

## Catalog Descriptions for Required and Elective Courses of Study leading to the Master of Technology

<p><b>ACCT 7134</b> <b>Financial Reporting and Analysis: 3-0-3</b></p> <p>This course focuses on the interpretation of financial statement information for decision making. Topics include understanding the importance of industry context and the firm's own strategic choices in evaluating the financial statement; assessing the quality of financial statement information and recognizing situations where more stringent forensic accounting measures might be appropriate; evaluating profitability and risk; associating subsets of the available analytical tools with the kinds of decisions for which they are most appropriate; and recognizing the effects of GAAP on the input variables of various firm valuation models. Includes coverage of recent relevant legislation and pronouncements of the FASB, SEC, and IASB.</p>
<p><b>ACCT 7230</b> <b>Accounting for Executives: 3-0-3</b></p> <p>A study of management accounting and control information. This course shows how to make pricing and product mix decisions, how to improve existing activities and processes, how to measure performance in decentralized operating units, and how to align organizational activities with long-term strategic objectives, both in a domestic and international setting.</p>
<p><b>BUSA 7030</b> <b>Special Topics in Business: 3-0-3</b></p> <p>A standard course developed for a special or newly emerging topic that is in demand by MBA students. Lectures, group work, readings, research, and writing are required as in any other advanced elective course.</p>
<p><b>CISM 7330</b> <b>Information Technology Management: 3-0-3</b></p> <p>Designed to enable the manager to effectively utilize and manage information technology in the applied business environment. The course focuses on the managerial, not the technical aspects of information management. No prior technical expertise is required. Relevant readings and cases are used to apply the concepts and techniques presented in the course.</p>
<p><b>CISM 7331</b> <b>Business Systems Analysis: 3-0-3</b></p> <p>Introduces the fundamental principles of business systems analysis and design. Students will learn to apply the tools and techniques used by systems analysts to analyze business problems and design information systems-based solutions to those problems. While classical, structured tools for describing data flows, data structures and input/output design will be presented, the emphasis will be on the concepts and techniques of object-oriented systems analysis and design.</p>
<p><b>CISM 7332</b> <b>Enterprise Data Management: 3-0-3</b></p> <p>This course examines the design and use issues underlying relational, object-oriented and multidatabase management systems. Design and implementation methods are examined with the support of modern software tools, such as Oracle. Data management issues are addressed, including modern data storage infrastructure technologies (such as Data Warehousing, and SANs), the role of metadata, and storage of semi-structured data.</p>
<p><b>CISM 7333</b> <b>Digital Commerce: 3-0-3</b></p> <p>This course aims to provide students with an introduction to the issues that surround the management of digital commerce technologies within the business environment. Topics include global issues of E-Commerce, Internet business models, online marketing, mobile and ubiquitous commerce, W3C E-Commerce standards, electronic payments, and online agent technologies.</p>
<p><b>CSCI 5230G</b> <b>Discrete Simulation: 3-0-3</b></p> <p>Introduction to discrete simulation models and their implementation on computers. Topics include modeling techniques, experiment design, analysis and validation of results. Students will be exposed to one or more computer simulation languages.</p>
<p><b>CSCI 5330G</b> <b>Algorithm Design and Analysis: 3-0-3</b></p> <p>An in-depth study of the design, implementation, testing, and analysis of algorithms.</p>
<p><b>CSCI 5430G</b> <b>Artificial Intelligence: 3-0-3</b></p> <p>Introduction to different paradigms for creating software that can reason, access a knowledge base, handle uncertainty, learn, communicate, perceive and act.</p>

<p><b>CSCI 7140</b>  <b>Software Development and Machine Architecture: 4-0-4</b>  Software and hardware topics that include an object oriented language, web page construction, electric circuits, architecture, language translation, operating systems and networks. Primarily intended for those that are beginning a Masters Degree in Applied Engineering. Cannot be taken for credit by those earning a Masters in Mathematics.</p>
<p><b>CSCI 7432</b>  <b>Algorithm Analysis and Data Structures: 3-0-3</b>  Advanced topics in algorithm design and analysis and data structures for implementing these algorithms. Problems considered from areas of information storage and retrieval, graph theory, cryptology and parallel processing.</p>
