

# ENGINEERING MANAGEMENT (EMGT)

## EMGT 803 Management of Engineering and Technology

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Description:** Covers the evolution of technical management and the transition from engineering and technical work to engineering and technology management. Emphasizes developing a broad understanding of the management functions of planning, organizing, leading and controlling in a technological environment. Engineering ethics and managing technology are also covered.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

## EMGT 804 Human Relations in Engineering and Sciences

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Provides a framework for the student to become proficient in recognizing, understanding, and predicting morale and discipline when managing in the technology industry. Includes case studies related to engineering, technology, and sciences, emphasizing the prevention of and solutions to problems unique to technical employees by means of appropriate policies, techniques, practices, and procedures. Group dynamics from the psychological and sociological perspectives of varying corporate situations related to engineering and science will also be examined.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

## EMGT 805 Teamwork for Organizational Commitment and Collaboration

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Provides an overview of the role that groups and teams play in achieving organizational success. Essential theories and concepts provide a framework for understanding and analyzing how teams are formed and function, including socioemotional and sociotechnical considerations. Critical issues in leading teams and managing team effectiveness are examined, including but not limited to power, influence, and conflict.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

## EMGT 806 Decision and Risk Analysis

**Prerequisites:** 1) Knowledge of Probability & Statistics as approved by Program Director. 2) Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Theory and practice of decision making under uncertainty. Graphical modeling techniques including influence diagram and decision trees. The value of information. Utility theory foundations, risk preference, and multi-attribute decision modes. Economic justification of projects.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

## EMGT 807 Project Management

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Covers the fundamentals of successful project management. Topics include project selection, planning and control, budgeting and cost estimation, scheduling and resource allocation, project termination, and performance measurement using key indicators.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** SUMMER

**Prerequisite for:** EMGT 813

## EMGT 808 Engineering Leadership

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Provides a framework to become more proficient in recognizing, understanding, predicting, and controlling the dynamics and outcomes of organizational behavior. Introduction to a variety of contemporary leadership theories and provide some suggested methods for developing leadership capacity at the individual and organizational levels.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

**EMGT 809 Engineering Economy for Decision Making**

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Applies economic and financial analysis to engineering projects and the operation of the firm. Concepts and methods help engineering and technology managers to make investment and funding decisions regarding projects, programs, products, business expansions, and other alternatives using the financial calculations involving time value of money, uncertainty, and risk. Topics include mutually exclusive projects, net present value, rate of return, constrained project selection, and the effect of taxes and depreciation on project analysis.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**EMGT 811 Legal Considerations for Engineering Managers**

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Covers legal issues and considerations that engineering firms face. Provides a general understanding of the basic legal principles applicable to the practice of engineering and the performance of engineering services. Topics include an overview of the U.S. legal system; business entity choices and licensing; tort and statutory liability; contract negotiation and terms; project delivery, management, and insurance; and dispute resolution.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**EMGT 813 Advanced Project Management I**

**Prerequisites:** EMGT 807. Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Includes content that spans the value delivery spectrum, including predictive, adaptive and hybrid approaches across the three performance domains in project management: People (Power Skills), Process (Ways of Working), and Business Environment (Business Acumen). Focuses on the Business Environment, Start of the Project, and Planning of the Project. Emphasis will be placed on thinking and practicing like a project manager and engaging in activities and assignments that prepare you for project management responsibilities.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Prerequisite for:** EMGT 814

**EMGT 814 Advanced Project Management II**

**Prerequisites:** EMGT 813. Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Includes content that spans the value delivery spectrum, including predictive, adaptive and hybrid approaches across the three performance domains in project management: People (Power Skills), Process (Ways of Working), and Business Environment (Business Acumen). Focuses on Leading the Team, Supporting Project Team Performance, and Closing of the Project/Phase. Emphasis will be placed on thinking and practicing like a project manager and engaging in activities and assignments that prepare you for project management responsibilities.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**EMGT 819 Applied Management Science for Engineering and Operations**

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Introduces optimization methods for decision making and planning. Several management science models and their application to engineering and operations management are covered. Emphasis is on problem formulation, software solution, and interpretation for application and decision-making. Topics include: linear programming and its applications such as product mix, blending, multi-period scheduling; data envelopment analysis; distribution models (transportation, transshipment, assignment); network flow models (shortest route, minimal spanning tree, maximal flow); integer programming and nonlinear programming.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**EMGT 820 Quantitative Analysis for Engineering Management Decisions**

**Prerequisites:** Knowledge of Probability & Statistics as approved by Program Director. Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** A working knowledge of the topics is essential for an engineering manager to effectively conduct business and communicate with internal and external members of work unit and organization. Emphasis is on problem formulation, software solution, and interpretation for application and decision-making. Topics are: decision analysis, multi-criteria decision making, queuing theory, project management, simulation, forecasting, and inventory management.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

### EMGT 822 Production and Operations Management

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Covers principles and issues regarding production and technical operations for the engineering manager. Topics and techniques for the management of manufacturing and services in engineering and technology environments are emphasized including a focus on manufacturing and business processes, lean systems, factory physics, and constraints management. Case studies and spreadsheet modeling are used to relate concepts to real-world technical operations applications.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

### EMGT 891 Special Topics in Engineering Management

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Subject matter in emerging areas of engineering management and closely related areas not covered in other courses within the MEM curriculum. Topics, activities, and delivery methods vary.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 12

**Grading Option:** Graded

### EMGT 901 Total Quality Management Using Six Sigma Techniques

**Prerequisites:** Knowledge of Probability & Statistics as approved by Program Director. Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Statistical quality control and improvement is more than an engineering concern. Quality management is a major business strategy for increasing productivity and gaining competitive advantage in all industries and types of organizations. Covers differing perspectives and definitions of quality; tools and techniques for managing quality and continuous improvement; statistical methods; creation and interpretation of variable and attribute control charts; and Six Sigma tools for detection and isolation of sources of variation, process control, and capability analysis. The goal is to develop an operational use and familiarity with contemporary methods that are effective in managing quality, including Six Sigma.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** SPRING

### EMGT 905 Strategic Management and Planning

**Prerequisites:** Only students fully admitted to the MEM degree program, or to the Graduate Certificate in Engineering Management may enroll.

**Notes:** Engineering work experience is a prerequisite to program admission and a prerequisite for this course.

**Description:** Creating new and innovative business and corporate entrepreneurship requires a strategic vision to inform and align decision making at all organizational levels. Focuses on strategies that a firm could apply to design a structure for becoming a learning and ethical organization, to create value, and to develop and sustain competencies to gain competitive advantage in the market.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded