Engineering Management (EMGT)

Course information contained within the Bulletin is accurate at the time of publication in June 2025 but is subject to change. For the most up-to-date course information, please refer to the Course Catalog.

EMGT 5631. Design Thinking. 1.5 Credit Hour.
Many technologists view design as a function that takes place after the product or solution has been developed. Design thinking offers an alternative, customer driven approach to the commercialization of technological innovation, which embeds potential customer usage patterns into the development from the outset. Design thinking is thus a radical approach to the design process that enables much higher levels of innovation (and therefore commercial success) into the design process, especially in comparison with the traditional view of design that tends to foster incremental thinking.
In this course we will share case studies of successful and unsuccessful product design, and provide participants with a series of tools to help them understand and deploy a design thinking process. In the course we will share frameworks for identifying market and technology trends that can stimulate opportunities for radical designs based on user engagement. With an improved understanding of the design thinking process participants will be better prepared for commercial success, whether they work in a large company deploying new solutions, or are interested in starting their own venture. The course will place particular emphasis on the importance and role of experimentation and learning from failure, as well as provide access to a series of tools that can help an organization decide whether, or not, to continue with a specific development process. In this course, students learn theories and practices for innovation, tools and methods for design inquiry, and characteristics of "design attitude." The course emphasizes hands-on project and studio-style project works.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5632. Intrapreneurship: Managing the New Product Development Process. 3 Credit Hours.
The course is designed to give technology students insights into the market and commercial factors that should be considered when developing new products or technologies. This course offers students the chance to understand and apply a number of analytical, decision making, and planning tools that can be used to guide the development of new products (and services) from idea to the marketplace (invoice). The course highlights critical issues associated with linking business objectives to technology development, and how each influences the other. Specific topics addressed include: the development of new product strategy and policy, selection of product market strategies, deployment and application of new product development processes, portfolio management, product development tools and metrics, market research, and importantly the people and organizational issues associated with the product development process. Participants in the course will learn to appreciate the advantages of introducing more formal new product development processes that break down the overall process into stages, and understand how and why the consideration of different strategic, technical and financial issues at each stage improve the likelihood of long-term commercial success. Not only will the course prepare participants for an active role in the product development process in a large organization or to participate in the technology development process in a new venture, they will also be prepared to obtain a certificate as a New Product Development Professional (NPDP) Certification offered by the PDMA.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5633. Management Principles for Innovators, Engineers and Technologists. 3 Credit Hours.
This is an introductory course for engineers and technologists who have no formal business training. It includes an introduction to the theory of the firm and the principles of management. It includes looking at the evolution of management, and the new roles for leaders and managers in innovative organizations. The course also gives a basic overview of corporate finance, and explains the various components of balance sheets, profit and loss and cash flow statements. Finally, the course deals with basic human resource and people management issues in the contexts of large organizations trying to adapt to rapid changes in the market.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5634. Project Management Overview and Project Management Essentials. 1.5 Credit Hour.
This course is designed for individuals working in both large and small organizations who are often faced with the challenges of managing multiple priorities and projects with limited resources. Whether these projects include a research and development project, the opening of a new production line, or the construction of a new facility, individuals are accountable for their on-time and on-budget performance. This course is an introduction course and follows a life-cycle approach to managing projects, beginning with project initiation concerns and ending with project termination.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5635. Financial Management for Technologists. 1.5 Credit Hour.
This course provides students with a real world understanding of what the key financial reports of a company actually mean and what is really important as a manager. It focuses on understanding profit and loss statements, budgets and cash flows. Also, it examines various methods for calculating financial return, and provides tools to help participants better budget, track project costs and decide between project alternatives.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5636. Lean Six Sigma and the Science of Improvement. 3 Credit Hours.
The discipline of quality management is increasingly recognized as an essential element in the management of any company. Quality management provides a number of approaches and tools to help individuals in both large and small organizations ensure that products and solutions consistently meet and exceed customer expectations, while ensuring that the company's processes maximize operational efficiency. In this course we will introduce a number of quality management tools: Six-Sigma, kaizen and TQM, that participants will be expected to deploy on actual cases. In addition, students will be provided with an overview of statistical tools that are essential when deploying a quality management system (i.e. Pareto Analysis, correlations and regression). The course will also focus on developing appropriate measurement systems, in order to use quantitative as well as qualitative tools to help identify specific areas that need attention. This will help quantify the magnitude of identified problems, prioritize the sequence in which each is going to be addressed, and then measure improvements made. The course is essential to those operating in larger companies, but the tools deployed will be useful to anyone looking to improve the effectiveness and efficiency of a smaller business, including those running their own ventures.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5637. Marketing Technological Products and Services. 1.5 Credit Hour.
This course applies the theories and constructs of marketing to the challenges of marketing technological products and services to organizational buyers. A firm's marketing initiatives can directly impact firm revenues (and costs), and ultimately firm value. It is therefore essential that managers understand the process of developing and managing marketing strategy (target market selection and customer value proposition). This course provides insight into marketing programs (product, promotion, place, and pricing), and describes how those programs can be integrated to yield a superior customer value proposition. A focus on technological products and business-to-business customers will be maintained throughout the course. Various pedagogical methods are utilized, including lectures, case studies, in-class presentations, and group projects.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5638. Executive Engineering Leadership. 1.5 Credit Hour.
This is an eclectic, interactive course aimed at facilitating technology professionals for the development of a deeper understanding of selected topics that contribute to heightened self-awareness as the foundation for a higher level of personal and executive development and effectiveness. The course examines the inter-relatedness between leadership and management, cognitive and affective aspects of executive behavior and managerial decision-making. It includes topics such as individual self-analysis of leadership style, communications skills, personal goals and values, interpersonal skills, team-building, negotiation skills, conflict management and group dynamics.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B- in EMGT 5633 (may be taken concurrently)

