

# Engineering Management (EMGT)

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**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. Idea to Invoice: 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 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 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 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.