MMET - MFG & MECH 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, non-traditional machining, welding, fabrication, casting and assembly. **Prerequisite:** Grade of C or better in MMET 105, ENGR 102, or ENGR 111, or concurrent enrollment.

MMET 201 Manufacturing and Materials

Credits 4. 3 Lecture Hours. 2 Lab Hours. Survey of metallic and nonmetallic materials; selection and applications of materials; introduction to traditional and non-traditional manufacturing processes, assembly processes, and metrology. **Prerequisite:** Grade of C or better in ENGR 102 or ENGR 111; grade of C or better in CHEM 107 and CHEM 117 or CHEM 120; industrial distribution major.

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:** Grade of C or better in CHEM 120 or CHEM 107 and CHEM 117; manufacturing and mechanical engineering technology or industrial distribution major or approval of department.

MMET 207 Metallic Materials

Credits 3. 2 Lecture Hours. 2 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:** Grade of C or better in CHEM 120 or CHEM 107 and CHEM 117; manufacturing and mechanical engineering technology or industrial distribution major or approval of department.

MMET 275 Mechanics for Technologists

Credits 3. 3 Lecture Hours. (ENGR 2301, ENGR 2401) Mechanics for Technologists. Forces, moments and couples in 2-D and 3-D systems; equilibrium of rigid bodies; structural analysis; friction and applications; centroids and moments of inertia. **Prerequisites:** Grade of C or better in MATH 152 and PHYS 206 or PHYS 218; manufacturing and mechanical engineering technology major.

MMET 281 Manufacturing and Assembly Processes II

Credits 3. 2 Lecture Hours. 2 Lab Hours. Survey of Polymer manufacturing processes, casting, expansion, extrusion, molding and thermoforming; additive manufacturing processes, material extrusion, vat photopolymerization, material jetting, binder jetting, sheet lamination, powder bed fusion and directed energy deposition. **Prerequisite:** Grade of C or better in MMET 181 and MMET 206; manufacturing and mechanical engineering technology major or approval of department.

MMET 301 Mechanical Power Transmission

Credits 3. 2 Lecture Hours. 2 Lab Hours. Overview of the engineering concepts of mechanical power and the components within a system to provide transmission of that power into useful work; experimental application of the related theory as it relates to the industrial distributor; "real world" knowledge learned for application in industry. **Prerequisites:** Grade of C or better in ENGL 103 or ENGL 104; grade of C or better in MATH 151, MATH 152, PHYS 206, and ENGR 216/PHYS 216 or PHYS 216/ENGR 216; grade of C or better in CHEM 107 and CHEM 117 or CHEM 120; grade of C or better in MMET 201 or concurrent enrollment; junior or senior classification in industrial distribution.

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:** Grade of C or better in MMET 275; manufacturing and mechanical engineering technology major.

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. **Prerequisite:** Grade of C or better in MMET 181 and MMET 207; junior or senior classification in manufacturing and mechanical engineering technology.

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:** Grade of C or better in STAT 211; junior or senior classification in manufacturing and mechanical engineering technology.

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 216/PHYS 216 or PHYS 216/ENGR 216, MMET 181, MMET 206, MMET 207, and MMET 275; junior or senior classification in manufacturing and mechanical engineering technology.

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. **Prerequisite:** Grade of C or better in MMET 376; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 370 Thermodynamics for Technologists

Credits 4. 3 Lecture Hours. 2 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:** Grade of C or better in PHYS 206, and ENGR 216/PHYS 216 or PHYS 216/ENGR 216; junior or senior classification in manufacturing and mechanical engineering technology.

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 ENGL 103 or ENGL 104; grade of C or better in MMET 207, MMET 275, MATH 151, MATH 152, CHEM 107 and CHEM 117 or CHEM 120, PHYS 206, and ENGR 216/PHYS 216 or PHYS 216/ENGR 216; 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 computeraided 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; 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:** Grade of C or better in MMET 380; junior or senior classification in manufacturing and mechanical engineering technology.

MMET 401 Fluid Power Transmission

Credits 3. 2 Lecture Hours. 2 Lab Hours. Engineering concepts of hydraulics and pneumatic power and its components within a system to provide transmission of that power into useful work; experimental application of the related theory as it relates to the industrial distributor; real world knowledge learned for application in industry. **Prerequisites:** Grade of C or better in MMET 201, MMET 301, PHYS 207, and ENGR 217/ PHYS 217 or PHYS 217/ENGR 217; junior or senior classification in industrial distribution.

MMET 402 Inspection Methods and Procedures

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; 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:** Grade of C or better in MMET 207 and MMET 313; junior or senior classification in manufacturing and mechanical 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 383 and ESET 300; 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 383 and ISEN 302; 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:** Grade of C or better in CHEM 107, PHYS 207, and ENGR 217/PHYS 217 or PHYS 217/ENGR 217; junior or senior classification in manufacturing and mechanical engineering technology.

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:** Grade of C or better in MMET 181; junior or senior classification in manufacturing and mechanical engineering technology.

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. **Prerequisite:** Grade of C or better in MMET 429; grade of C or better in MMET 410, MMET 412 and MMET 463, or concurrent enrollment; ENTC 399 or concurrent enrollment; must be taken in fall or spring semester; 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:** Grade of C or better in ISEN 302 and MMET 361; grade of C or better in MMET 363, or concurrent enrollment; must be taken in the fall or spring semester immediately prior to MMET 422; senior classification in manufacturing and mechanical engineering technology.

MMET 463 Mechanical Design Applications II

Credits 3. 3 Lecture 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; senior classification in manufacturing and mechanical engineering technology.

MMET 485 Directed Studies

Credits 1 to 6. 1 to 6 Other Hours. Directed study of selected problems in an in an area of manufacturing and mechanical engineering technology not covered in other courses. Maye be repeated for credit. **Prerequisites:** Senior classification and approval of instructor.

MMET 491 Research

Credits 0 to 4. 0 Lecture Hours. 0 Lab Hours. 0 to 4 Other Hours. Research conducted under the direction of faculty member in the college of engineering. May be repeated three times for credit. **Prerequisites:** Junior or senior classification and approval of instructor.