetry, focusing on the creative techniques and processes involved in producing short poems and song lyrics in a variety of formalist, free verse, and experimental forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6351 Creating Novels (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of the novel, focusing on the creative techniques and processes involved in producing novels in a variety of lyrical, experimental, and traditional forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6352 Creating Television and Movie Scripts (3 semester hours) An investigation in a workshop environment of the aesthetics of art and creation of movie, multimedia, video, and television scripts, focusing on the creative techniques and processes involved in producing scripts in a variety of experimental and traditional forms that combine verbal, written art with acting, filmmaking, and production. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6353 Creating Plays and Musicals (3 semester hours) An investigation in a workshop environment of the aesthetics of art and creation of drama, focusing on the creative techniques and processes involved in producing plays and musicals in a variety of experimental and traditional forms that combine verbal, written art with the musical and dramatic arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6354 Creating Short Fictions (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of the short story and the novella, focusing on the creative techniques and processes involved in producing short stories in a variety of experimental and traditional forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6355 Creating Nonfictions (3 semester hours) This workshop will draw from one or several nonfiction genres such as portraiture, historical accounts, essays, biography, and autobiography and will show how they are realized using techniques by the creation of art. Topics may vary but may include visual artists, filmmakers, composers, or other artists. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6373 Studies in Film, Television, and Digital Media (3 semester hours) Study of aspects of motion picture history, criticism, and aesthetics. Topics may include genre study, documentary practices, national cinemas or movements; theories of reception; or comparisons of these and other art forms. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HUAS 6375 Imagery and Iconography (3 semester hours) The study of the visual image and its use. Topics may include the nature of the visual image, our perception and interpretation of visual images, the relation of the visual to the verbal image, and the ways in which visual images are used in art to shape our imagination. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6377 Critical Theory and the Visual Arts (3 semester hours) A mapping of the relations between the visual arts and new critical theories from structuralism to post-structuralism. Focus will vary but may include semiotics, deconstruction, feminism, or psychoanalysis. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6380 Creating Poetry: Intermediate (3 semester hours) An intensive investigation into the forms (both ancient and modern), theories, and creations of poetry in a workshop environment that will focus on the creative techniques and processes involved in producing formalist, lyrical, free verse, and experimental poetry. Permission of the instructor and previous completion of HUAS 6350 are required. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6381 Creating Fiction: Intermediate (3 semester hours) An intensive investigation into the theories, aesthetics, and creation of fiction in a workshop environment that will focus both on structure and on creative techniques and creative process involved in producing sophisticated, challenging, and linguistically developed fictions. The course may emphasize the short story, novel, or novella. Permission of the instructor and previous completion of HUAS 6351 or HUAS 6354 are required. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6383 Creating Scripts: Intermediate (3 semester hours) An intense investigation of the theory, history, aesthetics, art, and creation of play, movie, and television scripts in a workshop environment that will focus on the creative techniques and processes involved not only in the creation of film, play, and television scripts, but also in the production of plays, films, and television episodes. Permission of the instructor and previous completion of either HUAS 6352 or HUAS 6353 required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6385 Creating Nonfictions: Intermediate (3 semester hours) An intensive investigation into the theory, aesthetics, and creation of biographies, autobiographies, and historical accounts in a workshop environment that will explore the boundaries between fiction and non-fiction and between art and reality. Permission of the instructor and previous completion of HUAS 6355 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6390 Special Topics in Aesthetic and Performance Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUAS 6391 Creativity: Visual Arts Workshop (3 semester hours) A workshop emphasizing the creation of artistic works in a specific area of the visual arts (e.g., painting, drawing, photography, sculpture). Topics, such as narrative representation or the study of a genre, are explored to examine the theoretical basis guiding practice. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours). (3-0) Y

HUAS 6392 Creativity: Image/Text Workshop (3 semester hours) An exploration of the visual possibilities inherent in the art of the text. Topics may include an investigation of techniques derived from various media that foster the transformation and combination of words and images. The problem of creating text for a visual environment will be examined. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6393 Creativity: Time-Based Arts Workshop (3 semester hours) Exploration of the conceptual demands inherent in time-based visual art. Topics may include interactive visual arts, installation, kinetic art, computer animation, and video processes. The potential of narrative models may be examined. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6394 Creativity: Performance (3 semester hours) A skills-based course intended to enable the exploration, development, and realization of a performance expression. Project-focused, the course may include playwriting, adaptation of non-dramatic or oral history sources, or be guided by specific text(s), improvisation, inter-cultural or inter-media explorations. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) Y

HUAS 6395 Creating Short Fiction (3 semester hours) An investigation in a workshop environment of the aesthetics of the short story and the novella, focusing on the creative techniques and processes involved in producing short stories in a variety of experimental and traditional forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6396 Creating Nonfictions (3 semester hours) This workshop will draw from one or several nonfiction genres such as portraiture, historical accounts, essays, biography, and autobiography and will show how they are realized using techniques by the creation of art. Topics may vary but may include visual artists, filmmakers, composers, or other artists. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7305 Advanced Topics in Art History (3 semester hours) Advanced studies in one or more arts of various places and historical periods. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7320 Advanced Topics in the Visual Arts (3 semester hours) Advanced explorations in various forms of the visual arts. The course may focus on a specific genre or form or on interrelations among visual forms. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7330 Advanced Topics in Music (3 semester hours) Advanced studies in forms of musical expression. The course will emphasize the nature, development, and artistic possibilities of various forms of music. Courses may relate music to developments in other arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7340 Advanced Topics in Theater and Dance (3 semester hours) Advanced investigation of theater, performance art, inter-media, and/or dance as forms of art. The course will relate to and incorporate trends in other arts and contemporary intellectual and cultural movements, theories and critical issues. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7350 Advanced Topics in Creative Writing (3 semester hours) Advanced investigation of the theory, history, aesthetics, art, and creation of creative writing in a workshop environment. The course may focus on poetry, short stories, scripts or other genres. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7360 Advanced Topics in Film, Television, and Digital Media (3 semester hours) Advanced study of particular aspects of motion picture history, criticism, and aesthetics. Topics may include genre study, documentary practices, national cinemas or movements, theories of reception, or comparisons of these and other art forms. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7380 Advanced Topics in Aesthetic Studies (3 semester hours) Advanced study of particular themes, topics, and issues in the various disciplines that constitute aesthetic studies. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7390 Advanced Special Topics in Aesthetic and Performance Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUAS 7390 Advanced Music Performance (6 semester hours) Study of instrumental/vocal techniques, interpretive insights, repertoire building and historical performance practice. (May be repeated for credit to a maximum of 12 credit hours.) (6-0) T

HUAS 8303 Independent Readings in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUAS 8305 Independent Research in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R
HUHI 6300 History of Early Modern Thought (3 semester hours) Introduction to and examination of the authors and texts influential in shaping Western culture through the eighteenth century. The course will treat philosophy as well as social, political, and religious thought during different periods. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6301 History of Modern Thought (3 semester hours) Introduction to and examination of the authors and texts influential in shaping modern Western culture since 1800. The course will treat philosophy as well as social, political, and religious thought during particular periods. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6305 Ideas In Contexts (3 semester hours) The study of an idea or ideas as developed in specific cultural circumstances, for example, the idea of revolution considered in theory as well as in its actualization in the American Revolution, the French Revolution, the Bolshevik Revolution, Maoism, etc. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6313 Thought, Culture, and Society in Europe (3 semester hours) Themes in the intellectual and cultural life of European societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6314 Thought, Culture, and Society in the United States (3 semester hours) Themes in the intellectual and cultural history of the United States. The course will focus on the writings of key thinkers chosen from different periods and on placing these writings within their intellectual and social contexts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6315 Thought, Culture, and Society in Latin America (3 semester hours) Themes in the intellectual and cultural life of Latin American societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6320 Perceptions of the Past (3 semester hours) Approaches to perceiving, reconstructing, appreciating, and analyzing the past. Formal historiographical methods, the fictionalization of the past, or the understanding of memory and nostalgia may be emphasized. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6323 Space, Time, and Culture (3 semester hours) The study of the relationship between changing philosophic and scientific concepts of space and time and forms of cultural expression such as art, literature, and music. (3-0) T

HUHI 6325 Movements in Thought and Culture (3 semester hours) The study of movements in thought and culture through a variety of perspectives, but emphasizing their intellectual bases: e.g., the Enlightenment, Romanticism, etc. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6327 Artist and Writer in Society (3 semester hours) Inquiries into the role of creative artists (e.g., painters, sculptors, musicians, writers, filmmakers) in various places and times. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6329 Philosophical Issues and the Humanities (3 semester hours) An investigation of the ways the humanities contribute to an understanding of such philosophical problems as hermeneutics, moral education, life and death, race, gender and sexual orientation, and the environment. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6332 European Enlightenment (3 semester hours) The study of the European intellectual movement of the Enlightenment, its precursors and consequences. (3-0) T

HUHI 6333 Exploring Urban Cultures (3 semester hours) The study of the European cities of Berlin, Paris, and London from the mid-nineteenth through the early twentieth century. (3-0) T

HUHI 6335 Modern Jewish Thought (3 semester hours) Study of modern and contemporary Jewish thought, with an emphasis on the relationship between Judaism and philosophy. (3-0) T

HUHI 6336 Modernity, Culture, and the Jews (3 semester hours) The study of the role of Jews in the creation of modern culture, with emphasis on Jewish participation as an area of interaction, exchange, and encounter. (3-0) T

HUHI 6337 Moving Pictures in Jewish Culture and Thought (3 semester hours) The study of the role of Jews in the movie industry from the silent era to contemporary Hollywood production. (3-0) T

HUHI 6338 The Holocaust (3 semester hours) An examination of the event, its background and consequences, with emphasis on the political, psychological, theological, and artistic responses it has engendered. (May be repeated for credit to maximum of 6 credit hours.) (3-0) Y

HUHI 6340 Readings in American Culture (3 semester hours) An examination of the ways in which Americans have defined themselves, and been defined by others, over time. Works read will be drawn...
from a variety of genres and may include studies of myth and symbol. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HUHI 6341 American Intellectual History (3 semester hours) The study of American thought from the seventeenth century to the present, with a focus on philosophy, political thought, and social thought. (3-0) T
HUHI 6342 American Political Cultures (3 semester hours) An inquiry into the development of political cultures in the United States since the late eighteenth century. Emphasis on how the apparatus of the state (courts, legislatures, elections, schools, asylums, the military) has provided formal frameworks for ongoing cultural contests among diverse Americans over the meanings of citizenship, family, work, property, nature, health, and privacy. (3-0) T
HUHI 6343 The American Experience in Vietnam (3 semester hours) The study of the reaction and response of American society to the political, military, and cultural turmoil engendered by the Vietnam War. (3-0) T
HUHI 6344 The 1960s (3 semester hours) The study of the "Long Decade" of the 1960s, from Elvis to the fall of Richard Nixon. The course will analyze political, economic, social, and cultural developments. (3-0) T
HUHI 6345 The Woman Question (3 semester hours) The study of how particular cultures and/or thinkers have defined the "woman question." Subjects may include particular geographical regions, major literary or historical movements and events. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T
HUHI 6346 New Directions in Southern Studies (3 semester hours) The study of how scholarship on the U.S. South has begun to push the conventional boundaries of the discipline through its focus on the categories of race, gender, sexuality, and transnationalism. (3-0) T
HUHI 6347 Topics in Feminist Philosophy (3 semester hours) Examination of various topics in metaphysics, ethics, philosophy of science, philosophy of language, philosophy of mind, or philosophy of religion from feminist perspectives. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HUHI 6348 Thought, Culture, and Society in Asia (3 semester hours) Themes in the intellectual and cultural life of Asian societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T
HUHI 6349 Thought, Culture, and Society in the Middle East (3 semester hours) Themes in the intellectual and cultural life of Middle Eastern societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T
HUHI 6350 Topics in the History of Ideas (3 semester hours) Topics in philosophy, intellectual and/or cultural history. (May be repeated for credit as topics vary to a maximum of 9 hours.) (3-0) R
HUHI 6351 Historical Inquiry (3 semester hours) A leveling course for graduate students with little background in the field as an advanced introduction to historical study and the history of ideas. (3-0) R
HUHI 6395 Advanced Topics in the History of Ideas (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) R
HUHI 7313 Advanced Topics in U.S. Thought, Culture, and Society (3 semester hours) Advanced topics in the intellectual and cultural history of the United States. The course will focus on key thinkers, ideas, schools of thought, or cultural beliefs chosen from different periods and understood within their intellectual and social contexts. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T
HUHI 7314 Advanced Topics in European Thought, Culture, and Society (3 semester hours) Advanced topics in the intellectual and cultural life of European societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T
HUHI 7315 Advanced Topics in Thought, Culture, and Society (3 semester hours) Advanced topics in intellectual and cultural history. The course may focus on different themes, periods, and geographical areas. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T
HUHI 7330 The History of Hermeneutics (3 semester hours) Studies in the history of hermeneutics as a biblical-philological method and its transformation by the modern German tradition into a philosophical approach to language and experience. Focus on the work of Schleiermacher, Dilthey, Heidegger, and Gadamer. (3-0) T

HUHI 7332 Topics in Recent Continental Philosophy (3 semester hours) Close textual study of the works of leading continental philosophers such as Nietzsche, Derrida, Foucault, Heidegger, Husserl, and others. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7335 Philosophical Topics in the Analytic Tradition (3 semester hours) Examination of philosophical issues arising from or inspired by the works of Russell, Wittgenstein, Frege, Carnap, and their heirs, including Popper, Quine, and Sellars. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7340 New Currents in the History of Ideas (3 semester hours) Exploration of significant recent approaches that represent major disciplinary and interdisciplinary contributions to the field. With emphasis on theory and method, focus falls upon critical study of new interests that include “new” social and cultural histories, mentalities, poststructuralism, feminism, critical theory, institutionalist history, hermeneutics, among others. (May be repeated for credit as topics vary to a maximum of 6 credit hours) (3-0) R

HUHI 7348 Topics in Thought and Society (3 semester hours) Studies in ideas, institutions, and applied history. The approach may be comparative or limited to a single cultural or geographical area. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUHI 7378 Science and Technology in Western Culture (3 semester hours) Topics will vary but may include consideration of the philosophical or historical basis for the evolution of scientific thought, the problem of conceptual change in the study of the fundamental character of technology and its impact on culture. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) R

HUHI 7391 Women in European Society (3 semester hours) A 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 to a maximum of 6 credit hours.) (3-0) R

HUHI 7393 Feminist Methodologies (3 semester hours) An investigation of the various types of feminist methodologies and their application to philosophical and historical issues. Methodologies to be addressed may include Marxist and socialist feminism, phenomenological feminisms, liberal feminism, and radical feminism. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) R

HUHI 7397 Women in American Society (3 semester hours) A historical examination of the varied experiences of American 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 to a maximum of 6 credit hours.) (3-0) R

HUHI 7399 Advanced Special Topics in the History of Ideas (3 semester hours) Independent studies course that may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUHI 8303 Independent Readings in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0) R

HUHI 8305 Independent Research in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0) R

Studies In Literature

HUSL 6304 Studies in Literary Themes (3 semester hours) Examinations of specific themes as they appear in various literary works and traditions. Themes considered in courses may include love, heroism, feminism, the anti-hero, or revolution. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6308 Studies in Literary Forms and Genres (3 semester hours) Studies in various literary genres, either individually or in relation to each other. Among topics considered will be the difficulties of defining genres, the nature of specific genres, their historical and aesthetic development, and their artistic possibilities. Genres for discussion may include tragedy, comedy, the novel, and various forms of poetic expression. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y
HUSL 6309 Literary Movements (3 semester hours) Studies in the nature of intellectual and artistic movements, with emphasis on how they affect literary expression. Examples of such movements are romanticism, naturalism, modernism, and postmodernism. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y

HUSL 6310 Studies in Literary Interpretation (3 semester hours) Study of the issues involved in the attempt to interpret dramatic, poetic, and fictional texts. Emphasis will be placed on the writing of interpretive essays and on the exploration of how various cultural and intellectual perspectives as well as different theoretical stances affect the reading of a specific text. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6312 Major Authors (3 semester hours) Study of one or more major literary figures, such as Dante, Chaucer, Milton, Cervantes, Goethe, Austen, Blake, Balzac, Dostoevsky, Tolstoy, Mann, Eliot, Pound, Woolf, Faulkner, Paz or Borges. (May be repeated for credit as subjects vary to a maximum of 9 credit hours.) (3-0) Y

HUSL 6313 Shakespeare (3 semester hours) Study of the dramatic and/or poetic writings of William Shakespeare. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6314 Jane Austen and Her Time (3 semester hours) Study of the writings of Jane Austen and the ways in which her work engages the political and social issues of her day. (3-0) Y

HUSL 6315 Literary Theory (3 semester hours) Consideration of major literary theories, such as new criticism, deconstruction, gender studies, and chaos theory, with emphasis on how these theories influence and modify the interpretation of literary and other artistic texts. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6330 Studies in Literature and the Other Arts (3 semester hours) An examination of the links between literature and music, the visual arts, film, theater, and/or dance. Topics and approaches will vary but may include, for example, the fantastic in literature and visual arts, structures in literature and music, adaptations of novels into film, and the pastoral in literature and the visual arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6340 Literature Before 1800 (3 semester hours) Studies in the literature and culture of selected periods in the Western tradition. May focus on ancient, medieval, or early modern periods. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6345 Early American Literature (3 semester hours) Study of literary works written in and about America from the early 1500s to 1800. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6350 Literature of the Nineteenth Century (3 semester hours) Studies in the literature and culture of the nineteenth century. May focus on British, European, American, Latin American, or Asian contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6355 Literature, Science, and Culture (3 semester hours) Seminar emphasizing the treatment in literature of scientific concepts (e.g., relativity, evolution) and technological developments (e.g., computers, virtual reality) of particular importance. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6360 Literature of the Twentieth Century (3 semester hours) Studies in the literature and culture of the twentieth century. May focus on British, European, American, Latin American, or Asian contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6370 Studies in Literature and Ideas (3 semester hours) Studies of the relationship between selected literary texts and major ideas in philosophy, science, and politics. The course will examine systems of thoughts as they are incorporated, delineated, and explored in literature. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) Y

HUSL 6372 Literature and Society (3 semester hours) Seminar studying the values and concerns of various social groups through a study of literary texts, including consideration of the role of literature and the writer in given societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y

HUSL 6373 Topics in Latin American Literature (3 semester hours) Studies in the literatures and cultures of Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6374 Modern Jewish Literature Across Cultures (3 semester hours) Study of modern Jewish literatures in multiple national contexts and languages, with emphasis on the interaction between modernity and vision of Jewish identities and traditions. (3-0) T
HUSL 6375 German Literature and Ideas 1870-1960 (3 semester hours) Study of the range and diversity of German-Austrian literature and thought from the end of the nineteenth century through the 1960s. (3-0) T

HUSL 6376 Literature of Weimar Germany (3 semester hours) Study of literature written during the Weimar Republic (1918-1933) with attention to formative influences on and cultural-political forces shaping the artistic imagination. (3-0) T

HUSL 6378 Literature and the Holocaust (3 semester hours) Seminar considering both major literary works (novels, short stories, and poems) written under the impact of the Holocaust as well as literary theories responding to these texts. Some emphasis placed on films and other works of visual art. (3-0) T

HUSL 6380 The Art and Craft of Translation (3 semester hours) Workshop designed to provide students with a model not only of literary interpretation but also of an interdisciplinary approach through the act of translating that can be applied to a wide range of texts and issues. Emphasis is on the actual translation of literary texts from another language into English. Issues involved in this process will form the basis of the workshop’s theoretical component. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) S

HUSL 6381 Critical Approaches to Translation (3 semester hours) The study of the various approaches to the history, theory, and criticism of literary and humanistic translation. Topics may include the translator’s working methods, interviews with translators, multiple translations, the changing nature of interpretive approaches, theoretical models of translation, and criteria for the evaluation of translations. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6383 Teaching First-Year Writing (3 semester hours) Covers both the methods of teaching first-year writing and pedagogical theories of modern composition. Enrollment required for teaching assistants assigned to sections of Rhetoric 1302, but not limited to such students. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) Y

HUSL 6384 Digital and Visual Rhetorics (3 semester hours) Covers a wide range of topics addressing the study of visual rhetoric as well as rhetoric in digital environments. Course also emphasizes the relationship of digital and visual rhetorics to media ecology/media studies as well as the implications of these rhetorics for composition pedagogy. (3-0) T

HUSL 6385 Rhetorical Theory (3 semester hours) A historical survey of Western rhetorical theory focusing on major figures in rhetoric. (3-0) T

HUSL 6386 Special Topics in Rhetoric (3 semester hours) A seminar in the study of rhetoric. May include one or more topics such as ethos, histories of rhetoric, the rhetoric of technology and science, the Sophists, rhetoric as epistemic, key figures in rhetoric (e.g., Burke, Foucault, Baudrillard, Spivak, etc.). (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 6388 The Nature of Language (3 semester hours) An inquiry into the nature, origins, and evolution of language, the relationship of language to thought and to creativity, language as a social tool, and nonverbal patterns of communication. Survey of linguistic theory and method applicable to the study of the phonological, morphological, lexical, semantic, and syntactic levels of language. (3-0) T

HUSL 6389 Applied Linguistics (3 semester hours) Techniques for comparing two or more languages. (3 semester hours) (May be repeated for credit.) (3-0) S

HUSL 6390 Theory and Practice in Literary Studies (3 semester hours) Group projects integrating the interpretation of literary texts or themes with experiments in creative writing and performance. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6392 Topics in Literary Studies (3 semester hours) The study of themes, genres, authors, and/or movements in literature. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 6393 Independent Readings in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUSL 6394 Independent Research in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUSL 6395 Special Topics in Literary Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUSL 6396 Spanish Language, Literature, and Culture (3 semester hours) Studies in the language, various literary movements, or the general cultures of Spanish-speaking peoples in Europe or Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

Deleted: Topics may vary.
HUSL 6398 World Literatures (3 semester hours) Studies in literatures from specific regions, ethnic groups, and nationalities within and outside the United States. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6399 Studies in Asian Literature (3 semester hours) Studies in the literature and cultures of Asia. Topics may include Zen/Chan History, Thought, and Poetry; Confucianism; and the I-Ching (Book of Changes). (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUSL 7308 Advanced Studies in Literary Forms and Genres (3 semester hours) Advanced studies in various literary genres, either individually or in relation to each other. Topics considered may include the difficulties of defining genres, the nature of specific genres, their historical and aesthetic development, and their artistic possibilities. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 7309 Advanced Studies in Literary Movements (3 semester hours) Advanced studies in the nature of intellectual and artistic movements, with emphasis on how they affect literary expression. Examples of such movements are romanticism, naturalism, modernism, and postmodernism. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUSL 7322 Advanced Translation Workshop (3 semester hours) An intensive investigation in a workshop environment of the aesthetics of the art and craft of literary translation focusing on the techniques and processes involved in producing English translations of poetic, dramatic, fictional, and essayistic works. Students are expected to produce publishable translations primarily of works by contemporary international writers. Discussions will include the history and theory of literary translation. Permission of the instructor or previous completion of HUSL 6380 required. (3-0) R

HUSL 7350 Advanced Studies in Nineteenth Century Literature (3 semester hours) Advanced studies in the literature and culture of the nineteenth century. May focus on British, European, American, Asian, or Latin American contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 7360 Advanced Studies in Twentieth Century Literature (3 semester hours) Advanced studies in the literature and culture of the twentieth century. May focus on British, European, American, Asian, or Latin American contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 7370 Advanced Studies in Literature and History (3 semester hours) Studies of selected literary texts and art movements in times of high political tension (American Revolution, Civil War, Weimar Germany, etc.) (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 7372 Advanced Studies in Literature and Society (3 semester hours) Advanced studies of the values and concerns of various social groups through the analysis of literary texts, including consideration of the role of literature and the writer in given societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 7390 Advanced Special Topics in Literary Studies (3 semester hours) Independent studies course that may count toward minor course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUSL 7391 Special Topics in Translation Studies (3 semester hours) The investigation of the field of Translation Studies. Topics may include the anthropological foundation of translation; the study of crossing cultural barriers; translation methodologies as a model for interdisciplinary research; communication as translation; translation and reading; historical aspects of translation; models of cultural differences; critical approaches to the theories of translation from the Greeks to the present; and specific research and translation projects. (May be repeated for credit as topics vary to a maximum of 9 hours.) (3-0) R

HUSL 8303 Independent Readings in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUSL 8305 Independent Research in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

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Education and General Courses

HUED 5535 (ED 553) Teaching English as a Second Language (3 semester hours) Investigation of modern techniques of teaching English as a second language in relation to the general development of language skills (listening, speaking, reading, and writing) in secondary schools. Contributions of modern linguistic science to both theory and practice. (3-0) Y

HUED 5560 Teaching Spanish (3 semester hours) Study of modern theories and practices of teaching
### Latin American Studies Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Repeatable</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMA 6300-6333</td>
<td>Advanced Workshops in Foreign Languages</td>
<td>(3 semester hours)</td>
<td>May be repeated for credit</td>
<td>(3-0) R</td>
</tr>
</tbody>
</table>

**Recommended preparation:** At least intermediate proficiency (usually equivalent to four semesters of undergraduate courses); the appropriate review course HUMA 6320-6323 is also recommended. Although students earn regular grades in secondary schools or community colleges, they do not count toward minimum course requirements for any degree, since they are offered to help students prepare for the program's proficiency examinations. Each workshop concludes with a translation examination, which comprises both the course final and the program's proficiency examination in the foreign language. (3-0) R

#### HUMA 6320 French Review
- **HUMA 6320 French Review**

#### HUMA 6323 German Review
- **HUMA 6323 German Review**

#### HUMA 6390 Topics in Arts and Humanities
- **HUMA 6390 Topics in Arts and Humanities** (3 semester hours) Studies of topics that incorporate multiple disciplinary materials and perspectives. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

#### HUMA 6393 Independent Readings in Arts and Humanities
- **HUMA 6393 Independent Readings in Arts and Humanities** (3 semester hours) (May be repeated for credit.) (3-0) R

#### HUMA 6395 Independent Research in Arts and Humanities
- **HUMA 6395 Independent Research in Arts and Humanities** (3 semester hours) (May be repeated for credit.) (3-0) R

#### HUMA 6V81 Special Topics in Arts and Humanities
- **HUMA 6V81 Special Topics in Arts and Humanities** (1-9 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. and Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) (1-9-0) R

#### HUMA 7303 Independent Readings in Arts and Humanities
- **HUMA 7303 Independent Readings in Arts and Humanities** (3 semester hours) (May be repeated for credit.) (3-0) R

#### HUMA 7V99 Ph.D. Dissertation
- **HUMA 7V99 Ph.D. Dissertation** (1-9 semester hours) (May be repeated for credit.) (1-9-0) R

### Latin American Studies Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Repeatable</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>LATS 6300</td>
<td>Introduction to Latin American Studies</td>
<td>(3 semester hours)</td>
<td>An interdisciplinary introduction to the theories, methodologies, topics, and themes relevant to the study of Latin America. Required of all students in the M.A. program in Latin American Studies. (3-0) Y</td>
<td></td>
</tr>
</tbody>
</table>

#### LATS 6390 Internship in Latin American Studies
- **LATS 6390 Internship in Latin American Studies** (3 semester hours) Students will complete an internship established in partnership with UT Dallas and businesses and/or not-for-profit agencies in the Dallas-Fort Worth area. (May be repeated but only 6 credit hours will be counted toward the M.A.) (3-0) R
LATS 6399 Capstone Project in Latin American Studies (3 semester hours) Students produce a capstone project on a topic of their choice in Latin American Studies in the form of either a research thesis or final project. (May be repeated but only 6 credit hours will be counted toward the M.A.) (3-0) R

Deleted: Thesis, Casebook And Dissertation Courses
HIST 8398 Master’s Thesis (3 semester hours) (May be repeated for credit but only 6 hours will be counted toward M.A.) (3-0) R
HUED 8304 Master Of Arts In Teaching Casebook (3 semester hours) (May be repeated for credit.) (3-0) R
HUMA 8V99 Ph.D. Dissertation (1-9 semester hours) (May be repeated for credit.) (1-9-0) R
HUAS 7350 Creating Nonfictions: Advanced (3 semester hours) An intensive investigation into the theory, aesthetics, and creation of biographies, autobiographies, and historical accounts in a workshop environment that will explore the boundaries between fiction and non-fiction and between art and reality. Permission of the instructor and previous completion of HUAS 6396 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7351 Creating Short Stories: Advanced (3 semester hours) An intensive investigation into the theories, aesthetics, and creation of the short story in a workshop environment that will focus both on structure and on creative techniques and creative process involved in producing sophisticated, challenging, and linguistically developed short stories. Permission of the instructor and previous completion of HUAS 6395 are required. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7352 Creating Poetry: Advanced (3 semester hours) An intensive investigation into the forms (both ancient and modern), theories, and creations of poetry in a workshop environment that will focus on the creative techniques and processes involved in producing formalist, lyrical, free verse, and experimental poetry. Permission of the instructor and previous completion of HUAS 6350 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7353 Creating Novels: Advanced (3 semester hours) An intensive investigation of the changing structural history, artistic development, and creation of the novel in a workshop environment that will focus on the creative techniques and the creative process involved in producing novels in a variety of realistic, minimal, lyrical, experimental, and traditional forms. Permission of the instructor and completion of a minimum of six hours of creative writing (fiction or nonfiction) at the graduate level are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7354 Creating Scripts: Advanced (3 semester hours) An intense investigation of the theory, history, aesthetics, art, and creation of play, movie, and television scripts in a workshop environment that will focus on the creative techniques and processes involved not only in the creation of film, play, and television scripts, but also in the production of plays, films, and television episodes. Permission of the instructor and previous completion of either HUAS6352 or HUAS6353 required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUHI 7375 Space, Time, and Culture (3 semester hours) Study of the relationship between changing philosophic and scientific concepts of space and time and forms of cultural expression such as art, literature, and music. (3-0) T

HUHI 7379 Philosophical Issues and the Humanities (3 semester hours) An investigation of the ways the humanities contribute to an understanding of such philosophical problems as hermeneutics, moral education, life and death, race, gender and sexual orientation, and the environment. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUHI 7386 Artist and Writer in Society (3 semester hours) Inquiries into the role of creative artists (e.g., painters, sculptors, musicians, writers, filmmakers) in various places and times. Topics may vary. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

HUSL 7323 Critical Approaches to Translation (3 semester hours) The study of the various approaches to the history, theory, and criticism of literary and humanistic translation. Topics may include the translator's working methods, interviews with translators, multiple translations, the changing nature of interpretive approaches, theoretical models of translation, and criteria for the evaluation of translations. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T
technology and science, the Sophists, rhetoric as epistemic, key figures in rhetoric (e.g., Burke, Foucault, Baudrillard, Spivak, etc.). (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

**HUSL 7334 Rhetoric Pedagogy Practicum** (3 semester hours) Supervised practicum in teaching rhetoric and composition, with various topics emphasizing rhetorical theory, composition pedagogy, and educational technology presented in a workshop setting. Enrollment required for teaching assistants assigned to sections of Rhetoric 1302, but not limited to such students. (May be repeated for credit.) (3-0) S

**HUSL 7335 Digital Rhetorics** (3 semester hours) Covers a wide range of topics concerned with rhetoric and writing in digital environments. It is designed specifically to address forms of expression (written and visual) and interpretation (reading protocols) with emphasis on critical analysis of various discourses and discourse communities (and disciplines) in which rhetoric is central in the age of information technologies. (3-0) T

**HUSL 7384 The Nature of Language** (3 semester hours) An inquiry into the nature, origins, and evolution of language, the relationship of language to thought and to creativity, language as a social tool, and nonverbal patterns of communication. Survey of linguistic theory and method applicable to the study of the phonological, morphological, lexical, semantic, and syntactic levels of language. (3-0) Y

**HUSL 7385 Applied Linguistics** (3 semester hours) Techniques for comparing two or more languages. The study of traditional and modern theories and practices of language learning and teaching. (3-0) Y
Proposed Academic Certificates Program

Title: Certificates in Systems Engineering & Management (SEM)

School: School of Management (SOM) and The Jonsson School of Engineering & Computer Science (ECS)

Contacts: SOM – Dr. Rajiv R. Shah; ECS – Dr. Duncan MacFarlane
            Rajiv.shah@utdallas.edu; Duncan.macfarlane@utdallas.edu

Implementation Date: Spring 2010

Introduction/Description: Traditional state-of-the-art areas of study in engineering and associated management in the last few decades have involved the study of small or “tiny” systems – micro-, nano-, info-, and bio- systems. However, there has been a large, growing “unmet” need for formalized education in engineering, management, as well as in other areas of more and more complex, larger and larger “macro” systems that involve a large number of interconnected components and have a very significant societal impact. These areas are at the intersection or overlap of traditionally “silo’d” disciplines of study not only in engineering and management, but also include – natural sciences, social sciences, as well as arts and humanities.

Academic Focus of the 2 Certificates: What follows is an overarching description that addresses 2 separate and distinct certificates, 12 credit hours each, with each certificate to be taken in at most 1 academic year. The names of the 2 Certificates will be –

(1) Certificate in Systems Engineering
(2) Certificate in Systems Management

Academically, the certificates will focus on educating industry sponsored corporate employees in the disciplines of – Systems Engineering and Systems Management. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate guest faculty in the local region who are leaders in their respective fields. The Program will also offer concentrations from a “systems” perspective in several areas, driven by market demand from local companies, and will invite appropriate faculty from other schools on campus, as well as experts in the field to teach these “non-core” specialty courses as part of the certificates program.

Job Market Need for the 2 Certificates:

The target customers for this program will be local and regional industry in various sectors that architect, develop, engineer, manufacture, manage, plan or research all aspects – engineering, as well as financial, human resources or project or program management - of large and complex systems.

The target vertical sectors could, therefore, be fairly wide-ranging – 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; macro-economic and financial systems; etc. The choice of specific certificates in the “non-core” areas of specialization will be driven by market demand from specific industry sectors and companies willing to sponsor employees through this program.
Systems Engineering & Management comprises of a wide range of areas – traditional industrial engineering, traditional engineering management, as well as segments of traditional - electrical engineering, computer science and engineering, hardware and software engineering, mechanical engineering, biomedical engineering, aerospace engineering, transportation engineering, operations research and others. As such, the field of Systems Engineering & Management potentially represents a large portion of the engineering population.

Data compiled by the Greater Dallas Chamber of Commerce (GDC), and the Texas Workforce Commission (TxWFC) in 2007 across various High-tech Sectors that might be relevant to SE&M, but not including the Defense, Energy and Healthcare Sectors, indicates an engineering population in the DFW Metroplex well in excess of 200,000. Even if 5% of these very conservatively are assumed to be Systems Engineers and Managers, that translates to about 10,000. Again, if we were to conservatively assume that these 10,000 engineers and managers renew their skills every 10 years that still creates a potential Total Available Market (TAM) of 1000 engineers and managers every year who would need SE&M training every year in the DFW alone.

Student Demand

Interests in this new discipline have been verified in discussions with local companies – TI, EDS-HP, Raytheon, Rockwell and others – along with an initial interest in potential commitment of employees to send through this program.

Programs in this field have developed at all tier-1 schools such as MIT, Stanford, Caltech, CMU, Georgia Tech, Cambridge University, and is also strongly supported by the NAE and the NSF.

Enrollment Projections

Based upon strong interests expressed by a number of area companies such as Texas Instruments, Rockwell, Raytheon, EDS-HP and other members of the SOM and ECS Advisory Boards we expect to have a commitment from these companies to send a certain number of students through the program at any given point in time. These discussions suggest that the following progression for enrollment might be very realistic.

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>FTSE</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

Admission Policy: The program will be targeted to corporate employees with a minimum of BS degree in engineering or mathematics or physics (in order to ensure adequate fundamental skills in mathematics) and at least 5 years of industry experience, who are potentially high performers in their respective companies, and will be sponsored by their corporate management to enhance their skills in both the engineering and management aspects of leading large and complex projects.

Organizational Arrangement: The program will be jointly offered and co-managed by two schools – SOM and ECS. Faculty for the core courses will be from these two

Dr. Rajiv R. Shah & Dr. Duncan MacFarlane
schools. Faculty from other schools on campus will be invited to teach “non-core” courses, as appropriate. Industry leaders with expertise in specific fields will be invited as appropriate, as well.

**Credit Hours and Degree Programs:** Each of the 2 separate certificates will require 12 credit hours each, with each certificate to be taken in at most 1 academic year. The courses will be offered in 4 hour modules, 2 modules per day, over either 3 days or 4 days per month format, thus requiring either 8 months or 6 months per certificate. These certificates constituting a total of 24 credit hours, along with 12 additional elective credit hours of courses, for a total of 36 credit hours will lead to an MS degree – details have been spelled out in the proposal for the Masters Program which has been applied for concurrently.

**Course Offerings and Site Locations (note new courses with an asterisk):**

**Table - 1**

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Core Curriculum</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6301</td>
<td>Systems Engineering Architecture &amp; Design (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6302</td>
<td>Quantitative Risk, Probability, Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6303</td>
<td>Systems Engineering Risk &amp; Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6304</td>
<td>Dynamic Systems Modeling &amp; Analysis (*)</td>
<td>3</td>
</tr>
<tr>
<td>IB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6305</td>
<td>Systems Project Management</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6306</td>
<td>Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6307</td>
<td>Human Factors in Complex Organizations</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6308</td>
<td>Manufacturing and Service Systems Planning and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6309</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6310</td>
<td>Systems and Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6311</td>
<td>Software Maintenance, Evolution and Re-engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6312</td>
<td>Advanced Requirements Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6313</td>
<td>Software Testing, Validation, Verification</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6314</td>
<td>Modeling and Simulation of Engineering Systems</td>
<td>3</td>
</tr>
<tr>
<td>IIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6315</td>
<td>Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6316</td>
<td>Innovation within the Corporation</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6317</td>
<td>The Management of High Tech Products (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6318</td>
<td>Marketing Management, Marketing Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6319</td>
<td>Business Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6320</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**Location:** All courses will be taught at UT Dallas
Table - 2

Faculty/Staffing (assign each course to a faculty member):

<table>
<thead>
<tr>
<th>Name of Core Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Farokh Bastani Professor</td>
<td>Ph.D. In Computer Science UC Berkeley</td>
<td>SYSM6313</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Alain Bensoussan Distinguished Research Professor</td>
<td>Ph.D. in Mathematics University of Paris, France</td>
<td>SYSM6303</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Cy Cantrell Professor</td>
<td>Ph.D. in Physics Princeton University</td>
<td>SYSM6314</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Huseyin Cavusoglu Assistant Professor</td>
<td>Ph.D. in MIS UT Dallas</td>
<td>SYSM6330</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. R. Chandrasekaran Ashbel Smith Professor</td>
<td>Ph.D. in Operations Research UC Berkeley</td>
<td>SYSM6309</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Kendra Cooper Associate Professor</td>
<td>Ph.D. In Electrical and Computer Engineering, U of British Columbia</td>
<td>SYSM6301</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Milind Dawande Professor</td>
<td>Ph.D. in Algorithms Carnegie Mellon University</td>
<td>SYSM6308</td>
<td>50%</td>
</tr>
<tr>
<td>Dr. Greg Dess Professor</td>
<td>Ph.D. in Organizational Behavior U of Washington</td>
<td>SYSM6320</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Nick Gans Assistant Professor</td>
<td>Ph.D. in Systems &amp; Entrepreneurial Engineering, U of Illinois</td>
<td>SYSM6304</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. R. Henderson Assistant Professor</td>
<td>Ph.D. in Electrical Engineering U of Michigan</td>
<td>SYSM6312</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Kamran Kiasaleh Professor</td>
<td>Ph.D. in Electrical Engineering USC</td>
<td>SYSM6310</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Robert Kieschnick Associate Professor</td>
<td>Ph.D. in Finance UT Austin</td>
<td>SYSM6306</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Nanda Kumar Associate Professor</td>
<td>Ph.D. in Marketing U of Chicago</td>
<td>SYSM6318</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Duncan MacFarlane Professor</td>
<td>Ph.D. In Electrical Engineering Brown University</td>
<td>SYSM6317</td>
<td>50%</td>
</tr>
<tr>
<td>Dr. Mathukumalli Vidyasagar, Program Co-Head</td>
<td>Ph.D. in Electrical Engineering University of Wisconsin</td>
<td>SYSM 6304</td>
<td>50%</td>
</tr>
</tbody>
</table>
1. The **Certificate in Systems Engineering** will require at least two courses from **Groups IA or IIA**, and two additional courses not already taken from Table-1.

