

# SUPPLY CHAIN MANAGEMENT CONCENTRATION

## Master of Science in Management & Administrative Sciences

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### General Information

Supply Chains (SC) are concerned with the efficient integration of suppliers, factories, warehouses and stores so that products are distributed to customers in the right quantity, at the right time and at a low cost. Supply Chain Management (SCM) graduates will use their analytical decision-making skills to design and manage SCs. They will provide a rational basis for decision making by seeking to understand and structure complex systems, and to use this understanding to improve system performances. SCM draws upon ideas from management, engineering and mathematics to contribute to a wide variety of application domains; the field is closely related to several other fields in the "decision sciences" -- applied mathematics, computer science, economics, industrial engineering and systems engineering. The concentration, being a medley of practice and methodology, surveys both industrial success stories and useful techniques; It provides an opportunity to effectively meld managerial ideas with analytical techniques.

The concentration in SCM is also supported by the Center for Intelligent Supply Networks (C4ISN) and the International Center for Decision and Risk Analysis (ICDRIA). Centers sponsor activities that complement the classroom learning. Interaction with the Advisory Boards of the centers, participation in a capstone project and student internships provide students the opportunity to network with industry leaders and gain practical experience. Students are also exposed to the current SC challenges and trends by listening to guest speakers and by visiting manufacturing and service organizations running effective SCs. The web addresses for the centers are [som.utdallas.edu/c4isn](http://som.utdallas.edu/c4isn) and [som.utdallas.edu/icdria](http://som.utdallas.edu/icdria).

SCM is distinguished by its broad applicability and by the wide variety of career opportunities and work styles it embraces. SCM specialists may implement SC models in industry, in public service and in managerial consulting contexts. In some contexts they are called "Management Analysts or Consultants". The US Bureau of Labor Statistics forecasted that the need for "Management Analysts" would grow about 21-35% from 1998 to 2008. In 1988, there were 344,000 "Management Analysts". Also then, about a million people were working in "Management and Public Relations Industry", 79% of which worked in "Management Services and Consulting". Both management analyst and consultant positions require a solid education; some consulting firms hire only people who hold master's degree in business administration, as reported by the US Bureau of Labor Statistics. Therefore, SCM graduates will be in great demand in both service businesses and manufacturing industries.

The Dallas area is the home of the world leader SC software and consulting companies such as i2, Sabre and EDS. American Airlines, Southwest Airlines, JC Penny and Frito-Lay are all in greater Dallas area and run complex SCs. The "Telecomm Corridor" houses several leading firms in the telecommunications industry, such as Nortel, Alcatel, Ericsson, Samsung and Cisco, which demand not only well-educated potential employees but also educational programs to improve the current employees' knowledge and skills. Furthermore, many firms, financial institutions, retailers, manufacturers, consulting companies and hospitals supply services or products made available through complex systems. The complexity of these systems is increasing with company mergers and globalization, hence so does the need for SCM professionals who are taught to analyze and improve such complex systems. The concentration aims to educate such professionals.

The Master of Science in MAS with SCM concentration will explore the key issues associated with the design and management of industrial SCs. It will include concepts dealing with the improvement of SC operations towards lower costs, faster delivery, higher quality and mass customization. The ultimate objective is using SCM to mold traditional business operations into competitive weapons for today's fierce global economy. Students will acquire not only fundamental knowledge of business management but also analytical decision-making skills especially for complex systems.

**Waivers and Transfers of Credit:** Waivers of program requirements may be granted in recognition of previous coursework completed with grade B or better within the past six years in a specific business program area. Waivers are approved by the appropriate Program Director through a process which allows a student to skip a core course and take the next higher level course in the same academic area with no reduction in the overall program hour requirements.

Transfer credits may be granted for equivalent graduate course work taken at other universities with a grade of B or better within the past six years. Up to 12 hours of course work from other universities may be waived from or transferred to the MS-MAS program. Consult the UTD Graduate Catalog for further details. Applications for approval of waivers and transfers may be obtained in and submitted to the School of Management Advising Office. For more info see [som.utdallas.edu/advising](http://som.utdallas.edu/advising).

