THE UNIVERSITY OF TEXAS AT AUSTIN
McCOMBS SCHOOL OF BUSINESS

IROM
Graduate Course Descriptions

Note – The following is a comprehensive list of courses offered by the Department of Information, Risk, and Operations Management. The semester in which a specific course is *most likely* to be offered is noted.

MIS 381N - Digital Strategies for Hypercompetitive Environments – Offered in Fall

Description: This course explores how innovative firms are effectively using digitally enabled strategies, operating models and capabilities to win in hypercompetitive environments. The rapid and unflagging evolutions of digital technologies and global economic liberalization policies have fueled hypercompetition not just in high-tech industries but also in traditionally low-tech industries. Barriers to entry and movement on a global scale have been reduced significantly. Discontinuities that used to occur infrequently now erupt frequently. In hypercompetitive environments, achieving profitable growth and sustaining competitive advantages is very difficult. Most firms manage to achieve either profitability or growth, but not both simultaneously. Firms that are able to create some competitive advantages at one point in time are not able to sustain them long. Rivals dethrone leading firms from their superior performance positions quickly, only to be dethroned themselves by other firms soon after. These dynamics render some of the traditional assumptions and logic of business strategy less effective in hypercompetitive environments. Critics argue that the pursuit of sustained competitive advantages, which is a traditional quest of business strategy, could be a deadly distraction for firms operating in hypercompetitive environments. Instead, they advocate the pursuit of temporary advantages, the renewal of the temporary advantages as they become eroded, and the concatenation of a series of temporary advantages.

The course will have equal emphasis on the theory (50%) and practice (50%) of digital strategies for hypercompetitive environments. The course delivery will rely on case studies and a participant-centered, active learning format.

Theoretically, this class will equip students with a sound understanding of the fundamental shifts that drive hypercompetition across a broad range of industries. The course will build on state-of-the-art academic research to explain how innovative contemporary firms address the challenges and exploit the opportunities presented by hypercompetitive environments. For example, it will present emerging digital business models, digital governance structures, operating models, and principles of competing with digital business platforms.

Practically, the course will have an i**ndustry-sponsored term project** component that will enable students to apply their theoretical knowledge to real strategic challenges and opportunities faced by firms. Working closely with the executives of the sponsoring firms will enhance student understanding of what it means to be a leader in hypercompetitive environments.

MIS 381N - Strategies for Networked Economy - Offered in Fall and Spring

Description: Firms have become globally interconnected creating a complex network of customers, suppliers and partners. New forms of IT-enabled and IT-driven services (e.g., Google Trends, Cloud Services) and platform-mediated networks (e.g. Mastercard, eBay, Facebook) are mushrooming globally attracting millions of customers. With that there is an explosion of data and hidden knowledge to be extracted. There are numerous opportunities and challenges for both producers and users from these IT innovations. This class explores the competitive dynamics of IT evolution and platform-mediated networks and how they create value or creatively destroy value (e.g., Blockbuster, Borders). This is an interdisciplinary class that integrates and complements concepts and principles from various functional areas. Case studies are used throughout the course to illustrate the application of theories and concepts. The course is highly valuable for consulting roles, entrepreneurs, investment firms (seeking to value new innovation and IT sector), and strategic management.

The class will address the following specific questions: How is digitization impacting competition and enabling industry transformation? What are some unique characteristics of, and how are producers competing in, the software, hardware, and communication ecosystems? How are new innovations like social networking and cloud computing impacting competition? Is IT-driven innovation changing industry structure, making markets more efficient, or altering a firm's boundary and competitive positioning? Are there profound changes in product and process design resulting from new capabilities? How to extract meaningful information about customer preferences/satisfaction/loyalty? How to create an IT infrastructure that will enable global sourcing? How to justify IT investments? How to manage IT-enabled transformation (change management)? How to assess and manage risks in complex projects?