2. The **Certificate in Systems Management** will require at least two courses from **Groups IB or IIB**, and two additional courses not already taken from Table-1.

3. Those pursuing more than one certificate, will be required to take courses that are distinct and different from those taken by them for a previous certificate – in other words, courses cannot be repeated.

Additional Information:

1. Course requirements have been developed through discussions with industry partners and colleagues through most of 2008 and the first half of 2009 – most notably Texas Instruments. TI has participated in all discussions about this program through these 18 months.

2. Program overviews have also been shared with representatives of EDS/HP and Raytheon, with strong support expressed for the objectives of the program.

3. Presentations have also been made about this program at the Industry Advisory Board Meetings of the Jonsson School and with some members of the SOM Advisory Board as well. These have been very well received with strong encouragement for moving forward with the program.
PROGRAM ASSESSMENT PLAN

Program/Unit Identification

<table>
<thead>
<tr>
<th>Program or Unit Name: Certificate in Systems Engineering</th>
<th>Schools: ECS &amp; SOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program or Unit Director: Dr. Rajiv R. Shah &amp; Dr. Duncan MacFarlane</td>
<td></td>
</tr>
</tbody>
</table>

Program or Unit Purpose or Mission Statement or Program Educational Objective

Provide formalized education in a large, growing “unmet” need primarily in the area of Systems Engineering, but also additional training in the areas of systems engineering and systems management of increasingly complex, increasingly large “macro” systems that involve a large number of interconnected components and potentially have a very significant societal impact. These areas are at the intersection or overlap of traditionally “silo’d” disciplines of study not only in engineering and in management, but also include – natural sciences, social sciences, as well as arts and humanities. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate faculty from other schools and in the local region who are leaders in their respective fields.

Student learning outcomes assessment is defined as the ongoing monitoring of the extent to which students are developing the knowledge, skills, beliefs, and attitudes that are appropriate for graduates of the respective academic programs.

Student Learning Objective #1

Learn advanced techniques in systems engineering including - systems architecture and design; probability and stochastic processes; quantitative risk and uncertainty assessment and engineering decision analysis; dynamic systems and modeling analysis.

<table>
<thead>
<tr>
<th>#</th>
<th>Performance Criteria</th>
<th>Measures and Procedures</th>
<th>Criteria: What Constitutes Success (Target)</th>
<th>Timeframe</th>
</tr>
</thead>
</table>
| 1 | Assessment procedures and methods may include those shown in the next column | i. Quizzes, Tests and Exams  
ii. Case Discussion and Case Studies  
iii. Class Discussion and Participation  
v. Projects, Project Reports and Presentations (SYSM6301 through SYSM6304 or SYSS6309 through SYSM6314) | Student success will be determined by their performance in each of the assessment methods chosen | At the end of Spring 2010, the 1st semester of course launch |
### Student Learning Objective #2

Learn advanced techniques in systems management including – Project and Program Management; Financial and Accounting Management; Operations Management; and People Management, Organizational Behavior and Leadership

<table>
<thead>
<tr>
<th>#</th>
<th>Performance Criteria</th>
<th>Measures and Procedures</th>
<th>Criteria: What Constitutes Success (Target)</th>
<th>Timeframe</th>
</tr>
</thead>
</table>
| 1  | Assessment procedures and methods may include those shown in the next column         | i. Quizzes, Tests and Exams
ii. Case Discussion and Case Studies
iii. Class Discussion and Participation
iv. Projects, Project Reports and Presentations (SYSM6305 through SYSM6308 or SYSS6315 through SYSM6320) | Student success will be determined by their performance in each of the assessment methods chosen | At the end of Spring 2010, the 1st semester of course launch |
# PROGRAM ASSESSMENT PLAN

## Program/Unit Identification

**Program or Unit Name:** Certificate in **Systems Management**  
**Schools:** SOM & ECS

**Program or Unit Director:** Dr. Rajiv R. Shah & Dr. Duncan MacFarlane

## Program or Unit Purpose or Mission Statement or Program Educational Objective

Provide formalized education in a large, growing “unmet” need primarily in the area of **Systems Management**, but also additional training in the areas of systems engineering and systems management of increasingly complex, increasingly large “macro” systems that involve a large number of interconnected components and potentially have a very significant societal impact. These areas are at the intersection or overlap of traditionally “silo’d” disciplines of study not only in engineering and in management, but also include – natural sciences, social sciences, as well as arts and humanities. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate faculty from other schools and in the local region who are leaders in their respective fields.

Student learning outcomes assessment is defined as the ongoing monitoring of the extent to which students are developing the knowledge, skills, beliefs, and attitudes that are appropriate for graduates of the respective academic programs.

## Student Learning Objective #1

Learn advanced techniques in systems management including – Project and Program Management; Financial and Accounting Management; Operations Management; and People Management, Organizational Behavior and Leadership

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<th>Measures and Procedures</th>
<th>Criteria: What Constitutes Success (Target)</th>
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ii. Case Discussion and Case Studies  
iii. Class Discussion and Participation  
iv. Projects, Project Reports and Presentations (SYSM6305 through SYSM6308 or SYSS6315 through SYSM6320) | Student success will be determined by their performance in each of the assessment methods chosen | At the end of Spring 2010, the 1st semester of course launch |
**Student Learning Objective #2**

Learn advanced techniques in systems engineering including - systems architecture and design; probability and stochastic processes; quantitative risk and uncertainty assessment and engineering decision analysis; dynamic systems and modeling analysis.

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<td>iv. Projects, Project Reports and Presentations (SYSM6301 through SYSM6304 or SYSS6309 through SYSM6314)</td>
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Faculty

**Professors:** Yves Chabal, Bruce E. Gnade, Moon J. Kim, Robert M. Wallace  
**Associate Professors:** Amy Walker, Jiyoung Kim  
**Assistant Professors:** Christopher Hinkle  
**Affiliated Faculty:** Kenneth J. Balkus (Chemistry), Ray H. Baughman (Chemistry), Cyrus D. Cantrell (Electrical Engineering), Kyeongjae Cho (Physics), Santosh R. D'Mello (Biology), Rockford K. Draper (Biology), John P. Ferraris (Chemistry), Yuri Gartstein (Physics), Robert Glosser (Physics), Juan E. González (Biology), Steven R. Goodman (Biology), Wenchuang Hu (Electrical Engineering), Gil S. Lee (Electrical Engineering), Jeong-Bong Lee (Electrical Engineering), Sanjeev K. Manohar (Chemistry), Inga Holl Musselman (Chemistry), Lawrence J. Overzet (Electrical Engineering), Eric Vogel (Electrical Engineering), Anvar A. Zakhidov (Physics)  
**Adjunct Faculty:** H. Edwards (Texas Instruments), E. Forsythe (Army Research Laboratory), R. Irwin (Texas Instruments), M. Quevedo-Lopez

Objectives

The program leading to the M.S. degree in materials science and engineering provides intensive preparation for professional practice in modern materials science by those 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 materials science and engineering is to prepare individuals to perform original, cutting edge research in the broad areas of materials science, including areas such as nano-structured materials, electronic, optical and magnetic materials, bio-mimetic materials, polymeric materials, MEMS materials and systems, organic electronics, and advanced processing of modern materials.

Advanced Electron Microscopy Laboratory

**Focused Ion Beam /Scanning Electron Microscopy**

The focused ion beam system is a FEI Nova 200 NanoLab which is a dual column SEM/FIB. It combines ultra-high resolution field emission scanning electron microscopy (SEM) and focused ion beam (FIB) etch and deposition for nanoscale prototyping, machining, 2-D and 3-D characterization, and analysis. Five
gas injection systems are available for deposition (e.g. Pt, C, SiO₂) and etching (e.g. iodine for metals, and a dielectric etch). Nanoscale chemical analysis is done with energy dispersive X-ray spectroscopy (EDS). A high resolution digital patterning system controlled from the User Interface is also available. Predefined device structures in Bitmap format can be directly imported to the patterning system for nanoscale fabrication. The FEI Nova 200 is also equipped with a Zyvex F100 nano-manipulation stage, which includes four manipulators with 10 nm positioning resolution. The four manipulators can be fitted with either sharp whisker probes for electrically probing samples or microgrippers for manipulating nanostructures as small as 10 nanometers. This is the first instrument of its kind in the world that combines a dual beam FIB with the F100 nanomanipulator, providing unparalleled nanofabrication and nanomanipulation.

High-Resolution Transmission Electron Microscopy

The facility operates and maintains two state-of-the-art transmission electron microscopes (TEM), and a host of sample preparation equipments. It also provides microscopy computing and visualization capabilities. Techniques and equipment available includes the following: (i) High Resolution Structural Analysis - The high-resolution imaging TEM is a JEOL 2100 F which is a 200kV field emission TEM. Its capability includes atomic scale structural imaging with a resolution of better than 0.19 nm, and in-situ STM/TEM. (ii) High Resolution Chemical and Electronic Structure Analysis - High resolution analytical TEM is a second JEOL 2100F field emission TEM/STEM equipped with an energy dispersive x-ray spectrometer (EDS), an electron energy loss spectrometer (EELS), and a high angle Z-contrast imaging detector. This instrument performs chemical and electronic structure analysis with a spatial resolution of better than 0.5 nm in EELS mode and is also capable of spectrum imaging and mapping. The image resolution in the chemically sensitive Z-contrast scanning TEM (STEM) mode will be about 0.14 nm. Its capability also includes in-situ cryogenic cooling and heating, and a computer control system for remote microscopy operation.

X-ray Diffraction Suite

A Rigaku Ultima III X-ray Diffractometer system is available for thin film diffraction characterization. The system is equipped with a cross beam optics system to permit either High-resolution parallel beam with a motor controlled multilayer mirror, or a Bragg-Brentano Para-Focusing beam (without the multilayer mirror) which are permanently mounted, pre-aligned and user selectable with no need for any interchange between components. Curved graphite crystal or Ge monochrometers are also available. An integrated annealing attachment permits the in-situ examination of film structure up to 1500°C. The instrument enables a variety of applications including in-plane and normal geometry phase identification, quantitative analysis, lattice parameter refinement, crystallite size, structure refinement, residual stress, density, roughness (from reflectivity geometries), and depth-controlled phase identification. Detection consists of a computer controlled scintillation counter. Sample sizes up to 100 mm in diameter can be accommodated on this system. A new Rigaku Rapid Image Plate Diffractometer system is also available for small spot (30mm - 300mm) XRD work. The digital image plate system enables the acquisition of diffraction data over a 204° angle with a rapid laser scanning readout system. An integrated annealing attachment permits the in-situ examination of film structure up to 900°C on this system. A complete set of new control, database and analysis workstations and software is associated with these new systems.

Wafer Bonding Laboratory

An UHV wafer bonding unit, especially designed to use surface characterization and thin-film deposition techniques to measure and control substrate and interface chemistry within limits necessary to make heterojunction devices, is available to produce integrated heterostructures with well controlled chemistry that are tractable for quantitative nanostructural and properties measurements. This unit is capable of synthesizing interfaces by direct wafer bonding and/or in-situ thin film deposition method, and offers greater flexibility for producing advanced integrated artificial structures. It consists of five interconnected ultra high vacuum (UHV) chambers for in-situ surface preparation and analysis, addition of interface
interlayers by e-beam or UHV sputter deposition, a bonding chamber, and a sample entry and preparation chamber. The base pressure is $2 \times 10^{-10}$ Torr. Orientation of the bonded pairs can be controlled to $\sim 0.1$ degree prior to bonding. Ex-situ surface preparations using etching and low energy reactive plasma cleaning is done in a cleanroom to protect substrates prior to insertion in the bonding instrument. An atomic force microscopy (AFM) is also available to provide direct measurements of these effects, to supplement the indirect information of RHEED.

**Computational Materials Science Laboratory**

Materials modeling software tools and hardware facilities are available for nanoscale materials research. Atomistic modeling software tools are used for structure and dynamic analysis of diverse material systems at nanoscales, and the examples include nanoelectronic materials and nanomaterials for renewable energy applications. For quantum mechanical analysis of materials, density functional theory (DFT) software tools (VASP, ABINIT, PWSCF, and SIESTA) are used on local parallel computing cluster. In-house quantum transport modeling software tool is used for I-V calculation of nanoelectronic devices using the non-equilibrium Green's function (NEGF) method. These software and hardware tools are also used for class projects of MSEN 5377.

**Cleanroom Research Laboratory**

The new cleanroom facility located in the Natural Science and Engineering Research Laboratory (http://www.utdallas.edu/eecs/cleanroom/) is utilized for materials and device research. The facility has 5,000 sq. ft. of class 10,000 space. This facility contains semiconductor processing equipment including optical and e-beam lithography, chemical processing hoods, evaporation and sputter deposition systems, as well as a wide variety of material and processing diagnostics.

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 Materials Science and Engineering**

**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 adviser 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 Electrical Engineering, Chemistry, Physics, or Biology.
- a grade-point average in graduate-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 M.S. degree 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. 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 thesis option must carry out a research project under the direction of a member of the Materials Science and Engineering Affiliated Faculty and complete and defend a thesis on the research project. 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 pass the following core courses with a grade of B or better:

Note: the presence of a course number in parentheses indicates that this course will be cross-listed with an existing course.

- MSEN 5310 Thermodynamics of Materials
- MSEN 5360 Materials Characterization
- MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials
- MSEN 6319 Quantum Mechanics for Materials Scientists

A student may petition for waiver of core courses, and if the Materials Science and Engineering Affiliated Faculty, or a designated committee, finds that the student has mastered the course material, the student may replace that core course with an elective course for a total of twelve semester credit hours.

A minimum of 9 semester credit hours will be required from the Advanced Course List

- MSEN 5340 Advanced Polymer Science and Engineering
- MSEN 5370 Ceramics and Metals
- MSEN (5377) (PHYS 5377) Computational Physics of Nanomaterials
- MSEN 6310 Mechanical Properties of Materials
- MSEN 6330 Phase Transformations
- MSEN 6350 Imperfections in Solids
- MSEN 6377 (PHYS 6377) Physics of Nanostructures: Carbon Nanotubes, Fullerenes, Quantum Wells, Dots and Wires

The remaining credit hours are to be taken from the following list of Specialized Courses (or approved electives from Physics, Chemistry, or Biology):

- MSEN 5300 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 5361 Fundamentals of Surface and Thin Film Analysis
• MSEN 5371 (PHYS 5371) Solid State Physics
• MSEN 5375 (PHYS 5375) Electronic Devices Based On Organic Solids
• MSEN 5383 (PHYS 5383 and EE 5383) Plasma Technology
• MSEN 5410 (BIOL 5410) Biochemistry of Proteins and Nucleic Acids
• MSEN 5440 (BIOL 5440) Cell Biology
• MSEN 6313 (EE 6313) Semiconductor Opto-Electronic Devices
• MSEN 6320 (EE6320) Fundamentals of Semiconductor Devices
• MSEN 6321 (EE6321) Active Semiconductor Devices
• MSEN 6322 (EE6322) Semiconductor Processing Technology
• MSEN 6340 Advanced Electron Microscopy
• MSEN 6341 Advanced Electron Microscopy Laboratory
• MSEN 6358 (BIOL 6358) Bionanotechnology
• MSEN 6361 Deformation Mechanisms in Solid Materials
• MSEN 6362 Diffraction Science
• MSEN 6371 (PHYS6371) Advanced Solid State Physics
• MSEN 6374 (PHYS6374) Optical Properties Of Solids
• MSEN 7320 (EE7320) Advanced Semiconductor Device Theory
• MSEN 7382 (EE7382) Introduction to MEMS
• 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

Doctor of Philosophy in Materials Science and Engineering

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 adviser 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 Electrical Engineering, Chemistry, Physics, or Biology.
• a grade-point average in graduate-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 60 semester hours beyond the Master’s degree.

All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 60 semester-hour requirement. Successful completion of the approved course of studies leads to the MSE.

Each doctoral student must carry out original research in the area of Materials Science and Engineering, under the direction of a member of the Materials Science and Engineering Affiliated Faculty, 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 at approximately the time that the students have completed their course work. The rules for the dissertation research and defense are specified by the Office of the Dean of Graduate Studies.

For each of the proposed degree programs, students must pass the following core courses with a grade of B or better:

Note: the presence of a course number in parentheses indicates that this course will be cross-listed with an existing course.

- MSEN 5310 Thermodynamics of Materials
- MSEN 5360 Materials Characterization
- MSEN 6319 Quantum Mechanics for Materials Scientists
- MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials

A student may petition for waiver of core courses, and if the Materials Science and Engineering Affiliated Faculty, or a designated committee, finds that the student has mastered the course material, the student may replace that core course with an elective course for a total of twelve semester credit hours.

A minimum of 9 semester credit hours will be required from the Advanced Course List

- MSEN 5340 Advanced Polymer Science and Engineering
- MSEN 5370 Ceramics and Metals
- MSEN (5377) (PHYS 5377) Computational Physics of Nanomaterials
- MSEN 6310 Mechanical Properties of Materials
- MSEN 6330 Phase Transformations
- MSEN 6350 Imperfections in Solids
- MSEN 6377 (PHYS 6377) Physics of Nanostructures: Carbon Nanotubes, Fullerenes, Quantum Wells, Dots and Wires

The remaining credit hours are to be taken from the following list of Specialized Courses (or approved electives from Physics, Chemistry, or Biology):

- MSEN 5300 Introduction to Materials Science
- MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I
- MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II
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- MSEN 5344 Thermal Analysis
- MSEN 5353 Integrated Circuit Packaging
• MSEN 5355 (CHEM 5355) Analytical Techniques I
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• MSEN 5383 (PHYS 5383 and EE 5383) Plasma Technology
• MSEN 5410 (BIOL 5410) Biochemistry of Proteins and Nucleic Acids
• MSEN 5440 (BIOL 5440) Cell Biology
• MSEN 6313 (EE 6313) Semiconductor Opto-Electronic Devices
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• MSEN 6322 (EE6322) Semiconductor Processing Technology
• MSEN 6340 Advanced Electron Microscopy
• MSEN 6341 Advanced Electron Microscopy Laboratory
• MSEN 6358 (BIOL 6358) Bionanotechnology
• MSEN 6361 Deformation Mechanisms in Solid Materials
• MSEN 6362 Diffraction Science
• MSEN 6371 (PHYS6371) Advanced Solid State Physics
• MSEN 6374 (PHYS6374) Optical Properties Of Solids
• MSEN 7320 (EE7320) Advanced Semiconductor Device Theory
• MSEN 7382 (EE7382) Introduction to MEMS
• 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
• MSEN 8V99 Dissertation
Master of Science in Biotechnology

Faculty

The following faculty members work with and teach students in the M.S. in Biotechnology degree program:

**Professors:** Larry P. Ammann (Mathematics), Ray H. Baughman (Chemistry), Lee A. Bulla (Molecular and Cell Biology), Santosh R. D’Mello (Molecular and Cell Biology), Rockford K. Draper (Molecular and Cell Biology), Sam Efroymovich (Mathematics), Steven R. Goodman (Molecular and Cell Biology), Donald M. Gray (Molecular and Cell Biology), Donald A. Hicks (EPPS), M. Ali Hooshyar (Mathematics), Stephen D. Levene (Molecular and Cell Biology), Betty S. Pace (Molecular and Cell Biology), Lawrence J. Reitzer (Molecular and Cell Biology)

**Associate Professors:** Mark C. Anderson (SOM), Gregg R. Dieckmann (Chemistry), Gail A. Breen (Molecular and Cell Biology), Ovidiu Daescu (Computer Science), David L. Deeds (SOM), Ernest M. Hannig (Molecular and Cell biology), Warren J. Goux (Chemistry), Robert L. Kieschnick (SOM), J B Lee (Electrical Engineering), Dennis L. Miller (Molecular and Cell Biology), Paul Pantano (Chemistry)

**Assistant Professors:** Wenchuang Hu (Electrical Engineering), Jung-Mo Anh (Chemistry), Yan Cao (Mathematics), Pankaj K. Choudhary (Mathematics), Mieczyslaw K Dabkowski (Mathematics), Ying Liu (Computer Science), Nirup M. Menon (SOM)

**Senior Lecturers:** Joseph C. Picken (SOM), Robert L. Robb (SOM)

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 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, or CS 6325 Introduction to Bioinformatics, BIOL 5381 Genomics, BIOL 6373 Proteomics, and BIOL 6384 Biotechnology Laboratory.
Students enrolled in the M.S. in Biotechnology M.S. 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 bachelor's 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 MS 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)
BIO 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

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.

Also available are four 1-SCH summer preparatory courses for students who do not have the background in both biology and mathematics that is required for success in the core courses. Students with a strong math background, who need access to modern biology, should take BIOL 5V00-06A (Biology Preparation – MS in Biotechnology I), BIOL 5V00-06M (Biology Preparation – MS in Biotechnology II), and MATH 5V06-06M (Mathematics Preparation – MS in Biotechnology II). Students with a strong biology background, who need access to mathematics/statistics, should take MATH 5V06-06A (Mathematics Preparation – MS in Biotechnology I), BIOL 5V00-06M (Biology Preparation – MS in Biotechnology II), and MATH 5V06-06M (Mathematics Preparation – MS in Biotechnology II).

Students who elect to prepare and defend a thesis must satisfy the MS 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.

A joint program in Bioinformatics and Computational Biology, administered through the Mathematical Sciences Department, is also available, and courses offered within that program are also available as electives.
New Program Request Form for Bachelor’s and Master’s Degrees

Directions: An institution shall use this form to propose a new bachelor’s or master’s degree program. In completing the form, the institution should refer to the document *Standards for Bachelor’s and Master’s Programs*, which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. Note: An institution which does not have preliminary authority for the proposed program shall submit a separate request for preliminary authority. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

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**Administrative Information**

1. **Institution:** The University of Texas at Dallas

2. **Program Name** – Show how the program would appear on the Coordinating Board’s program inventory (e.g., Bachelor of Business Administration degree with a major in Accounting):

   Master of Science in Systems Engineering & Management

3. **Proposed CIP Code:** 14.2701, Systems Engineering

4. **Brief Program Description** – Describe the program and the educational objectives:

   The current business environment requires that engineers in industry and government be trained to be good managers and leaders, and to be good stewards of corporate or government resources. Conversely, managers in industry need a better appreciation and understanding of technology and how to manage large and complex engineering projects. They are all also expected to be cognizant of the broader impact of their management and engineering activities on their companies and the society at large.

   Traditional areas of study in engineering have involved the study of “small” systems – micro-, nano-, info-, and bio- systems. However, there has over the years been a large and growing unmet need, as evidenced by discussions with our industry partners at Texas Instruments, Raytheon, EDS-HP, Rockwell and others, as well as, presentations at conferences, such as those organized by the MIT Enterprise Systems Division, June 15th 2009, for formalized education in engineering and management of increasingly complex “macro” systems with a large number of inter-dependent parts that have a very significant organizational or societal impact. These
areas are at the intersection of the traditionally separate disciplines of engineering and management.

According to the National Center for Education Statistics, which defines the national Classification of Instructional Programs (CIP) codes, Systems Engineering is a “program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of total systems solutions to a wide variety of engineering problems, including the integration of human, physical, energy, communications, management, and information requirements as needed, and the application of requisite analytical methods to specific situations.”\(^1\) The International Council on Systems Engineering (INCOSE) provides further detail on the difference between systems engineering and traditional specialty engineering: “Systems engineering is concerned with the overall process of defining, developing, operating, maintaining, and ultimately replacing quality systems. Where other engineering disciplines concentrate on the details of individual aspects of a system (electronics, mechanics, ergonometics, aerodynamics, software, etc.), systems engineering is concerned with the integration of all of these aspects into a coherent and effective system. Systems engineers concentrate their efforts on the aspects of the engineering process (requirements definition, top-level functional designs, project management, life cycle cost analysis...) that serve to organize and coordinate other engineering activities. The systems engineer is the primary interface between management, customers, suppliers, and specialty engineers in the systems development process.”\(^2\)

The need for systems engineers has come to the attention of the national press. A 2008 article on the aging systems engineering workforce commented that systems engineering involves “accurately assessing at the outset whether the technological goals are attainable and affordable, then managing the engineering to ensure that hardware and software are properly designed, tested and integrated”, and goes on to say, “Without [systems engineering], projects can turn into chaotic, costly failures.”\(^3\)

The objective of the UT Dallas Master of Science degree program in Systems Engineering & Management (MS in SEM) is to produce graduates who will be capable of undertaking challenging projects that will encompass wide ranging scientific, engineering and management disciplines. In other words, the objective of the program is to develop an “integrated systems engineering and systems management” skill set among the students who go through this program.

This program is targeted towards engineers with a number of years of industry experience, as well as towards graduates with a fresh bachelor’s degree.

The MS in SEM degree will require a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus 6 hours of thesis credit for the thesis option.

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The program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to pick up areas in which they are deficient, while still guaranteeing core competency in systems engineering and engineering management.

**Course Requirements (see Table 3 page 8)**

*Required Courses:* Students will be required to take at least 4 courses (a total of 12 credit hours) from an offered set of 8 courses in Systems Engineering (SYSM). Two of the courses must be from IA and two from IB in Table 3. Thus the 4 required courses contribute a total of 12 credit hours towards the MS degree.

*Prescribed Elective Courses* will consist of an additional 4 distinct courses (a total of 12 credit hours) from a core set of 20 courses (Table 3), which have not already been taken towards the required 4 courses. At least two of these courses must be chosen from either IA or IIA in Table 3.

*Free Elective Courses:* For the free electives students will be able to take any 4 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.

5. **Administrative Unit** – Identify where the program would fit within the organizational structure of the university (e.g., The Department of Electrical Engineering within the College of Engineering):

   A joint program between

   The Erik Jonsson School of Engineering and Computer Science (ECS), and

   The School of Management (SOM)

6. **Proposed Implementation Date** – Report the first semester and year that students would enter the program:

   Fall Semester 2010

7. **Contact Person(s)** – Provide contact information for the person who can answer specific questions about the program:

   Name: Dr. Mark W. Spong  
   Title: Dean, ECS  
   E-mail: mspong@utdallas.edu  
   Phone: 972-883-2974

   Dr. Hasan Pirkul  
   Title: Dean, SOM  
   E-mail: hpirkul@utdallas.edu  
   Phone: 972-883-6813
Program Information

I. Need

Note: Complete I.A and I.B only if preliminary authority for the program was granted more than four years ago. This includes programs for which the institution was granted broad preliminary authority for the discipline.

A. Job Market Need – Provide short- and long-term evidence of the need for graduates in the job market.

Systems Engineering & Management (SEM) is an interdisciplinary field between Engineering and Management that focuses on the engineering & management of complex engineering projects. For large, complex projects, SEM deals with issues such as automatic control of machinery, logistics and the coordination of different teams, work processes and tools to handle such projects. It overlaps with both technical and human centered disciplines, such as Control Engineering and Project Management.

Data compiled by the Greater Dallas Chamber of Commerce (GDC), and the Texas Workforce Commission (TxWFC) in 2007 across various High-tech Sectors that are relevant to SEM, excluding the Defense, Energy and Healthcare Sectors, indicates an engineering population in the DFW Metroplex well in excess of 200,000. Even if 5 % of these engineers are conservatively assumed to be Systems Engineers that translates to about 10,000. Again, if we were to conservatively assume that these 10,000 professionals renew their skills every 10 years, which creates a potential Total Available Market (TAM) of 1000 engineers and managers every year that would need SEM training every year in the DFW area alone. Of this population of engineers, the MS SEM Program is targeted towards engineers with 4 to 5 years of experience.

Again, using the GDC and TxWFC data, DFW area represents about 40 % of the state’s high-tech population, not including the defense, energy and healthcare sectors, significantly larger than any other city in the state. DFW area is already the 4th largest in the country by population and GDP. It is also home to the headquarters of about 25 large corporations, and also home to major divisions of a large number of companies not head-quartered in the region. Cumulative job growth, as well as population growth in the DFW area, over the next 10 years, is expected to be twice the national average.

Also according to the Bureau of Labor Statistics (BLS) and the American Electronics Association (AeA) – “Contrary to the hype about rampant outsourcing, high-tech has many job openings, as demonstrated by the BLS’s 2.5 % unemployment rate for computer scientists and under 2% for engineers.”¹

While interests in this new discipline have been verified in discussions with local companies – TI, EDS-HP, Raytheon, Rockwell and others – along with an initial interest in potential commitment of employees to send through this program, specific hard numbers to indicate potential future job market for this discipline are provided above.

Because the field of Systems Engineering & Management comprises a wide range of engineering disciplines, it potentially represents a large portion of the engineering population. The graduates of the UT Dallas SEM program will be employed by large corporations in various industries, and to mention just a few examples — defense, aerospace, and space systems; transportation; telecom and computers networks and systems integration and services; semiconductors and electronics; healthcare systems; sustainable and intelligent energy systems; etc.

B. Student Demand – Provide short- and long-term evidence of demand for the program.

The American Society for Engineering Education reports that the Master’s enrollment in industrial and manufacturing engineering grew steadily from around 5,000 in 1999 to more than 6,300 in 2008. Based upon the assumption that many industrial engineering students have a systems focus, student demand for systems engineering and closely related fields is growing at a slower rate than will probably be necessary for replacement of engineers who are now nearing retirement age. However, student demand is a trailing, not a leading, indicator of perceived job opportunities.

Several local industry representatives have been contacted and subsequently confirmed their interest in this program. Sample letters of support from some of those representatives are included in Appendix 1.

Also, over the last several years, SMU and other local universities began offering engineering-only focused courses. SMU offers an MS in Systems Engineering. No programs in the North Texas Region exist that combine systems engineering and systems management, leveraging the strengths of both the School of Engineering and the School of Management, except perhaps a dual-track program in MS Engineering Systems (MSES) and MBA launched in May 2009 by the University of North Texas (UNT) or the UNT MS in Engineering Systems program that has a 15-hour management curriculum offered at their home campus and at the Collin Higher Education Center in McKinney; however, this program is a traditional engineering technology program. Similarly, the Systems Engineering programs offered by SMU and UT Austin are offered only through their engineering schools and do not provide any business education.

A summary chart of data from the Coordinating Board’s PREP online database comparing programs from other Texas schools that could even remotely be considered similar to the proposed UTD Program is provided below, showing significant interest in this general area.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program Name</th>
<th>CIP Code</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>05-'06</th>
<th>06-'07</th>
<th>07-'08</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Tx A&amp;M</td>
<td>Industrial Engineering</td>
<td>14350100</td>
<td>441</td>
<td>548</td>
<td>621</td>
<td>755</td>
<td>42</td>
<td>42</td>
<td>57</td>
</tr>
<tr>
<td>2  Tx Tech</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>32</td>
<td>27</td>
<td>48</td>
<td>58</td>
<td>11</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>3  UT Arlington</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>28</td>
<td>29</td>
<td>33</td>
<td>31</td>
<td>10</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>4  UT Austin</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>33</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>5  UT Pan Am</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>14</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Profiles of Engineering Colleges, American Society for Engineering Education, 2009
The highly popular program at Texas A&M is in the area of Industrial Engineering, which might be thought of as a subset of the Systems Engineering & Management Program being proposed by UTD. The Texas A&M program, while highly popular, is offered only out of the engineering school and does not include any management disciplines that are so crucial in the mid- to upper-management of large projects.

The same is true of the Engineering Management degrees offered by Texas Tech, UT Arlington, UT Pan American and Lamar University – all offered entirely out of schools of engineering. This is true also of the traditional Engineering Technology program offered by the University of North Texas. The degree offered by UT Austin, is out of the Engineering School also, but does incorporate some business oriented courses.

The degree offered by the University of Houston is in the area of Operations Management and Supervision, which again could be thought of as a subset of the broad area of Systems Engineering and Management. Also, the program is offered entirely out of the Business School, with no engineering involvement.

The UTD proposed program will be unique in that, both advanced engineering and advanced management education will be provided together in MS in SEM, leveraging the strengths of two very quantitatively strong and highly ranked programs in the Schools of Management and Engineering. Students will not be required to pursue an MBA to get the complementary business education. The program is unique in that it is a true 50/50 collaboration between the two schools.

C. Enrollment Projections – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. (Include majors only and consider attrition and graduation.)

Based upon strong interests expressed by a number of area companies such as Texas Instruments, Rockwell, Raytheon, EDS-HP and other members of the SOM and ECS Advisory Boards, we expect to have a commitment from these companies to send students through the program at any given point in time. These discussions suggest the following progression for enrollment:

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>20</td>
<td>45</td>
<td>55</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>FTSE</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

(# Table-1 assumes, students graduating in 2 years and attrition rate of 10 %. This attrition is anticipated to be primarily due to industry participants in the program.
moving elsewhere, since these are expected to be senior, as well high-performing people in member companies.

II. Quality

A. Degree Requirements – Use this table to show the degree requirements of the program. *(Modify the table as needed; if necessary replicate the table for more than one option.)*

1. **Course Requirements:** The MS in SEM degree (non-thesis option) will require a total of 12 courses for a total of 36 credit hours.

   **Table – 2 SEM Non-Thesis Option Degree Requirements**

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
<th>Clock Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education Core Curriculum (bachelor’s degree only)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Required Courses</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Free Electives</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Other (Specify, e.g., internships, clinical work)</td>
<td>(if not included above)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>36</strong></td>
<td></td>
</tr>
</tbody>
</table>

2. **Thesis Option:** An alternative to 36 credit hours required for the MS SEM degree, would be to take 30 credit hours of courses and, in addition, write a Master’s Thesis, in lieu of the remaining 6 credit hours.

B. **Curriculum** – Use these tables to identify the required courses and prescribed electives of the program. Note with an asterisk (*) courses that would be added if the program is approved. *(Add and delete rows as needed. If applicable, replicate the tables for different tracks/options.)*

   Again, the program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to choose areas in which they are deficient, rather than having them all go through a prescribed set of courses.

   The Core Curriculum will consist of 20 Courses (**Table - 3**).

   1. All Courses listed below are 3 credit hours each
2. Courses with (*) are new courses
3. All non-asterisked courses already exist and are being offered under other prefixes.
4. Students who have taken other existing courses with other prefixes will be allowed to transfer to this program.

Table - 3

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Core Curriculum</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6301</td>
<td>Systems Engineering Architecture &amp; Design (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6302</td>
<td>Quantitative Risk, Probability, Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6303</td>
<td>Systems Engineering Risk &amp; Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6304</td>
<td>Dynamic Systems Modeling &amp; Analysis (*)</td>
<td>3</td>
</tr>
<tr>
<td>IB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6305</td>
<td>Systems Project Management</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6306</td>
<td>Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6307</td>
<td>Human Factors in Complex Organizations</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6308</td>
<td>Manufacturing and Service Systems Planning and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6309</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6310</td>
<td>Systems and Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6311</td>
<td>Software Maintenance, Evolution and Re-engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6312</td>
<td>Advanced Requirements Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6313</td>
<td>Software Testing, Validation, Verification</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6314</td>
<td>Modeling and Simulation of Engineering Systems</td>
<td>3</td>
</tr>
<tr>
<td>IIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6315</td>
<td>Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6316</td>
<td>Innovation within the Corporation</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6317</td>
<td>The Management of High Tech Products (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6318</td>
<td>Marketing Management, Marketing Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6319</td>
<td>Business Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6320</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

a) **Required Courses**: Students will be required to take at least 2 courses from Group IA and at least 2 courses from Group IB (a total of 6 credit hours) out of an offered set of 4 courses from Groups IA and IB. Thus the 4 required courses contribute a total of 12 credit hours towards an MS degree.

b) **Prescribed Elective Courses** will consist of an additional 4 distinct courses (a total of 12 credit hours) from the core curriculum of 20 courses, which have not already been taken towards the required 4 courses. At least two of these prescribed elective courses must be in Group IA or IIA.
c) **Free Elective Courses**: For the free electives, students will be able to take any 4 additional and distinct courses of the remaining 12 core courses that have not already been taken as required courses or prescribed elective courses. They may also take additional free elective courses that are already being offered in engineering or in management that will allow “concentration” or “specialization” in specific industry sectors.

Total Semester Credit Hours:
12 (Required) +12 (Prescribed Electives) +12 (Free Electives) = 36

d) **Thesis Option**: Alternatively, students who choose the thesis option will be able to substitute 6 hours of free electives with a written thesis in addition to the 12 required credit hours and 12 prescribed elective credit hours.

C. **Academic Council** – Due to the unique nature of this program and the 50/50 joint collaboration between Engineering and Management Schools, academic leadership and oversight for this program will be provided by a committee consisting 4 faculty from each school and more specifically by the Co – Program Heads of this program, one from each school *(Table-4)*.

<table>
<thead>
<tr>
<th>Table - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faculty Name</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

D. **Faculty** – Use these tables to provide information about Core and Support faculty. Add an asterisk (*) before the name of the individual who will have direct administrative responsibilities for the program. *(Add and delete rows as needed.)*

<table>
<thead>
<tr>
<th>Table - 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name of Core Faculty and Faculty Rank</strong></td>
</tr>
<tr>
<td>Dr. Farokh Bastani</td>
</tr>
<tr>
<td>Professor</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Dr. Alain Bensoussan Distinguished Research Professor</td>
</tr>
<tr>
<td>Dr. Cy Cantrell Professor</td>
</tr>
<tr>
<td>Dr. Huseyin Cavusoglu Assistant Professor</td>
</tr>
<tr>
<td>Dr. R. Chandrasekaran Ashbel Smith Professor</td>
</tr>
<tr>
<td>Dr. Kendra Cooper Associate Professor</td>
</tr>
<tr>
<td>Dr. Milind Dawande Professor</td>
</tr>
<tr>
<td>Dr. Greg Dess Professor</td>
</tr>
<tr>
<td>Dr. Nick Gans Assistant Professor</td>
</tr>
<tr>
<td>Dr. R. Henderson Assistant Professor</td>
</tr>
<tr>
<td>Dr. Kamran Kiasaleh Professor</td>
</tr>
<tr>
<td>Dr. Robert Kieschnick Associate Professor</td>
</tr>
<tr>
<td>Dr. Nanda Kumar Associate Professor</td>
</tr>
<tr>
<td>Dr. Duncan MacFarlane Professor</td>
</tr>
<tr>
<td>Dr. Mathukumalli Vidyasagar, Program Co-Head</td>
</tr>
</tbody>
</table>

Table - 6

<table>
<thead>
<tr>
<th>Name of Support Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Peter Lewin Clinical Professor</td>
<td>Ph.D. in Economics University of Chicago</td>
<td>SYSM6313</td>
<td>25%</td>
</tr>
</tbody>
</table>
D. **Students** – Describe general recruitment efforts and admission requirements. Describe plans to recruit and admit students from under-represented groups for the program.

This program will participate in the general recruitment efforts of the School of Management (SOM) and the School of Engineering and Computer Science (ECS), and will have the same admission requirements as the Master’s programs of these two schools.

In addition, the two schools jointly will promote this SEM program to local industry and corporations and will recruit heavily from these corporations – high performers in these companies with five to ten years of work experience in addition to their bachelor’s and other masters degrees.

The two schools will also make every effort to recruit and retain underrepresented students into this program. Such efforts will include, but will not be limited to, advertising the program widely to communities and organizations with underrepresented populations; open houses, providing needed advising to such students on their academic work; and helping them on their career path. In addition, the two schools will also work with corporate partners to recruit members of under-represented communities from these companies.

E. **Library** – Provide the library director’s assessment of library resources necessary for the program. Describe plans to build the library holdings to support the program.
The journal collection at the University of Texas at Dallas compares favorably with the collections at UT Arlington, UT Austin, and MIT. UT Dallas should add 2 additional titles during the next 3 years at the cost of $900. During the analysis of the book collection at the University of Texas at Dallas, the results indicated that the Library needed to increase the number of the titles available as compared to UT Austin and MIT. The Library immediately purchased 40 new titles at a cost of $5,062.

<table>
<thead>
<tr>
<th></th>
<th>Number of titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT Dallas</td>
<td>152+40 new titles (192)</td>
</tr>
<tr>
<td>UT Arlington</td>
<td>110</td>
</tr>
<tr>
<td>UT Austin</td>
<td>326</td>
</tr>
<tr>
<td>MIT</td>
<td>334</td>
</tr>
</tbody>
</table>

Given the shortage of book materials, the Library will need to increase spending by approximately 30 titles per year at a cost of $4,000 annually. Most of the new book titles will be purchased in electronic format using established procedures. Purchasing electronic books enables multiple customers to use the titles at one time and supports distance learning initiatives.

