

## **Certificate: Engineering Management**

The Engineering Management certificate provides an opportunity for students to learn about and manage the engineering functions and technology assets of their respective organizations. The program includes course selections in systems engineering, organizational behavior and business ethics/law. (12 credit hours)

### **EM 500 Managing the Engineering Function**

#### **2 Credits**

This course provides the knowledge and skills required to manage an efficient and productive engineering organization within the company. Topics include: starting a new department; missions; planning; organizing the department; integrating and coordinating functions and projects; measuring performance; components of the engineering operation; technical forecasts; state-of-the-art surveys; proposals; managing innovation; ethics and leadership.

### **EM 505 Systems Engineering**

#### **3 credits**

Introduction to systems and systems engineering, tools in systems analysis, the system design process, design for operational feasibility and systems engineering management.

### **EM 520 Production Management**

#### **3 credits**

Forecasting, inventory and scheduling activities in production systems are studied. Topics in forecasting include the regression method, exponential smoothing techniques, Winters' seasonal model, and adaptive control models. Continuous and periodic review inventory models, deterministic and probabilistic cases are also included. Dynamic and static job shop and flow shop scheduling problems are investigated using heuristic and mathematical models. Planning and scheduling for large-scale projects is studied. Material Requirements and Resources Planning (MRP I and II), and Aggregate Planning techniques are evaluated. Students are asked to select problems of interest and to present final project reports.

### **EM 525 Total Quality Management**

#### **3 credits**

The concepts of total quality control (TQC) for planning in production and service are introduced within a framework of quality, cost, and delivery (QCD). Various interpretations and practices of TQC are discussed. Quality function deployment (QFD) is treated as a system tool for quality development, maintenance, and improvement over the life cycle of a product. The roles and functions of statistical quality control (SQC) and QC Circles are defined and studied.

### **EM 530 Information Systems for Engineering Management**

Updated 3/05

\*Other courses are available for all certificate topic areas with approval of department advisor.

**3 credits**

This course covers the organizational foundations of information systems, their emerging strategic role, and the technical foundation for understanding computers and information systems. Topics include: introduction to management information systems; decision support systems artificial intelligence and expert systems, end-user computing; data vs. information; data communication and connectivity; data management.

**EM 541          Accounting Fundamentals for Decision Making****3 credits**

This course introduces fundamental accounting concepts and applications that are useful in the evaluation of financial information and decision tools relevant to project planning. Students will achieve an understanding of basic accounting and cost management tools that are essential to decision making. Emphasis will be placed on assessing financial statement information through an understanding of accounting practice, the relationship between business activities and an organization's cash flows.

**EM 545          Organization Behavior and Human Resources Management****2 credits**

This course encompasses key areas of human resource management and organization behavior as they relate to technical work environments. Organizational design and theory will be discussed, along with motivation, leadership, employee selection skills, group and team processes, and managing diversity. Techniques for devising a personal career development plan are covered.

**EM 550          Business Ethics / Law****2 credits**

This seminar exposes the student to concepts related to ethics and integrity from the standpoints of personal, professional and organizational decision making. Prominent authorities in the fields of business ethics, technology management, law, social science, education, government and action groups will serve as visiting lecturers.

**EM 580          Management of Product and Process Design****3 credits**

This course provides the knowledge and skills needed to manage the design of a product or process. Topics covered include: creativity, types of products, types of processes, identification and translation of customer needs into engineering specifications, designing for function and quality factors, design for manufacturability, life-testing, cost estimating, reporting on design projects, and concurrent engineering.

Updated 3/05

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