<p><b>CSCI 7434</b>  <b>Data Mining: 3-0-3</b>  The application of concepts and techniques from information science, statistics, visualization, artificial intelligence, and machine learning for the purpose of extracting, integrating, and visualizing information and knowledge from large databases.</p>
<p><b>FINC 7231</b>  <b>Financial Problems: 3-0-3</b>  A study of financial risk and return, capital budgeting, valuation, capital structure, working capital management and current topics in financial management. Prerequisites:</p>
<p><b>GCM 5334G</b>  <b>Imaging Systems: 2-2-3</b>  Imaging Systems is an in-depth course of how to effectively use, organize, and link imaging workstations, peripherals, systems, and files for information imaging. Current trends and issues of the industry are also covered.</p>
<p><b>GCM 5534G</b>  <b>Digital Output Applications: 2-2-3</b>  Covers the utilization of electronic imaging technologies for output applications for information imaging. Specific topics include internet development and management, and print-on-demand development and management.</p>
<p><b>GCM 7231</b>  <b>Digital Image Preparation: 2-2-3</b>  An exploration of the tools, processes and planning procedures used to capture, edit, and assemble images. The different image constraints required for various output or display methods are reviewed and demonstrated. Layout and design for various output and display methods are reviewed and implemented into course projects.</p>
<p><b>GCM 7232</b>  <b>Multimedia for Business and Industry: 2-2-3</b>  This course will cover the creation of digital components for multimedia presentations, including: sound, graphics, animation, and video techniques. The use of multimedia presentations for video, CD ROM, and the Internet, and the application of these technologies for the business and industrial setting will be explored and practiced.</p>
<p><b>MATH 5530G</b>  <b>Math for Scientists and Engineers: 3-0-3</b>  A survey of topics useful in the study of areas of applied mathematics such as physics, engineering and computer science. Topics include vector calculus, linear algebra, complex variables, numerical methods, Fourier series and partial differential equations. For non-math majors only.</p>
<p><b>MGNT 7330</b>  <b>Leadership and Motivation: 3-0-3</b>  A study of leadership and motivation. This course provides an overview of existing theories and models of leadership and motivation. Using readings, cases, discussion, and guest speakers, the course explains the importance of leadership, motivation, power, and influence in organizational life. Special emphasis is placed on leadership for change.</p>
<p><b>MGNT 7331</b>  <b>Managerial Decision Analysis: 3-0-3</b>  The course will provide a conceptual paradigm for decision makers to construct models and analyze decisions in today's business environment. Quantitative methods will be used to construct models with emphasis placed on representing real world problems and gaining insight and understanding of the decision making process. Specific models developed may include, but are not limited to, statistical fundamentals and probability for decision making, linear programming applications, multiple regression and forecasting models, and statistical quality control. The course will be spreadsheet based.</p>
<p><b>MGNT 7334</b>  <b>Global Management: 3-0-3</b>  Provides the student with an understanding of the global manager's role in the global organization. Provides graduate level skills in the management functions of global planning, international organizing, leading expatriates and diverse cultures, and controlling the global organization.</p>

<p><b>MGNT 7430</b>  <b>Management of Operations for Competitive Advantage: 3-0-3</b>  Provides an understanding of the production/operations function within an organization. It will focus on the type of decisions to be made at various organizational levels, and, where appropriate, on particular models and quantitative techniques that can be useful in making those decisions. Emphasis will be placed on how those decisions are interrelated and on their strategic implications for the firm. Finally, it will consider how the operations function fits with the other functional areas of the firm.</p>
<p><b>PBAD 7632</b>  <b>Public Safety Management: 3-0-3</b>  Provides the basic principles for important systems in the field of public safety management: law enforcement, jail administration, fire safety, emergency services, and hazard and disaster response.</p>
<p><b>PBAD 7337</b>  <b>Environmental Management and Policy: 3-0-3</b>  An overview of environmental and natural resource management in the United States. Particular attention will be paid to issues of regional importance, including water quality and availability, regulation and monitoring compliance, sustainable growth, and management within overlapping jurisdictions.</p>