EMGT 5639. Advanced Financial Management for Technologists. 1.5 Credit Hour.
This course is a continuation of EMGT 5635 and studies problems in planning, controlling, and directing engineering through the perspective of financial analysis. The course will exam the constructs of profitability, liquidity, and the organizational structure of the engineering function using financial analysis and forecasting. Financial techniques will be applied to adjust engineering operations to meet the organization's total financial position and goals. Various pedagogical methods are utilized, including lectures, homework and quiz assignments, exams, and a team financial analysis project of technology based organization.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B- in EMGT 5635 (may be taken concurrently)

EMGT 5641. Project Scheduling, Estimating and Resourcing. 1.5 Credit Hour.
The course builds on the project management fundamentals of EMGT 5634 to provide a structured approach to project scheduling, estimating, and resourcing. The course uses industry best practices and applies the latest in tools and methods to plan, monitor, and control projects. Students will learn effective methods to estimate cost, duration, and resource requirements for project activities. Students will learn how to balance the trade-offs of competing project requirements with constraints to finalize the project schedule and budget. Students will learn effective methods of project monitoring and controlling, including Earned Value Management, and several common approaches to reporting project progress.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B in EMGT 5634.

EMGT 5642. Project Management - Project Planning, Implementation and Case Study. 1.5 Credit Hour.
This course follows EMGT 5634 and includes project planning and scheduling which are given the most emphasis, making use of the PERT and CPM approaches. A course project is required. This course is designed to provide simple project management tools to help participants define project scope, agree on project milestones and track project performance. For individuals with multiple projects, learning these project management techniques is both an essential way of assigning priorities and increasing the likelihood of good performance, and in communicating with project participants and other stakeholders to allocate responsibilities and monitor outcomes. This course will provide participants with a number of project management tools and the opportunity to deploy them on case studies, in order for them to learn which tools are most appropriate for a specific application. In addition, the experience of using project management tools will help them to make sure they establish the groundwork for success when taking on new projects. Participants in this course may also gain credits for certification from the Project Management Institute (PMI).

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B in EMGT 5634 (may be taken concurrently)

EMGT 5643. Intrapreneurial Innovation Strategies - Basic. 1.5 Credit Hour.
The course is designed to give technology students insights into the market and commercial factors that should be considered when developing new products or technologies. This course offers students the chance to understand and apply a number of analytical, decision making, and planning tools that can be used to guide the development of new products (and services) from idea to the marketplace (invoice). The course highlights critical issues associated with linking business objectives to technology development, and how each influences the other. This basic course in the two course sequence includes: the development of new product strategy and policy (linked to the mission, vision, and strategic goals of the company), selection of product market strategies, deployment and application of new product development processes, and portfolio management. Participants in the course will learn to appreciate the advantages of introducing more formal new product development processes that break down the overall process into stages, and understand how and why the consideration of different strategic, technical and financial issues at each stage improve the likelihood of long-term commercial success. Each week students will discuss and correlate the fundamentals presented in the course materials with current business, technology, and innovation trends.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5644. Intrapreneurial Innovation Strategies - Advanced. 1.5 Credit Hour.
The course is designed to give technology students insights into the market and commercial factors that should be considered when developing new products or technologies. This second course in the two course sequence offers students the chance to understand and apply a number of analytical, decision making, and planning tools that can be used to guide the development of new products (and services) from idea to the marketplace (invoice). The course highlights critical issues associated with linking business objectives to technology development, and how each influences the other. Specific topics addressed include: market research, and importantly the people and organizational issues associated with the product development process. Participants in the course will learn to appreciate the advantages of introducing more formal new product development processes that break down the overall process into stages, and understand how and why the consideration of different strategic, technical and financial issues at each stage improve the likelihood of long-term commercial success. Each week students will discuss and correlate the fundamentals presented in the course materials with current business, technology, and innovation trends.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B in EMGT 5643 (may be taken concurrently)