In summary, the graduate degree in systems engineering and management will cost the Libraries approximately $4,900 annually, plus inflation.

F. Facilities and Equipment – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvements/additions.

Current facilities are adequate to support the program. The School of Management and the School of Engineering and Computer Science buildings are both newly constructed, with cutting edge computing and other teaching facilities and technologies. Both buildings offer adequate facilities and equipment, in terms of office and classroom spaces, computing, research and teaching resources to accommodate the proposed program.

The School of Engineering and Computer Science also has extensive computer labs and facilities that can be used for this program and are considered adequate to support the program.

G. Accreditation – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation.

Currently, the American Assembly of Collegiate Schools of Business (AACSB) is the accreditation body that accredits business school programs. Their standards for a business school can be found at [http://www.aacsb.edu/accreditation/standards.asp](http://www.aacsb.edu/accreditation/standards.asp). The School of Management was accredited by the AACSB in 2002 and will be accredited again in 2011. The management portion of the proposed MS in SEM degree program utilizes existing courses (as a part of our current MS and MBA degree programs) which meet the stated standards.
UT Dallas undergoes its standard SACS accreditation process and the new program will be integrated as part of the regular review and assessment procedures associated with this activity.

III.  Costs and Funding

Five-Year Costs and Funding Sources - Use this table to show five-year costs and sources of funding for the program.

<table>
<thead>
<tr>
<th>Five-Year Costs</th>
<th>Five-Year Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>Facilities and Equipment</td>
<td>$0</td>
</tr>
<tr>
<td>Library, Supplies, and Materials</td>
<td>$25,000</td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>$1,825,000</td>
</tr>
</tbody>
</table>

Notes:
(1) The costs include the costs of faculty teaching these courses for the designated % time allocated to this program. So although no new faculty are being hired at this time, a portion of the existing faculties salaries have been accounted for in the costs as well as the reallocated funds for this particular program.
(3) Formula funding calculations: 62.19 x 18 credit hours x 5.525 (averaged SOM and ECS rate) x new students for years 3, 4, and 5.
(4) Designated tuition fee rate: 18 credit hours x $50 (averaged SOM and ECS fee) x new students for years 3, 4, and 5.
1. **Adequacy of Funding** – The chief executive officer shall sign the following statement:

   *I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.*

   ___________________________  ___________________________
   Chief Executive Officer        Date

2. **Board of Regents or Designee Approval** – A member of the Board of Regents or designee shall sign the following statement:

   *On behalf of the Board of Regents, I approve the program.*

   ___________________________  ___________________________
   Board of Regents (Designee)                   Date of Approval

3. **Board of Regents Certification of Criteria for Commissioner of Assistant Commissioner Approval** –

   For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the eight criteria under TAC Section 5.50 (b): The criteria stipulate that the program shall:

   (1) be within the institution’s current Table of Programs;
   (2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
   (3) have sufficient clinical or in-service sites, if applicable, to support the program;
   (4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
   (5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
   (6) not unnecessarily duplicate existing programs at other institutions;
   (7) not be dependent on future Special Item funding
   (8) have new five-year costs that would not exceed $2 million.

   *On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).*

   ___________________________  ___________________________
   Board of Regents (Designee)                   Date
Appendix 1 Confirmation of Support

Local industry representatives that have been contacted and who have confirmed their interest, and a potential commitment to send 15 to 20 students through this program at any given point in time are –

1. Mr. Steve Lyle  s-lyle@ti.com
2. Mr. Martin Izard  izzard@ti.com
3. Mr. Alan Gatherer  gatherer@ti.com
4. Mr. Tom Hill  tom.hill@eds.com
5. Mr. John McDonald  John_T_McDonald@raytheon.com
6. Ms Lynn Mortensen  lmortensen@raytheon.com
7. Mr. Paul Klocek  p-klocek@raytheon.com
8. Mr. Alan Caslavka  accaslav@rockwellcollins.com

We have also included four formal letters of support.
To: Coordinating Board  
From: Thomas L. Hill, Director HP Enterprise Services Fellows and Distinguished Engineering  
Date: September 29, 2009  
Subject: Strong Support for The University of Texas at Dallas Systems Engineering and Management Program

HP Enterprise Services is excited to participate in the Systems Engineering and Management Program proposed by The University of Texas at Dallas. We have worked closely with the curriculum development team to ensure that the course content is relevant to our industry.

The current North Texas business environment requires that engineers also be adept managers and leaders with the ability to supervise large, complex engineering projects. Unlike other degree programs in Texas, this program is the first to address this particular need as it integrates disciplines, focusing on both systems engineering and systems management.

The Systems Engineering and Management degree program is ideal for candidates with five or more years of experience, and as a result, graduates will be uniquely positioned to join large engineering management or government organizations at mid- to upper- management levels. Additionally, graduates of this program, trained to manage large systems with many interdependent parts, will provide a competitive advantage of particular interest to HP Enterprise Services.

Most importantly, the flexibility of the program provides industry partners the opportunity to tailor the degree to address current business needs, while the adaptable, interdisciplinary curriculum also allows students to gain the specific skills they require to successfully oversee complex projects. Thank you for your consideration of this proposed degree program— it will certainly be of interest to organizations in North Texas. I will make sure our organization and other organizations are ready to enroll when the program begins.

Sincerely,

Thomas L. Hill  
HP Enterprise Services  
H4-GF-20  
5400 Legacy Drive  
Plano, Texas 75924
Technology for better business outcomes.
September 25, 2009

Dr. Rajiv Shah  
School of Management  
The University of Texas at Dallas  
800 West Campbell Road SM 43  
Richardson, Texas 75080-3021

Dear Dr. Shah,

This letter is offered in strong support for The School of Management and The Erik Jonsson School of Engineering and Computer Science’s proposed degree program, Systems Engineering and Management. Currently there is an industry need for trained leadership with experience in both engineering and management. This degree program, using an interdisciplinary approach, focuses on the engineering and management of complex engineering projects, such as the automatic control of machinery; logistics and the coordination of different teams; and implementing work processes and tools to handle such projects.

The degree program addresses both the technical and human centered disciplines by covering issues such as control engineering and project management. This unique program is both innovative and flexible, allowing students to concentrate on a host of disciplines ranging from healthcare and defense, both of particular interest to ELCAN, to macro-economic and financial services. The adaptability of the program allows companies the opportunity to target specific needs within their corporation by training future leaders in that area.

In my view, the ideal candidates for this degree program would have five to ten years of industry experience and the desire to transcend their discipline while enhancing their engineering skill-set. As the program becomes established, I anticipate that ELCAN would encourage and support enrollment in this degree program as part of our ongoing talent development activities. Beyond ELCAN, I believe this program aligns well with the interests of the large number of high-tech organizations in the North Texas region.

Sincerely,

[Signature]

Paul Klocék  
General Manager  
ELCAN Optical Technologies  
a Raytheon Company
September 30, 2009

Dr. Rajiv Shah  
School of Management  
The University of Texas at Dallas  
800 West Campbell Road SM 43  
Richardson, Texas 75080-3021

Dear Dr. Shah,

As an industry partner, you know that I have had the opportunity to work closely with both The School of Management and The Erik Jonsson School of Engineering and Computer Science to establish the proposed interdisciplinary degree program, Systems Engineering and Management. Today I write in strong support of this program which satisfies a growing industry need for trained business leaders with formalized education in both engineering and management.

By focusing on a candidate’s specific needs, this unique program’s flexible curriculum provides experienced candidates the necessary tools to manage complex “macro” systems. Graduates of the program will be equipped to oversee these challenging projects that require knowledge of scientific, engineering, and management disciplines.

As the program becomes established, I anticipate that Texas Instruments would encourage and support enrollment in this degree program as part of our ongoing talent development activities.

Please keep us advised of your progress in the development and implementation of this exciting new program.

Sincerely,


Steve Lyle  
Manager  
Education, Workforce Development & Diversity
September 29, 2009

Dr. Rajiv Shah  
School of Management  
The University of Texas at Dallas  
800 West Campbell Road SM 43  
Richardson, Texas 75080-3021

Dear Dr. Shah,

I am writing to express my support for the Systems Engineering and Management joint degree program collaboratively created by The School of Management and The Erik Jonsson School of Engineering and Computer Science. Successful management of large, complex engineering projects is critical for Raytheon, and in our industry, there is a need to formally educate leaders who can oversee these multifaceted projects.

This unique program leverages the strengths of both the Schools of Management and Engineering to train students based on their areas of need regarding systems engineering and systems management. In this way, experienced engineers and managers can focus on learning applicable skills that will enable them to architect, research, develop, engineer, manage, execute, and deliver complex systems programs while managing large teams and budgets.

Raytheon Intelligence & Information Systems, as well as other businesses in the North Texas region, will certainly take advantage of this program in terms of talent development and hiring of graduates. The Systems Engineering and Management degree program provides future business leaders the opportunity to pursue an interdisciplinary course of study critical for the continued success and growth of high-tech organizations.

Sincerely,

John T. McDonald  
Chief Engineer/Chief Architect  
RTN IIS Engineering  
972.205.7360 (office)  
214.244.2691 (BB)  
RTN Six Sigma Expert  

| Raytheon Certified Architect |
Faculty


**Associate Professors:** Dinesh Bhatia, Gerald O. Burnham, Jiyoung Kim, Jeong-Bong Lee, Jin Liu, Hlaing Minn, Won Namgoong, Mehrdad Nourani, Issa Panahi, Robert Rennaker, M. Saquib, Murat Torlak, Eric Vogel

**Assistant Professors:** Bhaskar Banerjee, Leonidas Bleris, Carlos A. Busso, Nicholas Gans, Rashaunda Henderson, Walter Hu, Roozbeh Jafari, Hoi Lee, Rama Sangireddy

**Research Assistant Professors:** Wooil Kim, Kostas Kokkinakis

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

Objectives

The program leading to the M.S.E.E. degree provides intensive preparation for professional practice in the high technology microelectronic and telecommunications aspects 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; digital systems; microelectronics and nanoelectronics, optics, optoelectronics; lightwave devices and systems; and wireless communications. Because of our strong collaborative programs with Dallas-area microelectronics and telecommunications 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 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 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 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 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, and speech/language technology. 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 15TB of diskspace and 72 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 driver-behavior systems, and multi-modal based interaction systems via image-video-speech research.

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**

**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 adviser 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 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 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 (Communications and Signal Processing; Digital Systems; Circuits and Systems; RF and Microwave Engineering, Biomedical Applications of Electrical Engineering, Solid State Devices and Micro Systems Fabrication; Optical Devices, Materials and Systems). 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., M.S.E.E. with major in Telecommunications, or M.S.E.E. with major in Microelectronics 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 6 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 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 adviser prior to enrolling for thesis credit. Research and thesis hours cannot be counted in a M.S.E.E. degree plan unless a thesis is written and successfully defended.

M.S.E.E.

This degree program is designed for students who want a M.S.E.E. without a designated degree specialization. One of the six concentrations listed below, subject to approval by a graduate adviser, should be used to fulfill the requirements of this 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.

M.S.E.E. with Major in Telecommunications

Within Telecommunications, there are two concentrations: Communications and Signal Processing, and Digital Systems.

Communications and Signal Processing

This curriculum emphasizes the application and theory of all phases of modern communications and signal processing used in telecommunications.

Each student electing this concentration must take EESC 6349, EESC 6352, and EESC 6360, and one of the following: EESC 6331, EESC 6340, EESC 6350 (12 hours).

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 and EEDG 6304. The remaining two must be selected from EEDG 6302, EECT 6325, and EEDG 6345 (12 hours).

Approved electives must be taken to make a total of 33 hours.
M.S.E.E. with Major in Microelectronics

Within Microelectronics, there are five concentrations: Circuits and Systems; Solid State Devices and Micro Systems Fabrication; Optical Devices, Materials and Systems, RF and Microwave Engineering, and Biomedical Applications of Electrical Engineering.

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 and EECT 6326. The remaining three must be selected from EEDG 6301, EEDG 6303, EEDG 6306, EEDG 6375, EECT 7325, EECT 7326, EECT 6378 and EERF 6330 (15 hours).

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, EEMF 6319 and at least two of the following four courses: EEMF 6320, EEMF 6321, EEMF 6322 and EEMF 6382

Additional standard electives include but are not limited to: EEMF 5383/EEMF 5283, EEMF 6324, EECT 6325, EEMF 6372, EEMF 6383/EEMF 6283, EEMF 6382, EEMF 7320, EECT 7325.

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: EEOP 6314, EEGR 6316, EEOP 6317, and at least one of the following two courses: EEOP 6310 and EEOP 6329. (12 hours).

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: EERF 6311, EEGR 6316, EERF 6355, and EERF 6395. (12 hours).

Approved electives must be taken to make a total of 33 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 EEBM 6371, EEBM 6373, EEBM 6374, and two core courses from any one other concentration. (15 hours).

Approved electives must be taken to make a total of 33 hours.

**Graduate Certificate in Infrared Technology**

**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 adviser and the course instructor.

Each student electing the Graduate Certificate in IR Technology must take the following five courses: EEGR 6316, EEOP 6317, EEOP 6309, EEOP 6315, and EEOP 6335.

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**

**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 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 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 adviser 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 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 the QE. The QE will be given during the fall and spring semesters.
- A comprehensive examination 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.

Research

The principal concentration areas for the M.S.E.E. program are: Communications and Signal Processing; Digital Systems; Circuits and Systems; Optical Devices, Materials, and Systems; and 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, 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, control theory, 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.
Biology Course Descriptions

Core Courses

BIOL 5410 (MSEN 5410) Biochemistry of Proteins and Nucleic Acids (4 semester hours) Chemistry and metabolism of amino acids and nucleotides; biosynthesis of nucleic acids; analysis of the structure and function of proteins and nucleic acids and of their interactions including chromatin structure. Prerequisite: BIOL 3361 (biochemistry) or equivalent. (4-0) Y

BIOL 5420 Molecular Biology (4 semester hours) Genetic analysis of gene structure (mutations and their analysis, complementation, and recombination), gene expression (transcription, RNA processing, translation), and the regulation of gene expression in selected model systems (viral, prokaryotic, organellar, eukaryotic); principles of genetic engineering (cloning and recombinant DNA technology). (4-0) Y

BIOL 5430 Macromolecular Physical Chemistry (4 semester hours) Structures and properties of macromolecules, interactions with electromagnetic radiation, thermodynamics of macromolecular solutions, and transport processes. Prerequisites: MATH 2417 (Calculus and PHYS 1301 (General Physics)). (4-0) Y

BIOL 5440 (MSEN 5440) Cell Biology (4 semester hours) Molecular architecture and function of cells and subcellular organelles; structure and function of membranes; hormone and neurotransmitter action; growth regulation and oncogenes; immune response; eukaryotic gene expression. Prerequisites: BIOL 5410 and BIOL 5420, or the equivalent, or permission of the instructor. (4-0) Y

Advanced Study

Work is offered beyond the core curriculum in four major areas that parallel four of the lecture-type core courses. Each area provides elective courses, advanced colloquia, and dissertation opportunities. Electives will usually be offered only one semester per year and in some cases only once every other year.

Topics in Biochemistry

(Bulla, DeJong, González, Gray, Hannig, Levene, Miller, Reitzer, Spiro, L. Zhang, M. Zhang)

General Electives

BIOL 6211 Posttranscriptional Regulation of Gene Expression (2 semester hours) Emphasis on current research in regulation of gene expression involving posttranscriptional mechanisms. Topics include translational regulation of gene expression, protein and messenger RNA turnover, regulation of protein folding and localization, protein phosphorylation, and the formation of active and inactive protein complexes. (2-0) T

BIOL 6354 Microbial Physiology (3 semester hours) Microbial physiology considers the basic processes of microbes, especially those variations that are unique to microbes: energy generation, fermentations, and other pathways specific to bacteria, cellular structure and differentiation, and bacterial responses to the environment. (3-0) Y

BIOL 6V19 Topics in Biochemistry (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y

BIOL 6V28 DNA Replication, Recombination, and Repair (2-3 semester hours) Focuses on central aspects of DNA enzymology and metabolism. The mechanisms of DNA replication, recombination, and repair are fundamental to understanding many principles of molecular biology, genetics, molecular medicine, and evolution. This course is mechanistically oriented and will provide a strong working
knowledge of these processes through an extensive overview, which includes discussions of some of the most recent publications on these topics. ([2-3]-0) T

Special Electives

**BIOL 7V10 Research Seminar in Biochemistry** (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) ([2-5]-0) Y

Topics in Molecular Biology

(Breen, DeJong, González, Hannig, Levene, Miller, Pace, Reitzer, Spiro, L. Zhang, M. Zhang)

General Electives

**BIOL 5381 Genomics** (3 semester hours) Genome sequence acquisition and analysis; genomic identification; biomedical genome research; DNA microarrays and their use in applied and healthcare research. (3-0) T

**BIOL 5376 Applied Bioinformatics** (3 semester hours) Genomic information content; data searches and multiple sequence alignment; mutations and distance-based phylogenetic analysis; genomics and gene recognition; polymorphisms and forensic applications; nucleic-acid and protein array analysis; structure prediction of biological macromolecules. Prerequisites: STAT 1342 (Introductory Statistics) and MATH 1325 and MATH 1326 (2 semesters of calculus) (3-0) T

**BIOL 6121-6123 Biotechnology I-III** (1 semester hour) Gene cloning, nucleotide sequencing and other aspects of genetic engineering. This course has between one and five components, which will be offered sequentially and which may therefore be taken independently (with consent of instructor). (0-2) Y

**BIOL 6227 RNA World** (2 semester hours) The nature of modern RNA suggests a prebiotic RNA world. This course will begin with a presentation of the arguments that a “RNA world” existed before the evolution of protein synthesis. Additional topics will include RNA evolution, the origin and evolution of introns, RNA replication, the evolution and involvement of tRNAs and rRNAs in protein synthesis, the structure and mechanism of large catalytic RNAs such as Group I and Group II introns and the RNase P RNA, the structure and mechanism of small nuclear RNAs such as hammerheads and hairpins, RNA editing, and the mechanism of telomerase. (2-0) T

**BIOL 6228 Prokaryotic Gene Expression** (2 semester hours) Principles of gene regulation in bacteria are discussed. The readings consist of recent developments described in the research literature. Topics will vary, but will include bacterial chromosome structure, function and structure of RNA polymerase and promoters, the mechanism of action of various repressors and activators, the coordination of gene expression in phage lambda, during nitrogen limitation, and during sporulation. (2-0) T

**BIOL 6335 Graduate Medical Microbiology** (3 semester hours) This course exposes students to advanced concepts and principles of medical microbiology. In addition, the course will deal with mechanisms associated with disease processes, microbial virulence, the control of bacterial growth, and host responses to infection. (3-0) T

**BIOL 6336 Parasitology** (3 semester hours) A look at the molecular level at microorganisms that live at the expense of higher eukaryotes. Emphasis will be given to the latest scientific literature describing these important pathogenic interactions. Therapeutic treatments and preventive methods will also be covered. (3-0) T

**BIOL 6337 Regulation of Gene Expression** (3 semester hours) An in depth look at how the cell makes use of its genetic information, with a primary focus on the mechanisms of transcription regulation. The course emphasizes a critical discussion of techniques and results from the recent scientific literature. Topics are taken from eukaryotic and/or prokaryotic systems and typically cover areas such as promoter organization, RNA polymerase and transcription factor structure and function, the organization and packaging of chromosomes, whole-genome analyses, and the pathways that control gene expression during growth and development. (3-0) Y

**BIOL 6338 Symbiotic Interactions** (3 semester hours) An in depth look, at the molecular level, of well
characterized symbiotic interactions between prokaryotes and eukaryotes. This course makes use of recent scientific literature and the latest discoveries in the area of symbiosis. (3-0) R

**BIOL 6373 Proteomics** (3 semester hours) Protein identification, sequencing, and analysis of post-translational modifications by liquid chromatography/tandem mass spectrometry; determination of protein three dimensional structure by x-ray crystallography; its use in drug design; understanding protein interactions and function using protein chip microarrays. (3-0) T

**BIOL 6V29 Topics in Molecular Biology** (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. (2-5)-0 Y

**BIOL 6V34 Quorum Sensing** (2-3 semester hours) The focus of this course is the analysis of quorum sensing and its role in pathogenic and symbiotic interactions. This course makes use of recent scientific literature and the latest discoveries in the area of population density dependent gene expression. (2-3)-0 R

**Special Electives**

**BIOL 7V20 Research Seminar in Molecular Biology** (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) (2-5)-0 Y

**Topics In Biophysics**

(Gray, Levene, Xia)

**General Electives**

**BIOL 6358 (MSEN 6358) Bionanotechnology** (3 semester hours) Protein, nucleic acid and lipid structures. Macromolecules as structural and functional units of the intact cell. Parallels between biology and nanotechnology. Applications of nanotechnology to biological systems. (3-0) R

**BIOL 6V30 Biopolymers** (2-4 semester hours) Structure and properties of biologically important macromolecules. (2-4)-0 R

**BIOL 6V32 Electron Microscopy** (2-3 semester hours) Theory and practice of electron microscopy. The laboratory section includes specimen preparation, operation of the electron microscope, and darkroom work. (2-3)-0 R

**BIOL 6V33 Biomolecular Structures** (2-3 semester hours) This course includes a discussion of DNA structures, protein structures, the folding and stability of domains, and the binding of proteins to DNA. Methods used to investigate the relation of structure to function are emphasized. Types of protein structures whose structure and function are considered include transcription factors, proteinases, membrane proteins, proteins in signal transduction, proteins of the immune system, and engineered proteins. (2-3)-0 Y

**BIOL 6V39 Topics in Biophysics** (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. (2-5)-0 T

**Special Electives**

**BIOL 7V30 Research Seminar in Biophysics** (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) (2-5)-0 R

**Topics In Cell Biology**

(Breen, Burr, D’Mello, Draper, Pace, L.Zhang)
General Electives

BIOL 6340 Developmental Neurobiology (3 semester hours) The course will cover the molecular and cellular mechanisms underlying key processes in the development of the vertebrate nervous system such as neural induction, morphogenesis of the neural tube, patterning of the brain, differentiation and migration of neurons, axon guidance, synaptogenesis and the regulation of neuronal survival. The course is designed to be interactive and will include lectures, student presentations, and discussion of important discoveries in the area. (3-0) Y

BIOL 6345 Molecular Basis of Acquired Immune Deficiency Syndrome (3 semester hours) Topics include an analysis of the molecular basis of the infection of target cells by HIV, the intracellular replication of retroviruses, with special attention given to the HIV *tat* and *rev* genes, and an analysis of the roles of the HIV accessory genes: *vif*, *vpr*, *vpu* and *nef*. The immunological response of the host to HIV is considered, as is the biological basis for the ultimate failure of the immune system to contain this virus, with attendant immune collapse. The molecular basis of a variety of existing and potential anti-retroviral therapies is considered. (3-0) Y

BIOL 6351 Cellular and Molecular Biology of the Immune System (3 semester hours) Innate and adaptive immunity. Structure and function of immunoglobulins and MHC molecules, and their role in the adaptive immune response. Function of the primary and secondary lymphoid tissues, and the role of professional antigen presenting cells. The molecular basis for the generation of diversity during cellular development of B and T lymphocytes. The role of complement in innate immunity, and details of T cell and B cell mediated immunity. (3-0) Y

BIOL 6357 Cell Signaling (3 semester hours) This course will provide information on signal transduction pathways controlling growth, development and diseases. Students will be required to present research papers and discuss experimental data. (3-0) R

BIOL 6V41 Oncogenes (2-4 semester hours) Properties of cancer cells, *in vivo* and *in vitro*. Telomeres and cellular immortality. The role of DNA and RNA viruses in human cancers. Molecular biology of chronic leukemia retroviruses and the acutely transforming retroviruses. Retroviral oncogenes; the role of mutation, amplification, and chromosomal translocation of cellular oncogenes in human cancer. Regulation of the eukaryotic cell cycle, and the role of tumor suppressor genes. The role of oncogenes in growth hormone signal transduction. The role of apoptosis, and developmental signaling pathways in cancer. ([2-4]-0) Y

BIOL 6V42 Membrane Biology I (2-4 semester hours) Membrane traffic in the secretory pathway. Topics covered include insertion of proteins into membranes, the mechanism of vesicular traffic from the rough endoplasmic reticulum through the Golgi apparatus to the plasma membrane, protein sorting during secretion and membrane biogenesis. ([2-4]-0) T

BIOL 6V43 Membrane Biology II (2-4 semester hours) Membrane traffic in the endocytic pathway. Topics covered include the structure, function and sorting of membrane receptors, the formation and function of clathrin-coated pits, membrane recycling and the biogenesis of endosomes and lysosomes. ([2-4]-0) R

BIOL 6V44 Animal Cell Culture (2-4 semester hours) Theory and practice of the growth of animal cells in culture. Topics include: the isolation and characterization of mammalian cell mutants, chromosome mapping, the use of somatic cell hybrids to investigate eukaryotic gene regulation, gene transfer into animal cells, gene targeting and production of "gene knockouts." ([2-4]-0) R

BIOL 6V49 Topics in Cell Biology (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y

Special Electives

BIOL 7V40 Research Seminar in Cell Biology (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading, may be repeated for credit.) ([2-5]-0) Y

General Topics in Molecular and Cell Biology

General Electives
BIOL 5V00 Topics in Biological Sciences (1-6 semester hours) May be repeated for credit to a maximum of 9 hours \((1-6\)-0\) Y

BIOL 5V01 Topics in Biological Sciences (1-6 semester hours) Includes a laboratory component. May be repeated for credit to a maximum of 9 hours \((1-0-10)\) Y

BIOL 5V95 Advanced Topics in Molecular and Cell Biology (Individual instruction) (1-6 semester hours) May be repeated for credit with permission of the graduate advisor \((1-6\)-0\) Y

BIOL 6V00 Topics in Biological Sciences (1-6 semester hours) May be repeated for credit to a maximum of 9 hours \((1-6\)-0\) Y

BIOL 6V01 Topics in Biological Sciences (1-6 semester hours) Includes a laboratory component. May be repeated for credit to a maximum of 9 hours \((1-0-10)\) Y

BIOL 6V04 Biology Seminar (1-6 semester hours) May be repeated for credit to a maximum of 6 hours \((1-4-10)\) Y

BIOL 6V92 Readings in Molecular and Cell Biology (3-9 semester hours) \((3-9\)-0\) Y

BIOL 6V95 Advanced Topics in Molecular and Cell Biology (Individual instruction) (1-6 semester hours) May be repeated for credit with permission of the graduate advisor \((1-6\)-0\) Y

Special Electives

BIOL 5V50 Methods in Molecular and Cell Biology I (2-6 semester hours) Laboratory instruction in biological, biophysical, and biochemical techniques. Supplemental lectures and demonstrations. (P/F grading) \((1-4-10)\) Y

BIOL 5V51 Methods in Molecular and Cell Biology II (2-6 semester hours) Laboratory instruction in advanced techniques in molecular and cell biology. Supplemental lectures and demonstrations. (P/F grading) \((1-4-10)\) Y

BIOL 5V52 Methods in Molecular and Cell Biology III (2-6 semester hours) Laboratory instruction in advanced techniques in molecular and cell biology. Supplemental lectures and demonstrations. \((1-0)\) Y

BIOL 6150 Current Research in Molecular and Cell Biology (1 semester hour) Analysis of recent developments in molecular and cell biology. Students will attend presentations of current research literature. P/F grading only. Maybe repeated for credit (4 hours maximum.) \((1-0)\) Y

BIOL 6193 Colloquium in Molecular and Cell Biology (1 semester hour) Required for all degree students except non-thesis M.S., to be taken before a Supervising Committee is appointed. (P/F grading) \((1-0)\) Y

BIOL 6252 Current Research in Molecular Biology (2 semester hours) Recent developments in biosynthesis, structure, function and expression of nucleic acids in prokaryotes and eukaryotes. Students will participate in a critical analysis of current research publications. (P/F grading, may be repeated for credit to a maximum of 8 hours.) \((2-0)\) S

BIOL 6352 Modern Biochemistry I (3 semester hours) Structure and function of proteins, including enzyme kinetics and catalytic mechanisms; structure and metabolism of carbohydrates, including oxidative phosphorylation and electron transport mechanisms. For students who have not had undergraduate biochemistry. \((3-0)\) S

BIOL 6353 Modern Biochemistry II (3 semester hours) Continuation of BIOL 6352. Structure and metabolism of lipids, including membrane structure and function. Nitrogen metabolism: amino acids and nucleotides. Polynucleotide replication, transcription, and translation. For students who have not had undergraduate biochemistry. \((3-0)\) Y

BIOL 6356 Eukaryotic Molecular and Cell Biology (3 semester hours) Regulation of cellular activities in eukaryotic cells; structural and molecular organization of eukaryotic cells; molecular basis of cell specialization; membranes and transport. For students who have not had undergraduate cell biology. \((3-0)\) S

BIOL 6V02 The Art of Scientific Presentation (1-2 semester hours) Students learn how to give an effective seminar by reading scientific articles on a central theme in biology and then delivering a presentation, first to their classmates, followed by another presentation to the Molecular and Cell Biology faculty and students. While learning the focused theme, students acquire skill sets in critical reading of scientific literature and oral presentation. Required for all Ph.D. students. (P/F grading) \((1-2\)-0\) Y

BIOL 6V31 Molecular Genetics (3-4 semester hours) A graduate survey of the phenomena and
mechanisms of heredity, its cytological and molecular basis, with a focus on bacterial and model
eukaryotic systems. Topics will include fundamentals of Mendelian Genetics, genetic recombination and
genetic linkage, as well as, gene structure and replication, gene expression and the transfer of genetic
information, mutation and mutagenesis, and applications of recombinant DNA techniques to genetic
analysis. For students who have not had undergraduate genetics ([3-4]-0) Y

BIOL 7450 Research Seminar in Molecular and Cell Biology (4 semester hours) Presentation and
analysis of ongoing independent research projects, accompanied by evaluation of recent related
literature. (P/F grading. May be repeated for credit.) (4-0) S

BIOL 8V01 Research in Molecular and Cell Biology (1-9 semester hours) (May be repeated for credit.)
((1-9)-0) S

BIOL 8V50 Internship in Biotechnology/Biomedicine (3-6 semester hours) Provides faculty
supervision for a student’s internship. Internships must be in an area relevant to the student’s coursework
for the MS in Biotechnology. ((1-6] - 0) R

BIOL 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) ([3-9]-0) S

BIOL 8V99 Dissertation (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S
Biomedical Engineering

Faculty

Professors: John H. L. Hansen, Philipos Loizou, Raimund Ober, Mathukumalli Vidyasagar, Li Zhang
Associate Professors: Dinesh Bhatia, Jinming Gao
Assistant Professors: Leonidas Bleris, Walter Hu, Hyun-Joo Nam

Objectives

The Biomedical Engineering Program is jointly offered by The University of Texas at Dallas, The University of Texas at Arlington, and The University of Texas Southwestern Medical Center at Dallas. The program coordinates research and teaching activities of many departments on all three campuses.

The objective of the Ph.D. Program in Biomedical Engineering is to train exceptional persons to become 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 allow the graduates of this program to tackle complex life sciences-related problems in novel ways and to create solutions for the future.

The objective of the MS degree program in Biomedical Engineering is to produce 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 School.

Master of Science in Biomedical Engineering

Admission Requirements

The University’s general admission requirements are discussed here.
The Joint Graduate Studies Committee in Biomedical Engineering (UT Southwestern/UT Arlington/UT Dallas) constitutes the admissions committee for the program. A student lacking undergraduate prerequisites for graduate courses in biomedical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor. An entrance examination may be required. Specific admission requirements follow.

The student entering the M.S.B.M.E. program should meet the following guidelines:

• An 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 3.0 or better on a 4-point scale, and
• 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 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.

Degree Requirements

The University’s general degree requirements are discussed here. The M.S.B.M.E. requires the completion of a minimum of 33 semester hours. All students must have an academic advisor and an approved degree plan. For the M.S.B.M.E program, all students must pass the following courses with a grade of B- or better:

• BMEN 6376 Lecture Course in Biomedical Engineering Applications
• BMEN 6373 Anatomy and Human Physiology for Engineers
• BMEN 6374 Genes, Proteins and Cell Biology for Engineers

The M.S.B.M.E. program has both a thesis and a non-thesis option. All part-time M.S.B.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. Research and thesis hours cannot be counted in a M.S.B.M.E. 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 MSBME classes, and a grade of B- or better in all their core MSBME classes in order to satisfy their degree requirements.

All full-time, supported students are required to participate in the thesis option.

Doctor of Philosophy in Biomedical Engineering

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 sciences 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 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 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 biomedical 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 adviser 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 18 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. A student entering the Ph.D. program with a M.S.B.M.E. must pass this exam within 3 long semesters, and a student entering without an M.S.B.M.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.

Note: In degree plan descriptions, course numbers followed by a D are offered at U.T. Southwestern.
Department of Geosciences

Faculty

Professors: Carlos L. V. Aiken, David E. Dunn (emeritus), William I. Manton, George A. McMechan, Richard M. Mitterer, John S. Oldow, Emile A. Pessagno, Jr. (emeritus), Dean C. Presnall (emeritus), Robert H. Rutford (emeritus), Robert J. Stern

Associate Professors: Thomas H. Brikowski, James L. Carter (emeritus), John F. Ferguson

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 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 microscope, rock preparation and mineral separation facilities, electronics shop and machine shop. Separate research facilities for computing, hydrology, thermal ionization mass spectrometry, and geophysics 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 10 and one with 32 64-bit processors, and 13 terabytes of disk. A GeoWall visualization facility permits immersive interaction with 3-D data.

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 and Perkin-Elmer 3300DV ICP-OES are 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 CG5 Gravimeters a Micro-g FG5 absolute gravimeter, 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, six dual frequency Leica 530 RTK GPS systems (4 receivers), three dual frequency Topcon HyperLite RTK GPS systems (2 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 and Trimble Pathfinder Office. 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 Bison 9048 48-channel floating point seismic acquisition system with Betsy, hammer, and explosive sources for shallow to deep exploration; and pulse EKKO IV and 1000 ground penetrating radars.

**Admission Requirements**

The University’s general admission requirements are discussed here.

Applicants are 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 (FO21, University of Texas at Dallas, 800 W Campbell Rd, Richardson, TX, 75080, USA), telephone (972-883-2401), or e-mail (geosci@utdallas.edu).

Entering students are expected to have completed the equivalent of the University’s B.S. degree in Geosciences, as well as a 3-hour scientific programming course. 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. Students may be admitted with some deficiencies but these must be completed during the first 18 graduate hours. It is understood that the minimum course requirements for the intended degree, as specified below, apply to well-prepared students.

**Degree Requirements**

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The University’s general degree requirements are discussed here. Additional requirements are specified below for each degree.

**Graduate Certificate in Remote Sensing**

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](http://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: GEOS 5325 Introduction to Remote Sensing, GISC 6381 Introduction to GIS, GEOS 5326 or GISC 7365 Remote Sensing Digital Image Processing, GISC 7366 Applied Remote Sensing and GEOS 7327 or GISC 7367 Remote Sensing Workshop.

**Master of Science in Geosciences**

**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 5307, GEOS 5327, GEOS 5375, and GEOS 5387  
- A minimum of 15 hours of additional graduate courses.
- A minimum of nine semester hours of thesis research including GEOS 8398 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.

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**Deleted:** GEOS 5303 or another acceptable, graduate level, computing course to be determined in consultation with the student's Supervisor and Graduate Advisor.

**Deleted:** GEOS 5390, GEOS 5375 and GEOS 5100.

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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 5307, GEOS 5327, GEOS 5375, and GEOS 5387
- 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
The Master of Science in Geographic Information Sciences 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 Social Sciences section of the catalog.

Doctor of Philosophy in Geosciences
All students seeking a Doctor of Philosophy degree in Geosciences must satisfactorily complete the following requirements (90 graduate hours minimum).

- GEOS 5307, GEOS 5327, GEOS 5375, and GEOS 5387
- A minimum of 30 hours of Geosciences graduate courses to be specified by the student’s research supervisory committee and the Graduate Advisor.
- A minimum of 40 hours of additional graduate courses or research.
- A minimum of nine semester hours of thesis research including GEOS 8399 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**

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 Social Sciences section of the catalog.)
Master of Science Program in Applied Cognition and Neuroscience

http://bbs.utdallas.edu/

Faculty

Assistant Professors: Daniel Krawczyk, Christa McIntyre
Distinguished Scholar in Residence: James Jerger

Objectives

The Master of Science in Applied Cognition and Neuroscience (ACN) program is an applied multidisciplinary program which incorporates and integrates methodologies from such diverse fields as psychology, neuroscience, and computer science. The Cognition and Neuroscience specialization area provides a flexible multidisciplinary curriculum for studying the mind and brain which is designed to be adaptable to the individual student’s interests. Students enrolling in the Cognition and Neuroscience specialization area with backgrounds in psychology and neuroscience will have the opportunity to gain the diverse skills needed to collect and interpret behavioral and neurophysiological data. The Computational Modeling/Intelligent Systems specialization area provides advanced training applicable to developing mathematical and computer simulation models of the brain and behavior as well as the development of artificially intelligent systems. The Human Computer Interaction specialization area provides excellent preparation for work in areas involving human computer interactions, such as usability engineering issues associated with the design and evaluation of user-friendly web-based systems. The Neurological Diagnosis and Monitoring specialization area provides advanced training and preparation for using functional brain imaging methodologies such as: EEG, SPECT, PET, and fMRI for both clinical and experimental investigations. All four specialization areas provide excellent preparation for doctoral work in the Cognition and Neuroscience area as well as medical school.

Career Opportunities

The Master of Science in Applied Cognition and Neuroscience (ACN) program is a multidisciplinary program which should be of interest to business professionals interested in retraining or continuing education and are currently working full-time in a professional-level job. Business professionals in different fields should pursue the appropriate ‘specialization area’ within the ACN degree program. Many courses in the ACN program are offered periodically as evening courses which 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 professionals, whose focus is the development of web sites, can acquire advanced training in the design and evaluation of web-site effectiveness using
advanced behavioral science methodologies through the Human-Computer Interaction specialization area.

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 professionals interested in the area of the implementation of complex mathematical algorithms in software. Such mathematical algorithms are now widely embedded in a variety of software programs for the purposes of providing “intelligent assistance” to the end-user. Software development professionals interested in continuing education in the area of artificial intelligence and artificial neural network modeling should consider the Intelligent Systems specialization area in the ACN program.

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 Multipurpose 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. Coursework used to fulfill the advanced elective requirement may be taken pass/fail. Internship coursework must be taken pass/fail.

**Required Core Courses (18 hours)**

- **Select two of the following approved core courses (6 hours).**
  - ACN 6330 Cognitive Science I
  - ACN 6395 Cognitive Psychology
  - ACN 6340 Cellular Neuroscience
  - ACN 6344 Functional Human Neuroanatomy
  - ACN 6346 Systems Neuroscience

  Select at least one approved quantitative methods course approved by the Program Head or from the following approved list of quantitative methods courses (3 hours).
  - ACN 6312 Research Methods in Behavioral and Brain Sciences – Part I
  - ACN 6313 Research Methods in Behavioral and Brain Sciences – Part II
  - ACN 6314 Research Methods in Behavioral and Brain Sciences – Part III
  - ACN 6351 Quantitative Methods in Neuroscience
  - ACN 6348 Neural Net Mathematics
  - ACN 6347 Intelligent Systems Analysis
  - ACN 6349 Intelligent Systems Design

  Select at least one methods course (3 hours).

**Select two advanced elective courses:** These courses may be chosen from either the Graduate Program in Human Development and Communication Sciences or the Applied Cognition and Neuroscience Program or the courses may be chosen from outside the School of Behavioral and Brain Sciences with approval from the ACN program head. Advanced elective courses may be taken pass/fail or for a grade.

**Area of Specialization (12 hours)**

The following four specialization areas have been approved for the Applied Cognition and Neuroscience program but alternative specialization area proposals may be submitted for consideration to the Applied Cognition and Neuroscience program head.

**Cognition and Neuroscience 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 Graduate Program in Human Development and Communication Sciences (i.e., courses with the prefix HCS).