<p><b>PUBH 8132</b>  <b>Environmental and Occupational Health: 3-0-3</b>  This course is designed to reinforce basic concepts of environmental and occupational health. Students will be exposed to the current impact of potential environmental and occupational health and safety hazards. Students will also be exposed to current concepts associated with environmental and occupational regulatory standards, assessment protocols, sampling and monitoring techniques, and remediation strategies.</p>
<p><b>STAT 6130</b>  <b>Statistics for Researchers: 3-0-3</b>  An introductory course in statistical methods for students in the natural sciences, social sciences, health and professional studies, technology, and business. Sampling techniques for the various disciplines, data summary techniques, analysis and reporting will be studied. Topics include descriptive statistics, point and interval estimation, hypothesis testing, categorical data analysis, contingency tables, regression and correlation analysis.</p>
<p><b>TEET 5541G</b>  <b>Programmable Controllers: 2-3-3</b>  A study of sequential programmable logic controllers (PLCs) as applied to industrial processes with emphasis on ladder diagrams, input/output devices, application programming design of beginning through advanced functions, systems and networking. Also includes laboratory activities in support of instruction. An Independent Research Project is required, including written and oral presentation. A familiarity with Programmable Logic Controllers and their applications is assumed.</p>
<p><b>TMAE 5131G</b>  <b>Essentials of Applied Mechanical Engineering: 2-3-3</b>  This is a course for students with no mechanical engineering experience. The principles of engineering mechanics are developed from a work/energy point of view. Survey topics include a review of the fundamentals of mechanics, elastic behavior of materials, stress-strain relationships and measurements, elasticity theory, stability, dynamics, and vibration theory.</p>
<p><b>TMAE 5132G</b>  <b>Essentials of Applied Electrical Engineering: 2-3-3</b>  This is a course for students with no electrical engineering experience. Survey topics include electrical energy sources, DC circuits, resistive networks, network theorems, inductance, capacitance, natural and step responses of RL, RC, and RLC circuit, sinusoidal steady state analysis, Three-phase circuits, computer circuit analysis, non-linear, active components such as diodes, transistors (both bipolar and MOSFET), and operational amplifiers.</p>
<p><b>TMAE 5133G</b>  <b>Production Planning and Facilities Design: 3-1-3</b>  The methods used to plan and control the efficient and effective use of equipment, tooling, people, materials, and other resources to manufacture products. This will lead to the examination of the fundamental theories, practices, and methods for the design of manufacturing and service facilities to enable productive flow of goods and services. Emphasis is placed on applied exercises utilizing spreadsheet and CAD software that culminates in a semester project.</p>
<p><b>TMAE 5134G</b>  <b>World Class Manufacturing: 3-1-3</b>  A comprehensive study of world class manufacturing. Topics include Just-In-Time production, Total Quality Control, Total Productive Maintenance, and Total Employee Involvement. Manufacturing systems are designed and developed and trial runs are conducted and evaluated. Students will be required to conduct an analysis of a real world case relevant to the course.</p>

<p><b>TMAE 5330G</b>  <b>Cost Engineering: 3-0-3</b>  Cost engineering is concerned with the cost determination and evaluation of engineering design, including the various types of cost estimates, cost information, and cost assurance.</p>
<p><b>TMAE 5890G</b>  <b>Selected Topics in Applied Engineering: 3-2-3</b>  This course is scheduled on an infrequent basis to explore special areas in applied engineering.</p>
<p><b>TMAE 7136</b>  <b>Mechatronics I: 2-3-3</b>  This course is designed to build a working familiarity with the electronics and techniques needed in the design and control of electro-mechanical systems. The topics in this course include integrated use of mechanical, electrical, and computer systems for control of machines and devices, system modeling, sensors and actuators, basic electronics design, signal processing, grounding, and interfacing techniques.</p>
