

Engineering Management Courses

124 Principles of Engineering Management	This course is an introduction to engineering management principles and concepts and will address issues that are relevant to today's successful engineering managers. Topics covered include management practices; communications; working in teams; project management; ethics and societal issues; and life long learning.
134 Managing Engineering And Technology	Introduces the management functions of planning, organizing, motivating, and controlling. Analyzes the application of these functions in research, design, production, technical marketing, and project management. Studies evolution of the engineering career and the transition to engineering management. Prerequisite: A grade of "C" or better is required in this course to meet Engineering Management degree requirements.
137 Economic Analysis of Engineering Projects	Engineering project analysis from an engineering economics perspective. Topics include: interest, equivalent worth, comparing alternatives, rate of return methods, depreciation and taxes, inflation and price changes, benefit-cost analysis and risk analysis.
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201 Special Topics	This course is designed to give the department an opportunity to test a new course. Variable title.
251 Marketing Management	Study of basic functions of marketing in the technological enterprise, including product selection and development, market research, market development, selection of distribution channels and advertising, marketing strategy. Prerequisite: Eng Mgt 134. A grade of "C" or better is required in this course to meet Engineering Management degree requirements.
252 Financial Management	Organization of financial function in the technically based enterprise; analysis and projection of financial statements, cost elements in pricing, cost control and design of accounting systems. Prerequisites: Eng Mgt 134 and 230. A grade of "C" or better is required in this course to meet Engineering Management degree requirements.
253 Operations And Production Management	Concepts of operations and production management are presented at an introductory level. Qualitative and quantitative tools and techniques used for the optimization of the operations component of the total enterprise are explored in the context of improved productivity and strategic competitiveness. Prerequisites: Eng Mgt 134 and 147; Stat 211, 213, or 215. A grade of "C" or better is required in this course to meet degree requirements.
254 Introduction to Project Management	This course covers the fundamentals of project management including project definition, project selection, project planning, estimating, scheduling, resource allocation and project control. Prerequisite: Eng Mgt 134.
257 Materials Handling And Plant Layout	The design and objectives of materials handling equipment including diversity of application in industry from the viewpoint of efficient movement of materials and products from the receiving areas to the shipping areas. The layout of a plant to include materials handling equipment is considered throughout. Cost comparison of various systems will be made.
260 General Management-Design And Integration	Integrating and executing marketing, production, finance, and engineering policies and strategies for the benefit of an enterprise. Analysis, forecasting, and design methods using case studies and management simulation. Prerequisites: Eng Mgt 147, 251, 253, 254; senior standing. A grade of "C" or better is required in this course to meet Engineering Management degree requirements.
266 Quality Philosophies and Methods	This course will provide an overview of quality tools and methodologies and how they apply to engineering management. Quality management methodologies will be explored as well as current and relevant tools and techniques used in the successful application of quality into various environments. Prerequisites: Stat 211, 213, or 215.
299 Senior Design	

301 Special Topics	This course is designed to give the department an opportunity to test a new course. Variable title.
308 Economic Decision Analysis	Comprehensive treatment of engineering economy including effects of taxation and inflation; sensitivity analysis; decisions with risk and uncertainty; decision trees and expected value, normally includes solutions on personal computer and student problem report. Prerequisite: Graduate students without previous course in engineering economy because of partial overlap.
309 Introduction to the Six Sigma Way	This course is an examination of the theory and practice of the breakthrough management strategy known as six sigma (6σ). The role of green and black belts, master black belts and champions will be examined. Prerequisites: Eng Mgt 375 or equivalent.
311 Human Factors	An examination of human-machine systems and the characteristics of people that affect system performance. Topics include applied research methods, systems analysis, and the perceptual, cognitive, physical and social strengths and limitations of human beings. The focus is on user-centered design technology, particularly in manufacturing environments. Prerequisite: Psych 50.
313 Managerial Decision Making	Individual and group decision making processes and principles for engineers and technical managers with emphasis on the limitations of human rationality and the roles of social influence and organizational contexts; principles and skills of negotiation. Prerequisite: Senior or graduate standing.
314 Management for Engineers and Scientists	The transition of the engineer or scientist to manager; study of management roles and theory, organizational systems and behavior, managing and motivating technical personnel, leadership, communication, processes, and customer focus. Prerequisite: Graduate standing.
320 Technical Entrepreneurship	Student teams develop a complete business plan for a company to develop, manufacture and distribute real technical/product service. Lectures & business fundamentals, patents, market/ technical forecasting, legal and tax aspects, venture capital, etc., by instructor and successful technical entrepreneurs. Prerequisite: Senior or graduate standing.
327 Legal Environment	Study of the effect of the legal environment on the decisions which the engineering manager must make. The course investigates the social forces that produced this environment and the responsibilities incumbent upon the engineer.
333 Management Information Systems	Study of the operational and managerial information needs of an organization. Emphasis is on the information needed throughout an organization and on information systems to meet those needs. Prerequisite: Senior or graduate standing.
351 Industrial Marketing Systems Analysis	An analysis of the factors of engineered products, customers, communication, promotion, personal selling, persuasion and management within a dynamic industrial sales environment.
352 Financial Decision Analysis	Understanding the principles and use of accounting standards and systems, financial statements, the time value of money, asset pricing models, sources of funds, financial ratios, dividend and growth policies, and capital structure for financial decision making.
354 Integrated Product And Process Design	Emphasize design policies of concurrent engineering and teamwork, and documenting of design process knowledge. Integration of various product realization activities covering important aspects of a product life cycle such as "customer" needs analysis, concept generation, concept selection, product modeling, process development, DFX strategies, and end-of-product life options. Prerequisite: Eng Mgt 253 or Mc Eng 253.
356 Industrial System Simulation	Simulation modeling of manufacturing and service operations through the use of computer software for operational analysis and decision making. Prerequisite: Stat 213 or 215.
358 Integrated Product Development	Students in design teams will simulate the industrial concurrent engineering development process. Areas covered will be design, manufacturing, assembly, process quality, cost, supply chain management, and product support. Students will produce a final engineering product at the end of the project. Prerequisite: Eng Mgt 354 or Mech Eng 357 or Mech Eng 253 or Mech Eng 308.
361 Project Management	Organization structure and staffing; motivation, authority and influence; conflict management; project planning; network systems; pricing, estimating, and cost control; proposal preparation; project information systems; international project management. Prerequisite: Graduate Standing.

