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Undergraduate Bulletin



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Course Descriptions - Engineering Management

Professors Anderson, Kline, Mason, and Schumacher

EMGT330 Introduction to Engineering Management 4R-0L-4C Undergraduate Only

Surveys issues important to the management of engineering activities and technological organizations. Topics include such things as the relationship of engineering and technology to management disciplines, the functions of a technical manager, principles and techniques for quality processes, project management, process management, logistics, legal issues, ethics, human resources, communication and organizational behavior.

EMGT427 Project Management 4R-0L-4C Undergraduate Only

Presents the major issues and techniques of project management. Topics include: project evaluation and selection, scope management, team building, stakeholder management, risk assessment, scheduling, task partitioning & communication, rework, and negotiation. Provides application experiences with these concepts through case analyses. Emphasizes typical problems and issues related to project management choices.

EMGT461 Multidisciplinary, Entrepreneurial Design I: Capture the Vision

3R-XL-4C Pre: Junior, Senior, or consent of instructor

Explores design processes characterized by interdisciplinary activity and focus on commercial success. Includes basic design processes with emphasis on data collection and specification, with special attention to the voice of the customer. Develops at least three creativity techniques and identifies sources of ideas for successful innovation. Demonstrates procedures for assessing markets and establishing conceptual business models and describes the fundamentals of project planning and management. Addresses aspects of professional practice -- -- ethics, communication, contemporary issues, social impacts, global context and team work in the design process. Uses a team project on reverse engineering to tie together course objectives, and identifies an entrepreneurial or appropriate externally sponsored project topic for later courses. Prerequisite: Junior standing or consent of instructor. *(Students completing EMGT 461 may not receive credit for ME 470.)*

EMGT462 Multidisciplinary, Entrepreneurial Design II: Expand the Concept 2R-XL-XC Pre: EMGT461 or consent of instructor

Expands on the basic design process issues such as solution identification and selection and the assessment of trade-offs and impacts on health, safety, quality, environment, sustainability, and manufacturability. Applies design disciplines to a specific project by using creativity techniques, identifying sustainable competitive advantages and appropriate intellectual property protection procedures. Uses project planning methods to estimate project size and assess risks, as well as other techniques to facilitate rapid product development. Provides experiences in communication, project retrospectives and design reviews. Completes the early stages of a team selected and conducted project in entrepreneurial design that has the approval of students in home department. Prerequisite: EMGT461 or consent of instructor.

EMGT463 Multidisciplinary, Entrepreneurial Design III: Deliver the Product 2R-XL-XC Pre: EMGT462 or consent of instructor

Further examines and applies design process disciplines, including techniques such as system modeling, optimization, statistical analysis, design of experiments, FMEA (Failure Modes and Effects Analysis), robust design, simulation and process improvement. Describes key business concepts needed

for a business plan and applies them to the team projects. Uses professional project approaches such as metrics, retrospectives, design reviews and proper documentation. Emphasizes team project work with home department approval of specific discipline related design activities and with practical applications of concepts in the realization of functional prototypes or systems. Concludes with written and oral presentations of team project reports. Prerequisite: EMGT462 or consent of instructor.

EMGT 497 Special Topics in Engineering Management (1-4)R-0L-(1-4)C

Examines particular engineering management topics of current interest and/or new courses for engineering management and other students. May require consent of instructor or specific prerequisites.

EMGT520 Accounting for Technical Managers 4R-0L-4C □ Management

An introduction to accounting principles and practices as related to financial and managerial accounting. The uses of accounting information and the means by which pertinent accounting data are gathered and analyzed for internal purposes and management decisions.

EMGT521 Financial Management in a Technical Environment 4R-0L-4C, Management

A comprehensive survey of financial concepts, techniques, instruments, and procedures which are related to the financial structure, assets management, dividend policy, and the capital budgeting decisions of a firm. Basic skills in financial analysis are developed. Operations of domestic and international financial markets are covered.

EMGT522 Organizational Management 4R-0L-4C - Management

Review of fundamental activities (planning, organizing, leading, controlling) related to the management of organizations. The concepts and techniques for maximizing the effectiveness of human resources in the achievement of organizational and project goals are emphasized. Topics include communication, team process, motivation, selection, development, and appraisal. Special focus is given to the management of human resources in a technical environment.

EMGT523 Marketing Issues in a Technical Environment 4R-0L-4C, - Management

A study and overview of the components of marketing principles and how those mesh with management in a technical environment. Topics will include activities associated with product, price, promotion, and distribution and how these impact the technical manager from idea generation through delivery to and service for the customer.

EMGT524 Production/Operations Management 4R-0L-4C, Technical or Management

To provide an introduction to operations management for the technical manager including contemporary management principles and technical methods. Key focus topics include development of strategy in operations activities □ and the use of a business simulation exercise and project to illustrate class concepts.