MIS 381N.7 - Information and Knowledge Management - Offered in Spring

Description: Knowledge is often considered to be the major competitive resource in modern organizations. There have been many technical artifacts developed to enhance the ability of organizations to store and manipulate data, information and (hopefully) knowledge. At the same time, the exploitation of a firm's knowledge has proven to be very difficult.

The purpose of this course is to acquaint the student with organizational and managerial issues surrounding the emergence of knowledge as a key factor in the competitive advantage of a firm. We will explore a variety of factors that inhibit and enhance an organization's ability to turn knowledge into profits. The course is organized around two ideas, knowledge as a manageable asset and why organizations do not use what they know. A basic assumption of the class is that organizations are complex adaptive systems operating in a highly competitive, information and knowledge rich environment. There are two texts and a modest set of readings. The course is conducted in a seminar format, with a heavy emphasis on student interaction.

MIS 382N.5 - Managing Complexity - Offered in Fall

Description: The world and the organizations in it are increasingly complex and the future is increasingly uncertain. Conventional management approaches are clearly not adequate to deal with these emerging realities. Do you want to enhance your ability to understand some of the multiple causes of this complexity and develop some effective strategies for managing this complexity?

Modern organizations can be understood as complex adaptive systems (CAS) and this understanding leads to new insights about managing complexity, particularly the role of information and information systems in this task. In this course we explore these new insights and discuss management implications of CAS theories with particular attention to specific recommendations for information systems that emerge from these theories. CAS have diverse, learning agents that have nonlinear relationships with each other and with their environments and the dynamics of CAS are dominated by self-organization, emergence and co-evolution. The result is that CAS are characterized by uncertainty and surprise leading to great difficulties for managers. In this course we emphasize sense making, learning, improvisation, thinking about the future, designing and managing relationships as complements to the traditional managerial activities of command, control, and planning. We also discuss the important role of leadership in CAS and how leadership should be different

when managing complexity. As we are all discovering in the turbulent times we now live in, those managerial strategies that depend on a fairly detailed knowledge of the present situation as well as the ability to make reasonable forecasts of a future situation are less useful than in the past. Fortunately, complexity science offers some ways of better understanding and managing these uncertain situations.

MIS 382N.9 - Data Mining for Business Intelligence - Offered in Spring

Description: In virtually every industry, the competitive strategies organizations are employing today rely extensively on data analysis to predict the consequences of alternative courses of action, and to guide executive decision making, more generally. Companies today are competing on analytical capabilities and require analysts and decision makers who both understand the value of analytics, can identify opportunities and know how best to apply data analytics to enhance business performance. The spreading of analytical competition spans industries, including health care, retailing, travel, entertainment, consumer good, consumer finance, and even professional sports teams.

This course provides a comprehensive introduction to data mining problems and tools to enhance managerial decision making at all levels of the organization and across business units. We discuss scenarios from a variety of business disciplines, including the use of data mining to support customer relationship management (CRM) decisions, risk management, decisions in the entertainment industry, and financial trading. The course is designed specifically to allow managers understand the business intelligence tools available to them to improve decisions by deriving valuable intelligence from data.

The three main goals of the course are to enable students to:
1. Approach business problems data-analytically by identifying opportunities to derive business value from data.
2. Interact competently on the topic of data-driven business intelligence (know the basics of data mining techniques and how they can be applied to extract relevant business intelligence.)
3. Acquire some hands-on experience so as to follow up on ideas or opportunities that present themselves.

The course is designed for students with various backgrounds -- the class does not require any technical skills or prior knowledge.

MIS 382N.12 - Social Media Analytics - Offered in Spring

Description: The rapid proliferation of social media such as Wikipedia, Facebook and Twitter has created unprecedented opportunities for firms to understand consumer sentiment and behavior as well as how social network interactions influence consumer decisions. Such interactions can bolster or destroy brands and profitability, and provide a glimpse of what really matters to the consumer. Leading edge firms in every vertical ranging from financial services to retail are focusing on this new channel in an attempt to transform business strategies and processes in order to achieve competitive advantage. This course will provide students with both theoretical foundations of and hands-on training in extracting critical business insights from social media data, and to link such insights to better decisions for superior business performance and competitiveness. Topics include social network analysis and metrics, text mining and sentiment analysis, new business models enabled by social media, and applications and best practices in brand management, public relations, sales, new product development, and customer service.

