

ENGINEERING MANAGEMENT (EM)

EM 4173 Cost Control and Analysis for Engineering and Technology Professionals

Prerequisites: IEM 3503 or IEM 3513 or permission of the department.

Description: Presents the fundamental concepts, methods, strategies and terminology necessary for engineers and engineering managers to interpret financial data properly. The information is designed to enable engineers and project managers to prepare, appraise, evaluate and approve financial plans to accomplish specific departmental and company objectives. May not be used for degree credit with EM 5173 or ETM 5173. Previously offered as ETM 4173.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5110 Seminar

Prerequisites: Admission to the master's program or consent of instructor.

Description: Guided study in a topic area selected to enhance a student's program. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours. Previously offered as ETM 5110.

Credit hours: 1-6

Contact hours: Contact: 1-6 Other: 1-6

Levels: Graduate

Schedule types: Independent Study

Department/School: Industrial Engr & Mgmt

EM 5111 Introduction to Strategy, Technology and Integration

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Introduces students to the discipline of engineering and technology management, emphasizing the importance of strategy, technology, and integration, where timing of products and services are keys to market success. Previously offered as ETM 5111.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5133 Capstone to Strategy, Technology and Integration

Prerequisites: Enrolled in last semester of MSEM program or consent of advisor.

Description: Independent analysis of a business problem. Student prepares a proposal and report that makes substantive use of MSEM material, and is a notable and relevant contribution to the student's organization. Readings and discussions. Previously offered as ETM 5133.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5143 Strategic Decision Analysis for Engineering and Technology Managers

Prerequisites: Admission to MSEM program or consent of instructor.

Description: Introduction to analytical concepts and procedures engineering and technology managers can use to strategically allocate resources to achieve business objectives. Strengths and weaknesses of alternative analytical procedures to evaluate alternative resource allocation decisions are outlined. Theoretical foundations, data requirements, application and strengths and weaknesses of cost-benefit analysis techniques when making strategic management decisions are evaluated. Previously offered as ETM 5143.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5153 Foundations of Engineering Management

Prerequisites: Admission to MSEM program or consent of instructor.

Description: Principles and practices of the management of engineering and technology activities. Focus is on the tools and methods for solving problems in service and industrial systems. Previously offered as ETM 5153.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5163 Business Innovation and Technology

Description: Advanced study of innovation and technology in a business setting. Strategic development of internal and external innovation. Planning, implementation, evaluation and control technology. Previously offered as ETM 5163. May not be offered for degree credit with MGMT 5553.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5173 Cost Control and Analysis for Engineering and Technology Professionals

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Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5183 Introduction to Systems Engineering

Description: Presents the fundamental processes, products, methodologies, tools, standards and considerations required during execution of the planning, designing, fielding, sustaining and decommissioning of a system. Requirements analysis, safety and risk management, test and evaluation, verification and validation, technical reviews, metrics analysis, configuration management and modifications management, will be presented and discussed using the systems engineering framework. Introduces INCOSE, IEEE, and ISO standards, policies, processes and guidelines.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5211 Enterprise Integration

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Conceptualizing, designing and operating advanced manufacturing systems within an integrated enterprise-wide framework. Recent developments in computer and communication technologies and conceptual breakthroughs regarding the nature and behavior of integrated enterprises. Previously offered as ETM 5211.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5221 Engineering Teaming

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Management and group issues inherent in the application and implementation of high performing work teams. The team's roles in improving organizational performance, along with the best practice procedures and techniques that increase team effectiveness. Previously offered as ETM 5221.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5231 Benchmarking

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Benchmarking as an effective approach to study and adopt or adapt methodologies representing best specific practices from any industry; or identify and assess performance based on equivalent and common measures, usually from those in the same or similar industries, including competitors. Previously offered as ETM 5231.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5241 Strategic Project Management

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Overview of traditional project management concepts and techniques (i.e., Gantt charts, PERT, CPT) along with several technical issues related to their effective use. Fundamental nature of the problems associated with several technical issues related to their effective use. Fundamental nature of the problems associated with effectively managing and coordination of multiple discrete projects within an overall systems integration initiative. A framework for addressing these problems. Previously offered as ETM 5241.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5253 Engineering Problem Solving and Decision-Making

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Processes and tools for problem solving and decision making in technical organizations. Focus on issues involving both quantitative and qualitative factors, where the quantitative factors are the result of an engineering analysis. Risk and systems analysis tools provide a fundamental background to understanding the context in which technical decisions are made. Concentration on general systems theory as developed by Ludwig von Bertalanffy. Course previously offered as ETM 5251 and ETM 5253.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5271 Technology Forecasting and Assessment

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: A framework and analytical tools for developing technological foresight. Technology monitoring, forecasting and assessment in the context of a family of emerging technologies. Previously offered as ETM 5271.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5283 Strategic Planning

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Continuous and systematic process of thought about the future, resulting in a plan or specific course of action for communicating, coordinating and controlling activities. Strategic, long-range, tactical, operational, contingency and performance planning. Course previously offered as ETM 5282 and ETM 5283.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5291 Failure Mode and Effects Analysis in Design