365 Operations Management Science	Application of management science with an emphasis on supporting managerial decision-making. Design and operations of systems are modeled and analyzed using quantitative and qualitative techniques implemented using modern technology. Specific approaches include mathematical modeling and optimization, probabilistic/statistical analysis, and simulation. Prerequisite: Eng Mgt 253 with at least a "C" or graduate standing.
366 Business Logistics Systems Analysis	An analysis of logistics function as a total system including inventory, transportation, order processing, warehousing, material handling, location of facilities, customer service, and packaging with trade-off and interaction. Prerequisite: Stat 213 or 215.
369 Patent Law	A presentation of the relationship between patent law and technology for students involved with developing and protecting new technology or pursuing a career in patent law. Course includes an intense study of patentability and preparation and prosecution of patent applications. Prerequisite: Senior or graduate standing.
372 Production Planning And Scheduling	Introduction to basic techniques of scheduling, manufacturing planning and control, just-in-time systems, capacity management, master production scheduling, single machine processing, constructive Algorithms for flow-shops, scheduling heuristics, intelligent scheduling systems are the topics covered. Prerequisite: Eng Mg 282.
375 Total Quality Management	Examination of various quality assurance concepts and their integration into a comprehensive quality management system: statistical techniques, FMEA's, design reviews, reliability, vendor qualification, quality audits, customer relations, information systems, organizational relationships, motivation. Prerequisite: Senior or graduate standing.
376 Introduction To Quality Engineering	This course is an introduction to the theory and practice of quality engineering with particular emphasis on the work of Genichi Taguchi. The application of the quality loss function, signal to noise ratio and orthogonal arrays is considered in-depth for generic technology development; system, product and tolerance design; and manufacturing process design. The emphasis of the course is off-line quality control. Other contributions in the field are also considered. Prerequisite: Eng Mg 375.
379 Packaging Machinery	Examination and evaluation of packaging machinery as a subset of the packaging system and its relation to the total production and marketing system. Determination of criteria for selection, design and implementation of packaging machinery and systems into the production facility. Prerequisite: Sr standing in engineering.
380 Work Design	Addresses the design of workstations and tasks. Topics include micromotion, operational analysis, manual material handling, workstations organization, macroergonomics, anthropometrics, biomechanics, cumulative trauma disorders, handtool design, controls/displays design, work sampling, stopwatch time studies, predetermined time standard systems, and time allowances. Prerequisite: Senior or graduate standing.
381 Management And Methods In Reliability	Study of basic concepts in reliability as they apply to the efficient operation of industrial systems. Prerequisite: Stat 213 or 215 or 343.
382 Introduction To Operations Research	Mathematical methods for modeling and analyzing industrial systems, topics including linear programming, transportation models, and network models. Prerequisite: Stat 213 or 215.
383 Packaging Management	Provides a comprehensive background in the field of packaging and its place in productive systems. Emphasizes the design or economics of the system. Analyzes the management of the packaging function and interrelationship with other functions of an enterprise.
385 Statistical Process Control	The theoretical basis of statistical process control procedures is studied. Quantitative aspects of SPC implementation are introduced in context along with a review of Deming's principles of quality improvement and a brief introduction to sampling inspection Prerequisite: Stat 213 or 215.
386 Safety Engineering Management	This course is an introduction to the principles of safety engineering applied to industrial situations. Job safety analysis, reduction of accident rates, protective equipment, safety rules and regulations, environmental hazards, health hazards, and ergonomic hazards are covered. Prerequisite: Senior or graduate standing.