**Prerequisites:** Calculus and competence in personal computing are required as prerequisites. If a student has not taken equivalent courses already, he/she will need to take MATH 5404 to meet the calculus requirement and BA 3351 for personal computing.

**Basic Business Core Courses (10 credit hours):** All students enrolling in the Master of Science in Management & Administrative Sciences with a concentration in SCM must complete the following Basic Business Core. Please see the course catalog for the prerequisite course information.

AIM 6201 Financial Accounting  
MECO 6303 Business Economics

MIS 6204 MIS Fundamentals  
OPRE 6301 Quant. Methods for Business Decision Making

**Required SCM Core Courses (At least 12 credit hours):**

**Fixed Core (At least 9 credit hours)**

OPRE 6302 Operations Management

OPRE 6363 Inventory Management

OPRE 6366 Supply Chain Management

**Flexible Core (At least 3 credit hours).** Satisfied by taking some of the following.

OPRE 6335 Risk and Decision Analysis

OPRE 6340 Flexible Manufacturing Strategies

OPRE 6368 Industrial Applications in Supply Chains

OPRE 6370 Logistics and Distribution

OPRE 6385 Scheduling

**Electives (14 credit hours):** Credit hours must be satisfied by taking graduate courses from the following list: Flexible Core courses (taken in addition to the minimum one course requirement) can be used to satisfy the elective course requirement.

AIM 6202 Managerial Accounting

MKT 6301 Marketing Management

AIM 6342 Strategic Cost Management

MKT 6322 Internet Business Models

AIM 6345 Business Valuation

OPRE 6311 Game Theory

AIM 6346 Financial Dimensions of Mergers and Acquisitions

OPRE 6330 Probability and Stochastic Processes

AIM 6347 Cost Benefit Analysis for Technology Management

OPRE 6331 Stochastic Models in Operations Research

BPS 6310 Strategic Management

OPRE 6360 Operations Strategy

BPS 6211 Strategy Implementation

OPRE 6361 Production Planning and Control

CS 6390 Advanced Computer Networks

OPRE 6362 Project Management

CS 6363 Design and Analysis of Computer Algorithms

OPRE 6364 Quality Control

CS 6373 Intelligent Systems

OPRE 6367 Capstone Projects in Supply Chain Management

CS 6360 Database Design

OPRE 6369 Supply Chain Software

FIN 6301 Financial Management

OPRE 7313 Network Flows

MIS 6318 Intro to Electronic Commerce

OPRE 7320 Optimal Control Theory and Applications

MIS 6319 Enterprise Resource Computing

OPRE 7330 Deterministic Models in Operations Research

MIS 6321 Systems Simulation

OPRE 7372 Advanced Topics in Supply Networks

MIS 6326 Database Management Systems

Courses are primarily offered in the late afternoon and evening of weekdays and Saturday morning. Several courses are currently offered and are planned to be offered through the World Wide Web.

Students can obtain a dual MBA and MS degree by taking a total of 71 credits (assuming all prerequisites are met). This serves students who would like to get additional SCM skills at a reduced cost. Furthermore, the courses that form the set of core and electives in the concentration can be used as electives in the MBA program.

## Aspects Concerning the Program and Students

**Length of study:** A full-time student can finish the concentration in 3 terms by taking about 12-13 credits per term. These three terms can be in a row, in which case they span only one academic year --starting late August and finishing early August in the next year. Part-time students typically take 6 credits per term and finish the concentration in two academic years. The length of the study also depends on the background of a student as waivers and credit transfers may reduce the number of credit hours required to be taken at the UTD.

**Frequency of courses:** The SOM offers the courses at a high frequency. All business core courses and OPRE 6302 are offered every semester including the summers. OPRE 6366 is offered every fall and spring semesters. OPRE 6363 is offered every spring semester. At least one course from the flexible SCM core is opened every semester. The ISOM is committed to keep the frequency of the course offerings at their current levels.

**Student characteristics:** The SCM core courses are taken by a mixture of master students pursuing the concentration, the MBA and a few PhD students. About half of the students have full-time status. The other half is made of part-time students who work during the day and attend the school in the evening or on the weekend. Students typically have an undergraduate degree in engineering, business, economics, computer science or mathematics. There are many international students coming from all over the world.