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: A design technique for reducing risk and improving reliability of a system, design or process. Potential failures in any of these studied methodically during design. The concepts, tools and techniques applicable to any product or process. Previously offered as ETM 5291.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5311 Value Engineering

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: The application of Value Engineering (also known as Value Analysis, Value Methodology) to improve customer value for a project, process, or product during or after engineering design. The development of VE, its objectives, definitions and methodologies, the use of the VE system, and its range of application. VE's use for improving performance reducing life cycle cost. Previously offered as ETM 5311.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5341 Leadership Strategies for Technical Professionals

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Leadership strategies, principles, styles and dynamics that must be understood by technical professionals engaged in the creation of products, processes, and services in technology-based organizations. Previously offered as ETM 5341.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5351 Planning Technical Projects

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Techniques and tools for project definition, staffing, scheduling, resource allocation, and time estimation. Behavioral and quantitative dimensions of project management. Performance measures of project progress and completion. Previously offered as ETM 5351.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5361 Managing Virtual Project Teams

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: The management and group issues inherent in the application and implementation of effective teamwork in virtual work-spaces. The appropriate use of virtual team issues and challenges associated with effective teamwork; virtual team structures, process, and technology facilitation skills; group dynamics; and team motivation. Previously offered as ETM 5361.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5371 Ethics for Practicing Engineers

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: A values-based approach to professional ethics and its application to the decision-making in a technology-intensive environment. Ethical concerns related to the expectations of stakeholders. Previously offered as ETM 5371.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5391 New Product Introduction and Commercialization

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Elements of the new product introduction (NPI) process and its impact on business strategy and planning. Organizational resources required for NPI and tools for determining commercial viability. Previously offered as ETM 5391.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5413 Engineering Economic Analysis

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: Basic concepts of time, value of money and discounted cash flow analysis. Quantitative evaluation of investment alternatives. Basis for comparison of alternatives, including present worth, savings investment ratio, rate of return and payback period methods. Decision making among capital constrained and unequal life projects. Introduction to taxes and depreciation. Previously offered as ETM 5411.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5461 Intellectual Property Management

Prerequisites: Admission to MSEM program or consent of instructor.

Description: Overview of intellectual property law and management of intellectual property. Exploration of ways to manage intellectual property from conception through production and licensing. Types of intellectual property and associated legal issues and management processes. Previously offered as ETM 5461.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5471 Introduction to System Safety

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: System safety as a discipline in research, development and acquisition of systems, sub-systems and components. The history and methodologies of mishap prevention including the development of system safety management and engineering processes. Previously offered as ETM 5471.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5481 Sustainable Enterprise Strategies

Prerequisites: Admission to the MSEM program or consent of instructor.

Description: The principles of sustainability in the context of industrial enterprises. The implications of sustainability in design of products, industrial systems and infrastructure. The importance of life cycle cost analysis as a key engineering economy tool. Previously offered as ETM 5481.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5491 ISO 9000

Prerequisites: Admission to the MSEM program or departmental permission.

Description: A detailed look at the requirements of ISO 9001:2008 from a systems perspective. The relationship between ISO 9001, ISO 9000, ISO 9004 and industry-related standards. Implementation and improvement of quality management systems (both high quality and typical methods). Previously offered as ETM 5491.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5511 Capstone Preparation

Prerequisites: Admission to the MSEM program and at least 17 hours earned toward MSEM degree or departmental permission.

Description: Introduction to the requirements for the EM Capstone Project, including problem statements, strategic implications, management systems, and problem metrics. Emphasis is placed on persuasive technical communication. Previously offered as ETM 5511.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5521 Quick Response Manufacturing

Prerequisites: Admission to the MSEM program or departmental permission.

Description: Introduction to QRM, an enterprise-wide strategy for lead-time reduction. Discussion of the four core concepts of QRM - realizing the power of time, rethinking organizational structure, understanding and exploiting systems dynamics, and implementing a unified strategy enterprise-wide. Definitions of manufacturing critical-path time (MCT) map. Focused target market segment (FTMS), and material control strategy POLCA. Case studies and MPX software. Previously offered as ETM 5521.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5531 Contract Law in Engineering and Technology

Prerequisites: Graduate standing.

Description: This course will provide engineers and architects with a background in common law as it applies to contracts. Topics will include concepts such as offer, acceptance, consideration and breach; contracts under the Uniform Commercial Code; express and implied warranties; and employment contracts. Previously offered as ETM 5531.

Credit hours: 1

Contact hours: Lecture: 1 Contact: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt

EM 5943 Lean Sigma Implementation

Prerequisites: IEM 5113, admission to the MSEM program or departmental permission.

Description: Introduction to the implementation skills necessary to successfully apply lean manufacturing and six sigma concepts and manage continuous improvement within a small to mid-sized firm. Successfully combining leadership, organizational dynamics, and skills in meeting customer expectations. Planning, applying, and monitoring these learned skills. Previously offered as ETM 5943.

Credit hours: 3

Contact hours: Lecture: 3 Contact: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Industrial Engr & Mgmt