EMGT526 Technology Management and Forecasting 4R-0L-4C, Technical or Management

Elements of managing the growth and operation of the technological systems. Technology forecasting tools including expert methods, quantitative trend analysis, simulation, and gaming. Consideration of secondary forecasts, especially those of social and economic nature. Techniques for enhancing creativity, managing multi-disciplinary projects and impact assessment techniques are considered. Computer-based forecasting tools are applied.

EMGT527 Project Management 4R-0L-4C - Technical or Management

Addresses the major issues and techniques of project management, including team building, project evaluation and selection, scheduling techniques, quality

management, development of negotiation and conflict management skills. Also examines project management success factors. Uses a large scenario planning exercise and several case studies to illustrate course content. Can be used as part of the technical or management core.

EMGT531 Economics for Technical Managers 4R-0L-4C □ Management

Applies economic analysis to the solutions of business problems. Emphasizes the economics of market and organizational structure, demand determinates, cost analysis, investment and strategy decisions, agency problems and ethics. Special reference is made to technology based organizations.

EMGT532 Technical Entrepreneurship 4R-0L-4C - Management

Examines the principles and tools for innovation and entrepreneurship in technologically based businesses. Includes perspectives for both independent entrepreneurs and intrapreneurs. Develops basic concepts of business planning. Emphasizes a major group business plan based upon a technological innovation. May be used as a management core class.

EMGT533 Intercultural Communication 4R-0L-4C □ Management

The core of this course is the presentation of the Constructivist theory of communication and its application. Students are exposed to ethnographic interview methods and the concept of culture shock using the BAFA role-play simulation. Discussion of organizational culture includes a review of publications on this topic, the impact of culture on organizations, as well as strategies for change. May be used as a management core class.

EMGT534 Management Science 4R-0L-4C □ Management or Technical

A study of the development and analysis of various mathematical models useful in managerial decision making. This includes discussions of what models are, how to create them, how they are used, and what insights they provide. Spreadsheets will be used to do much of the computational work. Topics considered include linear, integer, and nonlinear programming, network models, inventory management, project management, and simulation models. Examples from all areas of business and industry will be investigated. We will also investigate how companies are using these techniques to solve current problems.

EMGT535 Strategies for Organizational Change 4R-0L-4C, Management

Reviews the strategy literature and the issues surrounding strategy implementation in the context of organizational change. Includes a team project that explores the strategic implications of globalization for specific industries during the next 10 years and the construction of scenarios as a tool for understanding and communication. Individual students will develop and evaluate strategy for a specific organization within the scenarios developed in the team project.

EMGT586 Supply Chain Management 4R-0L-4C, Technical

Examines disruptions to traditional operations within supply chains due to changes in both technology and globalization. Shows how relationships between suppliers, customers, and competitors have changed dramatically to affect the entire manner in which organizations perform their manufacturing and business operations. Describes product supply chain complexity and the implications of expanding global customer bases, increasing supplier dependence, and larger ranges of locations and customers. Outcomes include the abilities to identify and define the critical components of supply chains, apply best practices in the buyer-seller relationship and understand why managing a supply chain is an important strategic capability for an organization.

EMGT587 Systems Engineering 4R-0L-4C, Technical

Introduces system engineering and analysis techniques, including the systems life cycle, system design procedures, risk analysis, analysis methods including reliability and maintainability. Provides applications for mechanical, electrical

and a wide variety of other systems. Uses Visio or CORE software to create IDEFO drawings and other documentation for system design.

EMGT588 Quality Management 4R-0L-4C - Technical

Introduction to quality for the technical manager including management principles and technical methods. Balance will be approximately 65% technical methods and 35% management concepts. Management topics focus on the concept of total quality (TQ) as it applies to technology based businesses including design, manufacturing and service activities. Contemporary quality philosophies are reviewed including Deming and Taguchi. Technical tools and methods are presented including basic statistical concepts, control charts for variable and attributes, process capability studies, six sigma, and tools for design and process improvement. Case studies and class labs will be used to highlight key topics.

EMGT589 Manufacturing Systems 4R-0L-4C □ Technical

Provides a comprehensive introduction to manufacturing systems covering the □behavior laws□ at work in batch production or assembly lines. Includes production strategy, scheduling, and control methods and detailed analysis of fundamental manufacturing measures such as cycle time, throughput, capacity, work-in-process, inventory, and variability. Explores historical practices and the natural behaviors that are described in □laws for manufacturing□ that help managers understand basic □factory physics□.

EMGT590 Integrated Project

Credits as assigned; however, not more than 8 credits can be applied to MS degree requirements Pre: Completion of technical component and business core or permission of instructor

The integration of business and technical considerations in new product development. The identification of managerial and engineering challenges faced in developing a commercially viable new product within the context of a rapidly changing and highly competitive business environment. Readings, case studies and individual projects dealing with strategic planning, entrepreneurship, new product development, and related topics. The focus is on a major team project. This integrated project must include the identification of a new product including all relevant business and technical issues and the development of a detailed plan for profitably bringing this new product to market. A final report with oral presentations is required.