**Program philosophy:** Two groups of educational principles guide the program to help the students become flexible problem solvers. Essentialist Principles:

- The program teaches the most essential academic skills by emphasizing the concepts instead of black-box techniques.
- Students master skills and knowledge by moving from less to more complex skills and detailed knowledge.
- Thinking deeply, analytically, flexibly and imaginatively is encouraged.
- Classroom problems/cases are similar to those encountered in the real world.

Progressive Principles:

- Broad curriculum supported with wide range of electives.
- Program geared towards students' interests and updated continuously to stay in touch with the business environment.
- Learning is self-paced (with online material), self directed and includes close relationships with the instructors.
- Interaction among students is encouraged; students learn as much from their peers as they do from instructors.

Moreover, experiences from work place, home, school are blended together to create an effective and active learning environment. Actively learning is also supported by capstone projects and internships arranged by C4ISN and ICDRIA, fieldtrips and games.

**Information Systems and Operations Management (ISOM):** The SCM concentration is administered by the ISOM area in the SOM. ISOM has about 30 faculty, about 12 of them focus on Operations Management:

Alain Bensoussan, Ph.D. University of Paris. Research Area: Risk and Decision Analysis, Optimal Control, Differential Equations. Teaching: OPRE 6335, OPRE 6301

Metin Çakanyildirim, Ph.D. Cornell. Research Area: Inventory and Supply Chain Management, Semiconductor Manufacturing. Teaching: OPRE 6302, OPRE 6366.

Milind Dawande, Ph.D. Carnegie Mellon. Research Area: Integer Programming, Discrete Models. Teaching: OPRE 6302, OPRE 6370, OPRE 7330.

Holly Lutze, Ph.D. Stanford. Research Area: Supply Chain Management, Inventory Control. Teaching: OPRE 6363.

Shun-Chen Niu, Ph.D. UC Berkeley. Research Area: Queuing Theory, Diffusion Models, Reliability Theory. Teaching: OPRE 6330, OPRE 6331, MIS 6321.

Divakar Rajamani, Ph.D. University of Windsor. Managing Director of Center for Intelligent Supply Networks. Teaching: OPRE 6302, OPRE 6362, OPRE 6368.

Awanti Sethi, Ph.D. Carnegie Mellon. Research: Linear Programming, Inventory Control Applications. Teaching: OPRE 6260, OPRE 6201.

Suresh Sethi, Ph.D. Carnegie Mellon. Research Area: Supply Chain Management, Stochastic Manufacturing Systems, Optimal Control, Investment/Consumption Problems. Teaching: OPRE 7320, OPRE 6363.

Chelliah Srisankarajah, Ph.D. Grenoble. Research Area: Production Planning and Scheduling in Modern Manufacturing, Scheduling. Teaching: OPRE 6302, OPRE 6385.

Kathryn E. Stecke, Ph.D. Purdue. Research Area: Flexible manufacturing. Teaching: OPRE 6302, OPRE 6340.

Yunzeng Wang, Ph.D. University of Pennsylvania. Research Area: Service parts logistics, Supply chain coordination.

Jun Zhang, Ph.D. Carnegie Mellon. Research Area: Lateral collaboration and risk pooling in supply chains, Service Operations.

Faculty web pages can be reached from [som.utdallas.edu/faculty/faculty\\_area\\_menu.htm](http://som.utdallas.edu/faculty/faculty_area_menu.htm).

One of the strengths of the ISOM is a widely known faculty that conducts leading-edge research using tools from operations research, mathematical programming, stochastic processes, optimal control theory, statistics, simulation and econometrics. The OR/MS Today (published by the Institute for Operations Research and the Management Sciences) ranks the ISOM faculty 6<sup>th</sup> worldwide in research productivity between 1996 and 2002. The strength of the faculty plays a key role in the success of the master and the Ph.D. programs offered by the ISOM. The programs are characterized by a high ratio of research faculty to students, which fosters close relationships between the faculty and students.

