Graduate Certificate in Engineering Management

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Courses

ETEM 5504 Engineering Management & Financial Intelligence
Discover the full picture of how business works within the organization. This course walks the student through the complete business cycle -- the roles the various functions play in a business operation as well as how information is used to make business decisions (e.g. financial data, marketing data, production data, economic data). To bring these learnings to life, this course also uses management simulation games and classroom competitions. Includes strategy, product planning and management, sales and support, research and development, manufacturing and supply chain, with particular emphasis on accounting, finance and the use of financial statements.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5505 Decision Analysis & Optimization
Expand the ability to analyze and optimize complex business situations by leveraging the key data. Decision-making in today's complex world requires advanced analytical methods and tools, including mathematical modeling and quantitative techniques. Powerful tools for forecasting, finance, operations, production and logistics. Emerging technologies such as the Industrial Internet of Things (I-IoT) and Block Chain are enabling a whole new set of possibilities!
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5507 Strategic Engineering Management
Learn the frameworks and process for developing a strategy focused on technology acquisition and value return. This course will cover the entire lifecycle of strategy development, from discovery and business case development, to evaluation and selection, and finally deployment and realization (value return). The tools in this course will help students determine direction when faced with a technology / automation investment decision. These strategies are built on so much more than just functional capabilities of a given technology and in turn, this course is structured to introduce students to all facets that go into a successful Technology Strategy.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5508 Marketing Innovation
Explore the intersection of marketing strategies and engineering processes as a way to enhance product development and market competitiveness. This course equips future engineering leaders with an understanding of essential marketing principles and the rationale behind effective strategy and implementation. Students will acquire the skills to critically evaluate a marketing plan, identify opportunities to align marketing activities to achieve their business goals, and segment/target customers.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5510 Understanding Emerging & Disruptive Technologies
The current era of rapid technology innovation is causing significant disruption to markets and societies. Blockbuster was the darling of Wall Street in 2004 and filed for bankruptcy in 2010. Blockbuster CEO in 2008: Neither Redbox nor Netflix are even on the radar screen in terms of competition. Blockbuster is not alone in their blindness. Microsoft laughed off the first iPhone, and laughed off Google. IBM laughed off the first personal computer. These should be a warning to all business leaders. Numerous technologies are threatening disruption todayUnderstanding what they are and how they might disrupt will make or break countless companies in the coming years.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5520 Introduction to Innovation & Entrepreneurship
What exactly is innovation, and what is entrepreneurship? How do they drive business and society? Where do good ideas come from? Can anyone learn to be innovative or be an entrepreneur, and does thinking like an engineer help or hinder this process? What does an innovative organization look and act like? What barriers exist to innovation/entrepreneurship, and can they be overcome? This course introduces important frameworks and concepts, offers the student hands-on individual and team learning, includes numerous guest lecturers, and cultivates essential communication skills, all with the goal of fostering an understanding of, and confidence in, innovation and entrepreneurship - both for the individual as well as for the organization.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5521 Human Performance in the Organization
Gain insights and practice in the art and science of leadership. This course addresses the leadership and management capabilities required to move into positions of greater responsibility, with a focus on technology-based organizations. Topics include leadership, goals, motivation and performance, management of change, conflict and effectiveness, organizational development and work design. Because when a leader gets better, everyone gets better.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5525 Innovating for Defense
This interdisciplinary entrepreneurial course gives students the unique opportunity to solve real problems facing the U.S. Department of Defense (DoD) and the U.S. Intelligence Community (IC). This course is open to all students who want to solve real problems for real stakeholders in real time. In consultation with course instructors, students will form their own interdisciplinary teams to explore a challenge experienced by a dedicated DoD problem sponsor who will be regularly engaged with the team. Student teams learn and use the Lean Startup methodology and the Mission Model Canvas made famous by Stanford University to iteratively cut through the complexity of the problem. Note: This course is sponsored by the U.S. DoD. It was originally developed at Stanford University and is now taught at 30+ U.S. universities. A student does NOT have to be a citizen of the United States to take this course; none of the DoD problems are classified.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5527 Entrepreneurship: Challenges & Opportunities
In a world with endless entrepreneurial opportunities, what is the skillset needed to understand the stages from idea to market? This course covers how to quantify the size of the potential market for any entrepreneurial idea, to assess the technical feasibility and financial viability of the idea, to prioritize an initial market for the idea, and to develop a strategy for pursuing the initial market for the idea, whether at a startup or an existing business.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5528 Legal Concepts for Engineering and Technical Managers
With emerging technologies developing at a non-linear rate, the law must adapt just as quickly. As engineering managers, you will be an integral collaborator with your legal team as these laws evolve. Whether it is determining who owns a patent for an invention developed by artificial intelligence, working through smart contracts, or even run-of-the-mill product liability issues, having a strong understanding of legal concepts will help you interact with attorneys and provide recommendations to guide your team through potential legal crossroads.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5530 Project Planning Methodologies
Build expertise with today's critical project management methodologies in our fast-paced world. Variations of waterfall are widely used in industry, but new uses of agile are being discovered every day, both inside and outside of software-based organizations. This course exposes the student to the fundamental and emerging techniques and tools used to manage successful projects of various sizes and complexity -- managing cost, schedule, quality, risk, solution and requirements -- while adapting to today's fast-paced and uncertain business environment. The primary focus of this course is on agile.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5531 Introduction to Agile Project Management
SCRUM, XP, Kanban, ScrumBan, SAFe - these are some of the key frameworks and processes covered in this course. Agile as a mindset, a skillset, and a toolset are all critical in our fast-paced world. Today's businesses have either started or will soon begin their Agile journey. This course will use books from industry recognized experts in the field of Agile development as well as case studies and varying practical assignments. Students will come away with a solid understanding of the core agile concepts, processes, frameworks, roles, and practices that are shown to deliver leading Market and Business value.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5532 The Art & Science of Risk Management
This course focuses on why many project managers miss requirements for schedule, budget or even both. The course concentrates on key risk management techniques practiced by leading project and program managers and taught through fact-filled lectures, case work and project execution as applied to information systems, engineering, financial, product/process and design projects/programs in today's fast-moving environment. Students will take away key value propositions, including risk identification, risk quantification, risk monitoring, risk control and risk mitigation. This course will enable the student to address common scope, schedule, quality and cost risk events that occur on complex projects. Project risk management examines the types of risk, with a focus on understanding the process of risk identification, assessment, prevention, mitigation, and recovery; governance, auditing, and control of confidentiality; integrity; and availability of data. Using common operational, strategic, tactical, and technological scenarios, the course work provides a comprehensive approach to the challenges faced by managers when global data is readily available, risk is pervasive, regulations are ever-increasing, and the threat of disruption from potential crises is real.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5581 Leading in a Technology-Rich World
Leadership has fundamentally changed from top-down, autocratic and task-focused to collaborative and people-focused in just a few generations. Great senior leaders now get their people to do the greatest things. They must constantly learn, think innovatively, move and adapt very quickly, and collaborate over short and long distances. Students will learn new leadership skills, explore their individual leadership styles, and discuss the senior leadership challenges in an evolving tech-rich world.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5582 Human Performance in the Organization
Why do some careers soar and others stall? Why it is easy to build relationships with some people - but not others? Why some teams function well and consistently outperform others? Curious about what kind of managers are leaders, or will be? Want to know more about how organizations decide who to hire and who to promote? Human Performance in the Organization is designed to help answer these questions. The content is a mix of relevant theory, personal reflection, and practical application. Our goal is to understand human performance at all levels of the organization. Topics include performance and career management; negotiation and influence; power and politics; mentoring and coaching; high-performance teams; conflict management; talent development and succession planning; and change management.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5586 Cross-Cultural Negotiation
This course introduces students to and gives them practice with principle-based tools and techniques to reach agreements across varied cultures. Best practices from the most famous negotiators of ancient history (i.e., the Phoenicians) are studied and used as a methodology that includes the role of a third party in resolving conflict. The cross-cultural elements are based on multicultural experiences, research studies and the real-life experiences of the instructor. The course is highly interactive (about 70% of the course work). Participants learn through role plays and simulation as well as through readings and case-study analysis.
Credit 3 units.
Typical periods offered: Fall, Spring, Summer

