



Engineering and Technology Management

Course Descriptions

In the course listings to follow, the number of semester credit hours is given by the last of the four-digit course number. For example, ETM 5XX1 is a 1-credit hour course. If a course ends in zero, the number of credit hours will be indicated in the description. A complete list of courses including new additions is maintained at etm.okstate.edu.

Required Courses

ETM 5111 Introduction to Strategy, Technology, and Integration 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.

ETM 5511 Capstone Preparation Students are introduced to the requirements for the ETM Capstone Project, including problem statement, strategic implications, management systems and problem metrics. Emphasis is placed on persuasive technical communication.

ETM 5133 Capstone to Strategy, Technology, and Integration Students independently prepare a proposal and report that makes substantive use of MSETM material, and is a notable and relevant contribution to the student's organization. Readings and discussions.

ETM 5143 Strategic Decision Analysis for Engineering and Technology Managers 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. Examples include situations in which the costs and benefits are distributed over different time periods, are difficult to quantify and are risky and uncertain.

One-credit-hour Electives (min of 3 hours/multiples of 3)

ETM 5221 Engineering Teaming Identifies the management and group issues inherent in the application and implementation of high performing work teams. The team's roles in improving organizational performance are described, along with the best practice procedures and techniques that increase team effectiveness.

ETM 5241 Strategic Project Management 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.

ETM 5291 Failure Mode and Effects Analysis in Design This course presents a design technique for reducing risk and improving reliability of a system, design or process. It applies a methodical way of studying causes and effects of failures before the system, design or process is finalized. The concepts, tools and techniques are applicable to any product or process.

ETM 5341 Leadership Strategies for Technical Professionals Leadership strategies, principles, styles and dynamics that must be understood to create and/or maintain the desired climate and effectiveness within an organization. Must be understood by technical professionals engaged in the creation of products, processes and services in technology-based organizations.

ETM 5351 Planning Technical Projects Presents techniques and tools for project definition, staffing, scheduling, resource allocation and time estimation. Considers the behavioral and quantitative dimensions of project management, as well as performance measures of project progress and completion.

ETM 5371 Ethics for Practicing Engineers Presents a values-based approach to professional ethics and its application to the decision making in a technology-intensive environment. Examines ethical concerns related to the expectations of stakeholders.

ETM 5391 New Product Introduction and Commercialization Presents the elements of the new product introduction (NPI) process and its impact on business strategy and planning. Includes overview of organizational resources required for NPI and tools for determining commercial viability.

ETM 5411 Engineering Economic Analysis Quantitative evaluation of investment alternatives. Basis for comparison of alternatives, including present worth, annual worth, rate of return and payout period methods. Decision making among capital constrained and unequal-life projects. Benefit-cost and cost effectiveness analysis.

ETM 5461 Intellectual Property Management, Patent Law and Trade Overview of intellectual property laws and management of intellectual property. Explore ways to manage intellectual property from conception through production and licensing. Topics include types of intellectual property and associated legal issues and management processes.

ETM 5481 Sustainable Enterprise Strategies 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.

ETM 5531 Contract Law in Engineering and Technology 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, breach, contracts under the Uniform Commercial Code, express and implied warranties and employment contracts.

Three-credit-hour Electives (remaining 21 hours)

ETM 5153 Foundations of Engineering Management Principles and practices of the management of engineering and technology activities. Focuses is on the tools and methods for solving problems in service and industrial systems.

ETM 5163 Business Innovation and Technology Advanced study of innovation and technology in a business setting. Strategic development of internal and external innovation. Planning, implementation, evaluation and control technology. No degree credit for those with credit in MGMT 5553 Management of Technology and Innovation.

ETM 5253 Engineering Problem Solving/Decision Making Processes and tools for problem solving and decision making in technical organizations. Focus on issues involving both quantitative and qualitative factors. Risk and systems analysis tools provide a fundamental background to understanding the context in which technical decisions are made. Patterns utilized by successful managers for decision making. Organizational skills, investigation through questioning and logic, decision- making among alternatives and ensuring the success of decision. Analyzing problems and decisions, appraising situations, managing problems of human performance and implementing processes.

ETM 5283 Strategic Planning This course examines a continuous and systematic process of thought about the future, resulting in a plan or specific course of action for communicating, coordination and controlling activities. Strategic, long-range, tactical, operational, contingency and performance planning are included.

ETM 5943 Lean Sigma Implementation Introduction to implementation skills necessary to successfully combine lean manufacturing and six sigma concepts into a small to mid-sized firm 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.

IEM 5413 Managing the Engineering and Technical Function Advanced study of the engineering and technical organization. Engineering and technical functions, management process, roles and activities. Individual study of current technical management issues of student interest.

IEM 5603 Project Management A systems approach to planning, organizing, scheduling and controlling projects. The behavioral and quantitative aspects of project management. Importance of working with personnel as well as technology. Project management software utilized.

IEM 5743 Information Systems and Technology For current and potential engineering and technology managers. Knowledge of information systems and technology to lead the specification, selection, implementation and integration of information technology in manufacturing and service organizations. Management issues involved in the use of information technology in organizations.

IEM 5763 Supply Chain Strategy Supply chain strategy including the philosophical base of business practice and the analytical base of modeling. Supply chain strategy, including key objectives and financial considerations, supply chain dynamics, supply chain performance measurement, supply chain integration, characteristics of different supply chains and supply chain performance modeling.

IEM 5813 Performance Measurement Systems Strategies and methods to define, measure and apply individual, group- and organizational-level performance metrics in a variety of service and production contexts. Implementation and effective use of metrics. Measurement's role in a management system, managerial decision styles and preferences, operational definitions of performance, processes for identifying and applying metrics, performance measurement tools and techniques, data collection, portrayal of quantitative and qualitative information and the role of computer technology in measurement system application.

MGMT 5113 Management and Organization Theory Contemporary theories of organization. Structure and dynamics of organizational goals and environments.

MGMT 5533 Leadership Challenges Contemporary leadership practices. Leadership as a behavior, not as a position. The challenges of leadership, regardless of position.

MKTG 5133 Marketing Management Consideration at an advanced level of the major elements of marketing from the point of view of the marketing executive. Emphasis on problem solving and decision making; using an interdisciplinary approach. Development of an integrated, comprehensive marketing strategy.

SOC 5813 Organizational Change: Myths and Realities A critical examination of the various theories and models that address change and improvement processes in complex organizations. Theoretical and methodological validity or assumptions underlying such organization theories and models.