**Financial Support, Tuition and Housing:** Support for students is available from C4ISN and ICDRIA which rely on qualified master and Ph.D. students to carry on the industrial projects with the industry. Moreover, these centers can arrange for paid summer internships. Additional funding can be possible for teaching assistantship duties such as grading and holding recitations. UTD financial aid office also offers scholarships to students; see [financial-aid.utdallas.edu](http://financial-aid.utdallas.edu).

The tuition at the UTD is based on the credit hours taken. In Fall 2005, tuition is \$3,230 for 12 credit hours for Texas residents and \$6,542 for non-residents. Students who receive financial aid from the university can be treated as Texas resident for the tuition purposes. For updates, see [controller.utdallas.edu/bursar](http://controller.utdallas.edu/bursar).

Students can live at the university housing which offers Waterview Park Apartments within walking distance of the classrooms. The rent for 1-bedroom apartments ranges from \$458 to \$642, it is \$860-936 for 2-bedrooms and \$1,136 for 3-bedrooms. Floor plans and updated rent information are available at [utdallas.edu/student/slife/housing/general](http://utdallas.edu/student/slife/housing/general).

**Admission requirements:** A prospective student needs to send his/her GRE or GMAT score, transcripts, TOEFL score, resume, recommendation letters and a statement of purpose. International students should apply by May 1 while the U.S. residents can apply by July 1. For more details and updates, see [som.utdallas.edu/advising/advising\\_admission.htm](http://som.utdallas.edu/advising/advising_admission.htm).

**Career Opportunities:** Graduates of the concentration can work in various positions, including as consultants, operations / logistics / supply chain analysts, project managers, procurement managers, material planners. To help the graduates to identify and choose careers, the SOM career center provides the following services: career counseling, resume assistance, interview assistance, job search assistance, career resource library, web resume database, on-campus recruiting, active internship programs. The career center's web address is [som.utdallas.edu/career](http://som.utdallas.edu/career). Another way to learn and search for SCM careers is visiting web pages such as [supplychaintoday.com](http://supplychaintoday.com), [supplyjobs.com](http://supplyjobs.com), [jobsinlogistics.com](http://jobsinlogistics.com), [supplychainrecruit.com](http://supplychainrecruit.com), [supply-chain.org](http://supply-chain.org). Students interested in pursuing academic careers in SCM are encouraged to continue their education with a Ph.D.; see [som.utdallas.edu/graduate/phd](http://som.utdallas.edu/graduate/phd).

**UTD School of Management:** The SOM, the largest of UTD's seven schools, has about 4500 students. This number includes approximately 2300 undergraduate students, 2000 MBA and master students, 100 Ph.D. students and 250 executive education and distance learning students. The school has about 100 faculty. Based on publications in the top 22 business journals, the SOM faculty ranks the 37<sup>th</sup> in research productivity among business school faculties in the U.S. The U.S. news and World Report ranks the full-time MBA program 54<sup>th</sup> in the U.S. The Financial Times ranks the Executive MBA program 32<sup>nd</sup> in the U.S. The SOM is fully accredited by AACSB International – the Association to Advance Collegiate Schools of Business. The school's new 18,900 m<sup>2</sup> (204,000 square-foot) building - featuring state-of-the-art classrooms, visual equipment, wireless connectivity – was opened in the Fall of 2003.

**Living in Dallas:** UTD students have an active life style. Information regarding student life issues can be reached from [utdallas.edu/student/slife](http://utdallas.edu/student/slife). The UTD is situated in the center of the Telecom Corridor, the second largest concentration of high tech companies in the U.S. Dallas is the eight largest city in the U.S. It is third and fourth, respectively, on the Fortune 500 lists of service-based and industry-based corporation headquarters. It is among the largest employment centers for high technology, ranking the third in job growth in computers, telecommunications and instruments. Daily flights connect the city to major European and Asian centers. The city has 312 parks covering 50,000 acres. There are 60 lakes within 100 miles of Dallas covering more than 550,000 acres. Dallas also boasts the Dallas Arboretum and Botanical Gardens, the world class M.H. Meyerson Symphony Center and the historic performing arts theater, The Majestic. Another major attraction is Fair Park, a 227-acre recreational and cultural facility that features over one dozen museums and attractions.