MMET - MFG & MEC ENGR TECH (MMET)

MMET 105 Engineering Graphics
Credits 2. 1 Lecture Hour. 3 Lab Hours.
(ENGR 1204, ENGR 1304) Engineering Graphics. Graphical approach to the engineering design process as applied to products; methods of graphical communications, three-dimensional geometry, working drawings, data analysis, computer graphics, introduction to team dynamics and creative problem solving.

MMET 181 Manufacturing and Assembly Processes I
Credits 3. 2 Lecture Hours. 3 Lab Hours.
A survey of metal manufacturing processes; traditional machining, nontraditional machining, welding, fabrication, casting and assembly.
Prerequisite: Grade of C or better in MMET 105 or ENGR 111, or concurrent enrollment.

MMET 201 Manufacturing and Materials
Credits 4. 3 Lecture Hours. 2 Lab Hours.
Survey of metallic and non-metallic materials; selection and applications of materials; introduction to traditional and non-traditional manufacturing processes, assembly processes, and metrology.
Prerequisite: ENGR 111 with a grade of C or better; CHEM 107 with a grade of C or better; CHEM 117 with a grade of C or better.

MMET 206 Nonmetallic Materials
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Introduction to structure, properties, processing and application of forest products, plastics, ceramics and composites; laboratory includes processing, physical and mechanical testing, applications, surface treatment and material identification.
Prerequisite: CHEM 102 or CHEM 107 with a grade of C or better; manufacturing and mechanical engineering technology or industrial distribution major or approval of department.

MMET 207 Metallic Materials
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Introduction to structure, properties and engineering application of ferrous and nonferrous materials; beneficiation, production of ferrous and nonferrous metals, destructive and nondestructive testing, protective coatings, strengthening and heat treatment; laboratory includes metallographic procedures, mechanical testing, heat treatment, surface treatment, corrosion testing, recrystallization and failure analysis.
Prerequisite: CHEM 102 or CHEM 107 with a grade of C or better; manufacturing and mechanical engineering technology or industrial distribution major or approval of department.

MMET 275 Mechanics for Technologists
Credits 3. 3 Lecture Hours.
Forces, moments and couples in 2-D and 3-D systems; equilibrium of rigid bodies; friction and applications; centroids and moments of inertia; review of particle dynamic principles; kinematics and kinetics of rigid bodies; principles of impulse-momentum and workenergy; computer use in selected areas.
Prerequisites: Grade of C or better in MATH 152 and PHYS 218; manufacturing and mechanical engineering technology major or approval of department.

MMET 281 Manufacturing and Assembly Processes II
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Continuation of MMET 181. Economics and manufacturability in polymer molding processes; assembly (fits and tolerances); compatibility of metallic and non-metallic discrete parts.
Prerequisites: Grade of C or better in MMET 181 and MMET 206; manufacturing and mechanical engineering technology major or approval of department.

MMET 303 Fluid Mechanics and Power
Credits 4. 3 Lecture Hours. 2 Lab Hours.
Fluid mechanics and fluid power applications for technologists; fluid properties; conservation of energy and momentum; incompressible flow in pipes; standard symbols; components and control of hydraulic systems and pneumatic systems.
Prerequisites: MMET 275, ENGL 104, MATH 151, MATH 152, CHEM 107 and PHYS 218 with a grade of C or better.

MMET 307 Computer Design Graphics
Credits 3. 3 Lecture Hours.
Use of microcomputers with currently available CAD software as an aid in the design process and as a means of increasing engineering productivity; review of ANSI standards and an introduction to a variety of computer graphics applications encountered in industry; user-oriented.
Prerequisites: Grade of C or better in MMET 105 or MMET 181.

MMET 313 Industrial Welding Processes
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Theory and practical applications of industrial welding and cutting processes; experience in operation of various machines and processes.
Prerequisites: Grade of C or better in MMET 181 and MMET 207 and MMET 376; grade of C or better in ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218; junior or senior classification in manufacturing and mechanical engineering technology major.

MMET 320 Quality Assurance
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Applied statistical process control and design-of-experiment techniques for quality improvement and process characterization; emphasis on organizations operating in a continuous-improvement, customer-driven environment; statistical thinking; control charts; capability analysis of product, process and measurement system; experimental process characterization, prediction models and input variable control.
Prerequisites: STAT 211 with a grade of C or better; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology major.

MMET 361 Product Design and Solid Modeling
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Design processes and methodologies including quality function deployment, materials and process selection, and design for manufacturing and assembly; fundamentals of modeling part geometry and mechanical assembly using parametric CAD software.
Prerequisites: Grade of C or better in ENGR 112, MMET 181, MMET 206, MMET 207 and MMET 275; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology major.
MMET 363 Mechanical Design Applications I  
Credits 3. 3 Lecture Hours.  
Principles of design of mechanical components; theories of failure; Soderberg and Goodman diagrams; fatigue and fracture design criteria; materials and their selection to engineering applications; component assembly aspects; design of fasteners and springs as examples.  
**Prerequisites:** MMET 376 with a grade of C or better; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 370 Thermodynamics for Technologists  
Credits 4. 3 Lecture Hours. 3 Lab Hours.  
Thermal and mechanical energy transformations; relationships applied to flow and non-flow processes in power and refrigeration cycles; devices include compressors, turbines, heat exchangers, nozzles, diffusers, pumps and piston-cylinder models; computer modeling.  
**Prerequisites:** PHYS 218 with a grade of C or better; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 375 Applied Dynamic Systems  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Study of translational mechanical system dynamics, rotational mechanical system dynamics, electrical system dynamics modeling, electro-mechanical/mechatronics system dynamics, fluid power dynamics and 2 dimensional rigid body dynamics.  
**Prerequisites:** Grade of C or better in MMET 275; junior or senior level classification.