**Human-Computer Interactions Specialization Area**

Students selecting this specialization area should take two of the following three courses: ACN 6341 Human Computer Interactions I, ACN 6342 Human Computer Interactions II, and ACN 6343 Human
Computer Interactions Lab. Students pursuing the behavioral sciences track should additionally take two courses from the Cognition and Neuroscience Specialization Area course selections. Students pursuing the user-interface development track should take: CS 5343 Algorithm Analysis and Data Structures and CS 6354 Software Engineering. Note that the prerequisites for CS5343 are: CSS303 Computer Science I (or equivalent) and CS 5333 Discrete Structures. Students specializing in the Human Computer Interactions area should regularly review the Arts and Technology courses offered in the School of Arts and Humanities which have the course prefix ATEC 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 7335 Computational Neuroscience, ACN 7367 Speech Perception Lab, ACN 6322 Computational Models of Language Understanding. 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, linear algebra, multivariable calculus, and ACN 5314 Cognitive and Neural Modeling Lab are recommended prerequisites for: ACN 6346. 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: CS6320 (Natural Language Processing), CS 6321 (Discourse Processing), CS6364 (Artificial Intelligence), CS6373 (Intelligent Systems), CS6375 (Machine Learning), CS6384 (Computer Vision), EE6362 (Speech Processing), EE6363 (Digital Image Processing), EE6364 (Pattern Recognition), and EE 6365 (Adaptive Signal Processing).

Neurological Diagnosis and Monitoring Specialization Area

Students should take ACN 6344 Functional Human Neuroanatomy and ACN 6346 Systems Neuroscience. Students should also choose at least 2 of the following courses as specialization area electives: ACN 6310 Fundamentals of Functional Brain Imaging, ACN 6373 Intraoperative Monitoring I, ACN 6374 Intraoperative Monitoring II, ACN 7315 Statistical Analysis of Brain Imaging Data, ACN 7329 Functional Brain Imaging Practica, ACN 6372 Pathophysiology of Disorders of the Nervous System, 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 HCS. 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.
Texas Higher Education Coordinating Board  
New Doctoral Degree Proposal

**Directions:** An institution shall use this form to propose a new doctoral degree program. In completing the form, the institution should refer to Texas Administrative Code (TAC) 5.46 relating to *Criteria for New Doctoral Programs*. This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval; and (3) if applicable, a member of the Board of regents or (designee), certifying that criteria have been met for Coordinating Board staff-level approval.

Note: If an institution does not have Preliminary Authority for the proposed doctoral program, it must first submit a separate request for Preliminary Authority. That request shall address criteria set in TAC Section 5.24 (b).

**Information:** Contact the Division of Academic Affairs and Research at 512/427-6200.

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**Administrative Information**

1. **Institution:**

   The University of Texas at Dallas

2. **Program Name** – Show how the program would appear on the Coordinating Board’s program inventory [*e.g., Doctor of Philosophy (Ph.D.) in Electrical Engineering*].

   Doctor of Philosophy in Mechanical Engineering (Ph.D.M.E.)

3. **Proposed CIP Code:**

   14.1901.00, Mechanical Engineering

4. **Program Description** – Describe the program and the educational objectives.

   The Erik Jonsson School of Engineering and Computer Science seeks approval for a Ph.D. degree program in Mechanical Engineering (CIP Code 14.1901.00). UT Dallas received preliminary authority for this degree in July 2008. This degree is required to meet the needs of the community served by The University of Texas at Dallas, and to support a research program for the faculty who are currently being hired into the Department of Mechanical Engineering to support the existing baccalaureate and Master’s degree programs.

   In 2004, the American Society of Mechanical Engineers, the leading professional society for mechanical engineering, issued a document titled *“A Vision of the Future of Mechanical Engineering Education”*.1 The document makes the following observation:

   “…mechanical engineering is changing from
   • ‘The branch of engineering that encompasses the generation and application of heat and mechanical power and the production, design and use of machines and tools’ (Webster’s II New

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According to the National Research Council, “Mechanical engineering is critical to the design, manufacture, and operation of small and large mechanical systems throughout the U. S. economy. It is often called upon to provide scientific and technological solutions for national problems, playing a key role in the transportation, power generation, advanced manufacturing, and aviation industries, to mention a few.”

Education in mechanical, fluidic and thermal design at all size scales fits well with the core U. T. Dallas competencies in micro-electro-mechanical systems (MEMS) and nanostructured materials, and with the needs of local industry.

The educational objective of the proposed doctoral program is to prepare talented doctoral students for careers in which they will create new technologies for thermal, fluidic and mechanical systems at all size scales. Because of the key enabling role of mechanical engineering in all areas of technology, the graduates of this program will be technical leaders in new and existing industry in Texas.

5. **Administrative Unit** – Identify where the program would fit within the organizational structure of the institution (e.g., *The Department of Electrical Engineering within the College of Engineering*).

The Department of Mechanical Engineering within the Erik Jonsson School of Engineering and Computer Science

6. **Proposed Implementation Date** – Report the first semester and year that students would enter the program.

Spring semester, academic year 2010–2011 (Start date: January 1, 2011)

7. **Contact Person** – Provide contact information for the person who can answer specific questions about the program.

   Name: Mark W. Spong

   Title: Dean, Erik Jonsson School of Engineering and Computer Science

   E-mail: mspong@utdallas.edu

   Phone: (972) 883-2974

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Program Information

I. Need

Note: All proposals must include this section. If preliminary authority for the program was granted within the last four years, include updated information.

A. Job Market Need – Provide short- and long-term evidence of the need for graduates in the national job market. Common sources for workforce need and workforce projections include the Bureau of Labor Statistics, the Texas Workforce Commission, and professional associations. In addition, identify existing programs in the state and nation, provide the number of graduates from these programs in the last five years, and explain how the proposed program would not unnecessarily duplicate them. Provide evidence that existing programs could not accommodate additional students and/or are not meeting current workforce need.

Long-term need

The participants in a National Science Foundation workshop predicted that mechanical engineering will play an essential role in the economy of the future: “Today, the synergy of science and technology is producing an era of profound change. [Mechanical engineering] is intrinsic to this change through its impact on enabling technologies. These technologies include: micro- and nano-technologies, cellular and molecular biomechanics, information technology, and energy and environment issues.”

The long-term, strategic need for a new mechanical engineering doctoral program in Texas arises from the key enabling role that mechanical engineering plays in essentially all manufacturing, mechanical, thermal and fluid systems at all size scales, as documented in the reports already referenced. The Texas economy, even more than the national economy, depends on leapfrogging traditional areas in order to establish leadership in emerging technologies. The degree program proposed here will include the strategic areas of MEMS, nano-electro-mechanical systems (NEMS), cellular and molecular biomechanics, and energy issues identified in the NSF workshop.

Data from the Bureau of Labor Statistics, presented in Chart 1, shows that over 14% of all employed engineers in the U. S. are mechanical engineers. Mechanical engineering is the second largest engineering specialty by employment, as the Bureau of Labor Statistics defines engineering specialties. On the other hand, Table 1, below, shows that Texas is substantially underproducing other high-technology states with respect to mechanical engineering doctorates.

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Chart 1: U.S. engineering employment in 2008.4

4 Source: U.S. Bureau of Labor Statistics
U.T. Dallas Ph.D. Mechanical Engineering Request
The State of Texas has committed substantial resources to the development of high-technology industry through efforts such as the Texas Research Incentive Program, the National Research University Fund, the Emerging Technology Fund, the STARS program, the Enterprise Fund, and Project Emmitt. The proposed doctoral program in Mechanical Engineering will provide much of the brainpower required for this investment to earn a substantial return for the taxpayers.

Short-term need

The short-term need for mechanical engineering doctoral graduates arises from an imbalance between the production of mechanical engineering Ph.D. graduates in Texas and the expected near-term and medium-term growth in mechanical engineering jobs in the state. The Texas Workforce Commission predicts that mechanical engineering jobs will grow by 12% in the Dallas area, and by 18% in Texas, in the decade between 2006 and 2016.\(^5\) This rate of growth is almost three times larger than the growth rate in mechanical engineering jobs predicted for the U. S. as a whole.\(^6\) However, net growth may underestimate the number of mechanical engineering graduates that will be needed during the next decade. The Bureau of Labor Statistics of the U. S. Department of Labor predicts that nearly 22% of mechanical engineering jobs will need to be replaced by 2016.\(^7\)

In fact, the fraction of engineers who practice mechanical engineering in the Metroplex is larger than in the U. S. as a whole because of the presence of some of the Nation’s largest defense manufacturing and systems integration companies. A significant fraction of these companies are in close proximity to The University of Texas at Dallas. Most engineering jobs in these companies require U. S. citizenship or permanent residence. In several of these companies, more than 50% of the engineering workforce is over 50 years of age. Success in supplying new engineering graduates to replace those who will retire between 2009 and 2025 will profoundly affect the continued vitality of some of the largest employers of engineers in the State of Texas.

The leadership for sustaining and refreshing engineering jobs comes in part from Ph.D. level personnel. The interplay between a high-technology cluster and a local, research-oriented university is an essential element of long-term economic health. Because of the dominance of Mechanical Engineering in defense-related industries in the Metroplex, it is strategically imperative to increase the production of Ph.D. graduates in areas of Mechanical Engineering that will help maintain and improve the competitive position of local defense-related companies.

Without adequate human capital, the Dallas/Fort Worth Metroplex cannot continue to be competitive in high-technology industries. Both engineering Ph.D. production and, commensurately, Federal research funding levels, must be raised in the Metroplex. The Metroplex shares of Federal academic engineering research funding and doctoral production are far below the proportions that one would expect from the Metroplex share of the U. S. population and the Metroplex contribution to the U. S. gross domestic product. In 2000, the state of Texas accounted for 7.4% of the U.S. population; the U.S. Census Bureau estimates that Texas will have 9.2% of the Nation’s population by 2030.\(^8\) Texas contributed 8.2% of the


\(^{8}\) [http://www.census.gov population/www/projections/stproj.html](http://www.census.gov population/www/projections/stproj.html)
U.S. GDP in 2008.\textsuperscript{9} However, despite excellence in the defense and medical sectors of its economy, Texas garners only 6.1\% of Federal academic engineering research funding.\textsuperscript{10} The shortfall in the DFW Metroplex is even greater. The DFW metropolitan area has slightly less than 2\% of the U.S. population\textsuperscript{11} and contributes 2.7\% of the U.S. GDP.\textsuperscript{12} However, the DFW area produces less than 0.8\% of the Nation's mechanical engineering Ph.D.s\textsuperscript{13} and less than 0.6\% of Federal academic engineering research funding.\textsuperscript{14} The Metroplex could see a factor of at least 3 increase in the production of mechanical engineering Ph.D.s and a factor of at least 4 increase in Federal engineering research funding. U. T. Dallas is in an excellent position to contribute to a significant reduction in this shortfall.

**Existing programs in Texas and the Nation**

According to the proceedings of the NSF workshop cited above, “The competitiveness of mechanical engineering research is dependent on the number of mechanical engineering Ph.D.s granted. ...between 1975 and 1995, the number of earned mechanical engineering Ph.D.s in the United States more than doubled due to increases in the number of doctorates awarded to both U. S. citizens and temporary residents. Over the past 10 years for which data are available (1995-2005), the number of earned mechanical engineering doctorates awarded each year has fluctuated, but overall remained above 800 doctorates awarded per year. At the same time, there was a significant decline in the number of doctorates awarded to U. S. citizens.”\textsuperscript{15} As noted above, many defense-sector companies in the Metroplex need U. S. citizen engineers.

Table 1 shows the number of U. S. citizen graduates and the total number of graduates for each of the existing mechanical engineering doctoral programs in Texas and selected programs elsewhere in the United States. The table shows that Texas universities lag well behind research universities elsewhere in the nation in terms of doctoral production in mechanical engineering, and that, at many institutions, fewer than half of the mechanical engineering doctoral graduates are U. S. citizens. Because Texas produces few doctoral graduates in mechanical engineering, and few of these are U. S. citizens, existing programs cannot meet the workforce need in the Dallas-Fort Worth Metroplex or the State of Texas.

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\textsuperscript{12} [http://www.bea.gov/newsreleases/regional/gdp_metro0909.xls](http://www.bea.gov/newsreleases/regional/gdp_metro0909.xls)


\textsuperscript{15} *Benchmarking the Competitiveness of the United States in Mechanical Engineering Basic Research*, Panel on Benchmarking the Research Competitiveness of the United States in Mechanical Engineering, National Research Council (2007), [http://www.nap.edu/catalog/12055.html](http://www.nap.edu/catalog/12055.html)
<table>
<thead>
<tr>
<th>Institution</th>
<th>2007–2008 PhDs in Mechanical Engineering</th>
<th>U. S. Citizens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice University</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Southern Methodist University</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Texas Tech University</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>University of Houston</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>The University of Texas at Arlington</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>The University of Texas at Austin</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>University of California, San Diego</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>University of California, Berkeley</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>40</td>
<td>16</td>
</tr>
<tr>
<td>Stanford University</td>
<td>36</td>
<td>17</td>
</tr>
<tr>
<td>MIT</td>
<td>52</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 1. Mechanical engineering doctoral graduates at Texas universities and selected universities in the Nation in 2007-2008.

Table 2 shows trends in doctoral production at Texas universities and selected universities in the Nation with well-established mechanical engineering programs for the four years preceding the year shown in Table 1. The data show a consistent shortfall in mechanical engineering doctoral production in Texas and the Metroplex. The number of Metroplex doctoral graduates in mechanical engineering fluctuated between 7 and 10 in the five-year period shown.
Relation to existing programs in Texas and the Metroplex

The Ph.D. program in Mechanical Engineering envisioned in this request will add to and complement existing programs in the Metroplex and the state. The U. T. Dallas emphasis and research thrusts in Mechanical Engineering will include MEMS and nanostructured materials, and, therefore, will ideally complement the program at U. T. Arlington. This will allow teams of researchers from both campuses to collaborate on proposals for Federal engineering research. Thus, duplication will be avoided and DFW students will have a broader base of expertise and opportunities from which to draw.

B. Student Demand – Provide short- and long-term evidence of demand for the program. Types of data commonly used include increased enrollment in related programs at the institution, high enrollment in similar programs at other institutions, qualified applicants rejected at similar programs in the state or nation, and student surveys.

Short-term demand

Undergraduate enrollment is a leading indicator of potential doctoral enrollment. Enrollment in the B.S.M.E. program at U. T. Dallas has expanded extremely rapidly since the program was authorized in July 2008. Despite the complete absence of print and Web advertising in the summer of 2008 for the new program, 11 students enrolled in August 2008. In the fall of 2009, undergraduate mechanical engineering enrollment was 135. Also, in the fall of 2009, more first-time freshmen chose mechanical engineering than electrical engineering. This local trend is aligned with a national trend towards higher undergraduate enrollment in mechanical engineering than in electrical engineering. For example, in 2008, the national full-time undergraduate enrollment in mechanical engineering was 85,249, versus 73,343 in electrical and computer engineering.\(^\text{18}\) National doctoral enrollment in mechanical engineering has also


risen steadily for the past three years, according to the American Society for Engineering Education.

In the fall of 2009, the Master’s enrollment in Mechanical Engineering at U. T. Dallas was 6. We expect this number to increase substantially after the Ph.D.M.E. program is approved.

Long-term demand

Enrollment in the most closely related doctoral programs at U. T. Dallas, Electrical Engineering and Materials Science and Engineering, has grown significantly since 2005, as shown in Table 3.19

<table>
<thead>
<tr>
<th>Year</th>
<th>Electrical Engineering</th>
<th>Materials Science &amp; Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>122</td>
<td>0</td>
</tr>
<tr>
<td>2006</td>
<td>128</td>
<td>5</td>
</tr>
<tr>
<td>2007</td>
<td>126</td>
<td>9</td>
</tr>
<tr>
<td>2008</td>
<td>145</td>
<td>18</td>
</tr>
</tbody>
</table>


Nationally, doctoral enrollment in mechanical engineering grew from 5,504 in 1999 to 7,273 in 2008. Enrollment growth was steady until 2004. Following an abrupt decline in 2005, mechanical engineering doctoral enrollment has resumed its pattern of steady growth.20

The supply of applicants to mechanical engineering doctoral programs comes partly from U. S. baccalaureate graduates in mechanical engineering, and partly from international baccalaureate graduates. In the United States, full-time undergraduate enrollment in mechanical engineering grew from 64,404 in 1999 to 85,249 in 2008.21 According to statistics compiled by the American Society for Engineering Education, undergraduate enrollment in mechanical engineering is now higher than for any other engineering discipline.22

C. Enrollment Projections – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. Provide an explanation of how headcount and FTSE numbers were determined.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Students23</td>
<td>8</td>
<td>15</td>
<td>21</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Cumulative Headcount</td>
<td>8</td>
<td>22</td>
<td>39</td>
<td>55</td>
<td>67</td>
</tr>
<tr>
<td>FTSE</td>
<td>7</td>
<td>20</td>
<td>35</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Attrition</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Graduates</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

19 http://profiles.asee.org/profiles/3984/screen/27?school_name=The+University+of+Texas+at+Dallas
22 The ASEE combines electrical and computer engineering when reporting undergraduate enrollments.
23 Includes both students who obtained B.S. or M.S. degrees at U. T. Dallas and students who are new to U. T. Dallas.
The number of full-time students was estimated as 90% of the headcount. It is expected that new faculty will bring extramural funding for full-time students.

The probable asymptotic mechanical engineering Ph.D. enrollment (FTSE = 72) was estimated by multiplying the 2008 doctoral enrollment in electrical and computer engineering (153 = 145 (EE) + 8 (CE)) by the national ratio of 2008 mechanical engineering doctoral enrollment to electrical and computer engineering doctoral enrollment (7,273/15,381 = 0.47).

For any given year, the headcount is equal to the previous year’s headcount, minus the sum of graduates and attrition, plus the number of new students.

The number of new students in each year was estimated from the number of new faculty, using the experience of the Electrical Engineering Department as a guide.

The mechanical engineering doctoral enrollment estimates arrived at by this process are almost certainly conservative, since they do not account for possible growth in Electrical Engineering and Materials Science & Engineering doctoral enrollments. Our Ph.D.M.E. enrollment estimates may be conservative for the additional reason that we have not taken into account a national trend of steady growth in mechanical engineering doctoral enrollment.
II. Resources

A. Degree Requirements – Use this table to show the degree requirements of the program. (Modify the table as needed. If necessary, replicate the table to show more than one option.)

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
<th>Clock Hours (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td>12</td>
<td>N/A</td>
</tr>
<tr>
<td>Free Electives</td>
<td>6</td>
<td>N/A</td>
</tr>
<tr>
<td>Dissertation</td>
<td>6 (minimum)</td>
<td>N/A</td>
</tr>
<tr>
<td>Other (Specify, e.g., internships, clinical work) Research in Mechanical Engineering</td>
<td>36 (minimum)</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL</td>
<td>75 (minimum)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

B. Curriculum

i. Describe the proposed educational objectives of the program.

The educational objective of the proposed doctoral program is to prepare talented doctoral students for careers in which they will create new technologies for thermal, fluidic and mechanical systems at all size scales. Because of the key enabling role of mechanical engineering in all areas of technology, the graduates of this program will be technical leaders in new and existing industry in Texas.

ii. Use these tables to identify the required courses and prescribed electives of the program. Note with an asterisk (*) courses that would be added if the program is approved. (Add and delete rows as needed. If applicable, replicate the tables for different tracks/options.)

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Required Courses</th>
<th>SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6301/</td>
<td>Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 6310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6305</td>
<td>CAD Technology</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6310</td>
<td>Intermediate Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6331</td>
<td>Systems and Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6340</td>
<td>Intermediate Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>MECH 8V70</td>
<td>Research in Mechanical Engineering (graded pass/fail)</td>
<td></td>
</tr>
<tr>
<td>*MECH 8V99</td>
<td>Dissertation (graded pass/fail)</td>
<td></td>
</tr>
</tbody>
</table>

The core organized courses (MECH 6301, 6305, 6310, 6331 and 6340) must be passed with a grade of B– (2.67) or better. A grade-point average of B (3.00) is required to remain in good standing.
As in the existing M.S.M.E. degree program, there will initially be two broad areas of concentration for the Ph.D.M.E.: MEMS and Mechanical Systems Engineering. The prescribed electives and free electives for both tracks are shown below. All of the prescribed and free elective courses already exist to support the M.S.M.E., M.S.E.E. and M.S.M.S.E. degree programs. Some courses with prefixes other than MECH may be taught by faculty who are not affiliated with the Mechanical Engineering Department.

Students must take four courses (for a total of 12 SCH) from one of the sets of prescribed electives tabulated below.

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Prescribed Elective Courses MEMS Track</th>
<th>SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH/EEGR 6382</td>
<td>Introduction to MEMS</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6302</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6315</td>
<td>Advanced Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6320</td>
<td>Conductive Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6321</td>
<td>Convective Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEMF/ MSEN 6322</td>
<td>Semiconductor Processing Technology</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEGR 6381</td>
<td>Numerical Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6385</td>
<td>Computational Modeling of Mechanical Systems (Prerequisite: MECH/EEGR 6381)</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5300</td>
<td>Introduction to Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5310</td>
<td>Thermodynamics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5340</td>
<td>Advanced Polymer Science and Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5353</td>
<td>Integrated Circuit Packaging</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 6330</td>
<td>Phase Transformations</td>
<td>3</td>
</tr>
<tr>
<td>MECH/MSEN 6361</td>
<td>Deformation Mechanisms in Solid Materials</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5377/ PHYS 5377</td>
<td>Computational Physics of Nanomaterials</td>
<td>3</td>
</tr>
<tr>
<td>MECH 7V80</td>
<td>Special Topics in Mechanical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Prefix and Number</td>
<td>Prescribed Elective Courses</td>
<td>SCH</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>MECH 6302</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6315</td>
<td>Advanced Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6320</td>
<td>Conductive Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6321</td>
<td>Convective Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEGR 6331</td>
<td>Systems and Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEGR 6332</td>
<td>Advanced Control (Prerequisite: MECH/EEGR 6331)</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEGR 6336</td>
<td>Nonlinear Control Systems (Prerequisite: MECH/EEGR 6331)</td>
<td>3</td>
</tr>
<tr>
<td>MECH/EEGR 6381</td>
<td>Numerical Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MECH 6385</td>
<td>Computational Modeling of Mechanical Systems (Prerequisite: MECH/EEGR 6381)</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 6330</td>
<td>Phase Transformations</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 6361</td>
<td>Deformation Mechanisms in Solid Materials</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 5377/PHYS 5377</td>
<td>Computational Physics of Nanomaterials</td>
<td>3</td>
</tr>
<tr>
<td>MECH 7V80</td>
<td>Special Topics in Mechanical Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Free Elective Courses</th>
<th>SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(various)</td>
<td>Free electives (subject to advisor’s approval)</td>
<td>6</td>
</tr>
</tbody>
</table>

It is apparent from the preceding tables that very strong synergies in the areas of material properties, MEMS and nanostructured materials already exist between the existing M.S.M.E. program and the graduate programs in Electrical Engineering and Materials Science & Engineering. These synergies will become even stronger and more fruitful if the proposed Ph.D.M.E. program is approved.
C. Faculty – Use these tables to provide information about Core and Support faculty. Add an asterisk (*) before the name of the individual who will have direct administrative responsibilities for the program. Add a pound symbol (#) before the name of any individual who has directed doctoral dissertations or master’s theses. Add and delete rows as needed. (Core Faculty: Full-time tenured and tenure-track faculty who teach 50 percent or more in the doctoral program or other individuals integral to the doctoral program who can direct dissertation research. Support Faculty: Other full-time or part-time faculty affiliated with the doctoral program.)

Core faculty in Mechanical Engineering are assigned 100% to the suite of Mechanical Engineering degree programs, with 33.3% assignments to each of the component degrees (B.S.M.E., M.S.M.E. and Ph.D.M.E.). This assignment updates the faculty time assignments presented in the B.S.M.E. and Ph.D.M.E. proposals. It is expected that each core Mechanical Engineering faculty member will supervise 4 to 5 Ph.D. students.

<table>
<thead>
<tr>
<th>Name of Core Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Ph.D. Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g.: Robertson, David Assoc. Prof</td>
<td>Ph.D. in Molecular Genetics</td>
<td>MG200, MG285, MG824 (Lab Only)</td>
<td>50%</td>
</tr>
<tr>
<td>#Matthew J. Goeckner, Prof.</td>
<td>Ph.D. in Physics, Univ. of Iowa, 1990</td>
<td>MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>#Hongbing Lu, Prof.</td>
<td>Ph.D. in Aeronautics, California Institute of Technology, 1997</td>
<td>MSEN 5340, MECH 6302, MECH/MSEN 6361</td>
<td>33.3%</td>
</tr>
<tr>
<td>*#Mario Rotea, Prof.</td>
<td>Ph.D. in Control Science and Dynamical Systems, Univ. of Minnesota, 1990</td>
<td>MECH 6331, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>#Mathukumalli Vidyasagar, Prof.</td>
<td>Ph.D. in Electrical Engineering, Univ. of Wisconsin (Madison), 1969</td>
<td>MECH 6332, MECH 6336, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Fatemeh Hassanipour, Asst. Prof.</td>
<td>Ph.D. in Mechanical Engineering, Southern Methodist University, 2009</td>
<td>MECH 6320, MECH 6321, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New Faculty for B.S./M.S. programs(^{24}) in Year 1</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6310, MECH 6315, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New Faculty for B.S./M.S. programs in Year 1</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6301, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New Faculty for B.S./M.S.</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6302, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

\(^{24}\) Faculty to be hired according to the plan in the proposals for the B.S.M.E. and M.S.M.E. degrees, which were authorized in July 2008.
<table>
<thead>
<tr>
<th>Programs in Year 1</th>
<th>Faculty for B.S./M.S. programs in Year 2</th>
<th>Ph.D. in Mechanical Engineering</th>
<th>MECH 6305, MECH 8V70, MECH 8V99</th>
<th>33.3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6361, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Faculty for B.S./M.S. programs in Year 2</td>
<td>Faculty for B.S./M.S. programs in Year 2</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6340, MECH 6385, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>PHYS 5377, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Faculty for B.S./M.S. programs in Year 3</td>
<td>Faculty for B.S./M.S. programs in Year 3</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH/ECE 6305, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6305, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Faculty for B.S./M.S. programs in Year 4</td>
<td>Faculty for B.S./M.S. programs in Year 4</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MSEN 5310, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 6310, MECH 6315, MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Faculty in Year 5</td>
<td>Faculty in Year 5</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Faculty in Year 5</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
<tr>
<td>Projected New</td>
<td>Projected New</td>
<td>Ph.D. in Mechanical Engineering</td>
<td>MECH 8V70, MECH 8V99</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Support faculty in Mechanical Engineering are assigned 50% to the suite of Mechanical Engineering degree programs, with 16.7% assignments to each of the component degrees (B.S.M.E., M.S.M.E. and Ph.D.M.E.). This assignment updates the faculty time assignments presented in the B.S.M.E. and Ph.D.M.E. proposals. It is expected that each support Mechanical Engineering faculty member will supervise 1 to 2 Ph.D. students.
<table>
<thead>
<tr>
<th>Name of Support Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses or Other Support Activity (e.g., Research Supervision) Assigned in Program</th>
<th>% Time Assigned To Ph.D. Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Andrew J. Blanchard, Prof.</td>
<td>Ph.D. in Electrical Engineering, Texas A&amp;M Univ., 1977</td>
<td>MECH 6301, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Cyrus D. Cantrell, Prof.</td>
<td>Ph.D. in Physics, Princeton Univ., 1968</td>
<td>MECH/EEGR 6381, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Yves J. Chabal, Prof.</td>
<td>Ph.D. in Physics, Cornell Univ., 1980</td>
<td>MSEN 5300, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Bruce E. Gnade, Prof.</td>
<td>Ph.D. in Nuclear Chemistry, Georgia Tech, 1982</td>
<td>MSEN 5340, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Moon J. Kim, Prof.</td>
<td>Ph.D. in Materials Science, Arizona State Univ., 1988</td>
<td>MSEN 5310, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Mark W. Spong, Prof.</td>
<td>D.Sc. in Systems, Science and Mathematics, Washington Univ., 1988</td>
<td>MECH 6336, MECH 7V80, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Robert M. Wallace, Prof.</td>
<td>Ph.D. in Physics, Univ. of Pittsburgh, 1988</td>
<td>MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>Gerald O. Burnham, Assoc. Prof.</td>
<td>Ph.D. in Electrical Engineering, Univ. of Southern California, 1973</td>
<td>MECH 6331</td>
<td>16.7%</td>
</tr>
<tr>
<td>Kyeongjae Cho, Assoc. Prof.</td>
<td>Ph.D. in Physics, MIT, 1994</td>
<td>MECH 6301/MSEN 6310, MSEN 5377/PHYS 5377, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Jiyoung Kim, Assoc. Prof.</td>
<td>Ph.D. in Materials Science &amp; Engineering, U. T. Austin, 1994</td>
<td>MSEN 6330, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>#Jeong-Bong Lee, Assoc. Prof.</td>
<td>Ph.D. in Electrical Engineering, Georgia Tech, 1997</td>
<td>MECH/EEGR 6382, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
<tr>
<td>Walter Hu, Asst. Prof.</td>
<td>Ph.D. in Electrical Engineering, Notre Dame, 2004</td>
<td>MECH/EEMF/MSEN 6322, MECH 8V70, MECH 8V99</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

D. **Student Recruitment** – Describe general recruitment efforts, including plans to recruit and retain students from underrepresented groups.

The historically underrepresented groups in engineering include African-Americans, Hispanic-Americans and women. The future of engineering jobs in Texas and the Nation depends on...
success in recruiting future engineers from these groups to replace expected retirements and enable growth in the number of engineers available to fill jobs in Texas and the U.S.

U. T. Dallas has historically graduated a higher proportion of women than the national average in both Electrical Engineering and Computer Science. For example, in 2006-2007, 28.9% of the students who earned Master's degrees in Electrical Engineering at U. T. Dallas were women; the national average is 19.9%. We attribute this relatively modest success to a welcoming culture and a strong system of support through student organizations such as the Society of Women Engineers. At the undergraduate level, U. T. Dallas has established a strong reputation in terms of recruitment and retention of minority students through the Academic Bridge Program under the leadership of Dean George Fair. Expanded post-enrollment support programs will be essential in maintaining a reputation that will encourage students from underrepresented groups to apply to U. T. Dallas.

Going forward, it is clear that no engineering school can afford to limit its efforts with respect to students from underrepresented groups to post-enrollment support and retention. U. T. Dallas will broaden and deepen its recruitment efforts for graduate students beyond our current Metroplex constituency to target baccalaureate graduates from Texas colleges and universities, especially historically minority institutions. The expanded recruitment effort will be staffed and operated in the Erik Jonsson School, working closely with the office of the recently hired Vice President for Enrollment Management and the Vice President for Diversity. As part of this initiative, the Texas Analog Center of Excellence (TxACE) has announced the TxACE/TI Diversity Fellowships to provide doctoral support to women and minorities pursuing the Ph.D. degree in analog electronics. U. T. Dallas' efforts to involve under-represented populations in mechanical engineering are in keeping with the initiative set forth in a position statement of the American Society of Mechanical Engineers.²⁵

E. Student Financial Assistance – Identify the number of full-time and part-time students who would be funded (e.g., teaching assistantships, research assistantships, scholarships, etc.) and the anticipated amount of the stipends for the first five years. (These costs should be reflected in the cost sheet as well.)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Assistantships # of students</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Amount per student</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
</tr>
<tr>
<td>Research Assistantships # of students</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Amount per student</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
<td>$24,972-$27,672 per year</td>
</tr>
<tr>
<td>Scholarships # of students</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Amount per student</td>
<td>$1,000 per year</td>
<td>$1000 per year</td>
<td>$1000 per year</td>
<td>$1000 per year</td>
<td>$1000 per year</td>
</tr>
</tbody>
</table>


U.T. Dallas Ph.D. Mechanical Engineering Request 17
F. **Admissions Standards** – Describe the institution’s general graduate admissions standards and the program-specific admissions standards for applicants of the program. If relevant, include policies for accepting students transferring from other graduate programs.

In order to be admitted to doctoral study at U. T. Dallas, an applicant must submit an application, Graduate Record Examination (GRE) scores, three letters of recommendation from individuals who are able to judge the applicant’s probable success in graduate school, a transcript of the work leading to the applicant’s baccalaureate degree, and, for applicants whose native language is not English and who have been educated outside the United States, an acceptable score on either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). At the time of enrollment, all test scores must be less than two years old. The University-wide minimum acceptable score on the TOEFL IBT for unconditional admission to graduate study is 80. Students with lower test scores will be considered, but are advised to improve their test scores and reapply.

In accord with Chapter 51, of the Texas Education Code, decisions on admission to degree-granting graduate programs at U. T. Dallas are based on holistic considerations of all information contained in the application material submitted, including academic, career and personal histories. Standardized test scores and coursework GPA levels cited in the catalog descriptions of some degree programs are listed for advisory purposes only, to indicate the typical achievement levels of students enrolled and succeeding in the various programs. No single quantitative or qualitative measure or any specific combination thereof, constitutes a definitive standard for admission. Rather, each application will be considered individually and each applicant’s complete profile of strengths and prospects for successful completion of the program will be evaluated.

The Graduate Admissions Committee of the Mechanical Engineering Department reviews all applications for graduate study in Mechanical Engineering. To be admitted as a doctoral student in the proposed program, an applicant will be required to meet the University-wide admission requirements noted above as well as the specific admission criteria of the Mechanical Engineering doctoral program. Adequate subject-matter preparation is necessary for graduate study; preparatory coursework may be required as a condition for continuing in the program beyond a time limit set by the Graduate Admissions Committee. Applicants to the proposed Ph.D. degree program in Mechanical Engineering will be required to meet standards equivalent to those currently required for admission to the Ph.D. degree programs in Electrical Engineering, Computer Engineering, Telecommunications Engineering, Computer Science and Biomedical Engineering. The requirements for unconditional admission to the Ph.D. degree program in Mechanical Engineering are a Bachelor of Science degree in Mechanical Engineering or a closely related field, a grade-point average of 3.5 (on a 4-point scale) in graduate course work, a GRE verbal + quantitative score of 1100, and, if applicable, the minimum TOEFL IBT score required by the University.

Students entering the Ph.D. program in Mechanical Engineering will be required to have a Bachelor of Science degree in Mechanical Engineering or a closely related field of study in engineering or science. Students whose preparation is deficient in some respects will be required to take leveling or prerequisite courses. A student may use at most three semester credit hours of 5000-level courses in this category towards meeting the graduation requirements for the PhD in Mechanical Engineering. This limitation does not apply to courses with 5xxx numbers that are not leveling courses. On the basis of previous experience with applicants for the doctoral degree program in Electrical Engineering, it is expected that most applicants for the PhD degree will be sufficiently well prepared in Mechanical Engineering or closely related fields that few students will be required to take more than 6 to 9 SCH to alleviate deficiencies.
G. Teaching Load – Indicate the targeted teaching load for core faculty supporting the program. 
(Teaching load: Total number of semester credit hours in organized teaching courses taught per academic year by core faculty divided by the number of core faculty in the prior year.)

The current teaching load of the identified faculty is a total of 3 courses per long academic year (Spring and Fall). Research-active faculty typically carry 1+2 or 2+1 in this time frame. Research-inactive faculty typically teach 4 courses per long academic year (2+2). In many cases existing faculty teach courses that have dual acceptance in several departments. Teaching assignments in these cases do not need to be altered. In the small number of cases where faculty teach courses instead of their normal home-department teaching load, credit is given for the course taught in the Mechanical Engineering degree program. Because several departments accept these courses, a variety of student majors will be represented in most of the classes. This will improve teaching efficiency by increasing class size, increasing the diversity of student interest and skill sets, and expanding the instructor’s ability to offer more technical diversity in the class.

H. Candidacy/Dissertation – If the program requires a dissertation, describe the process leading to candidacy and completion of the dissertation.

• 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 Master of Science degree in Mechanical Engineering (M.S.M.E.) must pass this exam within 3 long semesters, and a student entering without an M.S.M.E. must pass this exam within 4 long semesters. A student has at most two attempts at the QE. The QE will be given during the fall and spring semesters.
• A comprehensive examination 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 believes are necessary and appropriate to the student’s degree program.

I. Use of Distance Technologies – If applicable, describe the use of any distance technologies in the program.

The Erik Jonsson School of Engineering and Computer Science participated in a CS/EE online Master’s program offered through the U. T. TeleCampus, in collaboration with the University of Texas at Arlington, from 1999 until 2004. During that time period, fewer than 10 students enrolled in the CS/EE online program at UTD who were not already enrolled as on-campus students. While the CS/EE online program was convenient for students who had to travel during the semester, the program never paid for its own startup or operating costs. Similar results were achieved at U. T. Arlington. Therefore, the CS/EE online program was terminated by mutual agreement with U. T. Arlington in 2004.

Accordingly, there is currently no provision for the use of distance technologies in the Erik Jonsson School Ph.D. programs to the exclusion of in-person interactions. However, in cases in which temporary separations of the student and his/her advisor are unavoidable, distance technologies afford a valuable means for exchanging data, documents and verbal analyses.
J. **Library Resources** – Provide the library director’s assessment of both paper and electronic library resources for the program. Describe plans to build the library holdings to support the program.

Appendix G, prepared by the Dean of Libraries, Dr. Larry Sall, provides a detailed assessment of the paper and electronic holdings that support the Mechanical Engineering degree programs, and describes in detail plans to build the holdings to support the proposed doctoral program.

K. **Facilities and Equipment** – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvement or additions.

U. T. Dallas is in the midst of major campus construction, renovation and expansion through purchase or lease of adjacent facilities. Office space for up to 35 Mechanical Engineering faculty members and their graduate students will be made available through building renovations and expansions. The Founders Building, the oldest multistory academic and research building on campus, is being renovated to provide offices and classrooms for the Mathematics Department, which is currently housed in the Engineering North building. The vacated offices will be available for Mechanical Engineering faculty and graduate students. The Mathematics, Science and Engineering Teaching building, which is scheduled for completion by Fall 2010, will provide adequate lecture hall and undergraduate laboratory facilities in chemistry and physics to support the currently envisioned undergraduate enrollment growth in engineering. Parts of two commercial buildings adjacent to campus, one with high bay space, will be refitted as research and teaching laboratories for Mechanical Engineering.

Research laboratory equipment will be acquired as part of startup packages for new Mechanical Engineering faculty members. Existing laboratory facilities and equipment include the 192,000-ft² Natural Sciences and Engineering Research Laboratory, which contains a state-of-the-art clean room, a silicon process flow that is used to fabricate micro-electro-mechanical systems, and an ultrahigh-vacuum system for molecular-beam epitaxial growth and surface analysis.

L. **Accreditation** – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation. Accreditation in engineering disciplines is not performed at the doctoral level. The baccalaureate program in mechanical engineering will undergo accreditation review on the regular accreditation cycle for other engineering disciplines at U. T. Dallas.

The U. T. Dallas baccalaureate programs in Electrical Engineering, Telecommunications Engineering, Computer Engineering, Software Engineering and Computer Science are currently accredited by ABET (http://www.abet.org).

M. **Program Evaluation** – Describe how the program will be evaluated.

The procedures to be used for the institutional evaluation of the proposed program, as well as for all existing graduate programs, have been established by The University of Texas at Dallas and are described in Policy Memorandum 94-III.24-63 (Academic Program Review), which governs the periodic review of academic programs and charges the review team to provide an “assessment of the goals, plans, staffing, resources, existing and potential strengths, etc., of the unit, and those areas needing improvement.” The Office of the Executive Vice President and Provost maintains the schedule of reviews and works with the Program Review Committee (PRC) and the unit under review to facilitate the review. The process is peer review oriented and includes a review team that incorporates both internal and external members. In addition, there will be periodic internal evaluations, which will encompass job offerings, initial salary, institutional wide assessment, and supervisor satisfaction. U. T. Dallas has a rigorous process.
of program review and assessment that ensures that expected outcomes are clearly defined and measurable and are used for improving education. Each academic degree program as well as each academic certificate program at U. T. Dallas is assessed annually using U. T. Dallas’ online assessment tool, AT6. AT6 is a web-based solution to capture, manage, archive, and track academic and administrative assessment information for regional and disciplinary accreditation, program reviews, annual reporting, and program improvement.

N. Related and Supporting Programs – Use this table to list all undergraduate and graduate programs within the same 2-digit CIP code that would undergird the proposed program. Include enrollment, number of graduates, graduation rate, and average time to degree for the last five years. (Add and delete rows as needed.)

