

Master in Engineering Technology

Description of approved courses

ETECH 804. Quality: Management & Control. 3 hours. The use of advanced statistical process control techniques. Total Quality Management (TQM), ISO:9000 concepts and procedures, Design of Experiments (DOE), and process optimization using computer applications. Prerequisite: A working knowledge of statistical process control and computers or permission of instructor

ETECH 805. Current Issues in Engineering Technology. 3 hours. Study of specific activities/topics/trends impacting the various engineering technology disciplines. Case studies and current innovation emphasis. May be repeated.

ETECH 807. Systems Engineering & Analysis. 3 hours. A systems approach to product/project design. System design process from needs identification through conceptual and detail design, product/project development, systems testing and evaluation. Operational and economic feasibility, reliability, maintainability, supportability. Consideration of various project/product design aspects (mechanical, thermal, electrical/electronic, aesthetic, safety, etc.).

ETECH 809. Engineering Project Management. 3 hours. The design and control of technologically based projects. Considering theoretical and practical aspects of systems models, organizational development, project planning & control, resource allocation, team development, quantitative and qualitative decision making, financial and legal issues.

ETECH 810. Collaborative Projects for Engineering Technology. 3 hours. Multidisciplinary capstone course incorporating aspects of design, project/product management, value engineering, quality control, current technologies and specific engineering/technology techniques to develop/design/improve products or processes. Collaboration of multi-disciplinary backgrounds to address technical issues of varying duration and magnitude. Prerequisite: Should be taken as one of the last graduate courses in program. Permission of instructor.

ETECH 831. Value Engineering . 3 hours. Value engineering concepts, function analysis system techniques (FAST) diagramming, creativity, matrix evaluation, design to cost, life cycle costing, human relations and strategies for organizing, performing and implementing value engineering work.

CMCET 832. Land Development. 3 hours. Development of land for commercialization/improvement. Introduction to land development design, governmental planning and regulations, project approvals, site analysis, environmental considerations, development patterns and principles, site development, utility integration, property surveying and law. Use of case studies.

CMCET 833. Estimating and Bidding Strategy. 3 hours. (3 hours lecture). Strategy of contracting to maximize profit through overhead distribution, breakeven analysis, probability and statistical technique, a realistic risk and uncertainty objective, and bid analysis both in theory and in practice. Prerequisites: CMCET 631 Construction Estimating I and 639 Construction Estimating II or equivalent, graduate standing.

CMCET 834. Advanced Construction Management. 3 hours. (3 hours lecture). Existing and emerging systems for designing, planning, and construction of projects. Changing roles, relationships, and responsibilities of the parties involved. Time-cost relationships for various construction operations.

CMCET 835. Advanced Construction Structures. 3 hours. (3 hours lecture). Methods of analysis for framed structures, trusses, rigid frames, statically indeterminate structures, composite materials. Two-dimensional and three-dimensional finite element analysis.

ETECH 852. Integrated Design and Manufacturing Concepts. 3 hours. Product design and manufacturing from concept to completed project including automated design and manufacturing, solid modeling for design and analysis, prototype and mold development, material selection, packaging, quality, cost, lean manufacturing, six sigma and concurrent manufacturing.

ETECH 880. Advanced Engineering Materials. 3 hours. An applications-oriented study of **engineered** and **structural materials** with emphases on morphology and microstructure for detailed understanding of composition, structure, properties, characteristics and inter-relationship/connectivity of materials. Includes the dynamic and mechanical behavior to facilitate fracture and performance analyses of materials, and materials selection for problem solving, environmental-friendly, cost-effective designs and project implementation.

PET 882. Advanced Plastics Materials and Processes. 3 hours. Overview of thermoplastic and thermoset materials and processes. Laboratory work required. Not open to graduates of PSU Plastics Engineering Technology undergraduate degree.

PET 883. Rheology of Plastic Materials. 3 hours. The study of flow behavior of plastic materials as effected by temperature, time, and shear of material. Alloying, compounding and utilization for processing. Laboratory work required.

PET 884. Elastomeric Materials. 3 hours. Elastomeric materials, both natural and synthetic, their manufacture methods, chemical structures, compounding, and vulcanization. Processing methods, properties, test methods and characterizations. Laboratory work required.

PET 885. Composite Materials and Testing. 3 hours. New and advanced techniques of processing composites including resin structures and non-destructive testing techniques associated with composites. Laboratory work required.

PET 887. Plastics Simulation and Instrumentation. 3 hours. Computer simulations and use of specialized testing equipment for polymer materials. High and low temperature testing. Laboratory work required.

PET 888. Design of Experiments. 3 hours. The use of competing experimental strategies by blending them into a more powerful approach to solving production and processing problems. Prerequisite: Recommended knowledge of statistics.

ETECH 890. Research and Thesis. 3-6 hours. Development of a thesis under Option A. Prerequisite: TTED 891 Methods of Research. May be repeated for a maximum of 6 hours. May be taken as graded or pass-fail.

ETECH 895. Advanced Topics in Engineering Technology. 1-6 hours. Selected topics in engineering technology. Study pertains to a distinct body of technical knowledge. May be repeated if subject matter is different. Research paper and presentation to ETECH Graduate Committee required.

ETECH 899. Quantitative Decision Making in Industry. 3 hours. Methods of utilizing quantitative techniques in production planning, manufacturing engineering, quality control and product marketing for modern industry.

Courses from TED, TST, Business, Biology, Chemistry, Physics, may be acceptable if approved by MET graduate committee.

ETECH Chairperson

COT Dean

Graduate Studies Dean