MIS 383N - Decision Support Modeling - Offered In Spring

Description: This course is designed for MBA students who want to improve their modeling abilities, and (secondarily) for any student (many come from Engineering or Business or the LBJ school) who want a course on OR applications. The course is really an introduction to Operations Research (OR), and lots of interesting information on this field can be obtained at www.informs.org. OR adds value to data by using it to build models. These models take some of the data as inputs, and their outputs are used to help in decision making. Systems composed of databases, models, and user interfaces are called Decision Support Systems. We will use several important OR software systems, including Logical Decisions, the Excel Solver, and @Risk. However, our focus is on modeling. Formal math skills like calculus, linear algebra, and probability/statistics will be used some but not much. You don't have to be a nerd to do this, and this is not a math course. You do need the ability to think logically and systematically, but improving this ability is a course goal.

MIS 383N.13 - Managing Innovation in a Global Company - Offered in Spring

Description: How can companies successfully innovate in global, distributed, and open environments and what contributes to their innovation successes? Clearly there is no "one best way" to manage innovation including open innovation. This course gives you a rich understanding of and thinking tools for how to manage innovation in large, established organizations as well as in small start-ups operating in open and distributed environments around the world.

The course consists of several modules. The first two modules provide an overview of innovation management and development in different organizational forms and market structures. The third module surveys various types of open innovation models (e.g., crowdsourcing, innovation ecosystems, virtual communities, open source). The fourth module covers governance, legal, and ethical challenges of open innovation models. The last module deals with the broader institutional contexts in which open innovation is happening today. Learning will take place from case analyses, readings, guest lectures, class discussions, and hands-on experiences in open innovation communities. The final team project involves an analysis of an organization's current innovation model and how the model should be developed further for organizational success.

The main goals of the course are:

1. Understand the various ways that global organizations set up their innovation units physically and virtually and how the units evolve along with their leadership
2. Appreciate the broad spectrum of evolutionary and radical innovation models and how they are developed and implemented in the context of different types of innovations involving technology, processes, products, business models, services in global organizations
3. Understand the key dimensions in which open innovation models differ from closed models
4. Explore and experience virtual environments for open innovation and how technology-enablement is impacting the development and implementation of open innovation models
5. Understand the intellectual property issues (e.g., trade secrets, patents, copyrights), competition issues, technology transfer issues in open innovation models and open source
6. Understand how open innovation models vary by countries and by different institutional environments

The course is designed for students with various backgrounds -- the class does not require any technical skills or prerequisite courses on organizations. The course is vital for a broad range of business careers in which innovation in a global context is a core part including entrepreneurial start-ups, management consulting, R&D, strategic planning, marketing, information, operations, and risk management.

OM 386 - Pricing and Revenue Optimization - Offered in Fall

Description: Pricing and revenue optimization --or revenue management as it is also called-- focuses on how a firm should set and update pricing and product availability decisions across its various selling channels in order to maximize its profitability. A familiar example comes from the airline industry, where tickets for the same flight may be sold at many different fares, the availability of which is changing as a function of purchase restrictions, the forecasted future demand, and the number of unsold seats. The adoption of such systems has transformed the transportation and hospitality industries, and is increasingly important in retail, telecommunications, entertainment, financial services, health care and manufacturing. In parallel, pricing and revenue optimization has become a rapidly expanding practice in consulting services, and a growing area of software and IT development. Through a combination of case studies and lectures, the course will review the main methodologies that are used in

each of these areas, discuss legal issues associated with different pricing strategies, and survey current practices in different industries. The ultimate goal is for students to learn to identify and exploit opportunities for revenue optimization in different business contexts. Most of the topics covered in the course are either directly or indirectly related to pricing issues faced by firms that operate in environments where they enjoy some degree of market power. Within the broader area of pricing theory, the course focuses upon allocation decisions, tackled using quantitative models of consumer behavior (e.g., captured via appropriate price-response relations), demand forecasts and market uncertainty, and the tools of constrained optimization -- the two main building blocks of revenue optimization systems.