The following table does not list doctoral programs, since the information requested is available in the “18 characteristics” documents linked in Section II.P, below.

<table>
<thead>
<tr>
<th>Program</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS in Mechanical Engineering (New program in 2008)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrollment*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td># of Graduates</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Graduation Rate N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>BS in Electrical Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrollment*</td>
<td>709</td>
<td>712</td>
<td>717</td>
<td>620</td>
<td>584</td>
</tr>
<tr>
<td># of Graduates</td>
<td>114</td>
<td>118</td>
<td>132</td>
<td>132</td>
<td>106</td>
</tr>
<tr>
<td>Graduation Rate**</td>
<td>26.8%</td>
<td>23.8%</td>
<td>30.4%</td>
<td>33.0%</td>
<td>29.4%</td>
</tr>
<tr>
<td>BS in Computer Engineering (New program in 2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrollment*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td># of Graduates</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Graduation Rate**</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>BS in Telecommunications Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrollment*</td>
<td>108</td>
<td>69</td>
<td>72</td>
<td>64</td>
<td>46</td>
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<tr>
<td># of Graduates</td>
<td>13</td>
<td>3</td>
<td>12</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Graduation Rate**</td>
<td>11.8%</td>
<td>10.6%</td>
<td>6.8%</td>
<td>4.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>BS in Software Engineering (New program in 2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrollment*</td>
<td>132</td>
<td>145</td>
<td>150</td>
<td>139</td>
<td>165</td>
</tr>
<tr>
<td># of Graduates</td>
<td>17</td>
<td>12</td>
<td>26</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Graduation Rate**</td>
<td>N/A</td>
<td>N/A</td>
<td>0.0%</td>
<td>10.7%</td>
<td>13.6%</td>
</tr>
</tbody>
</table>

26 Academic years; e.g., "2004" means academic year 2004–2005.
27 Fall 2009 enrollment is 135. More than 470 applications were received for undergraduate admission in Mechanical Engineering.
<table>
<thead>
<tr>
<th>Program</th>
<th>Enrollment</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BS in Computer Science</strong></td>
<td>852</td>
<td>737</td>
<td>659</td>
<td>606</td>
<td>550</td>
<td></td>
</tr>
<tr>
<td># of Graduates</td>
<td>193</td>
<td>169</td>
<td>128</td>
<td>113</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Graduation Rate**</td>
<td>33.5%</td>
<td>26.7%</td>
<td>27.8%</td>
<td>30.6%</td>
<td>37.7%</td>
<td></td>
</tr>
<tr>
<td><strong>MS in Materials Science &amp; Engineering</strong></td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>13</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>(New program in 2006)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td># of Graduates</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>MS in Mechanical Engineering</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0^28</td>
<td></td>
</tr>
<tr>
<td>(New program in 2008)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td># of Graduates</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>MS in Biomedical Engineering</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>(new program, authorized 10/09)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td># of Graduates</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

*Source: CBM001 for Fall of respective years. Majors having the same CIP codes were delineated on the basis of short major in the Student Master. Post-baccalaureate students were excluded.

**Six-year graduation rate, computed using the number of graduates in the major from the initial FTIC cohort who declared the major shown (for example, declared EE and graduated in EE).

^28 Fall 2009 enrollment is 6. The M.S.M.E. enrollment is expected to rise after authorization of the Ph.D.M.E. program.

U.T. Dallas Ph.D. Mechanical Engineering Request
O. Graduation Rates – Use this table to show the institution’s total number of graduates and comprehensive graduation rates from undergraduate and graduate programs in each of the last five years.

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Undergraduate Programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Graduates*</td>
<td>2010</td>
<td>2145</td>
<td>2337</td>
<td>2303</td>
<td>2303</td>
</tr>
<tr>
<td>4-year Graduation Rate:</td>
<td>30.07%</td>
<td>35.45%</td>
<td>41.25%</td>
<td>39.42%</td>
<td>38.85%</td>
</tr>
<tr>
<td>(cohort year)</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
<td>2004</td>
<td>2005</td>
</tr>
<tr>
<td>6-year Graduation Rate:</td>
<td>55.98%</td>
<td>53.81%</td>
<td>55.29%</td>
<td>58.41%</td>
<td>61.41%</td>
</tr>
<tr>
<td>(cohort year)</td>
<td>1999</td>
<td>2000</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td>All Masters Programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Graduates**</td>
<td>1403</td>
<td>1429</td>
<td>1355</td>
<td>1436</td>
<td>1560</td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>62.6%</td>
<td>66.4%</td>
<td>63.3%</td>
<td>60.0%</td>
<td>55.1%</td>
</tr>
<tr>
<td>(cohort year)</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
<td>2004</td>
<td>2005</td>
</tr>
<tr>
<td>All Doctoral Programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Graduates***</td>
<td>126</td>
<td>124</td>
<td>139</td>
<td>119</td>
<td>124</td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>30.5%</td>
<td>30.2%</td>
<td>38.9%</td>
<td>42.6%</td>
<td>36.7%</td>
</tr>
<tr>
<td>(cohort year)</td>
<td>1999</td>
<td>2000</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
</tr>
</tbody>
</table>

Explanations:
*The number of graduates is the number of students who received a degree (not the number of degrees granted)
**The Master’s graduation rate was calculated as the percent of students who entered as Master’s students and received either a Master’s or a doctoral degree in 4 years or less.
***The doctoral graduation rate was calculated as the percent of students who entered at the doctoral level and completed a doctoral degree in 6 years or less.

Source of data: University of Texas at Dallas, Office of Strategic Planning and Analysis

P. Existing Doctoral Programs – (a) Provide the web link(s) for the 18 Characteristics of Doctoral Programs for each of the institution’s existing doctoral programs. (b) Describe how the data represent the current quality of the institution’s existing doctoral programs. (c) Describe how existing, closely related doctoral programs would enhance and complement the proposed program.

(a) For the Erik Jonsson School of Engineering and Computer Science: [http://www.utdallas.edu/dept/eecs/academics/THECB/thecb.html](http://www.utdallas.edu/dept/eecs/academics/THECB/thecb.html)
For the School of Management: [http://som.utdallas.edu/graduate/phd/docPrograms.php](http://som.utdallas.edu/graduate/phd/docPrograms.php)
For the School of Natural Sciences and Mathematics: [http://www.utdallas.edu/nsm/prospective/characteristics.html](http://www.utdallas.edu/nsm/prospective/characteristics.html)
For the School of Behavioral and Brain Sciences: [http://bbs.utdallas.edu/students/graduate/thecb.html](http://bbs.utdallas.edu/students/graduate/thecb.html)

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29 Academic years; e.g., “2004” means academic year 2004–2005.
For the School of Arts and Humanities:
http://www.utdallas.edu/ah/programs/graduate/18%20CHARACTERISTICS.pdf

For the School of Economic, Political and Policy Sciences:
http://epps.utdallas.edu/eco/18-Point-Characteristics.html
http://epps.utdallas.edu/crim/18-Point-Characteristics.html
http://epps.utdallas.edu/polsci/18-Point-Characteristics.html
http://epps.utdallas.edu/pa/18-Point-Characteristics.html
http://epps.utdallas.edu/eco/18-Point-Characteristics.html
http://epps.utdallas.edu/pppe/18-Point-Characteristics.html

(b) The data linked in part (a) show that, across the University, nearly all doctoral programs
are producing an adequate number of graduates, graduation rates are high, publications are
strong, and the faculty record of funding is strong in fields in which extramural funding is
available.

(c) The Ph.D. level authority requested here will significantly enrich the educational
opportunities for Jonsson School students at all levels by providing a broad, multidisciplinary
experience. The envisioned emphasis on a modern micro-mechanical and nano-materials
foundation in the proposed Mechanical Engineering Ph.D. program will complement and build
on strength in these areas in the existing graduate programs in electrical engineering,
chemistry and physics. New Mechanical Engineering faculty with expertise in heat transfer will
significantly strengthen the existing academic and research programs in Electrical and
Computer Engineering, because thermal issues are key system-level problems in modern
microelectronics and digital systems. The addition of Mechanical Engineering faculty with
expertise in computational modeling will create synergy with the Computer Science
Department, in accordance with the recommendations made by a distinguished review panel
in a 2007 study of the graduate programs in Computer Science and Software Engineering at
U. T. Dallas.

Also, many synergies will develop with the newly approved doctoral program in Biomedical
Engineering, especially in the areas of MEMS, novel materials, biological robotics and
biomechanics. Research collaborations and shared supervision of doctoral students between
faculty from the Departments of Mechanical Engineering, Electrical Engineering, and Materials
Science & Engineering, and the newly approved Ph.D. program in Biomedical Engineering, will
substantially increase the likelihood of success on large, multi-investigator proposals for
leading-edge research in high-impact areas.

Q. Describe how the proposed doctoral program fits into the institution’s overall strategic plan,
and provide the Web link to the institution’s strategic plan.

The U. T. Dallas strategic plan30 provides for several strategic initiatives, one of which, titled
“Discovering Tomorrow’s Inventions Today”, includes the Project Emmitt research enterprise
initiative for the Erik Jonsson School, and calls for major investments in nanotechnology and
biology-related areas, including biomedical engineering. As noted elsewhere in this proposal,
the Ph.D. program in Mechanical Engineering, in collaboration with the University of Texas
Southwestern Medical Center at Dallas, will be highly synergistic with the recently approved
Ph.D. program in Biomedical Engineering. Also, the research emphasis in the proposed
Mechanical Engineering doctoral program on mechanical, thermal and fluidic systems at small
size scales is required in order to implement the nanotechnology research vision outlined in
the University’s strategic plan.

30 http://www.utdallas.edu/strategicplan/
The proposed Mechanical Engineering doctoral program will contribute strongly to four of the eight strategic imperatives identified in the University’s strategic plan:

1. **Build faculty size.** The University cannot become a top research university without a faculty of adequate size. The numerical indices used to rank universities, such as total research funding, scale with faculty size.

2. **Add 5,000 new students.** As noted elsewhere in this proposal, the U. S. Census Bureau expects the population of Texas to grow by nearly 50% from 2006 to 2030. The State’s universities, and especially engineering schools, need to grow in order to accommodate the needs of both industry and the citizens of Texas.

3. **More than double external research funding.** To achieve this goal, the University must add doctoral programs in research-intensive areas, such as mechanical engineering.

4. **Increase the number of Ph.D.s awarded.** Currently U. T. Dallas graduates approximately 100 Ph.D.s per year. The proposed Ph.D. program in Mechanical Engineering, when fully grown, will increase this number by at least 10% to 15%.
III. Costs and Funding

Five-Year Costs and Funding Sources – On the attached forms, provide estimates of new costs to the institution related to the proposed program and provide information regarding sources of the funding that would defray those costs.

WORK IN PROGRESS

IV. Required Appendices

A. Course Descriptions and Prescribed Sequence of Courses, if Applicable
B. Curricula Vitae for Core Faculty
C. Curricula Vitae for Support Faculty
D. Five-Year Faculty Recruitment Plan/Hiring Schedule
E. Institution’s Policy on Faculty Teaching Load
F. Itemized List of Capital Equipment\(^\text{31}\) Purchases during the past five years
G. Librarian’s Statement of Adequate Resources

V. Recommended Appendices (as applicable)

H. List of Specific Clinical or In-Service Sites to Support the Program
I. Letters of Support

\(^{31}\) “Equipment” has the meaning established in the Texas Administrative Code as items and components whose cost are over $5,000 and have a useful life of at least one year. (See TAC §252.7(3))
Appendix A. Course Descriptions

Mechanical Engineering Course Descriptions

MECH 6301 (Same As MSEN 6310) Mechanical Properties of Materials (3 semester hours) Phenomenology of mechanical behavior of materials at the macroscopic level and the relationship of mechanical behavior to material structure and mechanisms of deformation and failure. Topics covered include elasticity, viscoelasticity, plasticity, creep, fracture, and fatigue. Prerequisite: MECH 3301 or equivalent. (3-0) Y

MECH 6302 Dynamics of Complex Structures (3 semester hours) Design, development, manufacturing and analysis of large, complex mechanical systems. Prerequisite: MECH 3302 or equivalent. (3-0) Y

MECH 6305 CAD Technology (3 semester hours) Introduction to computer-aided design. Principles of geometrical modeling. Curve and surface fitting in an automated environment. CAD/CAM simulation of manufacturing. Computer-aided solid modeling. Prerequisites: MECH 3305 or equivalent. (3-0) Y

MECH 6310 Intermediate Fluid Mechanics (3 semester hours) Ideal fluid flow including potential flow theory. Computer solutions in ideal fluid flow. Viscous flow and boundary layer theory. Introduction to turbulence. Prerequisite: MECH 3310 or equivalent. (3-0) Y

MECH 6315 Advanced Fluid Mechanics (3 semester hours) A mechanically and mathematically sophisticated introduction to the fundamentals of fluid mechanics. This course is intended to provide the beginning graduate student with a broad background in the fundamentals of fluid mechanics and an introduction to the various flow regimes. After completing this course, the student should be prepared to take subsequent courses in a broad range of engineering disciplines, such as mechanical, bioengineering, aerospace, and civil engineering. Derivation of the governing equations of motion. An introduction to viscous, inviscid, turbulent, and boundary-layer flows. Prerequisite: MECH 3310 or equivalent. (3-0) T

MECH 6320 Conductive Heat Transfer (3 semester hours) Introduction to fundamentals of conductive heat transfer with an emphasis on numerical and analytical solutions. Steady and transient onedimensional thermal conduction. Emphasis on analytical methods, numerical techniques and approximate solutions. Prerequisite: MECH 3320 or equivalent. (3-0) T

MECH 6321 Convective Heat Transfer (3 semester hours) A rigorous and advanced development of the fundamentals of convective heat transfer and its applications. Convection (forced and free) in laminar and turbulent, internal and external flows. Analogy between momentum and heat transfer. Scaling laws and modeling. Prerequisite: MECH 3320 or equivalent. (3-0) T

MECH 6322 (EEMF 6322, MSEN 6322) Semiconductor Processing Technology (3 semester hours) Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

MECH 6331 Systems and Control Theory (3 semester hours) Systems and control theory: state space, convolution integrals, transfer functions, stability, controllability, observability, and feedback. Prerequisites: MECH 2300 and MECH 4310 or equivalents. (3-0) Y

MECH 6332 (EEGR 6332) Advanced Control (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: MECH/EE 6331. (3-0) R

MECH 6336 (EEGR 6336) Nonlinear Control Systems (3 semester hours) Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: MECH/EE 6331. (3-0) R


MECH 6361 (MSEN 6361) Deformation Mechanisms in Solid Materials (3 semester hours) Linear elastic fracture mechanics, elastic-plastic fracture mechanics, time dependent failure, creep and fatigue, experimental analysis of fracture, fracture and failure of metals, ceramics, polymers and composites. Failure analysis related to material, product design, manufacturing and product application. Prerequisite: MECH 6301. (3-0) T

MECH 6381 (EEGR 6381) Numerical Methods In Engineering (3 semester hours) Numerical techniques in engineering and their applications, with an emphasis on practical implementation. Topics will include some or all of the following: numerical methods of linear algebra, interpolation, solution of nonlinear equations, numerical integration, Monte Carlo methods, numerical solution of ordinary and partial differential equations, and numerical solution of integral equations. Prerequisites: CE/EE/MECH 2300 and CE/EE/MECH 3300 or equivalents, and knowledge of a scientific programming language. (3-0) T
MECH 6382 (EEMF 6382) Introduction to MEMS (3 semester hours) Study of micro-electro-mechanical devices and systems and their applications. Microfabrication techniques and other emerging fabrication processes for MEMS are studied along with their process physics. Principles of operations of various MEMS devices such as mechanical, optical, thermal, magnetic, chemical/biological sensors/actuators are studied. Topics include: bulk/surface micromachining, LIGA, microsensors and microactuators in multi-physics domain. (3-0) T

MECH 6385 Computational Modeling of Mechanical Systems (3 semester hours) Modeling of mechanisms, thermal systems and fluid flow using the finite-element method. Prerequisite: MECH 6381 or equivalent. (3-0) T

MECH 6V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

MECH 7V40 Special Topics In Mechanical Engineering (1-6 semester hours) (May be repeated to a maximum of 9 hours.) For letter grade credit only. ([1-6]-0) S

MECH 8V70 Research In Mechanical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

Materials Science and Engineering Course Descriptions

MSEN 5300 (PHYS 5376) Introduction to Materials Science and Engineering (3 semester hours) This course provides an intensive overview of materials science and engineering and includes the foundations required for further graduate study in the field. Topics include atomic structure, crystalline solids, defects, failure mechanisms, phase diagrams and transformations, metal alloys, ceramics, polymers as well as their thermal, electrical, magnetic and optical properties. (3-0) R

MSEN 5310 Thermodynamics of Materials (3 semester hours) Fundamental laws of thermodynamics, theory of solution, thermodynamic identities and their uses, chemical reactions, phase equilibria. Electrochemistry. Thermodynamics of modern materials, kinetics. (3-0) R

MSEN 5340 Advanced Polymer Science and Engineering (3 semester hours) Polymer structure-property relations. Linear and nonlinear viscoelasticity. Dynamic mechanical analysis, time-temperature superposition, creep and stress relaxation. Mechanical models for prediction of polymer deformation, rubber elasticity, environmental effects on polymer deformation, instrumentation for prediction of long term properties. (3-0) R

MSEN 5377 (PHYS 5377) Computational Physics of Nanomaterials (3 semester hours) This course introduces atomistic and quantum simulation methods and their applications to modeling study nanomaterials (nanoparticles, nanowires, and thin films). The course has three main parts: basic theory of materials (thermodynamics, statistical mechanics, and solid state physics), computational methods to model materials systems, and applications to practical problems. There are three main themes of the course: structure-property relationship of nanomaterials; atomistic modeling for atomic structure optimization; and quantum simulations for electronic structure study and functional property analysis. (3-0) R

MSEN 6330 Phase Transformations (3 semester hours) Thermodynamic, diffusion processes, kinetic, and structural aspects of metallic phase transformations: surface energy and interfaces, solidification, diffusionless phase transformation, mechanisms and rate-determining factors in oxidation and thin film deposition; nucleation theory, precipitations from solid solution, order-disorder phenomena, and applications of phase diagrams. (3-0) R
Appendix B. Curricula Vitae for Core Faculty
Appendix C. Curricula Vitae for Support Faculty
Appendix D. Five-Year Faculty Recruitment Plan/Hiring Schedule

In engineering, excellence is a strong function of program size and reputation. Hence, the highest priority for FY’10 is to hire high-quality faculty, especially at the senior and mid-career level.

As of Fall 2009, nearly 150 students are enrolled in the B.S.M.E. and M.S.M.E. mechanical engineering. The department currently has four tenured-system faculty members, including a department head and an associate department head. The goal in FY’10 is to add six to eight faculty members. The search is open rank, but the emphasis is in hiring senior and mid-career faculty to anchor core areas of mechanical engineering.

Four core disciplinary areas are essential for developing the mechanical engineering program. In alphabetical order, these areas are:
- Controls & Dynamical Systems
- Design & Manufacturing
- Mechanics & Materials
- Thermodynamics & Fluids

These core disciplinary areas are essential for developing the BS, MS, and PhD programs in mechanical engineering. The four core disciplinary areas also provide the foundation for building strong interdisciplinary research programs within the department, the school, and the university. From this perspective, the FY’10 plan will emphasize the hiring of faculty with research interest in the following areas:
- Energy conversion and harvesting
- Energy utilization and thermal management
- Mechatronics, robotics, and cyber-physical systems
- Micro & nanotechnology systems and processes (e.g., MEMS, NEMS, micro-fluidics)

The pyramid in the figure illustrates how core mechanical engineering disciplines provide the foundation to build interdisciplinary research programs to address societal needs in energy and healthcare. This initial vision for the department will be revised as we hire faculty, and begin to interact with other faculty in the Jonsson School and the campus.
Hiring goals for subsequent years are flexible; numerical goals will be determined on the basis of actual and projected student enrollment growth. To provide for the student enrollment growth projected for 2015 in the full suite of Mechanical Engineering degree programs, the Mechanical Engineering Department will need to hire at least 30 full-time tenure-system faculty members in addition to the five core faculty who are currently in the department. This goal can be met by hiring an average of six T/T faculty members each year until 2015.

The annual search process begins with a determination of needs by the Dean and the Mechanical Engineering Department Head. The department generates a proposed search plan and search committee. After the Provost approves the plan and the committee membership, the committee places print and Web advertisements, and contacts department heads and senior faculty outside U. T. Dallas. The Dean and the Department Head, with the support of the search committee and other faculty, pro-actively recruit faculty candidates. The search committee meets biweekly to review all applications and recommend candidates for interviews.

The interview process normally takes 1-1/2 days. The candidate meets with the Provost, the Dean, the Department Head, students, and key faculty, presents a seminar, and tours the area around U. T. Dallas, possibly meeting with real estate agents. The search committee collects all responses from individuals who interviewed the candidate, and determines whether to recommend making an offer, and, if so, at what level. The Dean and Department Head negotiate with candidates to whom offers will be made with respect to the parameters of the offers.

If an offer is for a senior faculty position, the tenured departmental faculty vote whether to offer tenure to the candidate. If the vote is positive, the candidate’s file, including outside letters of recommendation, is forwarded to the Dean’s office, where an evaluative letter is prepared for the Provost and President with a recommendation on tenure and the parameters of the offer. The Dean’s letter and the candidate’s file are then forwarded to the Provost’s office, where the University-wide Committee on Qualifications of Academic Personnel reviews the file and votes on a recommendation to the President with respect to tenure. Following the President’s decision, the final offer is tendered in a letter from the Provost to the candidate.

Policy Memorandum 81-III.22-41 describes the U. T. Dallas policies and procedures for initial tenure-system faculty appointments.
Appendix E. Institution’s Policy on Faculty Teaching Load

The policy of The University of Texas at Dallas on minimum faculty workload\(^{32}\) provides that faculty on 100% faculty salary appointments must teach at least 3 SCH of organized undergraduate courses per year, and a minimum of 6 SCH of organized courses per semester. The policy also provides that faculty on 100% faculty salary appointments must teach the equivalent of at least 18 undergraduate SCH per 9-month academic year. In 2004 the Provost of U. T. Dallas authorized special provisions in the workload policy to help the Erik Jonsson School achieve first-tier status with respect to research and doctoral education. The Jonsson School policy provides that every faculty member who teaches at least 24 SCH of doctoral research during the 9-month academic year, or 33 SCH of doctoral research during the calendar year, will be able to teach a total of 9 SCH of graduate and undergraduate courses distributed over the academic year. The requirement of teaching at least one 3-SCH undergraduate course per academic year continues to apply to Jonsson School faculty. In addition, the School's workload policy provides that faculty can use contract and grant funds to buy out their teaching obligation down to 6 SCH per 9-month academic year, but not less.

\(^{32}\) [http://provost.utdallas.edu/policy/utdpp1060](http://provost.utdallas.edu/policy/utdpp1060)
Appendix F. Itemized List of Capital Equipment Purchases During the Past Five Years

The capital equipment that was purchased for the Mechanical Engineering core faculty during the past five years, and that may be used in the Mechanical Engineering doctoral program, is shown in the following table.

2008–09: Major rebuild of Val-Tech scientific vacuum pump (M. Goeckner laboratory): $6,205
Appendix G. Librarian’s Statement of Adequate Resources

Collection Assessment for MECHANICAL ENGINEERING
University of Texas at Dallas Libraries
November 2009

1. List any library holdings added in the past three years in anticipation of the program

In 2007, McDermott Library librarians compared our resources in mechanical engineering to those owned by UT Arlington and Texas A&M University libraries. At the time, both of those institutions supported a PhD program in Mechanical Engineering. We calculated that the library needed to add approximately 50 titles per year in order to compare satisfactorily with those two institutions.

In 2007 Texas A&M University Libraries held 6,851 titles in mechanical engineering. In 2009, it had 7,232 titles, an increase of 381 titles, an increase of 5.6%. In 2007, UT Arlington Libraries held 1,941 titles in mechanical engineering. In 2009, it had 2,135 titles, an increase of 194 titles, a 10% increase. In 2007, UT Dallas Libraries held 919 titles in mechanical engineering. In 2009, it had 1,286, an increase of 357 titles, an increase of 39.9%.

McDermott Library at the University of Texas at Dallas has made significant improvements in the availability of resources in support of mechanical engineering. The Library will continue to improve its collections while increasing the acquisition of graduate and professional level materials. Approximately 20 additional titles will be added annually. The average cost of titles in mechanical engineering is $132.01 for 2009.

2. Describe library holdings specifically relevant to the proposed program, noting strengths and weaknesses. If there are guidelines for the discipline, do current holdings meet or exceed standards? Describe planned actions that would maintain strengths and/or remedy weaknesses.

JOURNALS. A number of resources were used by the subject librarians to analyze the journal collection in mechanical engineering. The librarians used Ulrich’s Web and the Journal Citation Reports from ISI.

The Journal Citation Reports considers 105 mechanical engineering journals as most relevant in the subject. UT Libraries evaluated the top 50 titles whose ISI Impact Factor ranged between 8.000 and 0.740. At present, the UTD has coverage in whole or in part for 49 (98%) of the top 50 academic/scholarly journals in mechanical engineering. In particular, the Library subscribes to the journals of the American Society of Mechanical Engineers.

In the last 3 years, the Library purchased 4 new journal titles in addition to the journals of the American Society of Mechanical Engineers. The 2009 costs for these resources was $15,427 for 2009.

The Library does not recommend purchasing any additional subscriptions at this time. Rather, the Library recommends purchasing missing or incomplete titles when Interlibrary Loan requests for them exceed the copyright charge. We suggest reevaluating the Interlibrary Loan statistics for requests of articles from mechanical engineering journals two years after the PhD program commences to see if demand warrants any additional purchases of journal subscriptions.

ARTICLE DATABASES. Research suggests that the UT Dallas Libraries have superior database coverage for reviewing the scholarly literature in mechanical engineering and general technology. The Library maintains subscriptions to Web of Science (Science Citation Index), IEEE Xplore, INSPEC, SCOPUS, Compendex (Engineering Village), and ProceedingsFirst. Within the last three years, the Library added ASME Digital Library to its roster of databases, which bolstered access to electronic journals relevant to mechanical engineers by another 24 titles. No additional purchases are recommended at this time.

BOOKS. The University of Texas at Dallas book collections were reviewed using two different approaches: searching library catalogs by subject across three institutions and analyzing possible titles which could have been acquired through Blackwell, a library resources vendor.
The Engineering and Computer Science Librarians reviewed the book collections in the field of mechanical engineering for two institutions granting a doctorate (UT Arlington and Texas A&M University). The decision to compare these two institutions was based on the quality of their degree programs. The collections were compared to see what titles might be needed for the proposed degree plan and the number and cost of titles necessary to support future research.

The librarians compared the book collection for the all years and then analyzed the period from 2004-2009 more closely. For all years, a search of the McDermott Library catalog for “mechanical engineering” yielded 1,286 titles. The same search of UT Arlington’s library collections yielded 2,135 titles, 34% larger than the collection at UT Dallas. The same search of Texas A&M University’s library collections yielded 7,232 titles, a difference of 462%.

A search of the McDermott Library catalog for “mechanical engineering” for the years 2004-2009 yielded 160 titles. The same search at UT Arlington yielded 388. For Texas A & M University, the search yielded 896 titles.

The University of Texas at Arlington purchases an average of 50 titles per year, and Texas A & M University purchases an average of 179 titles. After carefully considering the purchasing habits of UT Arlington and Texas A&M, the Librarians recommend that the Library commit to purchasing 70 titles per year including 20 titles at the professional or graduate level.

SUMMARY. The Library has strong journal and superior database coverage in mechanical engineering. We do not recommend any new purchases in either of these areas at this time.

The Library has adequate coverage in book materials based on a comparison with two peer institutions (University of Texas Arlington and Texas A & M University) offering doctoral degrees in mechanical engineering. McDermott Library at the University of Texas at Dallas has increased its mechanical engineering collection in this subject by 39.9% since 2007.

Overall, the mechanical engineering collection would benefit from increased spending during the first 3 years of the program to meet or exceed the needs of graduate and faculty research:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 additional journals</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>20 additional books per year ($2640.20)</td>
<td>$7,920</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$7,920</strong></td>
</tr>
</tbody>
</table>

3. Describe cooperative library arrangements that would be available to students in this program.

The Libraries of the University of Texas at Dallas are active participants in Interlibrary Loan Services as administered by Amigos-OCLC. As a participant, the Library can borrow materials from other libraries willing to loan their items. In general, the Library can borrow most items for a user for a period of 3 weeks. In addition, the Library provides articles from journals not owned. The article is delivered electronically to an email address.

Secondly, the Library subscribes to thousands of electronic resources through cooperative agreements including the UT System, TexShare (Texas State Library and Archives), Amigos (the OCLC component for Texas libraries), and the local Phoenix Library Consortium.

4. Provide Library Director’s assessment of library resources necessary for the proposed program.

Thanks in large part to the University’s participation in the University of Texas System library consortium we are very well positioned in terms of journals in mechanical engineering. Our plan to base future journal subscriptions on demonstrated need is the most prudent fiscal course at this time. The addition of approximately 70 new titles per year in the field should pose no major problem to the library budget. Mechanical Engineering is already generating strong enrollment with greater potential, so that growth in enrollment should provide the funds necessary to supplement the library’s collection in that field.
Appendix H. List of Specific Clinical or In-Service Sites to Support the Program

(Not applicable)
Appendix I. Letters of Support

IN PROGRESS
Signature Page

1. Adequacy of Funding – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.

   __________________________  __________________________
   Chief Executive Officer       Date

2. Board of Regents Approval – A member of the Board of Regents or designee shall sign the following statement:

   On behalf of the Board of Regents, I certify that the Board of Regents has approved the program.

   __________________________  __________________________
   Board of Regents (Designee)   Date of Approval

3. Board of Regents Certification of Criteria for Commissioner or Assistant Commissioner Approval – For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the criteria under Texas Administrative Code (TAC) Section 5.50 (b) and (c). The criteria are:

   TAC §5.50(b):
   (1) be within the institution’s current Table of Programs;
   (2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
   (3) have sufficient clinical or in-service sites, if applicable, to support the program;
   (4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
   (5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
   (6) not unnecessarily duplicate existing programs at other institutions;
   (7) not be dependent on future Special Item funding;
   (8) have new five-year costs that would not exceed $2 million;

   TAC §5.50 (c)
   (1-2) be in a closely related discipline to an already existing doctoral program(s) which is productive and of high quality;
   (3) have core faculty that are already active and productive in an existing doctoral program;
   (4) have received no objections from other institutions during the 30-day comment period; and
   (5) have a strong link with workforce needs or the economic development of the state.

   On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (a and b).

   __________________________  __________________________
   Board of Regents (Designee)   Date
Please indicate with an X if your department catalog copy has no changes ______

SCHOOL_BBS_____________________

DEPARTMENT_ACN______________

BASIS FOR CATALOG CHANGES:
Reduce 7000 level courses to 6000 level courses

NEW PROGRAMS/DEGREES/CERTIFICATES

________________________________________

________________________________________

Course numbering and changes in credit hour changes should be reflected in the two categories below.
NEW COURSES ADDED: ACN 6316, ACN 6319, ACN 7324, ACN 6331, ACN 6339, ACN 6368
CHANGED IN COURSE NUMBERING: ACN 7344 (to ACN 6344), ACN 7322 (to ACN 6322)

COURSES DELETED:
CHANGES IN COURSE NUMBERING: ACN 7344 (to ACN 6344), ACN 7322 (to ACN 6322)

OTHER__________________________________________________________________
Course Descriptions

**BIOL 5376 Applied Bioinformatics** (3 semester hours) Genomic information content; database searches; pairwise and multiple sequence alignment; mutations and distance-based phylogenetic analysis; genomics and gene recognition; genetic polymorphisms and forensic applications; nucleic-acid and protein array analysis; structure prediction of biological macromolecules. Lectures are augmented with laboratory exercises and demonstrations. Introductory statistics and 2 semesters of calculus required. (3-0) Y

**CS 6325 Introduction to Bioinformatics** (3 semester hours) This course aims to introduce graduate students to the new field of bioinformatics. This area has arisen from the needs of biologists to utilize and help interpret the vast amounts of data that are constantly being gathered in biomedical research. This course provides an overview of the basic concepts in molecular cell biology and molecular genetics, outlines the nature of the existing data, and describes the kind of computer algorithms and techniques that are necessary to understand biomedical data. Prerequisite: CS5343 Data Structure or permission of instructor (3-0) Y

**BIOL 5381 Genomics** (3 semester hours) The fundamentals of how the human genome sequence was acquired and the impact of the human genome era on biomedical research, medical care and genetic testing will be explored. New tools such as DNA microarray, realtime PCR, mass spectrometry and data mining using bioinformatics will be covered. (3-0) Y

**BIOL 6373 Proteomics** (3 semester hours) Protein identification, sequencing, analysis of post-translational modifications, understanding protein interactions, and changes in content by mass spectrometry; and determination of function using protein chip microarrays. (3-0) Y

**BIOL 6384 Biotechnology Laboratory** (3 semester hours) Laboratory instruction in LC/MS/MS mass spectral analysis of protein sequence, ICAT (isotope coded affinity tag) reagents, and MS analysis of cellular proteomes, PCR and DNA Sequencing, and DNA microarray analysis; fluorescence and confocal microscopy and fluorescence activated cell sorting. Instructor may require students to demonstrate adequate laboratory skills in order to enroll. (1-2) Y

**Electives**

A sampling of electives available to students in the Biotechnology M.S. program follows:

- **BIOL 6V29 Topics in Molecular Biology** (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. (2-5-0) Y
- **BIOL 8V50 Internship in Biotechnology/Biomedicine** (3-6 semester hours). Provides faculty supervision for a students internship. Internships must be in an area relevant to the students coursework for the MS in Biotechnology. (1-6 - 0) R
- **CS 5343 Algorithm Analysis & Data Structures** (3 semester hours) Formal specifications and representation of lists, arrays, trees, graphs, multilinked structures, strings and recursive pattern structures. Analysis of associated algorithms. Sorting and searching, file structures. Relational data models. Prerequisites: CS 5303, CS 5333. (3-0) S
- **CS 6360 Database Design** (3 semester hours) Methods, principles, and concepts that are relevant to the practice of database software design. Database system architecture; conceptual database models; relational and object-oriented databases; database system implementation; query processing and optimization; transaction processing concepts, concurrency, and recovery; security. Prerequisite: CS 5343. (3-0) S
- **CS 6363 Design and Analysis of Computer Algorithms** (3 semester hours) The study of efficient algorithms for various computational problems. Algorithm design techniques. Sorting, manipulation of data structures, graphs, matrix multiplication, and pattern matching. Complexity of algorithms, lower bounds, NP completeness. Prerequisite: CS 5343 (3-0) S
- **CS 6372 Biological Database Systems and Datamining** (3 semester hours) This course emphasizes the concepts of database, data warehouse, data mining and their applications in biological science.
Topics include relational data models, data warehouse, OLAP, data pre-processing, association rule mining from data, classification and prediction, clustering, graph mining, time-series data mining, and network analysis. Applications in biological science will be focused on Biological data warehouse design, association rule mining from biological data, classification and prediction from microarray data, clustering analysis of genomic and proteomic data, mining time-series gene expression data, biological network (including protein-protein interaction network, metabolic network) mining. Prerequisite: CS 6325 Introduction to Bioinformatics or BIOL 5376 Applied Bioinformatics (3-0) Y.

**ENTP 6370 Entrepreneurship** (3 semester hours) This course is designed to provide an introduction to entrepreneurship for management and non-management students. There are no prerequisites for the course. The course emphasizes the development of new ventures including technology-based ventures, addressing opportunity identification and evaluation, market assessment, startup strategies, business plan development, venture financing, and startup management. Case studies and guest lectures by practicing entrepreneurs and investors provide a real-world perspective. The major deliverable of this course is business plan (including an early stage feasibility analysis) of a venture of the student's choosing. This course is available to all graduate students enrolled at UTD (3-0 credit hours). S

**FIN 6301 Financial Management** (3 semester hours) Theoretical and procedural considerations in the administration of the finance function in the individual business firm; planning, fundraising, controlling of firm finances; working capital management, capital budgeting and cost of capital. Co-requisites: STAT 5311 or OPRE 6301 and AIM 6201, or consent of instructor. (3-0) S

**MATH 6345 Mathematical Methods in Medicine and Biology** (3 semester hours) Introduction to the use of mathematical techniques in solving biologically important problems. Some examples of topics that might be covered are biochemical reactions, ion channels, cellular signaling mechanisms, kidney function, nerve impulse propagation. Prerequisites: MATH 1471, MATH 1472, (MATH 2420 recommended) Y

**STAT 5351 Probability and Statistics I** (3 semester hours) A mathematical treatment of probability theory. Random variables, distributions, conditioning, expectations, special distributions and the central limit theorem. The theory is illustrated by numerous examples. This is a basic course in probability and uses calculus extensively. Prerequisite: Multivariable calculus (MATH 2451). (3-0) T

**STAT 5352 Probability and Statistics II** (3 semester hours) Theory and methods of statistical inference. Sampling, estimation, confidence intervals, hypothesis testing, analysis of variance, and regression with applications. Prerequisite: STAT 5351. (3-0) T

**SCI 5V06/POEC 7329/HMGT 6326 Special Topics - Biomedical Ventures in the DFW Region.** This course explores the industrial and commercial opportunities at the intersection of biomedical/bioengineering research and clinical activity and North Texas' industrial strengths in information and communication technologies (ICT). The course is organized around guest presenters representing key sectors, technologies and organizations in the emerging DFW bio-economy. Students will study how to assess the potential payoffs, measured in terms of expanded economic activity and improved patient outcomes, of adding ICT-enhanced "precision" biomedical/health services delivery to its existing industrial strengths. Students may enroll either for graduate course credit or certificate credit. (3-0) Y
BMEN 6373 Anatomy and Human Physiology for Engineers (3 semester hours) This course provides an introduction to anatomy and human physiology for engineers and other non-life-scientists. Topics include nervous system, muscle and cardiac function, digestive system, immune system. (3-0) Y

BMEN 6374 Genes, Proteins and Cell Biology for Engineers (3 semester hours) This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life-scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y

BMEN 6375 Techniques in Cell and Molecular Biology (3 semester hours) Introduction to various cell and molecular laboratory techniques including DNA recombinant technology, protein biochemistry, structural biology, and molecular biology. Intended for engineers and other non-life-scientists. Prerequisite: BMEN 6374 or instructor permission. (3-0) Y

BMEN 6376 Lecture Course in Biomedical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y

BMEN 6377 Introduction to Protein Engineering (3 semester hours) Development of proteins with practical utility will be discussed using examples and case studies taken from the current literature. Prerequisites: BMEN 6374 or by instructor permission. (3-0) Y.

BMEN 6380 Introduction to Cellular Microscopy (3 semester hours) Image formation, diffraction, labeling techniques, fluorescence and image processing techniques will be introduced. (3-0) Y

BMEN 6381 Advanced Concepts in Microscopy (3 semester hours) Continuation of BMEN 6380, with emphasis on advanced approaches such as vectorial diffraction, stochastic aspects of image formation and analysis. Prerequisites: BMEN 6380 or by instructor permission. (3-0) Y.

BMEN 6382 Systems Biology (3 semester hours) An interdisciplinary approach to biology. It explores experimental, theoretical, and computational approaches from mathematics, physics, and engineering for the understanding and analysis of biological problems. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y.

BMEN 6383 Biological Networks (3 semester hours) This course will examine the fundamental principles and associated structure of a range of biological networks at the molecular, cellular, and population levels. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y.

BMEN 6384 Stochastic Methods in Biomedical Engineering (3 semester hours) This course will examine stochastic approaches to several problems in genomics and proteomics, such as sequence similarity detection, gene and protein classification, and structure prediction. Techniques such as Markov and hidden Markov models will be introduced in the course and applied to these problems. (3-0) Y.

BMEN 6V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. (3-9)-0 R

BMEN 6V71 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) For pass/fail credit only. (1-9)-0 R

BMEN 6V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) (1-9)-0 S

BMEN 6V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) (1-9)-0 R

BMEN 6V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. (3-9)-0 S

BMEN 7390 Works in Progress (1 semester hours) Presentation of research results obtained during dissertation research. (May be repeated for credit.) (2-0) Y.

BMEN 7391 Journal Club (2 semester hours) Presentation and discussion of scientific literature in biomedical engineering. (May be repeated for credit.) (2-0) Y.

