Engineering Management (EMGT)

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Engineering Management Website (https://engineering-management.uark.edu/)

Degree Offered:
M.S. in Engineering Management (EMGT)

The Master of Science in Engineering Management prepares engineers to lead and manage teams, projects, and organizations with technical workforces to meet strategic objectives. Students will increase their engineering and management knowledge to enable them to develop and deliver new products and services to create value for their organization and customers.

Mode of Delivery: Course work for the Master of Science in Engineering Management is delivered entirely online.

M.S. in Engineering Management

Admissions requirements:

1. Conferred bachelor of science in engineering degree from an engineering program accredited by the Engineering Accreditation Commission of ABET (or equivalent accreditation),
2. A grade point average (GPA) of 3.0 or better (A=4.0) on all course work taken prior to receipt of the engineering bachelor degree, or a GPA of 3.0 or better on the last 60 hours of course work taken prior to receipt of the engineering bachelor degree.
3. Applicants with a 3.0 or better GPA are not required to take the GRE.

Requirements for the Master of Science in Engineering Management:

Core Courses (15 hours)		
EMGT 50303	Introduction to Engineering Management	3
EMGT 54403	Decision Models	3
EMGT 54603	Economic Decision Making	3
EMGT 57803	Project Management	3
EMGT 57003	Probability and Statistics for Engineering Management	3
Electives (15 Hours)		**15**
Choose five courses from the available online EMGT, OMGT, or from engineering programs (listed above), or other graduate-level courses approved by the program director.		
Suggested Electives:		
EMGT 50503	Tradeoff Analytics for Engineering Management	
EMGT 56003	Systems Thinking and Systems Engineering	
EMGT 57703	Engineering Risk Analysis	
OMGT 59803	Advanced Project Management	
OMGT 56203	Strategic Management	
OMGT 52503	Leadership Principles and Practices	
OMGT 58703	Leading Change	
OMGT 50003	Introduction to Operations Management	
OMGT 54203	Operations Management & Global Competition	
OMGT 50103	Supply Chain Management for Operations Managers	
OMGT 51203	Finance for Operations Managers	
OMGT 53703	Quality Management	
OMGT 54303	Cost Estimation Models	
A minimum of 80 percent of course work, including all core and engineering sequence courses, must be completed prior to the comprehensive oral exam.		
Total Hours		**30**

Accelerated Master of Science in Engineering Management

Undergraduate students seeking a B.S. in any degree accredited by the Engineering Accreditation Commission of ABET at the University of Arkansas who choose to pursue graduate studies in Engineering Management may participate in the accelerated M.S.E.M. program. With department approval, up to 12 credit hours of 5000-level courses for the M.S.E.M. degree can be used for student's current undergraduate program at the University of Arkansas and apply to the M.S.E.M. degree.

The graduate courses taken as an undergraduate student must be taken during the final 12-month period of their undergraduate degree. Students then take the additional credit hours of approved M.S.E.M. graduate-level courses to meet the 30 credit hour M.S.E.M. degree requirements.

Undergraduate students interested in the accelerated M.S.E.M. degree should apply to the program prior to starting the second-to-last semester of their undergraduate program. To be eligible students must have a 3.0 cumulative GPA or higher and submit the normal application materials required by the graduate school for the M.S.E.M. degree program.

Graduate Certificate in Engineering Management

Admissions requirements:

1. Meet all graduate school admission requirements.
2. Conferred bachelor of science degree in engineering from an engineering program accredited by the Engineering Accreditation Commission of ABET (or equivalent accreditation) or a STEM degree from a regionally accredited program..
3. Applicants with a 3.0/4.0 or better undergraduate GPA are not required to take the GRE.
4. There are no prerequisites for students with an undergraduate degree from an ABET-accredited engineering program.
5. For students with a degree other than an ABET-accredited engineering degree, prerequisite courses may be required.
6. Only students with an ABET- accredited engineering degree may apply the graduate certificate courses to the Master of Science in Engineering Management Degree.

Core Courses (9 hours)		
EMGT 50303	Introduction to Engineering Management	3
EMGT 56003	Systems Thinking and Systems Engineering	3
OMGT 57803	Project Management for Operations Managers	3
Electives (select one)		3
OMGT 50003	Introduction to Operations Management	
OMGT 52503	Leadership Principles and Practices	

OMGT 54603	Economic Decision Making
Total Hours	**12**

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.