390 Undergraduate Research	Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six (6) credit hours allowed for graduation credit. Subject and credit to be arranged with the instructor. Consent of instructor required.
401 Special Topics	This course is designed to give the department an opportunity to test a new course. Variable title.
408 Financial Risk Management	Techniques and methods for managing financial risk, including portfolio theory, Monte Carlo methods, ARIMA, time series forecasting, Value-at-Risk, stress testing, extreme value theory, GARCH and volatility estimation, random variables and probability distributions, real options, decision trees, utility theory, statistical decision techniques, and game theory. Prerequisites: Eng Mgt 308, 352, or equivalent.
420 Technological Innovation Management	Technological innovation is new technology creating new products and services. This course studies the issues of managing technological innovation under four topics: 1) Innovation; 2) New Ventures; 3) Corporate Research & 4) R&D Infrastructure. Prerequisite: Eng Mg 314.
441 Case Studies In General Management	A quantitative study of engineering management problems related to the functioning of the industrial enterprise through case studies. Prerequisite: Preceded or accompanied by an Eng Mg 400 level course.
451 Advanced Marketing Management	Study of marketing decision areas in the technically based firm, including product selection and development, marketing research, market development, distribution, advertising, and promotion. Pricing policies including legal aspects and problems in selecting, training and controlling field sales force. Examination of interaction within consumer and industrial marketing environments. Prerequisites: Eng Mg 314, Econ 122.
452 Advanced Financial Management	Principles of financial organization and management in the technological enterprise; demands for funds; internal and external supply of funds; budgetary control; reserve and dividends policy. Emphasizes systems approach and problems of engineering design and automation as they influence financial decisions. Prerequisite: Eng Mgt 352.
454 Advanced Production Management	Examination of responsibilities of production manager in the technological enterprise for providing finished goods to meet the quality, price, quantity and specification needs of the market place. Study of functions of production manager. Quantitative approach to decision making in production management. Prerequisites: Senior or graduate standing and advanced mathematical modelling competence.
456 Advanced Personnel Management	Current practices of procurement and maintenance of technical personnel in research, development, and design organizations. Adaptation of such personnel to the technological enterprise, current practices in personnel administration, labor management relationships. Prerequisite: Eng Mg 314.
458 Case Studies in Project Management	Includes the main components of the Project Management Institute (PMI) Body of Knowledge; case studies in project management including project implementation, organizational structures, project estimating, project scheduling, project risk management, and conflict management. Prerequisite: Eng Mgt 361 or equivalent.
461 Global Project Management	In depth and advanced topics in project management including project management methodologies, strategic planning for excellence, project portfolio management, integrated processes, culture, and behavioral excellence; normally includes a hands-on group project. Prerequisite: Eng Mgt 361.
472 Lean Manufacturing Systems	Lean manufacturing is a total enterprise philosophy built on increasing the synergy between humans and technological systems. Use of various concepts such as flow, just-in-time, lead times, inventory turns, standardized work, pull system, value streams, quick changeover, workplace organization, and visual controls are covered to improve system performance. Prerequisites: Graduate standing, and Eng Mg 372 or equivalent.
475 Quality Engineering	This course is an examination of the theory and practice of quality engineering with particular emphasis on the work of Genichi Taguchi. The application of the quality loss function, signal to noise ratio and orthogonal arrays is considered indepth for generic technology development; system, product and tolerance design; and manufacturing process design. The emphasis of the course is off-line quality control. Prerequisites: Eng Mg 375 and Math 229 or equivalent.

480 Investment	An introduction to the theory and practice of investment, including financial markets and instruments, security trading, mutual funds, investment banking, interest rates, risk premiums, the capital asset pricing model, arbitrage pricing theory, market efficiency, bonds and the fixed income market, equity valuation, fundamental and technical analysis. Prerequisites: Eng Mgt 208, 308, 352, or equivalent.
481 Financial Engineering	An introduction to financial engineering, with an emphasis on financial derivatives, including the future markets, the pricing of forwards and futures, forward rate agreements, interest and exchange rate futures, swaps, the options markets, option strategies, the binomial and Black-Scholes models for option valuation, the option Greeks, and volatility smiles. Prerequisites: Eng Mgt 308, Eng Mgt 352; Eng Mgt 480 or Sys Eng 480 or equivalent.
490 Research	Investigations of an advanced nature leading to the preparation of a thesis or dissertation. Consent of instructor required.