<p><b>TMAE 7137</b>  <b>Mechatronics II: 2-3-3</b>  This course is designed to provide further fundamental information to understand the fusion of mechanical engineering, electrical engineering, and computer data acquisition/programming and their relationship to the field of Mechatronics. This course emphasizes the interfacing of microcomputers with sensors and actuators, hybrid (analog/digital) design, digital logic and analog circuitry, micro-computer architecture, assembly language programming, signal conditioning, filters, analog-to-digital and digital-to-analog conversion, and the interface of data acquisition systems with the control process.</p>
<p><b>TMAE 7430</b>  <b>Industrial Case Study Analysis: 3-0-3</b>  The systems approach and case study format are utilized for the resolution of current technical management problems of various industries. Problem solving methods are presented, discussed, and utilized in student activities.</p>
<p><b>TMAE 7431</b>  <b>Advanced Quality Control: 3-0-3</b>  A study of modern philosophies, methodologies, and technologies for quality control and improvement with emphasis on total quality management, statistical process control, quality improvement methods and acceptance sampling.</p>
<p><b>TMAE 7432</b>  <b>Advanced Engineering Economy: 3-0-3</b>  Consideration of probability and risk effects on estimates, selection of the minimum, attractive rate of return, capitol rationing, among competing projects and economic analysis in government.</p>
<p><b>TMAE 7433</b>  <b>Facilities Planning: 3-0-3</b>  An organized approach for planning a facility that achieves facilities location and design objectives, including how the activity's tangible assets best support achieving the activity's objectives. It is a composite of facilities location and facilities design with the approach based on the engineering design process. Techniques can be applied equally for non-manufacturing applications.</p>
<p><b>TMAE 7435</b>  <b>Manufacturing Systems Analysis: 3-0-3</b>  A study of the analysis of manufacturing systems, systems analysis and problem solving in manufacturing. The tools of systems analysis will be used to formulate the real problems of manufacturing, identify where computer systems can help, and solve challenging manufacturing systems problems.</p>
<p><b>TMAE 7530</b>  <b>Research and Applied Engineering: 3-0-3</b>  A study of modern research methods and their application to the preparation of the thesis and technical reports.</p>
<p><b>TMAE 7532</b>  <b>Global Technology: 3-0-3</b>  An examination of the developments of technology and industry worldwide and the effects upon international relations.</p>
<p><b>TMAE 7890</b>  <b>Selected Topics in Applied Engineering: 3-2-3</b>  This course is scheduled on an infrequent basis to explore special areas of applied engineering.</p>

<p><b>TMAE 7891</b>  <b>Independent Study: (0-3)</b>  Independent study is available for students to undertake individualized experimentation, research, study related to applied engineering, or a capstone project. The specific topic will be approved by a faculty member in the program, and credit will be assigned commensurate with the magnitude of the study.</p>
<p><b>TMAE 7895</b>  <b>Special Problems in Technology: (0-3)</b>  Individual and specialized study in the areas of applied engineering not otherwise covered in the program. Students must submit a proposal of the special problem for approval by the faculty member of record. Credit will be assigned commensurate with the magnitude of the study.</p>
<p><b>TMAE 7999</b>  <b>Thesis: (1-6)</b>  This course focuses on the preparation and completion of the thesis.</p>
<p><b>TMET 5133G</b>  <b>Vibration and Preventive Maintenance: 2-3-3</b>  An introduction to mechanical vibrations and preventative maintenance. Emphasis is placed on: undamped and damped free vibration of single degree of freedom systems, vibration analysis of system with multiple degrees of freedom, and forced vibration analysis with different excitations. Students will engage in hands-on experimental studies and develop analysis technique using vibration data. Preventive maintenance topics will also be studied.</p>
<p><b>TMET 5134G</b>  <b>Introduction to Finite Element Analysis: 1-4-3</b>  An introduction to the fundamentals of Finite Element Analysis. Students will develop a working knowledge of a commercial FEA software package. Students will model and analyze mechanical and thermal engineering problems using a commercial FEA package. Students will develop an ability and competence in interpretation and analysis of FEA results.</p>
<p><b>TMET 5136G</b>  <b>Mechanical Controls: 2-3-3</b>  An understanding of the elements of classical control theory will be developed. Students will be introduced to the concept of feedback and its properties; the concept of stability and stability margins; and the different tools that can be used to analyze these properties. Students will also develop a working knowledge of the basics of linear control techniques.</p>
<p><b>TMET 5137G</b>  <b>Mechanical System Design: 0-6-3</b>  A capstone design course requiring that students call upon all of their academic preparations in the solution of mechanical system problems.</p>