BMEN 7V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) (1-9)-0 S

BMEN 7V88 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) (1-9)-0 R
BMEN 8V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

BMEN 8V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.)
For pass/fail credit only. ([3-9]-0) R

BMEN 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

Courses offered at The University of Texas Southwestern Medical Center at Dallas (U.T. Southwestern):

BE 5300D. Special Topics in Bioengineering
BE 5396D. Individual Laboratory Projects
BE 5363D. Digital Processing of Medical Images
BE 5306D. Biochemistry
BE 5307D. Human Anatomy Lectures
BE 5308D. Human Anatomy Laboratory
BE 5309D. Human Physiology
BE 5331D. Introduction to Orthopedic Mechanics
BE 5332D. Orthopedic Biomaterials
BE 5680D. Mammalian Physiology

See the U.T. Southwestern Graduate Catalog for course descriptions.
Faculty


**Associate Professors:** J. Michael Farmer, Pamela Gossin, Midori Kitagawa, Shelley Lane, Patricia Michaelson, Venus O. Reese, Nina Roemer, Erin A. Smith, Dean Terry, Daniel Wickberg, Michael Wilson

**Assistant Professors:** Matt Bondurant, Susan Briante, Matthew Brown, Sean Cotter, Frank DuFour, Monica Evans, Eric Farrar, Todd Fechter, Jonathan Frone, Shari Goldberg, John Gooch, Charles Hatfield, Jessica Murphy, Cihan Muslu, Michelle Nickerson, Peter Park, David Parry, Monica Rankin, Natalie Ring, Mark Rosen, Eric Schlereth, Charissa Terranova, Marjorie Zieko

**Senior Lecturers:** Bruce Barnes, 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, MaryAnn Young

**Emeritus Professors:** Joan Chandler, Esteban R. Egea, 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.) in an appropriate field (i.e., Art, Computer Science), 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 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.
Materials Science and Engineering Course Descriptions

CORE COURSES

MSEN 5310 Thermodynamics of Materials (3 semester hours) Fundamental laws of thermodynamics, theory of solution, thermodynamic identities and their uses, chemical reactions, phase equilibria. Electrochemistry. Thermodynamics of modern materials, kinetics. (3-0) R

MSEN 5360 Materials Characterization (3 semester hours) Survey of atomic and structural analysis techniques as applied to surface and bulk materials. Physical processes involved in the interaction of ions, electrons and photons with solids; characteristics of the emergent radiation in relation to the structure and composition. (3-0) R

MSEN 6319 Quantum Mechanics for Materials Scientists (3 semester hours) Quantum-mechanical foundation for study of nanometer-scale materials. Principles of quantum physics, stationary-states for one-dimensional potentials, symmetry considerations, interaction with the electromagnetic radiation, scattering, reaction rate theory, spectroscopy, chemical bonding and molecular orbital theory, solids, perturbation theory, nuclear magnetic resonance. Prerequisite: EE 5300 or equivalent. (3-0) Y

MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials (3 semester hours) Foundations of materials properties for electronic, optical and magnetic applications. Electrical and Thermal Conduction, Elementary Quantum Physics, Modern Theory of Solids, Semiconductors and Devices, Dielectrics, Magnetic and Optical Materials properties. Prerequisite: MSEN 5300 or equivalent. (3-0) T

ADVANCED COURSE LIST

MSEN 5340 Advanced Polymer Science and Engineering (3 semester hours) Polymer structure-property relations, Linear and nonlinear viscoelasticity. Dynamic mechanical analysis, time-temperature superposition, creep and stress relaxation. Mechanical models for prediction of polymer deformation, rubber elasticity, environmental effects on polymer deformation, instrumentation for prediction of long term properties. (3-0) R.

MSEN 5370 Ceramics and Metals (3 semester hours) Emphasis on structure-property relationships: chemical bonding, crystal structures, crystal chemistry, electrical properties, thermal behavior, defect chemistry. Chemical and physical properties of metals and alloys. Topics include: powder preparation, sol-gel synthesis, densification, toughening mechanisms, crystal structure, thermodynamics, phase diagrams, phase transformations, oxidation, mechanical, electrical and magnetic properties. (3-0) R

MSEN 5377 (PHYS 5377) Computational Physics of Nanomaterials (3 semester hours) This course introduces atomistic and quantum simulation methods and their applications to modeling study nanomaterials (nanoparticles, nanowires, and thin films). The course has three main parts: basic theory of materials (thermodynamics, statistical mechanics, and solid state physics), computational methods to model materials systems, and applications to practical problems. There are three main themes of the course: structure-property relationship of nanomaterials; atomistic modeling for atomic structure optimization; and quantum simulations for electronic structure study and functional property analysis. (3-0) R

MSEN 6310 (MECH 6301) Mechanical Properties of Materials (3 semester hours) Phenomenology of mechanical behavior of materials at the macroscopic level and the relationship of mechanical behavior to material structure and mechanisms of deformation and failure. Topics covered include elasticity, viscoelasticity, plasticity, creep, fracture, and fatigue. (3-0) Y

MSEN 6330 Phase Transformations (3 semester hours) Thermodynamic, diffusion processes, kinetic, and structural aspects of metallic phase transformations: surface energy and interfaces, solidification, diffusionless phase transformation, mechanisms and rate-determining factors in oxidation and thin film
deposition; nucleation theory, precipitations from solid solution, order-disorder phenomena, and applications of phase diagrams. (3-0) R

**MSEN 6350 Imperfections in Solids** *(3 semester hours)* Point defects in semiconductors, metals, ceramics, and nonideal defect structures; nonequilibrium conditions produced by irradiation or quenching; effects of defects on electrical and physical properties, effects of defects at interfaces between differing materials. (3-0) R


**SPECIALIZED COURSE LIST**

**MSEN 5300 (PHYS 5376) Introduction to Materials Science and Engineering** *(3 semester hours)* This course provides an intensive overview of materials science and engineering and includes the foundations required for further graduate study in the field. Topics include atomic structure, crystalline solids, defects, failure mechanisms, phase diagrams and transformations, metal alloys, ceramics, polymers as well as their thermal, electrical, magnetic and optical properties. (3-0) R.

**MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I** *(3 semester hours)* Modern concepts of bonding and structure in covalent compounds. Static and dynamic stereochemistry and methods for study. Relationships between structure and reactivity. Prerequisite: CHEM 2325 or equivalent. (3-0) Y

**MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II** *(3 semester hours)* Application of the principles introduced in CHEM 5331, emphasizing their use in correlating the large body of synthetic/preparative organic chemistry. Prerequisite: MSEN 5331/CHEM 5331. (3-0) R

**MSEN 5341 (CHEM 5341) Advanced Inorganic Chemistry** *(3 semester hours)* Physical inorganic chemistry addressing topics in structure and bonding, symmetry, acids and bases, coordination chemistry and spectroscopy. Prerequisite: CHEM 3341, or consent of instructor. (3-0) Y.

**MSEN 5344 Thermal Analysis** *(3 semester hours)* Differential scanning calorimetry; thermogravimetric analysis; dynamic mechanical and thermomechanical analysis; glass transition; melting transitions, relaxations in the glassy state, liquid crystalline phase changes. (3-0) S

**MSEN 5353 Integrated Circuit Packaging** *(3 semester hours)* Basic packaging concepts, materials, fabrication, testing, and reliability, as well as the basics of electrical, thermal, and mechanical considerations as required for the design and manufacturing of microelectronics packaging. Current requirements and future trends will be presented. General review of analytical techniques used in the evaluation and failure analysis of microelectronic packages. (3-0) R

**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. (3-0) Y

**MSEN 5356 (CHEM 5356) Analytical Techniques II** *(3 semester hours)* Study of statistical methods (standard tests, statistical process control, ANOVA, experimental design, etc.) and problem solving
techniques for dealing with ill-defined analytical problems. Prerequisite: CHEM 5355 or MSEN 5355 or consent of instructor. (3-0) Y

**MSEN 5361 Fundamentals of Surface and Thin Film Analysis** (3 semester hours) Survey of materials characterization techniques; Rutherford backscattering; secondary ion mass spectroscopy; ion channeling; scanning tunneling and transmission microscopy; x-ray photoelectron and Auger electron spectroscopy; x-ray and electron diffraction. (3-0) R

**MSEN 5371 (PHYS 5371) Solid State Physics** (3 semester hours) Symmetry description of crystals, bonding, properties of metals, electronic band theory, thermal properties, lattice vibration, elementary properties of semiconductors. Prerequisites: PHYS 5400 and 5421 or equivalent. (3-0) Y

**MSEN 5375 (PHYS 5375) Electronic Devices Based On Organic Solids** (3 semester hours) Solid state device physics based on organic condensed matter structures, including: OLEDs (organic light emitting diodes), organic FETs, organic lasers, plastic photocells, molecular electronic chips. (3-0) R

**MSEN 5383 (PHYS 5383 and EE 5383) Plasma Technology** (3 semester hours) Hardware oriented study of useful laboratory plasmas. Topics will include vacuum technology, gas kinetic theory, basic plasma theory and an introduction to the uses of plasmas in various industries. (3-0) Y

**MSEN 5410 (BIOL 5410) Biochemistry of Proteins and Nucleic Acids** (4 semester hours) Chemistry and metabolism of amino acids and nucleotides; biosynthesis of nucleic acids; analysis of the structure and function of proteins and nucleic acids and of their interactions including chromatin structure. Prerequisite: biochemistry or equivalent. (4-0) Y

**MSEN 5440 (BIOL 5440) Cell Biology** (4 semester hours) Molecular architecture and function of cells and subcellular organelles; structure and function of membranes; hormone and neurotransmitter action; growth regulation and oncogenes; immune response; eukaryotic gene expression. Prerequisites: BIOL 5410 and BIOL 5420, or the equivalent, or permission of the instructor. (4-0) Y

**MSEN 6313 (EE 6313) Semiconductor Opto-Electronic Devices** (3 semester hours) Physical principles of semiconductor optoelectronic devices: optical properties of semiconductors, optical gain and absorption, wave guiding, laser oscillation in semiconductors; LEDs, physics of detectors, applications. Prerequisite: EE 3310 or equivalent. (3-0) T

**MSEN 6320 (EE 6320) Fundamentals of Semiconductor Devices** (3 semester hours) Semiconductor material properties, band structure, equilibrium carrier distributions, non-equilibrium current-transport processes, and recombination-generation processes. Prerequisite: EE 6319 or equivalent. (3-0) Y

**MSEN 6321 (EE 6321) Active Semiconductor Devices** (3 semester hours) The physics of operation of active devices will be examined, including bipolar junction transistors and field-effect transistors: MOSFETs, JFETS, and MESFETS. Special-purpose MOS devices including memories and imagers will be presented. Prerequisite: EE 6320. (3-0) Y

**MSEN 6322 (EE 6322, MECH 6322) Semiconductor Processing Technology** (3 semester hours) Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

**MSEN 6340 Advanced Electron Microscopy** (3 semester hours) Theory and applications of scanning and transmission electron microscopy; sample preparation, ion beam and analytical techniques. (3-0) Y
MSEN 6341 Advanced Electron Microscopy Laboratory (3 semester hours) Lab support for MSEN 6340. (0-3) Y

MSEN 6358 (BIOL 6358) Bionanotechnology (3 semester hours) Protein, nucleic acid and lipid structures. Macromolecules as structural and functional units of the intact cell. Parallels between biology and nanotechnology. Applications of nanotechnology to biological systems. (3-0) Y

MSEN 6361 (MECH 6361) Deformation Mechanisms in Solid Materials (3 semester hours) Linear elastic fracture mechanics, elastic-plastic fracture mechanics, time dependent failure, creep and fatigue, experimental analysis of fracture, fracture and failure of metals, ceramics, polymers and composites. Failure analysis related to material, product design, manufacturing and product application. Pre-requisites: MSEN 5300 or MECH 6301/MSEN 6310. (3-0) Y

MSEN 6362 Diffraction Science (3 semester hours) Structure of materials: crystal, amorphous, liquid crystals, Diffraction theory; scattering and diffraction experiments; x-ray topography; X-ray camera including XRD, textured structures, crystal structure analysis; disordered crystals; quasi-crystals. (3-0) S

MSEN 6371 (PHYS 6371) Advanced Solid State Physics (3 semester hours) Continuation of MSEN 5371/PHYS 5371, transport properties of semiconductors, ferroelectricity and structural phase transitions, magnetism, superconductivity, quantum devices, surfaces. Prerequisite: MSEN 5371/PHYS 5371 or equivalent. (3-0) R

MSEN 6374 (PHYS 6374) Optical Properties of Solids (3 semester hours) Optical response in solids and its applications. Lorentz, Drude and quantum mechanical models for dielectric response function. Kramers-Kronig transformation and sum rules considered. Basic properties related to band structure effects, excitons and other excitations. Experimental techniques including reflectance, absorption, modulated reflectance, Raman scattering. Prerequisite: MSEN 5371/PHYS 5371 or equivalent. (3-0) T

MSEN 7320 (EE 7320) Advanced Semiconductor Device Theory (3 semester hours) Quantum mechanical description of fundamental semiconductor devices; carrier transport on the submicron scale; heterostructure devices; quantum-effect devices. Prerequisite: EE 6320. (3-0) R

MSEN 7382 Introduction to MEMS (3 semester hours) Study of fabrication techniques for micro-electro-mechanical and micro-opto-mechanical devices and systems and their applications. Techniques for both silicon, non-silicon processing and emerging new micromachining processes are studied as well as their process physics. Topics to include: bulk and surface micromachining, electroplating-based micromachining and micro devices packaging. (3-0) Y

MSEN 7V80 Special Topics in Materials Science and Engineering (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

MSEN 8V40 Individual Instruction in Materials Science and Engineering (1-6 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-6]-0) R

MSEN 8V70 Research In Materials Science and Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

MSEN 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

MSEN 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S
New Program Request Form for Bachelor’s and Master’s Degrees

Directions: An institution shall use this form to propose a new bachelor’s or master’s degree program. In completing the form, the institution should refer to the document Standards for Bachelor's and Master's Programs, which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. NOTE: Preliminary authority is required for all engineering programs. An institution that does not have preliminary authority for a proposed engineering program shall submit a separate request for preliminary authority prior to submitting the degree program request form. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

Administrative Information

1. Institution: The University of Texas at Dallas

2. Program Name – Show how the program would appear on the Coordinating Board’s program inventory (e.g., Bachelor of Business Administration degree with a major in Accounting): Master’s of Science in Justice Administration and Leadership

3. Proposed CIP Code: 43.0103

4. Brief Program Description – Describe the program and the educational objectives:

The proposed M.S. program in Justice Administration and Leadership (M.S. in JAL) will prepare students for roles in leadership and management in criminal justice and other social service organizations. The program of study will target cohorts of 15 middle-level managers already working within criminal justice or related organizations. Students in the program represent the next generation of administrators and/or leaders. Building on an innovative cross-disciplinary structure (students will take coursework within the Schools of Economics, Political & Policy Sciences [EPPS] and the School of Management [SOM], the program will have an integrated curriculum that connects such key components of leadership as organizational behavior, organizational change, policy analysis, research design and program evaluation, and conflict resolution.

The M.S. in JAL degree requires completion of eight classes and a self-directed research project. The program, if approved, will begin in the fall. Classes will be taken in order, and the program can be completed in as little as 24 months. The curriculum will blend classroom and the virtual delivery of coursework and involves three stages. Most courses (i.e., research methods, statistics) will be within regular semesters; however, some courses (i.e., organizational behavior; power and politics in organizations; motivational leadership; and negotiation and dispute resolution) will be offered in shortened online formats. Overall, sixty percent of the programs’ total number of hours will be in the traditional classroom format.
Stage One (Background and Research Methodology/Analysis coursework): In this stage students, in cohorts of 15, will begin the program by taking the initial seminar on leadership and motivation (e.g., OB 6336). Then the students will register and complete a series of intensive seminars in evaluation research methods, research design, and statistics. The goal of this coursework is to prepare students to conduct their individual research projects. The cohort will also be divided into 4-5 peer resource groups and they will gain access to an online “Expert Learning Forum” where experts from the field (i.e., police chiefs, prison administrators, corporate executives, either currently employed or recently retired) will work with the peer groups to examine real life management issues (i.e., personnel evaluations, litigation, dealing with the media) and assist the students with developing their research projects. We define this segment of the curriculum as “leadership in action.” These forums will last the duration of the curriculum and will also facilitate networking and the experts will function as “coaches” for the students. Second Stage: coursework involves seminars in organizational behavior, dealing with change in justice organizations, and conflict resolution. Third Stage: coursework concludes the program of study wherein students complete their “capstone” research project of Master’s thesis-quality on a topic relevant to and of import to the student’s home organization. Students will have worked on their research projects throughout their program of study and all research projects will be evaluated and graded by core faculty.

The educational objectives of the M.S. program in J.A.L. are as follows:
1) Students will examine the role of leadership within criminal justice organizations.
2) Students will be able to evaluate and apply relevant research findings on leadership and personnel management to lead, influence and manage others in an increasingly diverse workforce and work environment.
3) Students will be able to understand the consequences of change within criminal justice organizations, and lead and manage personnel in periods of organizational change.
Students will be able to apply relevant techniques of conflict resolution and negotiation when confronted with conflict in criminal justice and related organizations.

5. Administrative Unit – Identify where the program would fit within the organizational structure of the university (e.g., The Department of Electrical Engineering within the College of Engineering):
The School of Economics, Political and Policy Sciences.

6. Proposed Implementation Date – Report the first semester and year that students would enter the program: fall 2010

7. Contact Person – Provide contact information for the person who can answer specific questions about the program:

Name: Brian Berry
Title: Dean
E-mail: bjlb@tx.rr.com
Phone: 972-883-4988
Program Information

I. Need

Note: Complete I.A and I.B only if preliminary authority for the program was granted more than four years ago. This includes programs for which the institution was granted broad preliminary authority for the discipline.

A. Job Market Need – Provide short- and long-term evidence of the need for graduates in the job market.

Currently, at the state and local level, many police and sheriff’s departments, adult and juvenile probation departments, jails and other detention settings, hospital and school security departments, and even fire departments have numerous job openings. At the federal level, for example, the Border Patrol was tasked in 2008 to hire and train over 18,000 agents (http://www.cbp.gov/). The U. S. Bureau of Labor Statistics (http://www.bls.gov/; see the Career Guide to Industries/State and Local Government, Except Education and Hospitals) predicts the job opportunities for front line police supervisors, will increase by 10% (between 2006—2016) and the growth rate for front line supervisors of correctional officers will be 12% across the latter time period. At the same time, we expect large numbers of retirements to converge across the spectrum of justice and other social service agencies and our letters of support note these job sector dynamics and the need for the proposed program.

A new generation of educated supervisors will be needed to lead in these organizations. In fact, researchers are now discussing the “leadership crisis” that is now confronting the law enforcement workplace. James P. Henchey, (Captain, Alhambra, California, Police Department) recently wrote,

If the law enforcement profession is serious about solving the current leadership crisis, and the crisis that looms in the future, agencies must begin targeting recruitment efforts at the most qualified workers today. Locally recruited leadership candidates should be identified early so that they may be afforded the time to be properly prepared for the police leadership positions of the future.¹

The program being proposed here is for the first-line supervisor and seeks to develop the next generation of supervisors (and leaders) who will be necessary to lead the large pool of recruits entering the organizations. In terms of numbers, for example, in the Dallas Police Department alone there are 440 sergeants and 125 supervisors at or above the rank of lieutenant. The vast majority of these latter police supervisors do not have advanced degrees. Students who successfully complete the proposed course of study will be better positioned for promotions resulting in longer retention within their respective organizations. Additionally, the program will be of interest to members from human services, education, and health who work in the nonprofit sector, serving the criminal justice field. These students might be mid-level executives in employment and training, aftercare, prevention, housing, and faith-based programs.

B. **Student Demand** – Provide short- and long-term evidence of demand for the program.

At this time, there are two master’s level degree programs in Texas that specifically target working practitioners in criminal justice and/or other related security organizations. One program is brand new (The University of Texas at Arlington - Fort Worth Center) and the other is the long-standing master of science in Criminal Justice Leadership and Management) at Sam Houston State University.

PREP on-line data indicate that 181 MS degrees in Criminal Justice Leadership and Management have been awarded to students by Sam Houston State University since 2000, or roughly 20 per year.

The proposed program at The University of Texas at Dallas (UT Dallas) is modeled somewhat after the Sam Houston State University program, and we fully expect that 15 students (in cohorts) will seek admission to the program. We will grow the program slowly and begin with cohorts of 15 high quality students.

The proposed program is not duplicative of existing programs in four primary ways. The UT Dallas program is a collaborative effort between the School of Economics, Political and Policy Sciences, and the School of Management. Students will take research methodology courses and coursework in organizational behavior—the necessary ingredients to make them better organizational leaders. Second, our approach will employ peer resource groups in which the students will periodically interact with other each via the Internet in small groups led by a “coach”. Discussion topics will involve practical aspects within the students’ workplace (i.e., dealing with the media, dealing with difficult employees, conducting annual performance evaluations). These web-based sessions will be lead a “coach” or a person with a long and successful supervisory career (i.e., former sheriffs, police chiefs, probation department chiefs). Third, the students will be exposed to the foundations of leadership in sessions marking the beginning and end of the program of study. Fourth, the public sector students or those from probation, police, and fire would benefit from a solid understanding of how the nonprofit and public sectors interact to provide services throughout the adult or juvenile systems.

The proposed program will not adversely affect the current masters or doctoral program in Criminology. In fact the proposed program compliments and will in the long run improve the existing graduate program. Currently there are nearly one dozen graduate students who work full time (e.g., local police and probation departments) and do not seek a doctoral degree—these students only desire a master’s degree, especially one with an on-line component. These “working students” would gravitate towards to the proposed degree program which would reduce the workload of existing faculty in terms of chairing theses and dissertation research, and teaching intensive doctoral level seminars.

C. **Enrollment Projections** – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. (*Include majors only and consider attrition and graduation.*)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>15</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>
Our enrolment goal is based on student cohorts of 15 quality students.

II. Quality

A. Degree Requirements – Use this table to show the degree requirements of the program. *(Modify the table as needed; if necessary; replicate the table for more than one option.)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
<th>Clock Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education Core Curriculum <em>(bachelor’s degree only)</em></td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Required Courses</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Free Electives</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Other <em>(Specify, e.g., internships, clinical work)</em> <em>(if not included above)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

B. Curriculum – Use these tables to identify the required courses and prescribed electives of the program. Note with an asterisk (*) courses that would be added if the program is approved. *(Add and delete rows as needed. If applicable, replicate the tables for different tracks/options.)*

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Required Courses</th>
<th>SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIM5310</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>CRIM5313</td>
<td>Descriptive &amp; Inferential Statistics</td>
<td>3</td>
</tr>
<tr>
<td>SOC6352</td>
<td>Evaluation Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>CRIM6v98</td>
<td>Analytical Writing 1 <em>(the initial 6 hours will involve research problem specification, literature review, and research design)</em></td>
<td>6</td>
</tr>
<tr>
<td>CRIM6v99</td>
<td>Analytical Writing 2 <em>(the final 6 hours involves data analysis, policy discussion, and presentation)</em></td>
<td>6</td>
</tr>
<tr>
<td>OB 6336</td>
<td>Motivational Leadership in Organizations <em>(online)</em></td>
<td>3</td>
</tr>
<tr>
<td>OB 6301</td>
<td>Organizational Behavior <em>(online)</em></td>
<td>3</td>
</tr>
<tr>
<td>OB 6331</td>
<td>Power and Politics in Organizations <em>(online)</em></td>
<td>3</td>
</tr>
<tr>
<td>OB 6332</td>
<td>Negotiation and Dispute Resolution <em>(online)</em></td>
<td>2</td>
</tr>
<tr>
<td>OB 6337</td>
<td>Coaching as a Leadership Style: The Science and Practice of Influencing Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>
C. Faculty – Use these tables to provide information about Core and Support faculty. Add an asterisk (*) before the name of the individual who will have direct administrative responsibilities for the program. *(Add and delete rows as needed.)*

<table>
<thead>
<tr>
<th>Name of Core Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g.: Robertson, David Asst. Professor</td>
<td>PhD. in Molecular Genetics Univ. of Texas at Dallas</td>
<td>MG200, MG285 MG824 (Lab Only)</td>
<td>50%</td>
</tr>
<tr>
<td><em>James W. Marquart</em></td>
<td>Phd in Sociology, Texas A&amp;M University</td>
<td>CRIM 5310 CRIM 6v98 CRIM 6v99</td>
<td>50%</td>
</tr>
<tr>
<td>Elmer Polk</td>
<td>Phd in Criminal Justice, Sam Houston State University,</td>
<td>CRIM 5310 SOC 6352</td>
<td>25%</td>
</tr>
<tr>
<td>Timothy Bray</td>
<td>Phd in Criminology, University of Missouri, St. Louis</td>
<td>CRIM 5313</td>
<td>50%</td>
</tr>
<tr>
<td>Sarah Maxwell</td>
<td>Phd in Public Policy, George Mason University</td>
<td>CRIM 5310 SOC 6352</td>
<td>25%</td>
</tr>
<tr>
<td>Robert Hicks</td>
<td>Phd in Organizational Psychology, University of Southern California</td>
<td>OB 6336 OB 6337</td>
<td>50%</td>
</tr>
<tr>
<td>Sue Freedman</td>
<td>PhD from Florida State University</td>
<td>OB 6301 OB 6331</td>
<td>50%</td>
</tr>
<tr>
<td>Laurie Ziegler</td>
<td>PhD from the University of Texas at Arlington</td>
<td>OB 6301 OB 6332</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Support Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracy Rockett</td>
<td>PhD the University of Texas at</td>
<td>OB 6336</td>
<td>25%</td>
</tr>
</tbody>
</table>
C. Students – Describe general recruitment efforts and admission requirements. In accordance with the institution’s Uniform Recruitment and Retention Strategy, describe plans to recruit, retain, and graduate students from underrepresented groups for the program.

The proposed program is geared towards working professionals in criminal justice and service-related organizations, especially those in the North Texas region. We will market the program to all state and municipal police and fire agencies, adult and juvenile community corrections and supervision departments, county sheriff’s departments and detention facilities, and hospitals.

The Criminology Program is a member of the North Texas Crime Commission (NTCC) whose members include the chiefs of police from over fifteen area police departments, the Dallas Independent School District, the Texas Department of Public Safety, the Dallas County Sheriff’s Office, the FBI, U. S. Marshals, Secret Service, and a host of other local, state, and federal justice related organizations. The NTCC meets monthly at the Dallas Park City Club, and we will advertise the program at these meetings and post information about the program on the NTCC’s website. We will also market the program to all justice-related organizations within the North Texas Council of Governments - a 16 county region centered around the urban areas of Dallas and Fort Worth. The School of Economics, Political and Policy Sciences, and the School of Management at UT Dallas will make every effort to recruit and retain underrepresented students into this program. Such efforts will include, but not be limited to, advertising the program widely to communities and organizations with underrepresented populations; providing needed advising to such students on their academic work; and helping them on their career path.

D. Library – Provide the library director’s assessment of library resources necessary for the program. Describe plans to build the library holdings to support the program.

The graduate degree in justice administration and management will cost the Library approximately $7,000 (per year for the next three years) for increased book spending and journal acquisitions over present levels of holdings. A detailed library and or current holdings report has been included which discusses upgrade and acquisition plans. The report concludes “The total cost to the library is not a great burden.”

F. Facilities and Equipment – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvements/additions.

Existing facilities and equipment are adequate to launch the program.

G. Accreditation – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation.

The Academy of Criminal Justice Sciences (ACJS) has an accreditation process and the UT Dallas Criminology undergraduate and Graduate Programs will enter the accreditation process in spring 2010.
H. Evaluation – Describe the evaluation process that will be used to assess the quality and effectiveness of the new degree program.

The assessment plans for the proposed degree program will comply with those set forth by the Southern Association of Colleges and Schools, or SACS. Specifically we will assess the quality and effectiveness of the program by

1. Ensuring the quality of the analytical or policy research writing project. All students enrolled in the program will be required to conduct an independent research project directed by a core faculty member (who has experience chairing theses) on a topic directly relevant to the student’s area of employment. The research (primarily policy-based) will examine a “real world” problem or issue confronting their agency that needs analysis. Rubrics will be developed to evaluate the final project.

2. End of course evaluations.

3. Exit interviews. All students who complete the program of study will complete an exit survey or questionnaire containing response items about the quality of the course work, relevance of the materials covered, instructional experiences, and overall satisfaction with the program.

4. Student performance in Crim 5310, OB 6336, and OB 6301.

In addition, the program will be evaluated through the process described in Policy Memorandum 94-III.24-63 Academic Program Review, which states that all UT Dallas programs are reviewed every five years.

III. Costs and Funding

Five-Year Costs and Funding Sources - Use this table to show five-year costs and sources of funding for the program.

<table>
<thead>
<tr>
<th>Five-Year Costs</th>
<th>Five-Year Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel¹</td>
<td>$1,010,000</td>
</tr>
<tr>
<td>Facilities and Equipment</td>
<td>$0</td>
</tr>
<tr>
<td>Library, Supplies, and Materials</td>
<td>$35,915</td>
</tr>
<tr>
<td>Other²</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>$1,145,915</strong></td>
</tr>
<tr>
<td><strong>Reallocated Funds</strong></td>
<td><strong>$1,010,000</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Anticipated New Formula Funding³</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Special Item Funding</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Other⁴</strong></td>
</tr>
<tr>
<td><strong>Total Funding</strong></td>
<td><strong>$1,431,125</strong></td>
</tr>
</tbody>
</table>

1. No new faculty or instructors will be hired. All personnel currently exist and this dollar amount reflects the cost of the individual instructor per the percentage of time devoted to the new program. See section C of this proposal for the list of faculty and time assignments.
2. Specify other costs here (e.g., administrative costs, travel). We estimate $20,000 per year for payments to the expert coaches.
3. Indicate formula funding for students new to the institution because of the program; formula funding should be included only for years three through five of the program and should reflect enrollment projections for years three through five. Figure was based on (30 students x 18 hours x 4.18) x 62.19=$140,375 per year x 3 == 421,125.
4. Report other sources of funding here. In-hand grants, “likely” future grants, and designated tuition and fees can be included. None anticipated at this time.
5. The reallocated funds represent the percentage of time (based on total salary) and salary allocated to the new program. We are using existing personnel and re-allocating a percentage of their salaries to launch the program.

Finally, the Certification form for new bachelor’s/masters’ degrees has been included.
1. Adequacy of Funding – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.

   ________________________________  ______________________
   Chief Executive Officer              Date
2. **Board of Regents or Designee Approval** – A member of the Board of Regents or designee shall sign the following statement:

> On behalf of the Board of Regents, I approve the program.

<table>
<thead>
<tr>
<th>Board of Regents (Designee)</th>
<th>Date of Approval</th>
</tr>
</thead>
</table>

3. **Board of Regents Certification of Criteria for Commissioner of Assistant Commissioner Approval** – For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the eight criteria under TAC Section 5.50 (b): The criteria stipulate that the program shall:

1. be within the institution’s current Table of Programs;
2. have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
3. have sufficient clinical or in-service sites, if applicable, to support the program;
4. be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
5. attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
6. not unnecessarily duplicate existing programs at other institutions;
7. not be dependent on future Special Item funding
8. have new five-year costs that would not exceed $2 million.

> On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).

<table>
<thead>
<tr>
<th>Board of Regents (Designee)</th>
<th>Date</th>
</tr>
</thead>
</table>
September 15, 2009

To Whom It May Concern:

It has come to my attention that a new Masters Degree in Justice Administration and Leadership is being proposed at the University of Texas at Dallas. After discussing the proposed program with Dr. James Marquart, as well as having the privilege of reviewing the proposal, it is with pleasure that I submit this letter of recommendation.

I have served as an adult probation department administrator for the past sixteen years. It is with regret that I report that there exists a glaring lack of quality leadership in criminal justice. It is my opinion that this is not due to a lack of qualified, motivated professionals, but rather it is due to an inadequacy of quality training and education.

A new generation has become the driving force of our workplaces. This new generation brings new, and often frustrating, challenges. Effective leadership of these individuals is crucial to the development and implementation of new methods of providing exceptional criminal justice programs in the field. The unique concept of implementing this MS program as a collaborative effort between various disciplines within the university, all of which bring a different but relevant expertise, seems to be a perfect approach to meeting the challenges brought forth by the new workforce.

Finally, as an administrator, properly selecting new supervisors to oversee various units within the organization is one of the more daunting tasks I face. There may be no higher responsibility than entrusting the people who make our department function with a respected, knowledgeable, and competent leader. A review of the required courses for the proposed MS program indicates that every educational need to properly train new supervisors to meet the challenges they will face is met.

It is with enthusiasm that I recommend the implementation of the proposed Masters Degree in Justice Administration and Leadership at the University of Texas at Dallas. I am confident that the program will reflect favorably on the university, and that it will serve to properly educate those who enroll. Perhaps it will even become the model program used to solve the leadership crisis which exists in the criminal justice profession.

Very truly yours,

Toby Ross
Director
James W. Marquart, Ph.D.
Associate Provost &
Director, Program in Criminology
School of Economic, Political & Policy Sciences The University of Texas at Dallas
800 West Campbell Road
Richardson, TX 75080-3021

Dear Dr. Marquart,

I appreciate the opportunity you have given me to review your proposed masters degree in Justice Administration and Leadership. Programs like the one you are proposing are needed in the area of law enforcement, especially for ranking officers seeking promotions and greater levels of supervisory responsibility. Ranking officers need additional education in the areas of leadership, organizations, and policy analysis. The field of law enforcement is rapidly changing and there is a currently a glaring need for highly educated supervisors. I am sure that you are aware that the field of law enforcement will experience large numbers of retirements in the next few years and we will need a new generation of supervisors to lead many of this state's departments. Based on my own personal experience and knowledge of the field, I have no doubt that your program will be very popular among police officers in general and those officers with aspirations for promotion. Finally the structure of the proposed program will be extremely popular among working professionals. I will work hard to encourage my colleagues to pursue criminal justice programs such as the one you have proposed so that law enforcement professionals can continue to adapt to the needs of both our officers and the communities that we serve.

If I can be of other assistance to you and your proposed program, please contact me.

Sincerely,

David Hale
Deputy Chief of Police
July 31, 2009

James W. Marquart, Ph.D.
Associate Provost and
Director, Program in Criminology
School of Economic, Political and Policy Sciences
The University of Texas at Dallas
800 West Campbell Road
Richardson, TX 75080-3021

Dear Dr. Marquart:

The purpose of this letter is to express our full support for your proposed masters degree in “Justice Administration and Management.” As you know, public safety retirements expected over the near future will create a leadership vacuum requiring the education and preparation of an entirely new cadre of leaders. Given your proposed format (using on-line and intensive courses), I have no doubt that the student demand will be high.

The programs we offer here at the Institute for Law Enforcement Administration attract hundreds of law enforcement leaders and executives each year, and I am certain that your new masters program will be of considerable interest to them. I look forward to the opportunity to work closely with you in making this program a success and a model for others across the country.

Thank you for the opportunity to voice our support for this program. As we move ahead, please be assured of the cooperation and assistance of the Institute for Law Enforcement Administration in all areas of mutual concern.

