

MASTER OF SCIENCE - ENGINEERING MANAGEMENT

Degree Requirements for Master of Science degree majoring in Engineering Management

Students should refer to their DegreeWorks degree audit located in their Digital Backpack for more information regarding their specific degree requirements.

Code	Title	Hours
Major Requirements		
ENGM 505	Principles of Engineering Management	3
ENGM 510	Engineering Project Management	3
ENGM 515	Operations Research for Engineering Management	3
ENGM 525		
ENGM 535	Advanced Engineering Economics	3
ENGM 545	Strategic Management for Engineers	3
ENGR 599	Independent Research	1-6
Choose a 9sch Specialization Concentration from:		9
Energy Management Professional		
ENGM 520	Energy, Environment, and Sustainability	
ENGM 521	Energy Law and Regulation	
ENGM 522	Renewable Energy Economics	
Manufacturing		
ENGM 529	Principles of Manufacturing Processes	
ENGM 530	Production & Inventory Control	
ENGM 531	Advanced Quality Control	
Pulp and Paper Packaging		
ENGR 570	Introduction to Pulp and Paper Technology	
ENGM 571	Economics of Pulp and Paper Industry	
ENGR 573	Paper Converting and Packaging	
Construction Management		
CM 511	Sustainability and LEED	
CM 512	Strategic Bidding and Estimating	
ENGM 580		
Business		
SCM 512	Supply Chain Management Systems	
SCM 554	Logistics and Transportation Management	
MKT 521	Marketing Management	
Total Hours required for Degree		30

CM 510. Construction Management. 3 Hours.

This course provides an understanding of construction management, including contracts, estimating, scheduling, subcontracting, cost control, claims, safety, quality, and project closeout.

CM 511. Sustainability and LEED. 3 Hours.

This course comprehensively explains the latest U.S. Green Building Council (USGBC) guidelines for LEED-accredited professionals. It delves into the fundamental LEED categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.

CM 512. Strategic Bidding and Estimating. 3 Hours.

An exploration of the standard bid-preparation procedures conducted within a prime contractor's framework, encompassing various stages from project selection and receiving initial drawings and specifications to the concluding stages of the estimation process, sub-bid research, bid assembly, markup, and submission. Additionally, the course will delve into postmortems and the requisite follow-up actions. Emphasis will be placed on bidding strategies, techniques, and recommended practices essential for executing these tasks effectively.

ENGM 505. Principles of Engineering Management. 3 Hours.

Functions of engineering managers: planning, organizing, leading, and controlling. Business fundamentals for engineering managers. Engineering leadership and engineering management. Project management methods: planning, scheduling, and controlling.

ENGM 510. Engineering Project Management. 3 Hours.

Explores methods for organizing, coordinating, and controlling resources to minimize risk and conflict, and to maintain budgets and schedules. Discuss the evaluation of competing alternatives, organization of a project, scheduling of tasks and resources, and the role of management. Project control methods such as the Project Evaluation and Review Technique (PERT) and Critical Path Method (CPM) are introduced. A project case study is carried out throughout the semester to illustrate decisions and problems encountered in technical project management.

ENGM 515. Operations Research for Engineering Management. 3 Hours.

This course provides you with an understanding of how various business situations are modeled and optimized effectively using mathematical modeling and quantitative techniques. Examples of the techniques covered in this course are time-series analysis, regression, optimization (linear, nonlinear, and discrete), probabilistic modeling, decision analysis, and simulation. Application areas include forecasting, finance, operations, production, and logistics. You will learn through examples, cases, and the use of software.

ENGM 520. Energy, Environment, and Sustainability. 3 Hours.

This survey course provides an overview of energy issues in the context of global sustainability. Energy demands for transportation, residential, and commercial uses are presented, and strategies for demand reduction are discussed. Major potential sustainable energy sources will be presented, including solar, wind, hydroelectric, geothermal, biofuels, waves, and tides, along with coal, nuclear, and hydraulic fracturing technologies. Issues associated with carbon capture, energy storage, and the power grid will be discussed. While this course will address many technical and scientific aspects of energy, no prerequisite technical courses are required.

ENGM 521. Energy Law and Regulation. 3 Hours.

This course explores how state and federal energy policy have shaped the energy landscape and can support or hinder the transition to a low-carbon economy. It examines the various drivers for policy change, and it reviews the major U.S. and Texas policies and regulations shaping the energy landscape with a focus on electricity. Topics covered include the role and perspectives of the key actors in policy making, including utilities, regulatory agencies, and advocacy organizations, as well as frameworks for policy evaluation.

ENGM 522. Renewable Energy Economics. 3 Hours.

This course introduces students to renewable energy sources, systems, economics, and the environment. It covers fundamental characteristics of renewable resources like solar, wind, and geothermal. Technical generation systems for photovoltaics, wind, hydroelectric, and more will be analyzed. The economic and environmental impacts of these technologies will also be evaluated.

ENGM 529. Principles of Manufacturing Processes. 3 Hours.

The course covers theoretical and practical aspects of manufacturing processes, including material properties and behavior influenced by the manufacturing process. In-depth study of such manufacturing processes as casting, heat treatment, bulk forming, sheet metal forming, metal cutting, nontraditional machining, and process monitoring through measurement of manufacturing process variables.

ENGM 530. Production & Inventory Control. 3 Hours.