<p><b>TMET 5234G</b>  <b>HVAC: 2-3-3</b>  Introductory course in Heating, Ventilating, and Air Conditioning (HVAC) systems. HVAC processes are analyzed and load calculations are performed in accordance with ASHRAE practices. Design projects are included.</p>
<p><b>TMET 5431G</b>  <b>Automation and CIMS: 2-3-3</b>  A capstone course in materials science and processing. Fundamental manufacturing, automation, and topics in production and related control systems are covered. Numerical control, computer integrated manufacturing, and flexible manufacturing systems are included. Laboratory includes work with a Mini-CIM system.</p>
<p><b>TMET 5531G</b>  <b>Numerical Methods in Applied Engineering I: 2-3-3</b>  This course is designed to be a survey of numerical methods within the context of applied engineering problems. Topics include an overview of linear algebra and matrix operations, partial differential equations, Laplace and Fourier Transformations, and related computational methods.</p>
<p><b>TMFG 5230G</b>  <b>International Manufacturing: 3-0-3</b>  A study of opportunities, issues, and problems involved in manufacturing products for import and export, and in dealing with global suppliers of materials, parts, and assemblies. Focus is on those aspects unique to the management of technical operations, such as ISO (International Organization for Standardization) quality standards, scheduling, and technology transfer. Additional topics may include transportation, Customs documentation, global trends and trade policies, and cultural issues.</p>

<p><b>TMFG 5233G</b>  <b>Manufacturing Applications in Information Technology: 3-0-3</b>  A senior level seminar emphasizing the application of commercially available software to solve manufacturing production problems. Topics include Theory of Constraints, Failure Mode and Effect Analysis, Flow Charting, and Project Management.</p>
<p><b>TMFG 5234G</b>  <b>Introduction to Technical Management &amp; Leadership: 2-3-3</b>  A study in the application of modern technical management and leadership principles to individuals and groups. This course is directly linked to the knowledge and applications learned in the technical manufacturing courses taken in the Industrial Management Program.</p>
<p><b>TSEC 5331G</b>  <b>Occupational Safety: 3-0-3</b>  The technical aspects of developing and implementing occupational safety programs in manufacturing industries. Emphasis on hazard identification and control. Topics include: OSHA compliance, accident investigation, fire protection, machine guarding, noise abatement, and electrical safety.</p>
<p><b>TSEC 5332G</b>  <b>Ergonomics: 3-0-3</b>  The human machine interface in manufacturing industries as it relates to the well-being of workers and efficiency of production systems. The application of human factors from both physiological and psychological perspectives are examined. Emphasis is placed on regulatory compliance.</p>
<p><b>TSEC 5333G</b>  <b>Industrial Hygiene and Ergonomics: 3-1-3</b>  A study of the techniques used by health and safety professionals to anticipate, recognize, evaluate, and control those environmental factors or stresses arising in or from the workplace that adversely effect an employees' health, comfort, and performance. Ergonomic tool and work area design and work procedures are emphasized. Regulatory agencies, compliance, and program management issues are discussed.</p>
<p><b>TSEC 5334G</b>  <b>Hazardous Waste Management: 3-0-3</b>  A study of hazardous waste substances as they are created by various industries and their proper management by combining planning, organizing, and controlling techniques with a knowledge of generating, storing, transporting, treating, recycling and disposing of hazardous materials. Issues of environmental impact, regulatory compliance, ethics, and program management are discussed from a technical management perspective.</p>
<p><b>TSEC 5335G</b>  <b>Systems Safety in Manufacturing: 3-0-3</b>  A study of the application of systems safety concepts to manufacturing and production systems. Emphasis is placed on the critical analysis of systems through modeling and the development of control strategies to reduce the frequency and severity of industrial accidents.</p>
<p><b>TSEC 5336G</b>  <b>Environmental Law: 3-0-3</b>  A course designed to provide an introduction and overview (for those without legal or specific scientific training) of the system through which our nation attempts to preserve the environment. The U.S. legal system, national, and international environmental policy is reviewed. Emphasis is placed on the control of air quality, water quality, toxic substances, and hazardous releases as it relates to environmental regulation of industry.</p>