OM 386 - Strategic Sourcing - Offered in Fall

Description: Today's business environment depends significantly on the interdependent relationships that make up the supply chain of virtually any successful manufacturing or service company. Whatever the supplier provides, the effective organization needs a robust system to procure the correct goods and services at the best possible price for the organization. Once the organization has made the decision to procure goods and services from another organization, both organizations must clearly define the parameters of the relationship. This course will address the process of procurement including terminology, metrics, and decision making. Additionally, we will investigate the best practices and processes for managing the relationships with suppliers and their performance. We will also explore the sourcing decision and the strategic ramifications of producing/providing goods and services internally or purchasing them from external organizations.

OM 386 - Supply Chain Management - Offered in Spring

Description: Supply Chain Management involves the flows of materials and information among all of the firms that contribute value to a product, from the source of raw materials to end customers. We will integrate issues from finance (investments in productive assets), marketing (channels of distribution), logistics, and operations management to develop a broad understanding of a supply chain. By taking a strategic perspective, we will focus on relatively long term decisions involving the investment in productive resources, configuration of processes, product designs, and development of partnerships with suppliers and channels of distribution.

Although the development of analytical tools is not one of the primary objectives of the course, students should be comfortable with quantitative analysis. By the end of the course, you should have developed an appreciation for the major strategic issues trade-offs in supply chain management as well as the ability to use analytical tools and conceptual frameworks to make decisions.

OM 386.4 - Operations Practicum - Offered in Spring

Description: The Operations Practicum provides a hands-on experience in tackling real-world problems in operations management. Groups of 4-6 students will act as a consulting team to manage a substantial project with a well-known manufacturing or service firm in order to hone their abilities in process analysis and design, supply-chain management, and operations strategy. Each team responds to a request from a sponsoring company with a proposed work plan, implements it, and reports the results to the client during the semester This class builds on the knowledge gained from the core operations class to enable students to 1) solve practical problems in operations management; 2) improve their consulting and presentation skills; 3) integrate their operations and information management toolkits; 4) differentiate themselves for the job market with real-world experience; and 5) take a closer look at some promising prospective employers.

RM 392.1 - Financial Modeling and Optimization - Offered in Spring

Description: This course is designed for MBA students, engineers, operations research students, computer scientists, and others who are interested in operations research methods and their application to finance and investing. Methods used include optimization, simulation, statistics, and decision analysis. Topics include financial statement modeling, option pricing, and asset allocation (portfolios of bonds, stocks, and oil field development projects). The texts are "Financial Modeling" by Simon Benninga, MIT Press, 3rd edition, 2008 and "Financial Models Using Simulation and Optimization II" by Wayne Winston. Software used includes Excel and the Excel Solver for optimization, @RISK for Monte Carlo Simulation, Precision Tree for Decision Tree analysis, and the GAMS algebraic modeling language.

RM 395.7 - Managing International Risk - Offered in Fall

Description: This course will focus on considerations in and influences on international risk management. In so doing, we will discuss: basic risk and crisis management principles pertinent to multinational firms, including financial, legal and cultural cross-national differences that impact corporate risk management strategies; and specific multinational marketplaces (e.g., reinsurance markets, captive offshore insurance companies, foreign exchange markets, etc.). These strongly affect the traditional United States of America corporate structure and risk management process. Such topics as terrorism risk and security precautions will also be discussed from a business (as opposed to social) perspective. We will also develop an in-depth comparative global risk strategic management analysis through an individualized group project.