ETEM 5587 Communication Excellence for Influential Leadership
Exceptional communicators become extraordinary leaders. This course will guide students to learn to exceptionally communicate their message by applying refined nuances that inspire and transform those with whom they converse. Through a proven communicative process, students will acquire skills necessary to differentiate them as leaders. Students will learn how to communicate across a variety of settings using strategies that result in clear, vivid, and engaging exchanges. Students will practice: storytelling; creating and using clear visuals; engaging listeners; demonstrating passion when speaking; responding to questions with clarity and brevity, and, using their distinctive voice as a leadership asset. Each student will learn how to assess his or her own communication capabilities, adjust to different listeners, and

how to evaluate speaker effectiveness and provide valuable feedback to others. Video recordings will be used to demonstrate incremental communicative changes throughout the course, and to show how these strategies bring about outstanding leadership.

Credit 3 units.

Typical periods offered: Fall, Spring, Summer

ETEM 5600 Supply Chain for Engineering Managers

This course provides a comprehensive introduction to the fundamentals of supply chain management by applying theoretical concepts to actual quantitative and qualitative problem sets across various economic sectors. Through a case-based approach, students explore both the mechanics and the business context of strategic and tactical decisions across the end-to-end supply chain. Special emphasis is given to the intersections of supply chain and engineering, including product lifecycle management, strategic sourcing, and high-tech manufacturing.

Credit 3 units.

Typical periods offered: Fall, Spring, Summer

ETEM 5985 MEM Capstone

The MEM capstone course is the culmination of the Master of Engineering Management degree program. Taken at the end of the program, the capstone course gives each student (as part of a team) an opportunity to apply a cross-section of knowledge and skills gained toward a current challenge/project from industry, government or nonprofit organization. Student teams are encouraged to interface with the sponsoring organization throughout the semester. Prerequisite: Completion or co-enrollment in all required MEM courses.

Credit 3 units.

Typical periods offered: Fall, Spring, Summer

ETEM 5998 Applied Research Study

Applied Research Study (ARS) is an advanced, project-based course designed to allow students to develop in-depth knowledge and further their education building on the education offered in the Programs. Applied research is a type of examination looking to find practical solutions for existing problems. These can include challenges in the workplace, education, and society. Students collaborate with an adjunct faculty advisor to collect data. Findings are applicable and may be implemented upon completion of a study. Applied research focuses on answering one specific applied research question for a client or sponsor. Applied Research Study must have prior approval of a faculty sponsor and the Program Director.

Credit 3 units.

Typical periods offered: Fall, Spring, Summer