MMET 376 Strength of Materials  
Credits 4. 3 Lecture Hours. 2 Lab Hours.  
Stress and strain; elastic moduli Poisson’s ratio; torsion, bending, unsymmetrical bending; design of beams and shafts; deflection of beams; buckling of columns; material and strength characterization laboratory tests.  
**Prerequisites:** Grade of C or better in MMET 207 and MMET 275; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 380 Computer-Aided Manufacturing  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Basic concepts in computer-aided manufacturing with emphasis on a system approach to manufacturing activities; use of numerical control machine tools and other computer based software as applied to different industries.  
**Prerequisites:** Grade of C or better in MMET 181 and MATH 152; completion of ENGL 104, MATH 151, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 383 Manufacturing Information Systems  
Credits 4. 3 Lecture Hours. 3 Lab Hours.  
Use of information technology for manufacturing enterprise applications, including computer-integrated manufacturing, database, computer networking, web-technology and enterprise resource planning.  
**Prerequisites:** MMET 380 with a grade of C or better; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 384 Manufacturing Automation and Robotics  
Credits 3. 2 Lecture Hours. 2 Lab Hours.  
Hardware for automated work handling, conveyors, loaders, robots, storage devices; power sources and methods of control, electric motors, controllers, program logic controllers, robot programming; interfacing of equipment controls; and manufacturing work cells.  
**Prerequisites:** Grade of C or better in MMET 361, MMET 376, MMET 380, MMET 383 and IDIS 300; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 385 Manufacturing Applications II  
Credits 3. 2 Lecture Hours. 2 Lab Hours.  
Methods and procedures in nondestructive inspection of materials and industrial products; ultrasonics, dye penetrants, magnetic particle, radiography and supportive evaluation methods such as weld sectioning, polishing, etching and macroscopic analysis.  
**Prerequisites:** Grade of C or better in MMET 281 and MMET 376; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 405 Weldability of Ferrous Metals  
Credits 3. 3 Lecture Hours.  
Applied principles of metallurgy with reference to weldability of ferrous metals.  
**Prerequisites:** MMET 207 or MEEN 340; MMET 313 or approval of instructor; admitted to major degree sequence (upper-level) in engineering technology.

MMET 410 Manufacturing Automation and Robotics  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Hardware for automated work handling, conveyors, loaders, robots, storage devices; power sources and methods of control, electric motors, controllers, program logic controllers, robot programming; interfacing of equipment controls; and manufacturing work cells.  
**Prerequisites:** Grade of C or better in MMET 361, MMET 376, MMET 380, MMET 383 and IDIS 300; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 412 Production and Inventory Planning  
Credits 3. 2 Lecture Hours. 2 Lab Hours.  
An introductory treatment of models and techniques for the planning of production and inventory systems.  
**Prerequisites:** Grade of C or better in MMET 320, MMET 380, MMET 383 and ISEN 302; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; senior classification in manufacturing and mechanical engineering technology.

MMET 414 Micro/Nano Manufacturing  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Product miniaturization and impact; review of atomic structure, electrical and physical properties of materials; ultraprecision machining; microlithography; dry and wet etching/sputtering techniques; isotropic and anisotropic processes; pattern transfer with additive processes; surface micromachining; microreplication processes; introduction to packaging technology and nanometrology; manufacturing of selected Microsystems (MEMS) and their applications.  
**Prerequisites:** CHEM 107; PHYS 208; senior or graduate in engineering or science; admitted to major degree sequence (upper-level) in engineering technology for ENTC majors.

MMET 418 Medical Manufacturing  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Surveys relevant regulations, biocompatibility of engineering materials, and emphasizes suitable techniques for medical device manufacturing.  
**Prerequisites:** MMET 181, junior or senior level classification or approval of instructor.
MMET 422 Manufacturing Technology Projects
Credits 2. 1 Lecture Hour. 3 Lab Hours.
A capstone projects course utilizing a team approach to an analysis and solutions of manufacturing problems.
Prerequisites: MMET 429 with a grade of C or better; completion of junior-level courses; must be taken semester of graduation; approval of instructor; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; senior classification in manufacturing and mechanical engineering technology.

MMET 429 Managing People and Projects in a Technological Society
Credits 3. 3 Lecture Hours.
Supervisory and project management duties and responsibilities in technology based organizations and the methods required to fulfill these functions.
Prerequisites: ISEN 302 with a grade of C or better; MMET 361 with a grade of C or better; or approval of instructor; must be taken during long semester prior to MMET 422; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; senior classification in manufacturing and mechanical engineering technology.

MMET 463 Mechanical Design Applications II
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Applications of principles of analysis and design of machines and machine elements including linkages, robots, cam and follower systems, shafts, gears, clutches, belt and chain drives; introduction to the mathematical tools for the analysis and design of these machines and machine elements.
Prerequisites: Grade of C or better in MMET 361 and MMET 363; completion of ENGL 104, MATH 151, MATH 152, CHEM 107 and CHEM 117, and PHYS 218 with a grade of C or better; senior classification in manufacturing and mechanical engineering technology.