Sincerely,

Daniel P. Carlson
Vice President, Center for American and International Law
Director, Institute for Law Enforcement Administration
Graduate Program in Arts and Technology

Master of Arts

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 thing 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 Immersive Environments
- ATEC 6355 Animation Production Lab
- ATEC 6361 Writing for Interactive Media
- ATEC 6371 Community Media
- ATEC 6374 Digital Textuality
- ATEC 6375 Cyberpsychology
- ATEC 6376 E-Business Environment Design
- ATEC 6V81 Special Topics in Emergent Communication
- HUAS 6313 The Business of the Arts
- HUAS 6312 Art and Society
- HUAS 6330 Studies in Visual Arts
- HUAS 6375 Imagery and Iconography
- HUAS 6392 Image/Text Workshop
- HUAS 6393 Time-Based Arts Workshop
- HUSL 6308 Studies in Literary Forms
- HUSL 6370 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**

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)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEC 6349</td>
<td>Interdisciplinary Approaches to Arts and Technology</td>
</tr>
<tr>
<td>ATEC 6331</td>
<td>Aesthetics of Interactive Arts</td>
</tr>
</tbody>
</table>

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 Immersive Environments
- ATEC 6355 Animation Production Lab
- ATEC 6361 Writing for Interactive Media
- ATEC 6371 Community Media
- ATEC 6374 Digital Textuality
- ATEC 6375 Cyberpsychology
- ATEC 6376 E-Business Environment Design
- ATEC 6V81 Special Topics in Emergent Communication

HUA 6312 Art and Society
HUA 6313 The Business of the Arts
HUA 6317 Art and Authorship
HUA 6330 Studies in Visual Arts
HUA 6352 Creating TV and Movie Scripts
HUA 6373 Studies in Film
HUA 6375 Imagery and Iconography
HUA 6392 Image/Text Workshop
HUA 6393 Time-Based Arts Workshop
HUA 6354 Creating Short Fictions
HUSL 6308 Studies in Literary Forms
HUSL 6370 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.
Course Descriptions

CHEM 5314 Advanced Physical Chemistry (3 semester hours) Modern concepts from the three pillars of physical chemistry: quantum mechanics, thermodynamics/statistical mechanics, and kinetics. Prerequisite: CHEM 3322 or equivalent. (3-0) Y

CHEM 5331 (MSEN 5331) Advanced Organic Chemistry I (3 semester hours) Modern concepts of bonding and structure in covalent compounds. Static and dynamic stereochemistry and methods for study. Relationships between structure and reactivity. Prerequisite: CHEM 2325 or equivalent. (3-0) Y

CHEM 5333 (MSEN 5333) Advanced Organic Chemistry II (3 semester hours) Application of the principles introduced in CHEM 5331, emphasizing their use in correlating the large body of synthetic/preparative organic chemistry. Prerequisite: CHEM 5331. (3-0) R

CHEM 5341 (MSEN 5341) Advanced Inorganic Chemistry I (3 semester hours) Physical inorganic chemistry addressing topics in structure and bonding, symmetry, acids and bases, coordination chemistry and spectroscopy. Prerequisite: CHEM 3341, or consent of instructor. (3-0) Y

CHEM 5343 Advanced Inorganic Chemistry II (3 semester hours) Builds on CHEM 5341 to explore the synthesis and reactivity of inorganic/organometallic molecules. Practical applications will be demonstrated by discussing industrial processes catalyzed by metal complexes. Prerequisite: CHEM 5341. (3-0) R

CHEM 5355 (MSEN 5355) Analytical Techniques I (3 semester hours) Study of fundamental analytical techniques, including optical spectroscopic techniques, mass spectrometry, and microscopic and surface analysis methods. (3-0) Y

CHEM 5356 (MSEN 5356) Analytical Techniques II (3 semester hours) Study of chromatography (GC, LC, CZE), statistical methods (standard tests and ANOVA), chemical problem solving, and modern bio/analytical techniques such as biochips, microfluidics, and MALDI-MS. Prerequisite: CHEM 5355 or MSEN 5355 or consent of instructor. (3-0) R

CHEM 5357 Process Analytical Chemistry (3 semester hours) An introduction to process analytical chemistry as practiced in the chemical process and other industries. Includes process control, instrumental techniques, sample and conditioning systems, project integration, and chemometrics. Prerequisite: CHEM 5355 or consent of instructor. (3-0) R

CHEM 5V84 Special Topics in Chemistry/M.A.T. (1-9 semester hours) Various special topics in chemistry of interest to teachers will be discussed. (May be repeated for credit.) (May not be counted as credit toward the M.S. or Ph.D. degrees.) ([1-9]-0) R

CHEM 5V87 Independent Study in Chemistry (1-9 semester hours) In conjunction with a member of the Chemistry faculty, the student will develop a paper or project which emphasizes the ways in which chemical knowledge is confirmed and extended or which leads to improved instruction in chemistry. (May not be counted as credit toward the M.S. or Ph.D. degrees.) May be repeated for credit (9 hours maximum). ([1-9]-0) R

CHEM 6317 Industrial Chemistry (3 semester hours) Survey of chemical industry including commodities, chemical processes, scale-up and process development, environmental concerns, patents. Study of chemical engineering principles. (3-0) R

CHEM 6V19 Special Topics in Physical Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include spectroscopy, quantum mechanics, computational chemistry, and surface chemistry. Prerequisite: CHEM 5314 or consent of instructor. ([1-9]-0) R

CHEM 6V39 Special Topics in Organic Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include organic photochemistry, organometallic chemistry, homogeneous and heterogeneous catalysis, solid state, polymer chemistry, and advanced NMR techniques. Prerequisite: CHEM 5331 or consent of instructor. ([1-9]-0) R

CHEM 6V49 Special Topics in Inorganic Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include physical methods of inorganic chemistry, and bioinorganic chemistry. Prerequisite: CHEM 5341 or consent of instructor. ([1-9]-0) R

CHEM 6V59 Special Topics in Analytical Chemistry (1-9 semester hours) Subject matter will vary. Examples of topics include NMR, X-ray crystallography. May be repeated to a maximum of 9 hours. Prerequisite: CHEM 5355 or consent of instructor. ([1-9]-0) R

CHEM 6V69 Special Topics in Biochemistry (1-9 semester hours) Subject matter will vary. May be
CHEM 6V79 Special Topics in Materials Chemistry (1-9 semester hours) Subject matter will vary. Examples of topics include polymers, membrane technology, zeolites, nanoscience and technology. May be repeated to a maximum of 9 hours. Prerequisite: Consent of instructor. (1-9-0) R

CHEM 6361 Physical Biochemistry (3 semester hours) Protein structure, fundamental metabolism, structures and properties of macromolecules, interactions with electromagnetic radiation, thermodynamics of macromolecular solutions, transport processes, and other topics. Prerequisite: Consent of instructor (3-0). R

CHEM 6372 Materials Science (3 semester hours) Relationship between the properties and behavior of materials and their internal structure. Treatment of the mechanical, thermal and electrical properties of crystalline and amorphous solids including metals, ceramics, synthetic polymers and composites. Prerequisite: Consent of instructor. (3-0) R

CHEM 6383 Computational Chemistry (3 semester hours) The application of computer techniques to the understanding of molecular structure and dynamics: force field, semi-empirical, ab initio, and molecular dynamics techniques. Information retrieval from large structural databases and use of this information. Prerequisite: Consent of instructor. (3-0) R

CHEM 6389 Scientific Literature and Communication Skills (3 semester hours) Acquaints students with techniques for searching the scientific literature using hard copy and electronic approaches. Introduces students to important steps in creating and improving technical communications in both written and oral formats. (3-0) Y

CHEM 6V84 Special Topics in Applied Chemistry (1-9 semester hours) Subject matter will vary and may be repeated for credit to a maximum of 9 hours. Prerequisite: Consent of instructor. (1-9-0) R

CHEM 8981 Research Practicum (9 semester hours) Offers training of students in the direct solution of chemical problems through use of the literature; analysis; and the design, construction and performance of experiments. Method of instruction will be primarily individual direction, questioning, and feedback by the responsible faculty member and/or industrial scientist. Intended for Ph.D. students. May be repeated for credit. (9-0) S

CHEM 8V91 Research in Chemistry (2-9 semester hours) May be repeated for credit. (2-9-0) S

CHEM 8398 Thesis (3 semester hours) May be repeated for credit. (3-0) S

CHEM 8399 Dissertation (3 semester hours) May be repeated for credit (3-0) S

CHEM 8V99 Dissertation (1-9 semester hours) May be repeated for credit. (1-9-0) S
GRADUATE CATALOG CHANGES  
CATALOG YEARS: 2010-2012  

DATE: NOVEMBER 10, 2009  
TO: GRADUATE DEAN  
FROM: MICHAEL WILSON, ARTS & HUMANITIES  

BASIS FOR CATALOG CHANGES:  

NEW PROGRAMS/DEGREES/CERTIFICATES  
M.A. in Latin American Studies  

NEW COURSES ADDED  
ATEC 6300, ATEC 6332, ATEC 6333, ATEC 6334, ATEC 6335, ATEC 6343, ATEC 6345, ATEC 6352, ATEC 6353, ATEC 6354, ATEC 6355, ATEC 6374, ATEC 6375, ATEC 6376, ATEC 6382, ATEC 6383, ATEC 6384, ATEC 6385, ATEC 6390, ATEC 6397, ATEC 6398, ATEC 6V95, ATEC 7331  
EMAC 6300, EMAC 6374, EMAC 6V91  
HIST 6301, HIST 6324, HIST 6326, HIST 6327, HIST 6332, HIST 6333, HIST 6335, HIST 6350, HIST 6360, HIST 6365, HIST 6370, HIST 6390, HIST 6395, HIST 6397, HIST 6398, HIST 6399  
HUAS 6310, HUAS 6312, HUAS 6317, HUAS 6333, HUAS 6334, HUAS 6336, HUAS 6337, HUAS 6339, HUAS 6347, HUAS 6348, HUAS 6354, HUAS 6355, HUAS 6380, HUAS 6381, HUAS 6383, HUAS 6385, HUAS 6390, HUAS 6397, HUAS 6398, HUAS 7305, HUAS 7320, HUAS 7330, HUAS 7340, HUAS 7350, HUAS 7360, HUAS 7380  
HUED 6304  
HUHI 6315, HUHI 6320, HUHI 6323, HUHI 6327, HUHI 6329, HUHI 6332, HUHI 6334, HUHI 6335, HUHI 6336, HUHI 6337, HUHI 6338, HUHI 6341, HUHI 6343, HUHI 6344, HUHI 6346, HUHI 6349, HUHI 6395, HUHI 6396, HUHI 6397, HUHI 6398, HUHI 6399, HUHI 7313, HUHI 7314, HUHI 7315  
HUMA 6300, HUMA 6330, HUMA 6331, HUMA 6333, HUMA 6339, HUMA 6390, HUMA 6393, HUMA 6395, HUMA 7V81  
HUSL 6313, HUSL 6314, HUSL 6345, HUSL 6373, HUSL 6374, HUSL 6375, HUSL 6376, HUSL 6380, HUSL 6381, HUSL 6383, HUSL 6384, HUSL 6385, HUSL 6386, HUSL 6388, HUSL 6389, HUSL 6392, HUSL
6393, HUSL 6394, HUSL 6395, HUSL 7308, HUSL 7309, HUSL 7350, HUSL 7360, HUSL 7372
LATS 6300, LATS 6390, LATS 6399

COURSES DELETED
ATEC 5349, ATEC 7301
EMAC 5300, EMAC 7301, EMAC 7V81
HIST 5311, HIST 7399, HIST 8303, HIST 8305, HIST 8398
HUAS 6395, HUAS 6396, HUAS 7301, HUAS 7304, HUAS 7310, HUAS 7350, HUAS 7351, HUAS 7352, HUAS 7353, HUAS 7354
HUED 8304
HUHI 7320, HUHI 7345, HUHI 7355, HUHI 7375, HUHI 7379, HUHI 7386
HUMA 5300, HUMA 7320, HUMA 7321, HUMA 7323, HUMA 7330, HUMA 7331, HUMA 7332, HUMA 7333, HUMA 7334, HUMA 7335
HUAS 7321, HUSL 7323, HUSL 7333, HUSL 7334, HUSL 7335, HUSL 7384, HUSL 7385

CHANGES TO EXISTING COURSES
ATEC 6341, ATEC 6351, ATEC 6V81, ATEC 7V81, ATEC 7V82
EMAC 6361, EMAC 6372, EMAC 6V81, EMAC 6383
HUAS 6303, HUAS 6305, HUAS 6315, HUAS 6318, HUAS 6320, HUAS 6330, HUAS 6331, HUAS 6340, HUAS 6373, HUAS 6375, HUAS 7355, HUAS 7390
HUHI 6300, HUHI 6301, HUHI 6305, HUHI 6313, HUHI 6314, HUHI 6325, HUHI 6340, HUHI 6345, HUHI 6347, HUHI 6348, HUHI 7332, HUHI 7355, HUHI 7340, HUHI 7368, HUHI 7387, HUHI 7391, HUHI 7393, HUHI 7397, HUHI 7399
HUMA 6V81, HUMA 7390
HUAS 6304, HUSL 6308, HUSL 6309, HUSL 6310, HUSL 6315, HUSL 6330, HUSL 6340, HUSL 6350, HUSL 6355, HUSL 6360, HUSL 6370, HUSL 6372, HUSL 6390, HUSL 6396, HUSL 6398, HUSL 6399, HUSL 7322, HUSL 7370, HUSL 7390, HUSL 7391

OTHER Due to extensive renumbering across the curriculum, there are changes on every page of the A&H sections of the catalog.
Approved:______________________________

School/Department
Doctor of Philosophy in Economics

http://www.utdallas.edu/epps/eco/

Faculty

Professors: Daniel G. Arce, Kurt J. Beron, Rachel Croson, Catherine Eckel, James Murdoch, Todd Sandler, Barry J. Seldon, Donggyu Sul

Associate Professors: Nathan Berg, Susan Williams McElroy, Kevin Siqueira

Assistant Professors: Rodney Andrews, Chetan Dave, Xin (Sherry) Li

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.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University’s Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University’s Computing Center provides 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.

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, education, 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 Microeconomics; (ii) ECON 3311 Intermediate Macroeconomics; (iii) ECON 4351 Mathematical Economics; (iv) EPPS 7316 Advanced Regression Analysis or ECON 4355 Econometrics; (v) EPPS 7313 Basic 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 (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 a grade of A- or better); (iii) be certified in two research areas within the science of Economics; and (iv) 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 8301** Microeconomics Theory III
- **ECON 6302** Macroeconomics Theory I
- **ECON 7302** Macroeconomics Theory II
- **ECON 6305** Mathematical Economics
- **ECON 6311** Statistics for Econometrics
- **ECON 6309** Econometrics I
- **ECON 7309** Econometrics II
- **ECON 8309** Econometrics III

In addition, they are required to register for the following courses at the appropriate stages of their study:

- ECON 7V01 Survey/Research 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 (i) making a grade of B or better in three courses within each area; (ii) writing an acceptable research paper in one 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 U.T.Dallas Graduate Catalog. See Graduate Registration Requirements.
Course Descriptions

AUD 6303 Hearing Science (3 semester hours) Basic acoustics and psychoacoustics. (3-0) Y
AUD 6305 Anatomy and Physiology of Audition (3 semester hours) Structure and function of the auditory system including external, middle, and inner ear, and central auditory mechanisms. (3-0) Y
AUD 6306 Speech Science (3 semester hours) The physical properties of speech and the perceptual, cognitive and neural processes that intervene between the production and perception of speech in everyday speech communication. (3-0) Y
AUD 6310 Advanced Clinical Audiology (3 semester hours) Instrumentation and calibration standards for audiology practice. The development and application of standard diagnostic audiological procedures. Administration and interpretation of standard audiometric tests. (3-0) Y
AUD 6311 Diagnostic Audiology (3 semester hours) The development and application of advanced diagnostic procedures for audiological diagnosis including behavioral and electrophysiological measures (ABR and OAE). Administration and interpretation of diagnostic audiological tests. (3-0) Y
AUD 6316 Audiologic Rehabilitation for Adults (3 semester hours) Evaluation and remediation of impairment, limitations and restrictions associated with hearing loss. Emphasis on hearing aid orientation and benefit, counseling, assistive technology, coping skills, communication strategies, speech reading, advocacy for adults with hearing loss, and partnering with community mentors. (3-0) Y
AUD 6318 Pediatric Audiology (3 semester hours) Etiological, medical and genetic considerations relevant to the pediatric population. Emphasis on current diagnostic options with infants and young children, including those having mental retardation or multiple disabilities. (3-0) Y
AUD 6321 Theories of Amplification (3 semester hours) Principles underlying soundfield acoustics and measures, liability, malpractice, and practice management. (3-0) Y
AUD 6322 Laboratory Procedures in Audiology and Hearing Science (1-9 semester hours) Application in structured laboratories of principles taught in diagnostic audiology, rehabilitation audiology, hearing science, amplification, cochlear implant and electrophysiology courses. To be taken with AUD 6303, AUD 6310, AUD 6311, AUD 6316, AUD 7321, AUD 7326, AUD 7327 and AUD 7353. (May be repeated for credit.) (0-[1-9]) Y
AUD 6324 Advanced Audiology (3 semester hours) Principles underlying soundfield acoustics and calibration, earmold acoustics, speech perception in hearing impaired persons, and fitting methods. (3-0) Y
AUD 7310 Professional Issues in Audiology (3 semester hours) Ethics and professional issues in various practice settings, including multicultural considerations, licensure, certification, outcome measures, liability, malpractice, and practice management. (3-0) Y
AUD 7321 Theories of Amplification (3 semester hours) Principles underlying soundfield acoustics and calibration, earmold acoustics, speech perception in hearing impaired persons, and fitting methods. (3-0) Y
AUD 7324 (COMD 7324, ACN 7324) Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments (3 semester hours) Overview of prosthetic alternatives to conventional amplification for individuals with severe-to-profound hearing loss. Topics include candidacy determination, technology, programming/fitting of devices, aural (re)habilitation, and awareness of controversial areas related to cochlear implantation. (3-0) Y

AUD 7325, Intensive Auditory Rehabilitation for Adult Hearing Loss (3 semester hours) Intensive experience with comprehensive rehabilitation of adults and/or teens with a focus on research and clinical techniques to facilitate communication in employment, social, and home situations through the use of communication strategies and advanced assistive technology. (3-0) Y
AUD 7326 Aural Habilitation of Children with Hearing Impairments (3 semester hours) Issues in selection and fitting of amplification and FM systems for children, rationale and methods of auditory training, optimizing the auditory environment, communication options, and family-centered intervention. (3-0) Y
AUD 7327 Evaluation and Fitting of Amplification Systems (3 semester hours) Advanced study of analog and digital technology in amplification systems including: programmable hearing aids, compression characteristics, noise reduction, and speech enhancement strategies. (3-0) Y
AUD 7328 Auditory Rehabilitation for Adults (3 semester hours) Issues in communication strategies and advanced assistive technology. (3-0) Y
AUD 7329 Auditory Rehabilitation for Children (3 semester hours) Issues in selection and fitting of amplification and FM systems for children, rationale and methods of auditory training, optimizing the auditory environment, communication options, and family-centered intervention. (3-0) Y

AUD 7330 Professional Issues in Audiology (3 semester hours) Ethics and professional issues in various practice settings, including multicultural considerations, licensure, certification, outcome measures, liability, malpractice, and practice management. (3-0) Y

AUD 7331 Professional Issues in Audiology (3 semester hours) Ethics and professional issues in various practice settings, including multicultural considerations, licensure, certification, outcome measures, liability, malpractice, and practice management. (3-0) Y

AUD 7332 Seminar (3 semester hours) Advanced study of analog and digital technology in amplification systems including: programmable hearing aids, compression characteristics, noise reduction, and speech enhancement strategies. (3-0) Y

Courses may not be repeated for credit. (0-12) Y
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>AUD 7328</td>
<td>Hearing Loss Prevention (3 semester hours) Identification and prevention of</td>
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<td>hearing loss in children and adults through screening programs. Includes school,</td>
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<td>community, and industrial-based hearing conservation programs, hearing</td>
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<td>protection, and ototoxicity.</td>
<td>(3-0) Y</td>
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<td>AUD 7338</td>
<td>Research in Audiology (3 semester hours) Review of statistical principles</td>
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<td>including the relationship between working hypotheses and methodology and</td>
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<td>outcomes to prepare individuals to become a critical consumer of research.</td>
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<td>Scientific writing process is taught including components of journal</td>
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<td>publication, scientific posters, and writing style.</td>
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<td>AUD 7339</td>
<td>(COMD 7339) Evidence-Based Practice in Communication Disorders (3 semester</td>
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<td></td>
<td>hours) Origins, strengths and limitations of the evidence-based practice</td>
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<td>paradigm. Methods for finding, appraising, and incorporating high-quality</td>
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<td>evidence into clinical decisions about screening, diagnosing and treating</td>
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<td>speech, language, and hearing disorders. (3-0) Y</td>
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<td>AUD 7340</td>
<td>Auditory Processing Disorders (3 semester hours) Auditory processing disorders</td>
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<td>with respect to underlying etiologies and behavioral and electrophysiologic</td>
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<td>procedures for diagnosis and therapeutic management.</td>
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<td>AUD 7351</td>
<td>Physiologic Assessment of Vestibular System (3 semester hours) Anatomy,</td>
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<td>physiology and pathophysiology of the vestibular, oculomotor and related</td>
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<td>systems used for maintaining equilibrium and balance. Procedures used for</td>
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<td>diagnostic assessment of the vestibular system and medical and non-</td>
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<td>medical treatments for vestibular disorders. (3-0) Y</td>
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<td>AUD 7353</td>
<td>Clinical Electrophysiology (3 semester hours) Evoked and event-related</td>
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<td>potentials including recording techniques, neurophysiological mechanisms,</td>
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<td>and applications to clinical populations. (3-0) Y</td>
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<td>AUD 7371</td>
<td>Doctoral Seminar in Audiology (3 semester hours) Selected topics and current</td>
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<td>research in audiology and hearing science. (May be repeated for credit.)</td>
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<td>(3-0) Y</td>
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<td>AUD 7V80</td>
<td>Doctoral Practicum in Audiology (1-9 semester hours) Supervised doctoral</td>
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<td>level experience in assessment and habilitation/rehabilitation of hearing</td>
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<td>impairment. (May be repeated for credit.)</td>
<td>(3-0) Y</td>
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<td>AUD 7V82</td>
<td>Special Topics in Hearing Science and Audiology (1-9 semester hours)</td>
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<td>Selected topics and current research in hearing science and audiology.</td>
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<td>Topics will vary from semester to semester. (May be repeated for credit.)</td>
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<td>(1-9) S</td>
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<tr>
<td>AUD 8V80</td>
<td>Individual Research in Audiology (1-9 semester hours) Independent research</td>
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<td>project to fulfill the Doctor of Audiology research requirement. (May be</td>
<td>(1-9) S</td>
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<td>repeated for credit.)</td>
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<tr>
<td>AUD 8V97</td>
<td>Doctoral Internship in Audiology (1-9 semester hours) Intensive, full-time,</td>
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<td>clinical audiology practicum in a work setting that provides exposure to a</td>
<td>(1-9) S</td>
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<td>diverse clinical population and a wide breadth of audiological services.</td>
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<td>Completed during the fourth year of the Au.D. Program. (May be repeated for</td>
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<td>credit.)</td>
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Prosthetic alternatives available for individuals with profound hearing impairments. Topics include speech perception in children and adults, signal processing, aural rehabilitation techniques, prosthetic devices such as cochlear implants and techniques for using such devices. (3-0) Y
Course Descriptions

Mathematics and Applied Mathematics Courses

MATH 5301 Elementary Analysis I (3 semester hours) Real numbers, differentiation, integration, metric spaces, basic point set topology, power series, analytic functions, Cauchy’s theorem. Prerequisite: Multivariable calculus (MATH 2421) and theoretical concept of calculus (MATH 3310) or equivalent. (3-0) Y

MATH 5302 Elementary Analysis II (3 semester hours) Continuation of MATH 5301. Prerequisite: MATH 5301. (3-0) Y

MATH 5304 Applied Mathematical Analysis for Non-Majors (3 semester hours) Techniques of mathematical analysis applicable to the social, behavioral and management sciences. Differential and integral calculus of one and many variables. No credit allowed to mathematical sciences majors. Prerequisite: College Algebra (3-1) S

MATH 5305 Higher Geometry for Teachers (3 semester hours) Topics in modern Euclidean geometry including distinguished points of a triangle, circles including the nine-point circle, cross ratio, transformations; introduction to projective geometry. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior level mathematics course. (3-0) T

MATH 5306 Non-Euclidean Geometry for Teachers (3 semester hours) The relations among elliptic, Euclidean and hyperbolic geometries, Euclidean models of elliptic and hyperbolic geometries. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior-level mathematics course. (3-0) T

MATH 5313 Modern Algebra for Teachers (3 semester hours) Study of modern algebra involving groups, rings, fields and Galois theory. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior-level mathematics course. (3-0) R

MATH 5390 Topics in Mathematics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R

MATH 6301 Real Analysis (3 semester hours) Measure theory and integration. Hilbert and Banach spaces. Prerequisites: Undergraduate analysis course (e.g., MATH 4301-2 or MATH 5301-2) undergraduate course in linear algebra (MATH 2418) or equivalent. (3-0) Y

MATH 6302 Real and Functional Analysis (3 semester hours) Continuation of MATH 6301, Hilbert and Banach space techniques. Prerequisite: MATH 6301. (3-0) Y

MATH 6303 Theory of Complex Functions I (3 semester hours) Complex integration, Cauchy’s theorem, calculus of residues, power series, entire functions, Riemann mapping theorems. Riemann surfaces, conformal mapping with applications. Prerequisite: Undergraduate analysis (e.g., MATH 4301-2), (3-0) Y

MATH 6304 Theory of Complex Functions II (3 semester hours) Continuation of MATH 6303. Prerequisite: MATH 6303. (3-0) T

MATH 6305 Mathematics of Signal Processing (3 semester hours) The course is devoted to a mathematical foundation of some of the key topics in signal processing: discrete and continuous signal transforms, analysis and design of filters [e.g. lattice filters], least square methods and algorithms. Prerequisites: Undergraduate analysis (MATH 4301-2 or MATH 5301-2); undergraduate course in linear algebra (MATH 2418); undergraduate course in complex variables (MATH 3379) or equivalent. (3-0) T

MATH 6306 Topology and Geometry (3 semester hours) Topics in topology, differential geometry and their applications to areas such as biological sciences and engineering. Prerequisite: Undergraduate analysis (MATH 4301-2 or MATH 5301-2), (3-0) T

MATH 6307 Wavelets and Their Applications (3 semester hours) An introduction to windowed Fourier and continuous wavelet transforms, generalized frames, discrete wavelet frames, multiresolution analysis, Daubechies’ orthogonal wavelet bases, and their applications in partial differential equations and signal processing. Prerequisite: Undergraduate linear algebra (MATH 2418) and differential equations (MATH 2420) or equivalent. (3-0) T

MATH 6308 Inverse Problems and Applications (3 semester hours) Exact and approximate methods of nondestructive inference, such as tomography and inverse scattering theory in one and several
dimensions, with applications in physical and biomedical sciences and engineering. Prerequisite: Undergraduate linear algebra (MATH 2418) and differential equations (MATH 2420) or equivalent. (3-0) T
MATH 6311 Abstract Algebra I (3 semester hours) Basic properties of groups, rings, fields, and modules. Topics selected from group representations, Galois theory, local rings, algebraic number theory, classical ideal theory, basic homological algebra, and elementary algebraic geometry. Prerequisite: Undergraduate algebra course (MATH 3311) or equivalent. (3-0) T
MATH 6313 Numerical Analysis (3 semester hours) A study of numerical methods including the numerical solution of non-linear equations, linear systems of equations, interpolation, iterative methods and approximation by polynomials. Prerequisites: Knowledge of a high level programming language, Linear algebra (MATH 2418) and multivariable calculus (MATH 2451). (3-0) T
MATH 6315 Ordinary Differential Equations (3 semester hours) The study of ordinary differential equations with emphasis on existence, uniqueness, linear systems, boundary value problems, and stability. Prerequisites: Undergraduate course in algebra (MATH 3311) or equivalent; undergraduate analysis (MATH 4301-2 or Math 5301-2); undergraduate course in ordinary differential equations (MATH 2420). (3-0) Y
MATH 6316 Differential Equations (3 semester hours) Continuation of MATH 6315 and an introduction to partial differential equations. Prerequisite: MATH 6315. (3-0) T
MATH 6318 Numerical Analysis of Differential Equations (3 semester hours) Practical and theoretical aspects of numerical methods for both ordinary and partial differential equations are discussed. Topics selected from: initial value problems for ordinary differential equations, two-point boundary value problems, projection methods, finite difference, finite element and boundary element approximations for partial differential equations. Prerequisites: MATH 6313 or equivalent. (3-0) T
MATH 6319 Principles and Techniques in Applied Mathematics I (3 semester hours) Mathematical methods usually used in applied sciences and engineering. Topics chosen from basic linear space theory; Hilbert spaces; fixed point theorems and applications to differential and integral equations; spectral theorem; distributions; Sobolev spaces; the Fourier transforms; complex function theory, calculus of residues; exact, approximate and asymptotic solutions to Laplace, heat and wave equations, Eikonal and WKB methods, and special functions. Prerequisite: Undergraduate algebra (MATH 2418), and differential equations (MATH 2420) or equivalent. (3-0) T
MATH 6320 Principles and Techniques in Applied Mathematics II (3 semester hours) Continuation of MATH 6319. Prerequisite: MATH 6319. (3-0) T
MATH 6321 Optimization (3 semester hours) Introduction to theoretical and practical concepts of optimization in finite and infinite dimensional setting, least-squares estimation, optimization of functionals, local and global theory of constrained optimization, iterative methods. Prerequisites: Undergraduate ordinary differential equations (MATH 2420) and linear algebra (MATH 2418). (3-0) T
MATH 6331 Linear Systems and Signals (3 semester hours) Basic principles of systems and control theory: state space representations, stability, observableness, controllability, realization theory, transfer functions, feedback. Prerequisites: Undergraduate course in linear algebra (MATH 2418) and undergraduate analysis course or MATH 5301-2. (3-0) T
MATH 6332 Advanced Control (3 semester hours) Theoretical and practical aspects of modern control methodologies in state space and frequency domain, in particular LQG and H-infinity control: coprime factorizations, internal stability, Kalman filter, optimal regulator, robust control, sensitivity minimization, loop shaping, model reduction. Prerequisite: MATH 6331. (3-0) T
MATH 6336 Nonlinear Control Systems (3 semester hours) Differential geometric tools, input-output maps, feedback linearization, nonlinear observers, input-output linearization, output tracking, and regulation. Prerequisites: MATH 6315 and MATH 6331. (3-0) T
MATH 6339 Control of Distributed Parameter Systems (3 semester hours) Theoretical and technical issues for control of distributed parameter systems in the context of linear infinite dimensional dynamical systems: Evolution equations and control on Euclidean space, elements of functional analysis, semigroups of linear operators, abstract evolution equations, control of linear infinite dimensional dynamical systems, approximation techniques. Prerequisites: Undergraduate course in partial differential equations (MATH 4362) and analysis (MATH 4301). (3-0) T
MATH 6341 Bioinformatics (3 semester hours) Fundamental mathematical and algorithmic theory behind current bioinformatics techniques are covered and implemented. They include hidden Markov models, dynamic programming, genetic algorithms, simulated annealing, neural networks, cluster analysis, and information theory. Prerequisites: Knowledge of Unix and a high level programming
MATH 6343 Computational Biology (3 semester hours) Mathematical and computational methods and techniques to analyze and understand problems in molecular biology are covered. Topics include sequence homology and alignment, genetic mapping, protein folding, and DNA computing. Prerequisite: MATH 2418 or equivalent. (3-0) T

MATH 6345 Mathematical Methods in Medicine and Biology (3 semester hours) Introduction to the use of mathematical techniques in solving biologically important problems. Some examples of topics that might be covered are biochemical reactions, ion channels, cellular signaling mechanisms, kidney function, nerve impulse propagation. Prerequisites: MATH 2417, MATH 2419, MATH 2420 recommended. (3-0) T

MATH 6364 Stochastic Calculus in Finance (3 semester hours) Brownian Motion, Ito Calculus, Feynman-Kac formula and an outline of Stochastic Control, Black Scholes Analysis, Transaction Costs, Optimal Portfolio Investment. Prerequisites: STAT 4351 or equivalent, and MATH 2451 or equivalent. (3-0) T

MATH 6390 Topics in Mathematics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R

MATH 6V81 Special Topics in Mathematics (1-9 semester hours) Topics vary from semester to semester. May be repeated for credit. (1-9-0) S

MATH 7313 Partial Differential and Integral Equations I (3 semester hours) Topics include theory of partial differential and integral equations. Classical and modern solution techniques to linear and nonlinear partial differential equations and boundary value problems. Introduction to the theory of Sobolev spaces. Prerequisite: MATH 6316 recommended. (3-0) T

MATH 7314 Partial Differential and Integral Equations II (3 semester hours) Continuation of MATH 7313. General theory of partial differential and integral equations, with emphasis on existence, uniqueness and qualitative properties of solutions. Prerequisite: MATH 7313. (3-0) T

MATH 7316 Wave Propagation with Applications (3 semester hours) Study of the wave equation in one, two and three dimensions, the Helmholtz equation, associated Green's functions, asymptotic techniques for solving the propagation problems with applications in physical and biomedical sciences and engineering. Prerequisites: MATH 6303, MATH 6318. (3-0) T

MATH 7319 Functional Analysis (3 semester hours) Elements of operator theory, spectral theory, topics in Banach and operator algebras. Prerequisites: MATH 6301-2. MATH 6303 recommended. (3-0) T

Statistics Courses

STAT 5191 Statistical Computing Packages (1 semester hour) Introduction to use of major statistical packages such as SAS, BMD, and Minitab. Based primarily on self-study materials. No credit allowed to mathematical sciences majors. Prerequisite: One semester of statistics. (1-0) S

STAT 5351 Probability and Statistics I (3 semester hours) A mathematical treatment of probability theory. Random variables, distributions, conditioning, expectations, special distributions and the central limit theorem. The theory is illustrated by numerous examples. This is a basic course in probability and uses calculus extensively. Prerequisite: Multivariable calculus (MATH 2451). (3-0) T

STAT 5352 Probability and Statistics II (3 semester hours) Theory and methods of statistical inference. Sampling, estimation, confidence intervals, hypothesis testing, analysis of variance, and regression with
STAT 5390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) T

STAT 6326 Sampling Theory (3 semester hours) Introduction to survey sampling theory and methods. Topics include simple random, stratified, systematic, cluster, unequal probability, multistage, spatial sampling designs. Estimation of means, proportions, variances, ratios, and other parameters for a finite population, optimal allocation, detectability, multiplicity. Prerequisite: STAT 5351. (3-0) T

STAT 6329 Applied Probability and Stochastic Processes (3 semester hours) Basic random processes used in stochastic modeling, including Poisson, Gaussian, and Markov processes with an introduction to renewal processes and queuing theory. Measure theory not required. Prerequisite: STAT 5351. (3-0) T

STAT 6331 Statistical Inference I (3 semester hours) Introduction to fundamental concepts and methods of statistical modeling and decision making. Basic distribution theory, Decision theory. Exponential families of models, Sufficiency, Estimation and hypothesis testing, Likelihood methods and optimality, Large sample approximations. Prerequisites: STAT 5352 or equivalent and MATH 5302 or equivalent, (3-0) Y

STAT 6332 Statistical Inference II (3 semester hours) Elementary and advanced asymptotic methods, treating sample quantities, U-statistics, differentiable statistical functions and influence curves, the MLE, L-statistics, M-statistics, and the bootstrap. Advanced aspects of statistical inference, likelihood-based inference, robust statistics, General forms of Neyman-Pearson lemma, Metrics on spaces of probability distributions. Prerequisites: STAT 6331 and, either before or concurrently, STAT 6344. (3-0) T

STAT 6337 Advanced Statistical Methods I (3 semester hours) Statistical methods most often used in the analysis of data. Study of statistical models, including multiple regression, nonlinear regression, stepwise regression, regression diagnostics, balanced and unbalanced analysis of variance, analysis of covariance, and log-linear analysis of multiway contingency tables. Prerequisites: MATH 2418 and STAT 5352 or STAT 6331. (3-0) T

STAT 6338 Advanced Statistical Methods II (3 semester hours) This course continues STAT 6337. Topics include one-way and multiway analysis of variance, fixed, random, and mixed effects models, nested designs, repeated measures designs, fractional designs, Latin squares, diagnostics, and implementation of statistical methods in SAS. Prerequisite: STAT 6337. (3-0) T

STAT 6339 Linear Statistical Models (3 semester hours) Vectors of random variables, multivariate normal distribution, quadratic forms. Theoretical treatment of general linear models, including the Gauss-Markov theorem, estimation, hypotheses testing, and polynomial regression. Introduction to the analysis of variance and analysis of covariance. Prerequisites: STAT 6331 and MATH 2418 or equivalent. (3-0) T

STAT 6341 Numerical Linear Algebra and Statistical Computing (3 semester hours) A study of computational methods used in statistics. Topics to be covered include the simulation of stochastic processes, numerical linear algebra, QR decomposition and least squares regression, SV decomposition and multivariate data, statistical programming languages, and graphical methods. Prerequisite: STAT 5352 or STAT 6337. (3-0) T

STAT 6343 Experimental Design (3 semester hours) This course focuses on the planning, development, implementation and analysis of data collected under controlled experimental conditions. Repeated measures designs, Graeco-Latin square designs, randomized block designs, balanced incomplete block designs, partially balanced incomplete block designs, fractional replication and confounding. The course requires substantial use of computer facilities. Prerequisite: STAT 6338 or equivalent knowledge of fixed and random effects crossed ANOVA designs. (3-0) T

STAT 6344 Probability Theory I (3 semester hours) A measure theoretic coverage of probability theory. Measure, integration, Fubini’s theorem, random variables, distribution functions, characteristic functions, independence, laws of large numbers, central limit theorem, three-series theorem, Glivenko-
Cantelli theorem, conditional probability and expectation, introduction to martingales. Prerequisite: MATH 6301. (3-0) T

STAT 6347 Applied Time Series Analysis (3 semester hours) Methods and theory for the analysis of data collected over time. The course covers techniques commonly used in both the frequency domain (harmonic analysis) and the time domain (autoregressive, moving average models). Prerequisite: STAT 6337 or equivalent. (3-0) T

STAT 6348 Applied Multivariate Analysis (3 semester hours) The most frequently used techniques of multivariate analysis. Topics include T/T2, MANOVA, principal components, discriminant analysis and factor analysis. Prerequisite: STAT 5352 or STAT 6331. (3-0) T

STAT 6365 Statistical Quality and Process Control (3 semester hours) Statistical methodology of monitoring, testing, and improving the quality of goods and services is developed at the intermediate level. Topics include control charts for variables and attributes, assessment of process stability and capability, construction and interpretation of CUSUM, moving average charts and V-masks, optimal sampling techniques, and evaluation of operating-characteristic curves and average time to detection. Prerequisite: STAT 5351 or equivalent. (3-0) T

STAT 6390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). Topics selected from but not limited to choices such as spatial statistics, nonparametric curve estimation, functional data analysis, statistical learning and data mining, actuarial science, sampling theory, statistical quality and process control, sequential analysis, survival analysis, longitudinal data analysis, categorical data analysis, and clinical trials, for example. (3-0) R

STAT 6V99 Statistical Consulting (1-3 semester hours) Practical experience in collaboration with individuals who are working on problems which are amenable to statistical analysis. Problem formulation, statistical abstraction of the problem, and analysis of the data. Course may be repeated but a maximum of three hours may be counted toward the requirements for the master’s degree. Prerequisite: Consent of instructor. ([1-3]-0) T

STAT 7330 Decision Theory and Bayesian Inference (3 semester hours) Statistical decision theory and Bayesian inference are developed at an intermediate mathematical level. Prerequisites: MATH 5302 or equivalent, and STAT 6331. (3-0) T

STAT 7331 Multivariate Analysis (3 semester hours) Vector space foundations and geometric considerations. The multivariate normal distribution: properties, estimation, and hypothesis testing. Multivariate t-test. Classification problems. The Wishart distribution. General linear hypothesis and MANOVA. Principal components, canonical correlations, factor analysis. Multivariate nonparametric and robust methods. Prerequisite: STAT 6331 or equivalent. (3-0) T


STAT 7338 Time Series Modeling and Filtering (3 semester hours) Theory of correlated observations observed sequentially in time. Stationary processes, power spectra, stationary model fitting, correlation analysis and regression. Prerequisite: STAT 6331 or equivalent. (3-0) T

STAT 7345 Advanced Probability and Stochastic Processes (3 semester hours) Taught as a continuation of STAT 6344. Martingales, Kolmogorov’s existence theorem, random walk, Markov chains, the Poisson process, the general birth and death process, other Markov processes, renewal processes, Brownian motion and diffusion, stationary processes, and the empirical process. Prerequisite: STAT 6344. (3-0) T

STAT 7390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). Topics selected from but not limited to choices such as spatial statistics, nonparametric curve estimation, functional data analysis, statistical learning and data mining, actuarial science, sampling theory, statistical quality and process control, sequential analysis, survival analysis, longitudinal data analysis, categorical data analysis, and clinical trials, for example. (3-0) R

STAT 4301 or MATH 4301 and MATH 4302 or either isor

or STAT 6338

or STAT 6338

or STAT 6338

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or STAT 6338
estimation, functional data analysis, statistical learning and data mining, actuarial science, sampling theory, statistical quality and process control, sequential analysis, survival analysis, longitudinal data analysis, categorical data analysis, and clinical trials, for example. (3-0) R

STAT 8V02 Individual Instruction in Statistics (1-6 semester hours) May be repeated for credit. ([1-6]-0) S

STAT 8V03 Advanced Topics in Statistics (1-6 semester hours) May be repeated for credit. ([1-6]-0) R

STAT 8V07 Research in Statistics (1-9 semester hours) Open to students with advanced standing, subject to approval of the graduate adviser. May be repeated for credit. ([1-9]-0) S

STAT 8V98 Thesis (3-9 semester hours) May be repeated for credit. ([3-9]-0) S

STAT 8V99 Dissertation (1-9 semester hours) May be repeated for credit. ([1-9]-0) S
Graduate Program in History

Master of Arts

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 6398 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.
School of Arts and Humanities

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.)

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 Communication (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., M.A.T., 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
Master of Fine Arts in Arts and Technology

Master of Arts in Emerging Media and Communication

Master of Arts in History

Master of Arts in Humanities
Master of Arts in Humanities Major in Aesthetic Studies
Master of Arts in Humanities Major in History of Ideas
Master of Arts in Humanities Major in Studies in Literature

Master of Arts in Teaching in Humanities Major in Aesthetic Studies
Master of Arts in Teaching in Humanities Major in History of Ideas
Master of Arts in Teaching in Humanities Major in Studies in Literature
Doctor of Philosophy in Humanities
Doctor of Philosophy in Humanities Major in Aesthetic Studies
Doctor of Philosophy in Humanities Major in History of Ideas
Doctor of Philosophy in Humanities Major in Studies in Literature

Certificate in Holocaust Studies

Master of Arts in Latin American Studies
GRADUATE CATALOG CHANGES  
CATALOG YEARS: 2010-2012

DATE: 10/21/2009  
TO: GRADUATE DEAN  
FROM: Bob Stillman  

Please indicate with an X if your department catalog copy has no changes _______

SCHOOL_BBS______________________

DEPARTMENT__AUD______________

BASIS FOR CATALOG CHANGES:  
_____________________________________________________________________________

NEW PROGRAMS/DEGREES/CERTIFICATES  
_____________________________________________________________________________

Course numbering and changes in credit hour changes should be reflected in the two categories below.  
NEW COURSES ADDED: AUD 7182  
_____________________________________________________________________________

COURSES DELETED: AUD 6348  
_____________________________________________________________________________

OTHER__________________________________________________________

Approved:___________________________________________  
School/Department
Please indicate with an X if your department catalog copy has no changes: 

SCHOOL: Economic, Political and Policy Sciences

DEPARTMENT: CRIMINOLOGY

BASIS FOR CATALOG CHANGES:

Most changes reflect course renumbering at the direction of the University. 3 courses are being added for curricula reasons.

NEW PROGRAMS/DEGREES/CERTIFICATES:

Course numbering and changes in credit hour changes should be reflected in the two categories below.

