

ENGINEERING AND SCIENCE MANAGEMENT (ESM)

ESM F422 Engineering Decisions

3 Credits

Offered Spring

Risk and uncertainty in engineering decisions. Basic applied probability and statistics, data analysis, regression analysis and time series.

Practical applications of decision tools: linear programming, inventory analysis, queuing, network models and utility theory. Engineering judgment and uncertainty. Public safety and ethics.

Recommended: Calculus through MATH F302.

Stacked with ESM F622.

Lecture + Lab + Other: 3 + 0 + 0

ESM F450 Economic Analysis and Operations (W)

3 Credits

Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics and human relations. Note:

Undergraduate engineering students who are taking graduate ESM courses as technical electives should have completed or be concurrently enrolled in ESM F450. Note: Not offered for credit toward the M.S. degree in Engineering Management or Science Management.

Prerequisites: WRTG F111X; WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X; ES F201 or CS F201; senior standing in engineering.

Lecture + Lab + Other: 3 + 0 + 0

ESM F492 Engineering Mgt Seminar

1 Credit

Lecture + Lab + Other: 0 + 0 + 0

ESM F492P Engineering Mgt Seminar

1 Credit

Lecture + Lab + Other: 0 + 0 + 0

ESM F601 Managing and Leading Engineering Organizations

3 Credits

Offered Fall Even-numbered Years

Leadership knowledge and skills as applied to motivation, direction and communication within engineering and technical organizations, and their relations with other organizations and the public. Leadership training complements management knowledge and activities such as organizational structures, planning, monitoring, directing and controlling. The general tools of management are reviewed including management theory, communications, conflict management and resolution.

Recommended: B.S. degree in engineering or physical science or permission of instructor.

Lecture + Lab + Other: 3 + 0 + 0

ESM F605 Engineering Economic Analysis

3 Credits

Offered Spring Even-numbered Years

The economic basis of engineering decisions. Graduate level studies of capital investment analysis techniques, including present worth, annual cash flow and rate of return. Applications to replacement problems, benefits/cost analysis and capital budgeting. Consideration of impacts of depreciation accounting, income taxes and inflation. Risk and uncertainty in economic decisions. Simulation.

Recommended: Graduate standing.

Lecture + Lab + Other: 3 + 0 + 0

ESM F608 Legal Principles for Engineering Management

3 Credits

Offered Fall Odd-numbered Years

Those aspects of law specifically related to technical management.

Contracts, sales, real property, business organization, labor, patents and insurance.

Recommended: Graduate standing.

Lecture + Lab + Other: 3 + 0 + 0

ESM F609 Project Management

3 Credits

Offered Spring Even-numbered Years

Organizing, planning, scheduling and controlling projects. Use of CPM and PERT; computer applications. Case studies of project management problems and solutions.

Recommended: Graduate standing.

Lecture + Lab + Other: 3 + 0 + 0

ESM F620 Statistics for ESM

3 Credits

Offered As Demand Warrants

Forecasting applications and technique— technological, time series, judgmental and regression; decision trees; Bayesian statistics; utility theory with trade-offs between expected value and risk in decision making; bidding strategies; and data analysis.

Recommended: MATH F253X; STAT F200X.

Lecture + Lab + Other: 3 + 0 + 0

ESM F621 Operations Research

3 Credits

Offered As Demand Warrants

Mathematical techniques for aiding technical managers in decision making. Linear programming, transportation problem, assignment problem, network models, PERT/CPM, inventory models, waiting line models, computer simulation, dynamic programming. Emphasis on use of techniques in actual technical management situations. Computer applications.

Recommended: MATH F253X; STAT F200X.

Lecture + Lab + Other: 3 + 0 + 0

ESM F622 Engineering Decisions

3 Credits

Offered Spring

Risk and uncertainty in engineering decisions. Basic applied probability and statistics, data analysis, regression analysis and time series.

Practical applications of decision tools: linear programming, inventory analysis, queuing, network models, utility theory. Engineering judgment and uncertainty. Public safety and ethics. A class project and paper are required.

Recommended: Calculus through MATH F302.

Lecture + Lab + Other: 3 + 0 + 0

ESM F684 Engineering Management Project

3 Credits

Comprehensive study of an actual engineering management problem resulting in reports and presentations which include recommendations for action.

Prerequisites: Graduate standing in Engineering Science Management.

Lecture + Lab + Other: 3 + 0 + 0

ESM F692 Engineering Mgt Seminar

1 Credit

Lecture + Lab + Other: 0 + 0 + 0

ESM F698 Non-Thesis Research/Project

1-6 Credits

Lecture + Lab + Other: 0 + 0 + 0

ESM F699 Thesis

1-9 Credits

Lecture + Lab + Other: 0 + 0 + 0