EMGT 5645. Fundamentals of Interpersonal Leadership for Technologists. 1.5 Credit Hour.
This is an introductory course for engineers and technologists who have no formal business training. The course deals with basic human resource and people management issues in the context of large organizations trying to adapt to rapid changes in the market.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EMGT 5646. Fundamentals of Team Leadership. 1.5 Credit Hour.
This is an introductory course for engineers and technologists who have no formal business training. The course deals with the formation and leadership of teams in the contexts of large organizations trying to adapt to rapid changes in the market.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: Minimum grade of B in EMGT 5645 (may be taken concurrently)

EMGT 5647. Fundamentals of Agile Project Management. 1.5 Credit Hour.
The course is designed to provide students with a practical overview of Agile Project Management including an understanding of the fundamentals of Agile Project Management by introducing the values, principles, and practices. This course is not meant to replace the study required to take and pass the PMI Agile Project Management Certification. The course is designed to allow students to begin thinking about how their projects can be managed using Agile methods. Agile was originally introduced to support software development projects. Students who are not part of software development teams will also benefit from this course. It will allow them to introduce Agile to the project management of the products and services they support.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Engineering.

Repeatability: This course may not be repeated for additional credits.

EMGT 5651. Cybersecurity Across Fields. 3 Credit Hours.
This innovative interdisciplinary course will advance and promote the practice of cybersecurity and privacy by bringing together students from different disciplines (such as computer science, engineering, and legal). Together, these students will develop a Security Incident Response plan for a critical infrastructure service and work through related experiential and practical exercises. This course will offer students from each discipline insights into how their own disciplines and others approach cyber risks, actual incidents and their aftermath.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Engineering.

Repeatability: This course may not be repeated for additional credits.

EMGT 5652. Disruptive Innovation Management. 3 Credit Hours.
A course focusing on the management and execution of disruptive innovation is crucial as it equips students with the knowledge and skills to navigate this rapidly changing landscape. The fact that management of innovation, particularly disruptive innovation, is not simply the management of new technology or research and development (R&D) is the key feature and principle of the class. This proposed curriculum will delve deeply into the mechanisms behind disruptive innovations, exploring the principles, strategies, and case studies that underpin their success. Through interdisciplinary learning, students will gain a holistic understanding of how disruptive technologies emerge, evolve, and impact various sectors. Moreover, the course will foster critical thinking, creativity, and adaptability, empowering students to anticipate future disruptions and capitalize on emerging opportunities. By examining the principles and real-world examples of disruptive innovation, students will develop the entrepreneurial and intrapreneurial mindset and problem-solving abilities necessary to drive innovation and shape the future of technology and society.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Engineering.

Repeatability: This course may not be repeated for additional credits.

EMGT 5653. Application of Disruptive Technologies. 3 Credit Hours.
Upon completion of this course, the students will be able to bridge the gap between technology and business/industry trends by understanding the role/relationship between you and your audience; analyzing the latest IT trends and how they are shaping the business world; integrating the industry lexicon; learning and applying Finance and Accounting relevant to the audience; evaluating the latest industry trends, strategic initiatives, and Key Performance Indicators (KPIs); understanding the focus and value proposition of the audience's competitor landscape; and positioning technology with a business outcome.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Engineering.

Repeatability: This course may not be repeated for additional credits.

EMGT 5654. Lean Six Sigma for Engineering. 1.5 Credit Hour.
This course provides an introductory overview of process improvement, focusing on the program known as Lean Six Sigma. The concepts of Lean Six Sigma will be covered, followed by the tools used for improving processes. Students will develop one improvement project based on this approach.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: Engineering.

Repeatability: This course may not be repeated for additional credits.

EMGT 8110. Special Topics in Engineering Management. 1.5 to 3 Credit Hour.
Selected topics in Engineering Management. Please consult with instructor for detailed description.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EMGT 9682. Independent Study in Engineering Management. 3 Credit Hours.
The Independent Study course will allow students to work on a relevant project in the field of Engineering Management under the direct supervision of faculty.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EMGT 9995. Capstone for Engineering Management. 3 Credit Hours.
The Capstone course will allow students to complete final projects in their Engineering Management program.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.