This course focuses on traditional and contemporary techniques in production and inventory control within operations management. Key topics include forecasting, inventory control under deterministic and stochastic demand, lot sizing, supply chain management, scheduling, Materials Requirements Planning (MRP), just-in-time (JIT) systems, pull control models, and aggregate planning. The course also examines the design, development, implementation, and management of production planning systems, including master production scheduling, capacity and inventory planning, and production activity control.

ENGM 531. Advanced Quality Control. 3 Hours.

Advanced methods applied to quality control and anomaly detection; classical treatments and recent developments in statistical process control; evaluation, design, and maintenance of quality control programs; focus on monitoring and root cause identification.

ENGM 535. Advanced Engineering Economics. 3 Hours.

The design and analysis of financial strategies in a technical environment. Emphasis is on the application of these strategies in the competitive industry. Core topics include review and application of basic engineering economy concepts, mathematical techniques and models, treatment of risk and uncertainties, cost of capital, demand and price elasticity as it applies to capital investment decisions, financial statements, financial ratio analysis, taxes and inflation, capital budgeting, and financial planning. Special topics include ethics and legal perspectives.

ENGM 545. Strategic Management for Engineers. 3 Hours.

This course integrates concepts from all functional areas of an enterprise to provide strategic direction and organizational leadership. It equips engineers with a management perspective that complements their technical expertise. Emphasis is placed on strategies that promote success and sustainability in competitive, profit-driven environments across economic cycles. Students develop a framework for understanding the interrelationships among accounting, finance, operations, engineering, and marketing. The course employs a combination of lectures, case study analyses, open discussions, guest speakers, and student presentations.

ENGM 571. Economics of Pulp and Paper Industry. 3 Hours.

This course serves as an introduction to a global perspective on economic issues that affect the pulp and paper industry. Issues covered are the main characteristics of the global pulp and paper industry, the world paper market, information on forest industry raw material resources and energy resources, the worldwide structure and various strategies of the industry, and the economic consequences of decisions taken in a pulp and paper mill.

ENGM 599. Capstone Project. 3 Hours.

Introduction and development of an engineering management research project. The application of engineering management theory and science to real-world projects is the focus of this course. The research project includes literature reviews, data collection, data analysis, and conclusions based on the findings. Upon completion of the project, the student must submit a report and present an oral defense. To be taken in the last semester of the degree plan.

ENGR 525. Machine Learning for Data Analytics. 3 Hours.

This course introduces participants to the dynamic realm of predictive data analytics via key machine learning techniques. From raw data to informed decisions, students will unravel four foundational machine learning strategies: information-based, similarity-based, probability-based, and error-based learning. Learners will hone their skills through straightforward explanations paired with mathematical models and illustrative examples. The curriculum further emphasizes evaluating predictive models, supplemented by practical case studies.

ENGR 570. Introduction to Pulp and Paper Technology. 3 Hours.

The purpose of pulp and paper technology is to teach the students the fundamentals of pulping & papermaking technology. Wood raw materials, wood handling, pulping, bleaching, recycling, surface treatment, the paper and paperboard's structural characteristics, the paper and board-making processes' basic mechanisms, and product quality aspects are the topics dealt with. The future as well as emerging trends and transformative technologies in the pulp & paper industry, are discussed. The course also covers strategic and sustainable energy management practices in the industry. The course includes seminar presentations, individual studies, and laboratory work.

ENGR 573. Paper Converting and Packaging. 3 Hours.

This course introduces the students to the converting of paper and paperboard and the technology of converted paper products. This includes the basics of unit operations and descriptions of various coating and lamination processes. The most common converted products are studied with particular attention to the manufacture, properties, and end-use. The packaging of food products and non-food products, as well as the environmental effects of packaging, are reviewed.

ENGR 599. Independent Research. 1-6 Hours.

Independent research in Engineering conducted by a student under the guidance of a faculty member of his or her choice. Credits and hours are by arrangement and, with a change in content, this course may be repeated for credit. Prerequisite: Consent of instructor.

SCM 512. Supply Chain Management Systems. 3 Hours.

The supply chain professional learns the basic techniques and concepts which includes building sales and operations plans. Prerequisite: Admission into the MBA program.

SCM 543. Purchasing and Quality Management. 3 Hours.

This course focuses on the management system, which is concerned with planning and meeting customer needs through leadership and strategic planning. Prerequisite: Admission into the MBA program.

SCM 554. Logistics and Transportation Management. 3 Hours.

This course focuses on the functional areas of logistics and transportation, with emphasis placed on the quantitative treatment of the design and planning issues in logistics. Prerequisite: Admission into the MBA program.

SCM 568. Supply Chain Management Financial Strategy and Profitability. 3 Hours.

This course includes case studies, examples, and in-depth analysis of technical issues involved in supply chain management, network design, and strategic partnering. The course engages students in managing a supply chain and provides a starting point for discussing the value of information in the supply chain, strategic partnering, and centralized decision making. This course is equivalent to both FIN 568 and ACCT 568. Prerequisite: ACCT 2301 and ACCT 2302, or ACCT 526.

SCM 589. Independent Study. 3 Hours.

This course provides individual instruction. Students may repeat the course when topics vary.

SCM 597. Special Topics. 3 Hours.

Instructors will provide an organized class designed to cover areas of specific interest. Students may repeat the course when topics vary.