<table>
<thead>
<tr>
<th>NEW COURSES ADDED:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIM 7342 Qualitative Criminology (Renumbered from CRIM 6340)</td>
</tr>
<tr>
<td>CRIM 7351 Advanced Criminology Theory Seminar (Add only: new to program)</td>
</tr>
<tr>
<td>CRIM 7381 Special Topics in Criminology (Add only: new to program)</td>
</tr>
<tr>
<td>CRIM 8V92 Independent Advanced Research (Add only: new to program)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSES DELETED:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIM 5310 Research Design (Changed to EPPS 6310)</td>
</tr>
<tr>
<td>CRIM 5313 Descriptive &amp; Inferential Statistics (Split/Changed to EPPS 6313 &amp; EPPS 7313)</td>
</tr>
<tr>
<td>CRIM 5316 Descriptive &amp; Inferential Statistics (Split/Changed to EPPS 6316 &amp; EPPS 7316)</td>
</tr>
<tr>
<td>CRIM 5355 Introduction to Homeland Security (Changed to PA 5355)</td>
</tr>
<tr>
<td>CRIM 5356 Pre-emptive Strategies &amp; Tactics (Changed to PA 5356)</td>
</tr>
<tr>
<td>CRIM 5357 Info Sharing and Communication (Changed to PA 5357)</td>
</tr>
<tr>
<td>CRIM 5358 Soc Networks &amp; Intelligence Led Policing (Changed to PA 5358)</td>
</tr>
<tr>
<td>CRIM 5359 Prot Critical Resources &amp; Infrastructure (Changed to PA 5359)</td>
</tr>
<tr>
<td>CRIM 6340 Qualitative Criminology (Changed to CRIM 7342)</td>
</tr>
<tr>
<td>CRIM 6346 Qualitative Research Methods (Changed to EPPS 6346)</td>
</tr>
<tr>
<td>CRIM 6V96 Masters Thesis Research (Delete only)</td>
</tr>
<tr>
<td>CRIM 7302 Seminar in Criminology Research (Delete only)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIM 6v98 Analytical Writing Research (Credit hours changed to 1-9 with no max)</td>
</tr>
</tbody>
</table>
Item #13WW

Approved: ____________________________

_______________________________
School/Department
Graduate Program in the Humanities

Master of Arts

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 as early as possible in their programs.

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., 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.
Master of Arts in Teaching

To earn the M.A.T. in Humanities, a degree specifically designed for practicing teachers, students must complete a total of thirty-six semester hours of course work. While most courses are the same as those for other students in the school, some courses are concerned specifically with the school classroom. It is possible for students who are particularly interested in English and History to design their degree programs so that their work in these areas can be focused and set in an interdisciplinary context. The M.A.T. degree does not require demonstration of reading proficiency in a foreign language.

Normally students applying for admission to the M.A.T. program should have a teaching certificate. Students may be teaching full-time while they are pursuing the degree.

Core Courses (6 hours)

HUED 6300 Teaching of the Humanities in the Secondary School
HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities

Specialization (15 hours)

Fifteen hours in organized courses at the 5000- or 6000-level in one of these areas of concentration: Aesthetic Studies or History of Ideas or Studies in Literature.

Professional Development (6 hours)

Six hours in education courses in addition to HUED 6300. Three hours may be taken as independent study to prepare for the casebook.

Elective Courses (6 hours)

Six hours of electives at the 5000- or 6000-level in any organized courses outside the area of specialization.

Casebook: HUED 6304 (3 hours)

The casebook consists of two parts, a critical essay on an interdisciplinary topic as well as a curriculum plan that adopts that topic to the candidate’s teaching level in twenty to thirty lesson plans.

Doctor of Philosophy

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 qualifying 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.
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 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., 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 qualifying 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, MAT, and PhD students in the School of Arts and Humanities (A & H) from The Ackerman Center for Holocaust Studies (Center) at UT Dallas. Students who wish to pursue the Certificate must do so in coordination with A & H’s requirements for graduation from their specified program. Graduates of this 15 credit hours certificate will have a critical understanding of the Holocaust as well as modern Jewish culture, the history of anti-Semitism, and the major contemporary philosophical, aesthetic, and analytical responses to this major event.

In order to begin work toward the Certificate, each student must complete a registration form, and is required to be advised each semester by Professor Zsuzsanna Ozsvath or Professor Nils Roemer. In addition, each semester, Certification students must also meet with their academic counselor provided to them by A & H. Certificates can only be awarded to those students who have their advising forms completed from both the School of Arts and Humanities and the UT Dallas Ackerman Center for Holocaust Studies. The Certificate will be awarded in addition to the diploma earned in the student’s chosen field after graduation.

The Requirements:

Each student seeking a Certificate in Holocaust Studies must complete 15 Graduate credit hours (hours) chosen from the Holocaust Certification Courses below. Students must take 12 of the 15 required hours in organized classes. The remaining 3 hours of coursework may be completed either in an organized class, or by independent study with the permission of the student’s Center Advisor. Independent study courses must focus on topics relating to: German history, philosophy, and literature; Interwar Germany; Jewish Studies; or other Holocaust-related topics. Students may not take “Foundation Courses” by independent study.

NOTE: Students enrolled in the professional option of the MA degree may not take an independent study course.

Special Requirements for MAT Students Enrolled in HUAS Degree Plans

MAT students with a concentration in HUAS must take an additional 6 to 9 hours beyond their required 36 hours for the Holocaust Certification unless they receive prior special permission from the Associate Dean for Graduate Studies.

Holocaust Certification Courses

I. Foundation Courses:

HUHI 6338: The Holocaust

AND

(HUSL 6378: Literature and the Holocaust

(6 hours)

(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;
I. German Studies:

**HUSL 6375:** German Literature and ideas 1870-1960 (3 hours) OR **HUSL 6376:** Literature of Weimar Germany (3 hours)

(As new courses are developed, students may substitute a required course with the permission of the Center’s Director.)

II. Jewish Studies:

**HUSL 6374:** Modern Jewish Literature Across Cultures AND **HUHI 6336:** Modernity, Culture, and the Jews (6 hours)

(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. The student, however, 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 on the table in front of the Arts and Humanities Office as well as online at [www.utdallas.edu/holocaust](http://www.utdallas.edu/holocaust). 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.
New Program Request Form for Bachelor’s and Master’s Degrees

Directions: An institution shall use this form to propose a new bachelor’s or master’s degree program. In completing the form, the institution should refer to the document *Standards for Bachelor’s and Master’s Programs*, which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. Note: An institution which does not have preliminary authority for the proposed program shall submit a separate request for preliminary authority. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

Administrative Information

1. **Institution**: The University of Texas at Dallas

2. **Program Name** – Show how the program would appear on the Coordinating Board’s program inventory (e.g., *Bachelor of Business Administration degree with a major in Accounting*):

   Master of Science in Systems Engineering & Management

3. **Proposed CIP Code**: 14.2701, Systems Engineering

4. **Brief Program Description** – Describe the program and the educational objectives:

   The current business environment requires that engineers in industry and government be trained to be good managers and leaders, and to be good stewards of corporate or government resources. Conversely, managers in industry need a better appreciation and understanding of technology and how to manage large and complex engineering projects. They are all also expected to be cognizant of the broader impact of their management and engineering activities on their companies and the society at large.

   Traditional areas of study in engineering have involved the study of “small” systems – micro-, nano-, info-, and bio- systems. However, there has over the years been a large and growing unmet need, as evidenced by discussions with our industry partners at Texas Instruments, Raytheon, EDS-HP, Rockwell and others, as well as, presentations at conferences, such as those organized by the MIT Enterprise Systems Division, June 15th 2009, for formalized education in engineering and management of increasingly complex “macro” systems with a large number of inter-dependent parts that have a very significant organizational or societal impact. These
areas are at the intersection of the traditionally separate disciplines of engineering and management.

According to the National Center for Education Statistics, which defines the national Classification of Instructional Programs (CIP) codes, Systems Engineering is a “program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of total systems solutions to a wide variety of engineering problems, including the integration of human, physical, energy, communications, management, and information requirements as needed, and the application of requisite analytical methods to specific situations.”¹ The International Council on Systems Engineering (INCOSE) provides further detail on the difference between systems engineering and traditional specialty engineering: “Systems engineering is concerned with the overall process of defining, developing, operating, maintaining, and ultimately replacing quality systems. Where other engineering disciplines concentrate on the details of individual aspects of a system (electronics, mechanics, ergonomics, aerodynamics, software, etc.), systems engineering is concerned with the integration of all of these aspects into a coherent and effective system. Systems engineers concentrate their efforts on the aspects of the engineering process (requirements definition, top-level functional designs, project management, life cycle cost analysis...) that serve to organize and coordinate other engineering activities. The systems engineer is the primary interface between management, customers, suppliers, and specialty engineers in the systems development process.”²

The need for systems engineers has come to the attention of the national press. A 2008 article on the aging systems engineering workforce commented that systems engineering involves “accurately assessing at the outset whether the technological goals are attainable and affordable, then managing the engineering to ensure that hardware and software are properly designed, tested and integrated”, and goes on to say, “Without [systems engineering], projects can turn into chaotic, costly failures.”³

The objective of the UT Dallas Master of Science degree program in Systems Engineering & Management (MS in SEM) is to produce graduates who will be capable of undertaking challenging projects that will encompass wide ranging scientific, engineering and management disciplines. In other words, the objective of the program is to develop an “integrated systems engineering and systems management” skill set among the students who go through this program.

This program is targeted towards engineers with a number of years of industry experience, as well as towards graduates with a fresh bachelor’s degree.

The MS in SEM degree will require a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus 6 hours of thesis credit for the thesis option.

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The program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to pick up areas in which they are deficient, while still guaranteeing core competency in systems engineering and engineering management.

**Course Requirements (see Table 3 page 8)**

*Required Courses:* Students will be required to take at least 4 courses (a total of 12 credit hours) from an offered set of 8 courses in Systems Engineering (SYSM). Two of the courses must be from IA and two from IB in Table 3. Thus the 4 required courses contribute a total of 12 credit hours towards the MS degree.

*Prescribed Elective Courses* will consist of an additional 4 distinct courses (a total of 12 credit hours) from a core set of 20 courses (Table 3), which have not already been taken towards the required 4 courses. At least two of these courses must be chosen from either IA or IIA in Table 3.

*Free Elective Courses:* For the free electives students will be able to take any 4 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.

5. **Administrative Unit** – Identify where the program would fit within the organizational structure of the university (e.g., The Department of Electrical Engineering within the College of Engineering):

   A joint program between
   
   The Erik Jonsson School of Engineering and Computer Science (ECS), and
   
   The School of Management (SOM)

6. **Proposed Implementation Date** – Report the first semester and year that students would enter the program:

   Fall Semester 2010

7. **Contact Person(s)** – Provide contact information for the person who can answer specific questions about the program:

   Name: Dr. Mark W. Spong
   Title: Dean, ECS
   E-mail: mspong@utdallas.edu
   Phone: 972-883-2974

   Dr. Hasan Pirkul
   Title: Dean, SOM
   E-mail: hpirkul@utdallas.edu
   Phone: 972-883-6813
Program Information

I. Need

Note: Complete I.A and I.B only if preliminary authority for the program was granted more than four years ago. This includes programs for which the institution was granted broad preliminary authority for the discipline.

A. Job Market Need – Provide short- and long-term evidence of the need for graduates in the job market.

Systems Engineering & Management (SEM) is an interdisciplinary field between Engineering and Management that focuses on the engineering & management of complex engineering projects. For large, complex projects, SEM deals with issues such as automatic control of machinery, logistics and the coordination of different teams, work processes and tools to handle such projects. It overlaps with both technical and human centered disciplines, such as Control Engineering and Project Management.

Data compiled by the Greater Dallas Chamber of Commerce (GDC), and the Texas Workforce Commission (TxWFC) in 2007 across various High-tech Sectors that are relevant to SEM, excluding the Defense, Energy and Healthcare Sectors, indicates an engineering population in the DFW Metroplex well in excess of 200,000. Even if 5% of these engineers are conservatively assumed to be Systems Engineers that translates to about 10,000. Again, if we were to conservatively assume that these 10,000 professionals renew their skills every 10 years, which creates a potential Total Available Market (TAM) of 1000 engineers and managers every year that would need SEM training every year in the DFW area alone. Of this population of engineers, the MS SEM Program is targeted towards engineers with 4 to 5 years of experience.

Again, using the GDC and TxWFC data, DFW area represents about 40% of the state’s high-tech population, not including the defense, energy and healthcare sectors, significantly larger than any other city in the state. DFW area is already the 4th largest in the country by population and GDP. It is also home to the headquarters of about 25 large corporations, and also home to major divisions of a large number of companies not headquartered in the region. Cumulative job growth, as well as population growth in the DFW area, over the next 10 years, is expected to be twice the national average.

Also according to the Bureau of Labor Statistics (BLS) and the American Electronics Association (AeA) – “Contrary to the hype about rampant outsourcing, high-tech has many job openings, as demonstrated by the BLS’s 2.5% unemployment rate for computer scientists and under 2% for engineers.”

While interests in this new discipline have been verified in discussions with local companies – TI, EDS-HP, Raytheon, Rockwell and others – along with an initial interest in potential commitment of employees to send through this program, specific hard numbers to indicate potential future job market for this discipline are provided above.

Because the field of Systems Engineering & Management comprises a wide range of engineering disciplines, it potentially represents a large portion of the engineering population. The graduates of the UT Dallas SEM program will be employed by large corporations in various industries, and to mention just a few examples – defense, aerospace, and space systems; transportation; telecom and computers networks and systems integration and services; semiconductors and electronics; healthcare systems; sustainable and intelligent energy systems; etc.

B. **Student Demand** – Provide short- and long-term evidence of demand for the program.

The American Society for Engineering Education reports that the Master’s enrollment in industrial and manufacturing engineering grew steadily from around 5,000 in 1999 to more than 6,300 in 2008. Based upon the assumption that many industrial engineering students have a systems focus, student demand for systems engineering and closely related fields is growing at a slower rate than will probably be necessary for replacement of engineers who are now nearing retirement age. However, student demand is a trailing, not a leading, indicator of perceived job opportunities.

Several local industry representatives have been contacted and subsequently confirmed their interest in this program. Sample letters of support from some of those representatives are included in Appendix 1.

Also, over the last several years, SMU and other local universities began offering engineering-only focused courses. SMU offers an MS in Systems Engineering. No programs in the North Texas Region exist that combine systems engineering and systems management, leveraging the strengths of both the School of Engineering and the School of Management, except perhaps a dual-track program in MS Engineering Systems (MSES) and MBA launched in May 2009 by the University of North Texas (UNT) or the UNT MS in Engineering Systems program that has a 15-hour management curriculum offered at their home campus and at the Collin Higher Education Center in McKinney; however, this program is a traditional engineering technology program. Similarly, the Systems Engineering programs offered by SMU and UT Austin are offered only through their engineering schools and do not provide any business education.

A summary chart of data from the Coordinating Board’s PREP online database comparing programs from other Texas schools that could even remotely be considered similar to the proposed UTD Program is provided below, showing significant interest in this general area.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program Name</th>
<th>CIP Code</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>05-'06</th>
<th>06-'07</th>
<th>07-'08</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tx A&amp;M</td>
<td>Industrial Engineering</td>
<td>14350100</td>
<td>441</td>
<td>548</td>
<td>621</td>
<td>755</td>
<td>42</td>
<td>42</td>
<td>57</td>
</tr>
<tr>
<td>2 Tx Tech</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>32</td>
<td>27</td>
<td>48</td>
<td>58</td>
<td>11</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>3 UT Arlington</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>28</td>
<td>29</td>
<td>33</td>
<td>31</td>
<td>10</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>4 UT Austin</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>33</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>5 UT Pan Am</td>
<td>Engineering Management</td>
<td>14999901</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>14</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

---

The highly popular program at Texas A&M is in the area of Industrial Engineering, which might be thought of as a subset of the Systems Engineering & Management Program being proposed by UTD. The Texas A&M program, while highly popular, is offered only out of the engineering school and does not include any management disciplines that are so crucial in the mid- to upper-management of large projects.

The same is true of the Engineering Management degrees offered by Texas Tech, UT Arlington, UT Pan American and Lamar University – all offered entirely out of schools of engineering. This is true also of the traditional Engineering Technology program offered by the University of North Texas. The degree offered by UT Austin, is out of the Engineering School also, but does incorporate some business oriented courses.

The degree offered by the University of Houston is in the area of Operations Management and Supervision, which again could be thought of as a subset of the broad area of Systems Engineering and Management. Also, the program is offered entirely out of the Business School, with no engineering involvement.

The UTD proposed program will be unique in that, both advanced engineering and advanced management education will be provided together in MS in SEM, leveraging the strengths of two very quantitatively strong and highly ranked programs in the Schools of Management and Engineering. Students will not be required to pursue an MBA to get the complementary business education. The program is unique in that it is a true 50/50 collaboration between the two schools.

C. Enrollment Projections – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. (Include majors only and consider attrition and graduation.)

Based upon strong interests expressed by a number of area companies such as Texas Instruments, Rockwell, Raytheon, EDS-HP and other members of the SOM and ECS Advisory Boards, we expect to have a commitment from these companies to send students through the program at any given point in time. These discussions suggest the following progression for enrollment:

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>20</td>
<td>45</td>
<td>55</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>FTSE</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

(# Table-1 assumes, students graduating in 2 years and attrition rate of 10 %. This attrition is anticipated to be primarily due to industry participants in the program
moving elsewhere, since these are expected to be senior, as well high-performing people in member companies.

II. Quality

A. **Degree Requirements** – Use this table to show the degree requirements of the program. *(Modify the table as needed; if necessary replicate the table for more than one option.)*

1. **Course Requirements:** The MS in SEM degree (non-thesis option) will require a total of 12 courses for a total of 36 credit hours.

   ![Table - 2 SEM Non-Thesis Option Degree Requirements](chart)

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
<th>Clock Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education Core Curriculum <em>(bachelor’s degree only)</em></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Required Courses</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Free Electives</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Other <em>(Specify, e.g., internships, clinical work)</em> <em>(if not included above)</em></td>
<td>(if not included above)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>36</strong></td>
<td></td>
</tr>
</tbody>
</table>

2. **Thesis Option:** An alternative to 36 credit hours required for the MS SEM degree, would be to take 30 credit hours of courses and, in addition, write a Master’s Thesis, in lieu of the remaining 6 credit hours.

B. **Curriculum** – Use these tables to identify the required courses and prescribed electives of the program. Note with an asterisk (*) courses that would be added if the program is approved. *(Add and delete rows as needed. If applicable, replicate the tables for different tracks/options.)*

Again, the program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to choose areas in which they are deficient, rather than having them all go through a prescribed set of courses.

The Core Curriculum will consist of 20 Courses *(Table - 3).*

1. All Courses listed below are 3 credit hours each
2. Courses with (*) are new courses
3. All non-asterisked courses already exist and are being offered under other prefixes.
4. Students who have taken other existing courses with other prefixes will be allowed to transfer to this program.

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Core Curriculum</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6301</td>
<td>Systems Engineering Architecture &amp; Design (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6302</td>
<td>Quantitative Risk, Probability, Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6303</td>
<td>Systems Engineering Risk &amp; Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6304</td>
<td>Dynamic Systems Modeling &amp; Analysis (*)</td>
<td>3</td>
</tr>
<tr>
<td>IB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6305</td>
<td>Systems Project Management</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6306</td>
<td>Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6307</td>
<td>Human Factors in Complex Organizations</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6308</td>
<td>Manufacturing and Service Systems Planning and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6309</td>
<td>Dynamics of Complex Structures</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6310</td>
<td>Systems and Control Theory</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6311</td>
<td>Software Maintenance, Evolution and Re-engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6312</td>
<td>Advanced Requirements Engineering</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6313</td>
<td>Software Testing, Validation, Verification</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6314</td>
<td>Modeling and Simulation of Engineering Systems</td>
<td>3</td>
</tr>
<tr>
<td>IIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSM6315</td>
<td>Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6316</td>
<td>Innovation within the Corporation</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6317</td>
<td>The Management of High Tech Products (*)</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6318</td>
<td>Marketing Management, Marketing Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6319</td>
<td>Business Economics</td>
<td>3</td>
</tr>
<tr>
<td>SYSM6320</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

a) **Required Courses**: Students will be required to take at least 2 courses from Group IA and at least 2 courses from Group IB (a total of 6 credit hours) out of an offered set of 4 courses from Groups IA and IB. Thus the 4 required courses contribute a total of 12 credit hours towards an MS degree.

b) **Prescribed Elective Courses** will consist of an additional 4 distinct courses (a total of 12 credit hours) from the core curriculum of 20 courses, which have not already been taken towards the required 4 courses. At least two of these prescribed elective courses must be in Group IA or IIA.
c) **Free Elective Courses**: For the free electives, students will be able to take any 4 additional and distinct courses of the remaining 12 core courses that have not already been taken as required courses or prescribed elective courses. They may also take additional free elective courses that are already being offered in engineering or in management that will allow “concentration” or “specialization” in specific industry sectors.

Total Semester Credit Hours:
12 (Required) +12 (Prescribed Electives) +12 (Free Electives) = 36

d) **Thesis Option**: Alternatively, students who choose the thesis option will be able to substitute 6 hours of free electives with a written thesis in addition to the 12 required credit hours and 12 prescribed elective credit hours.

C. **Academic Council** – Due to the unique nature of this program and the 50/50 joint collaboration between Engineering and Management Schools, academic leadership and oversight for this program will be provided by a committee consisting 4 faculty from each school and more specifically by the Co – Program Heads of this program, one from each school (Table-4).

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dr. Milind Dawande, <em>Program Co-Head</em></td>
<td>SOM</td>
</tr>
<tr>
<td>2 Dr. Mathukumalli Vidyasagar, <em>Program Co-Head</em></td>
<td>ECS</td>
</tr>
<tr>
<td>3 Dr. Alain Bensoussan</td>
<td>SOM</td>
</tr>
<tr>
<td>4 Dr. Duncan MacFarlane</td>
<td>ECS</td>
</tr>
<tr>
<td>5 Dr. Ozalp Ozer</td>
<td>SOM</td>
</tr>
<tr>
<td>6 Dr. Rajiv R. Shah</td>
<td>SOM</td>
</tr>
<tr>
<td>7 Dr. Lakshman Tamil</td>
<td>ECS</td>
</tr>
<tr>
<td>8 Dr. Bhavani Thuraisingham</td>
<td>ECS</td>
</tr>
</tbody>
</table>

D. **Faculty** – Use these tables to provide information about Core and Support faculty. Add an asterisk (*) before the name of the individual who will have direct administrative responsibilities for the program. *(Add and delete rows as needed.)*

<table>
<thead>
<tr>
<th>Name of Core Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Farokh Bastani</td>
<td>Ph.D. In Computer Science</td>
<td>SYSM6313</td>
<td>25%</td>
</tr>
<tr>
<td>Professor</td>
<td>UC Berkeley</td>
<td>Courses Assigned in Program</td>
<td>% Time Assigned To Program</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Dr. Alain Bensoussan</td>
<td>Ph.D. in Mathematics University of Paris, France</td>
<td>SYSM6303</td>
<td>25%</td>
</tr>
<tr>
<td>Distinguished Research Professor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Cy Cantrell</td>
<td>Ph.D. in Physics Princeton University</td>
<td>SYSM6314</td>
<td>25%</td>
</tr>
<tr>
<td>Professor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Huseyin Cavusoglu</td>
<td>Ph.D. in MIS UT Dallas</td>
<td>SYSM6330</td>
<td>25%</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. R. Chandrasekaran Ashbel Smith Professor</td>
<td>Ph.D. in Operations Research UC Berkeley</td>
<td>SYSM6309</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Kendra Cooper Associate Professor</td>
<td>Ph.D. In Electrical and Computer Engineering, U of British Columbia</td>
<td>SYSM6301</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Milind Dawande Professor</td>
<td>Ph.D. in Algorithms Carnegie Mellon University</td>
<td>SYSM6308</td>
<td>50%</td>
</tr>
<tr>
<td>Dr. Greg Dess Professor</td>
<td>Ph.D. in Organizational Behavior U of Washington</td>
<td>SYSM6314</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Nick Gans Assistant Professor</td>
<td>Ph.D. in Systems &amp; Entrepreneurial Engineering, U of Illinois</td>
<td>SYSM6304</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. R. Henderson Assistant Professor</td>
<td>Ph.D. in Electrical Engineering U of Michigan</td>
<td>SYSM6312</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Kamran Kiasaleh Professor</td>
<td>Ph.D. in Electrical Engineering USC</td>
<td>SYSM6310</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Robert Kieschnick Associate Professor</td>
<td>Ph.D. in Finance UT Austin</td>
<td>SYSM6306</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Nanda Kumar Associate Professor</td>
<td>Ph.D. in Marketing U of Chicago</td>
<td>SYSM6312</td>
<td>25%</td>
</tr>
<tr>
<td>Dr. Duncan MacFarlane Professor</td>
<td>Ph.D. In Electrical Engineering Brown University</td>
<td>SYSM6317</td>
<td>50%</td>
</tr>
<tr>
<td>Dr. Mathukumalli Vidyasagar, Program Co-Head</td>
<td>Ph.D. in Electrical Engineering University of Wisconsin</td>
<td>SYSM 6304</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Table - 6**

<table>
<thead>
<tr>
<th>Name of Support Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned To Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Peter Lewin Clinical Professor</td>
<td>Ph.D. in Economics University of Chicago</td>
<td>SYSM6313</td>
<td>25%</td>
</tr>
</tbody>
</table>
D. Students – Describe general recruitment efforts and admission requirements. Describe plans to recruit and admit students from under-represented groups for the program.

This program will participate in the general recruitment efforts of the School of Management (SOM) and the School of Engineering and Computer Science (ECS), and will have the same admission requirements as the Master’s programs of these two schools.

In addition, the two schools jointly will promote this SEM program to local industry and corporations and will recruit heavily from these corporations – high performers in these companies with five to ten years of work experience in addition to their bachelor’s and other masters degrees.

The two schools will also make every effort to recruit and retain underrepresented students into this program. Such efforts will include, but will not be limited to, advertising the program widely to communities and organizations with underrepresented populations; open houses, providing needed advising to such students on their academic work; and helping them on their career path. In addition, the two schools will also work with corporate partners to recruit members of under-represented communities from these companies.

E. Library – Provide the library director’s assessment of library resources necessary for the program. Describe plans to build the library holdings to support the program.

Note – In both tables, Table-5 and Table-6, some faculty are shown assigned at 25 % and some are shown assigned at 50 %. This is due to the differences in their anticipated involvement in not only academic but also with program management and support responsibilities.
The journal collection at the University of Texas at Dallas compares favorably with the collections at UT Arlington, UT Austin, and MIT. UT Dallas should add 2 additional titles during the next 3 years at the cost of $900.

During the analysis of the book collection at the University of Texas at Dallas, the results indicated that the Library needed to increase the number of the titles available as compared to UT Austin and MIT. The Library immediately purchased 40 new titles at a cost of $5,062.

<table>
<thead>
<tr>
<th></th>
<th>Number of titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT Dallas</td>
<td>152+40 new titles (192)</td>
</tr>
<tr>
<td>UT Arlington</td>
<td>110</td>
</tr>
<tr>
<td>UT Austin</td>
<td>326</td>
</tr>
<tr>
<td>MIT</td>
<td>334</td>
</tr>
</tbody>
</table>

Given the shortage of book materials, the Library will need to increase spending by approximately 30 titles per year at a cost of $4,000 annually. Most of the new book titles will be purchased in electronic format using established procedures. Purchasing electronic books enables multiple customers to use the titles at one time and supports distance learning initiatives.

In summary, the graduate degree in systems engineering and management will cost the Libraries approximately $4,900 annually, plus inflation.

F. Facilities and Equipment – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvements/additions.

Current facilities are adequate to support the program. The School of Management and the School of Engineering and Computer Science buildings are both newly constructed, with cutting edge computing and other teaching facilities and technologies. Both buildings offer adequate facilities and equipment, in terms of office and classroom spaces, computing, research and teaching resources to accommodate the proposed program.

The School of Engineering and Computer Science also has extensive computer labs and facilities that can be used for this program and are considered adequate to support the program.

G. Accreditation – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation.

Currently, the American Assembly of Collegiate Schools of Business (AACSB) is the accreditation body that accredits business school programs. Their standards for a business school can be found at [http://www.aacsb.edu/accreditation/standards.asp](http://www.aacsb.edu/accreditation/standards.asp). The School of Management was accredited by the AACSB in 2002 and will be accredited again in 2011. The management portion of the proposed MS in SEM degree program utilizes existing courses (as a part of our current MS and MBA degree programs) which meet the stated standards.
UT Dallas undergoes its standard SACS accreditation process and the new program will be integrated as part of the regular review and assessment procedures associated with this activity.

III. Costs and Funding

Five-Year Costs and Funding Sources - Use this table to show five-year costs and sources of funding for the program.

<table>
<thead>
<tr>
<th>Five-Year Costs</th>
<th>Five-Year Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel¹</td>
<td>Reallocated Funds</td>
</tr>
<tr>
<td>$1,800,000</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>Facilities and Equipment</td>
<td>Anticipated New Formula Funding³</td>
</tr>
<tr>
<td>$0</td>
<td>$650,000</td>
</tr>
<tr>
<td>Library, Supplies, and Materials</td>
<td>Special Item Funding</td>
</tr>
<tr>
<td>$25,000</td>
<td>$0</td>
</tr>
<tr>
<td>Other²</td>
<td>Other⁴</td>
</tr>
<tr>
<td>$0</td>
<td>$95,000</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>Total Funding</strong></td>
</tr>
<tr>
<td><strong>$1,825,000</strong></td>
<td><strong>$2,545,000</strong></td>
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Notes:
1. The costs include the costs of faculty teaching these courses for the designated % time allocated to this program. So although no new faculty are being hired at this time, a portion of the existing faculties salaries have been accounted for in the costs as well as the reallocated funds for this particular program.
2. Formula funding calculations: 62.19 x 18 credit hours x 5.525 (averaged SOM and ECS rate) x new students for years 3, 4, and 5.
3. Designated tuition fee rate: 18 credit hours x $50 (averaged SOM and ECS fee) x new students for years 3, 4, and 5.
Signature Page

1. **Adequacy of Funding** – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.

   ________________________________________  _______________________
   Chief Executive Officer                        Date

2. **Board of Regents or Designee Approval** – A member of the Board of Regents or designee shall sign the following statement:

   On behalf of the Board of Regents, I approve the program.

   ________________________________________  _______________________
   Board of Regents (Designee)                   Date of Approval

3. **Board of Regents Certification of Criteria for Commissioner of Assistant Commissioner Approval** –

   For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the eight criteria under TAC Section 5.50 (b): The criteria stipulate that the program shall:

   (1) be within the institution’s current Table of Programs;
   (2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
   (3) have sufficient clinical or in-service sites, if applicable, to support the program;
   (4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
   (5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
   (6) not unnecessarily duplicate existing programs at other institutions;
   (7) not be dependent on future Special Item funding
   (8) have new five-year costs that would not exceed $2 million.

   On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).

   ________________________________________  _______________________
   Board of Regents (Designee)                   Date
Appendix 1 Confirmation of Support

Local industry representatives that have been contacted and who have confirmed their interest, and a potential commitment to send 15 to 20 students through this program at any given point in time are –

1. Mr. Steve Lyle  
   s-lyle@ti.com

2. Mr. Martin Izard  
   izzard@ti.com

3. Mr. Alan Gatherer  
   gatherer@ti.com

4. Mr. Tom Hill  
   tom.hill@eds.com

5. Mr. John McDonald  
   John_T_McDonald@raytheon.com

6. Ms Lynn Mortnesen  
   lmortensen@raytheon.com

7. Mr. Paul Klocek  
   p-klocek@raytheon.com

8. Mr. Alan Caslavka  
   accaslav@rockwellcollins.com

We have also included four formal letters of support.
To: Coordinating Board  
From: Thomas L. Hill, Director HP Enterprise Services Fellows and Distinguished Engineering  
Date: September 29, 2009  
Subject: Strong Support for The University of Texas at Dallas Systems Engineering and Management Program

HP Enterprise Services is excited to participate in the Systems Engineering and Management Program proposed by The University of Texas at Dallas. We have worked closely with the curriculum development team to ensure that the course content is relevant to our industry.

The current North Texas business environment requires that engineers also be adept managers and leaders with the ability to supervise large, complex engineering projects. Unlike other degree programs in Texas, this program is the first to address this particular need as it integrates disciplines, focusing on both systems engineering and systems management.

The Systems Engineering and Management degree program is ideal for candidates with five or more years of experience, and as a result, graduates will be uniquely positioned to join large engineering management or government organizations at mid- to upper-management levels. Additionally, graduates of this program, trained to manage large systems with many interdependent parts, will provide a competitive advantage of particular interest to HP Enterprise Services.

Most importantly, the flexibility of the program provides industry partners the opportunity to tailor the degree to address current business needs, while the adaptable, interdisciplinary curriculum also allows students to gain the specific skills they require to successfully oversee complex projects. Thank you for your consideration of this proposed degree program—it will certainly be of interest to organizations in North Texas. I will make sure our organization and other organizations are ready to enroll when the program begins.

Sincerely,

Thomas L. Hill  
HP Enterprise Services  
H4-GF-20  
5400 Legacy Drive  
Plano, Texas 75924
Technology for better business outcomes.
September 25, 2009

Dr. Rajiv Shah  
School of Management  
The University of Texas at Dallas  
800 West Campbell Road SM 43  
Richardson, Texas 75080-3021

Dear Dr. Shah,

This letter is offered in strong support for The School of Management and The Erik Jonsson School of Engineering and Computer Science’s proposed degree program, Systems Engineering and Management. Currently there is an industry need for trained leadership with experience in both engineering and management. This degree program, using an interdisciplinary approach, focuses on the engineering and management of complex engineering projects, such as the automatic control of machinery; logistics and the coordination of different teams; and implementing work processes and tools to handle such projects.

The degree program addresses both the technical and human centered disciplines by covering issues such as control engineering and project management. This unique program is both innovative and flexible, allowing students to concentrate on a host of disciplines ranging from healthcare and defense, both of particular interest to ELCAN, to macro-economic and financial services. The adaptability of the program allows companies the opportunity to target specific needs within their corporation by training future leaders in that area.

In my view, the ideal candidates for this degree program would have five to ten years of industry experience and the desire to transcend their discipline while enhancing their engineering skillset. As the program becomes established, I anticipate that ELCAN would encourage and support enrollment in this degree program as part of our ongoing talent development activities. Beyond ELCAN, I believe this program aligns well with the interests of the large number of high-tech organizations in the North Texas region.

Sincerely,

Paul Klocék  
General Manager  
ELCAN Optical Technologies  
a Raytheon Company
September 30, 2009

Dr. Rajiv Shah  
School of Management  
The University of Texas at Dallas  
800 West Campbell Road SM 43  
Richardson, Texas 75080-3021

Dear Dr. Shah,

As an industry partner, you know that I have had the opportunity to work closely with both The School of Management and The Erik Jonsson School of Engineering and Computer Science to establish the proposed interdisciplinary degree program, Systems Engineering and Management. Today I write in strong support of this program which satisfies a growing industry need for trained business leaders with formalized education in both engineering and management.

By focusing on a candidate’s specific needs, this unique program’s flexible curriculum provides experienced candidates the necessary tools to manage complex “macro” systems. Graduates of the program will be equipped to oversee these challenging projects that require knowledge of scientific, engineering, and management disciplines.

As the program becomes established, I anticipate that Texas Instruments would encourage and support enrollment in this degree program as part of our ongoing talent development activities.

Please keep us advised of your progress in the development and implementation of this exciting new program.

Sincerely,

Steve Lyle  
Manager  
Education, Workforce Development & Diversity
September 29, 2009

Dr. Rajiv Shah
School of Management
The University of Texas at Dallas
800 West Campbell Road SM 43
Richardson, Texas 75080-3021

Dear Dr. Shah,

I am writing to express my support for the Systems Engineering and Management joint degree program collaboratively created by The School of Management and The Erik Jonsson School of Engineering and Computer Science. Successful management of large, complex engineering projects is critical for Raytheon, and in our industry, there is a need to formally educate leaders who can oversee these multifaceted projects.

This unique program leverages the strengths of both the Schools of Management and Engineering to train students based on their areas of need regarding systems engineering and systems management. In this way, experienced engineers and managers can focus on learning applicable skills that will enable them to architect, research, develop, engineer, manage, execute, and deliver complex systems programs while managing large teams and budgets.

Raytheon Intelligence & Information Systems, as well as other businesses in the North Texas region, will certainly take advantage of this program in terms of talent development and hiring of graduates. The Systems Engineering and Management degree program provides future business leaders the opportunity to pursue an interdisciplinary course of study critical for the continued success and growth of high-tech organizations.

Sincerely,

John T. McDonald
Chief Engineer/Chief Architect
RTN IIS Engineering
972.205.7360 (office)
214.244.2691 (BE)
RTN Six Sigma Expert

Raytheon Certified Architect
Faculty


Assistant Professors: Joao Cangussu, Kendra M.L. Cooper, Jing Dong, Xiaohu Guo, Kevin Hamlen, Murat Kantarcioglu, Yang Liu, Ying Liu, Vincent Ng, Weili Wu

Senior Lecturers: Rekha Bhowmik, Tim Farage, Herman Harrison, Sam Karrah, Lawrence King, Greg Ozbirn, Cort Steinhorst, Laurie Thompson, Nancy Van Ness

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 with Major in Software Engineering, Ph.D. degree in Computer Science, and the PhD 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.

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 adviser, a diagnostic exam may be required. The required
prerequisite courses common to all Master's students are:

- CS 5301 Advanced Professional and Technical Communication
- CS 5303 Computer Science I
- CS 5330 Computer Science II
- CS 5333 Discrete Structures
- CS 5343 Algorithm Analysis and Data Structures
- CS 5348 Operating Systems Concepts

Substitution of CS 5303, 5330 by professional experience will be considered. Additional prerequisite
courses required for the various degree plans are:

For the Traditional Computer Science and Bioinformatics Tracks:
- CS 5349 Automata Theory
- CS 5390 Computer Networks

For the Networks and Telecommunications Track:
- CS 3341 Probability and Statistics
- CS 5390 Computer Networks

For the Intelligent Systems Track:
- CS 5349 Automata Theory

For the Major in Software Engineering:
- CS/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 adviser, 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 adviser. Specific degree requirements follow.

**Core Requirements (15 hours)**

Students are required to complete one of the following:

**Traditional Computer Science Track**

CS 6363 Design & 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 Structure & Design of Programming Languages

**Networks and Telecommunications Track**

CS 6352 Performance of Computer Systems and Networks  
CS 6363 Design & 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 6360 Database Design  
CS 6363 Design & Analysis of Computer Algorithms  
CS 6364 Artificial Intelligence  
CS 6375 Machine Learning  
CS 6378 Advanced Operating Systems

**Bioinformatics Track**

CS 6325 Introduction to Bioinformatics  
CS 6363 Design & Analysis of Computer Algorithms  
CS 6360 Database Design
Two of the following four courses:

- CS 6333 Algorithms in Computational Biology
- CS 6365 Data and Text Mining for Computational Biology
- CS 6383 Computational Systems Biology
- CS 6393 Advanced Algorithms in Biology

Major in Software Engineering (M. S. C. S.)

- CS/SE 6361 Requirements Engineering
- CS/SE 6362 Software Architecture and Design
- CS/SE 6367 Software Testing, Validation and Verification
- CS/SE 6387 Advanced Software Engineering Project

One of the following four courses:

- CS 6353 Compiler Construction
- CS/SE 6360 Database Design
- CS 6371 Advanced Programming Languages
- CS/SE 6388 Software Project Planning and Management

Students must satisfy the core requirements by either earning a 3.2 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 earning a grade of B or better in this additional elective.

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 adviser; 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.

While the Department of Computer Science offers both the Master of Science in Computer Science and the Master of Science in Computer Science with Major in Software Engineering degrees, students are not permitted to pursue both degrees.

Doctor of Philosophy

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 adviser. 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 with Major in 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 with Major in Software Engineering.

- Pass a qualifying examination.
  - Pass, with a grade of B or better, courses chosen as follows:
    - CS 6382 Theory of Computation; in addition, students pursuing the Ph.D. degree in Software Engineering should take CS/SE 6389 _ Formal Methods and Programming Methodology.
    - 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 adviser in choosing electives.

Dissertation

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation adviser 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.
Graduate Program in Latin American Studies

Master of Arts

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 & 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.
ITEM # 16

PROPOSED

2010-2011

ELECTION CALENDAR

January 20, 2010  Appoint ad hoc Election Committee

February 5, 2010  Distribute nominating petitions to Voting Members of the General Faculty and to Full-Time Senior Lecturers

February 19, 2010  Deadline for Nominating Petitions for Academic Senate to be returned to Academic Governance Office

March 1, 2010  Ballots for Academic Senate to be distributed to Voting Members of the General Faculty and to Full-Time Senior Lecturers

March 19, 2010  Deadline for Ballots for Academic Senate due in Academic Governance Office

March 29, 2010  Academic Senate election results announced

April 16, 2010  Senate – Elect Caucus
Election of Speaker of the Faculty, Secretary of the Faculty, and Academic Council

May 5, 2010  Joint Meeting – Council/Council-Elect

May 19, 2010  Joint Meeting – Senate/Senate-Elect

1/08/2010