Engineering Management (EMGT)

Courses

EMGT 50303. Introduction to Engineering Management. 3 Hours.
The course provides an introduction to engineering management. Students will learn about the following engineering management topics: leadership and organizational management; strategic planning and management; financial resource management; engineering economic analysis; project management; quality management systems; operations and supply chain management; management of technology, research and development; systems engineering; legal issues in engineering management; professional codes of conduct and ethics; and decision analysis. The course provides a foundation in the principles and practice of engineering management. Prerequisite: Must be admitted to the Master of Science in Engineering Management Program, or Engineering Management Graduate Sponsored Certificate or MicroCertificate Program, be a Non-Degree Seeking Graduate Student or have departmental consent. (Typically offered: Irregular)

EMGT 50503. Tradeoff Analytics for Engineering Management. 3 Hours.
Use trade-off analytics to inform technical and management decisions. Learn sound methodology to identify stakeholders, stakeholder objectives, and measures of performance. Apply descriptive, predictive, and prescriptive data, models, and analytics to evaluate decisions in each system life cycle stage. Develop decision support tools to provide trade-off analytics insights. Prerequisite: EMGT 50303, EMGT 57003, and EMGT 54403 or instructor consent or department consent. (Typically offered: Fall, Spring and Summer)

EMGT 5140V. Special Topics in Engineering Management. 1-3 Hour.
Consideration of current engineering management topics not covered in other courses. May be repeated for up to 6 hours of degree credit. Prerequisite: Graduate standing and must be admitted to the Master of Science in Engineering Management Program, or the Project Management Graduate Certificate Program, or be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EMGT 54403. Decision Models. 3 Hours.
Focus on quantitative decision models for technical and managerial problems for private and public organizations. Topics include shareholder value, stakeholder value, Value-Focused Thinking, axioms of decision analysis, decision making challenges, decision traps, cognitive biases, decision processes, decision framing, influence diagrams, value hierarchy structuring, designing creative alternatives, single objective models, multiobjective additive value model, swing weights, sensitivity analysis, portfolio decision models with binary linear programming, probability elicitation, Bayes Theorem, decision trees, Monte Carlo simulation, expected value, dominance (deterministic and stochastic), tornado diagrams, value of information, risk preference, utility models, expected utility, and communicating analysis insights. Prerequisite: EMGT 50303 or INEG 23104, and must be admitted to the Master of Science in Engineering Management Program, Engineering Management Certificate Programs, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)
This course is cross-listed with INEG 54403, OMGT 54403.

EMGT 54603. Economic Decision Making. 3 Hours.
Principles of economic analysis with emphasis upon discounted cash flow criteria for decision-making. Comparison of criteria such as rate of return, annual cost, and present worth for the evaluation of investment alternatives. Required course (may be substituted by OMGT 51203). Prerequisite: EMGT 50303, and must be admitted to the Master of Science in Engineering Management Program, Engineering Management Graduate Certificate Programs, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)
This course is cross-listed with OMGT 54603.

EMGT 56003. Systems Thinking and Systems Engineering. 3 Hours.
This course introduces systems thinking and systems engineering (SE) concepts, processes, methods, and tools. Students will apply these concepts to the acquisition and/or development of systems with a focus on life cycle models, development of system architectures and architecture frameworks, system configurations, system requirements, requirements allocation, interface analysis, testing, verification and validation, and post-development concepts. Prerequisite: Must be admitted to the Master of Science in Engineering Management Program, or Engineering Management Graduate Sponsored Certificate or MicroCertificate Program, or be a Non-Degree Seeking Graduate Student or have departmental consent. (Typically offered: Fall, Spring and Summer)

EMGT 57003. Probability and Statistics for Engineering Management. 3 Hours.
This course introduces students to advanced quantitative techniques employed in the graphical and statistical interpretation and analysis of data, using appropriate statistical software tools. Students will learn to implement effective descriptive techniques, to use probability to characterize uncertainty, to write and test statistically valid hypotheses, and to use forecasting models to help solve engineering management problems. Applies engineering management specific case studies. Applies non-parametric, advanced variable transformation for regression individually and in team environments to simulate engineering management tasks and work environment. Prerequisite: Must be admitted to Master of Science in Engineering Management, Master of Science in Engineering, Master of Science in Operations Management; proficient in Excel and undergraduate course in statistics, equivalent background or department consent. (Typically offered: Fall, Spring and Summer)

EMGT 57703. Engineering Risk Analysis. 3 Hours.
Students will understand and apply tools to analyze, assess, and manage risk for engineering organizations. Course work includes methods to identify risks, create and apply risk models, assess risk, evaluate and communicate risk management options. Case studies are used to understand risk analysis challenges in systems development in complex organizations. Prerequisite: EMGT 50303, EMGT 57003 and must be admitted to the Master of Science in Engineering Management Program or have departmental consent. (Typically offered: Irregular)

EMGT 57803. Project Management. 3 Hours.
An introduction to the Critical Path Method and Program Evaluation and Review Technique. Covers project planning and control methods; activity sequencing; time-cost trade-offs; allocation of manpower and equipment resources; scheduling activities and computer systems for PERT/CPM with emphasis on MS project. Case studies include topical issues combining methodologies and project management soft skills, such as conflict management, negotiation, presentations to stakeholders, and team building. Prerequisite: Must be admitted to the Master of Science in Engineering Management Program, Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)
This course is cross-listed with OMGT 57803.