MANUFACTURING ENGINEERING TECHNOLOGY (MET)

MET 100 Electrical Circuits for Manufacturing Credits: 3
Typically Offered: Fall.
Course Description: Studies fundamentals of electricity, solution of DC and AC circuits, motors and generators, three-phase industrial power, power generation, distribution, transmission, and transformers. Includes laboratory sessions to demonstrate and reinforce understanding of these topics. Two hours lecture, three hours lab.

MET 101 Electronic Instrumentation for Manufacturing Credits: 3
Typically Offered: Spring.
Course Description: Studies electronic devices used in manufacturing and control equipment, such as diodes, transistors, SCR's, triacs, and integrated circuits. Also studies electronic circuits including power supplies, amplifiers, oscillators, digital electronics, basic principles of electronic communications, and electronic control circuits. **Prerequisite(s):** MET 100.

MET 111 Manufacturing Processes Credits: 2
Typically Offered: Spring.
Course Description: Introduction to manufacturing engineering. OSHA safety regulations, GMP, quality control, SPC, Lean manufacturing and Six-sigma.

MET 132 Manufacturing Methods Credits: 3
Typically Offered: Spring.
Course Description: Machine shop practices using hand tools, precision measuring equipment, and machine tools. Topics include metal casting and forming, machining of materials, and inspection. Operating traditional machine tools such as engine lathe, milling machines, drill presses and grinders. Two hours lecture, three hours lab.

MET 223 Machines and Tooling Credits: 3
Typically Offered: Fall.
Course Description: Introduction to tooling for different machining processes, machining fixtures, jigs, and dies. Study and practice manufacturing and inspection procedures and the necessary equipment needed to manufacture specific products or components. **Prerequisite(s):** MET 132.

MET 232 Computer Integrated Manufacturing Credits: 2
Typically Offered: Fall.
Course Description: Study of the various components and operations in automated manufacturing systems including material handling, robotics, tooling, inspection, and quality control. Study of PLC programming and operation. One hour lecture, two hours lab. **Prerequisite(s):** MET 101.

MET 241 CNC Machining Credits: 3
Typically Offered: Spring.
Course Description: Basic theory and laboratory work in basic programming, operation and maintenance of CNC machines. Two hours lecture, three hours lab. **Prerequisite(s):** MET 132.

MET 242 CNC Machining Processes Credits: 2
Typically Offered: Fall.
Course Description: Study and practice of CNC machine operation including setup, programming, coordinate system, tool change, tool compensation, work-hold, and machine-computer interface. One hour lecture, two hours lab. **Prerequisite(s):** MET 132.

MET 260 Mechanics of Materials Credits: 4
Typically Offered: Spring.
Course Description: Axial, torsional, bending, and combined stress and strain analysis; mechanical properties and applications for static, fatigue, creep, and impact conditions; emphasizes beam stresses and deflections, columns, and riveted and welded connections. There will be specific emphasis on quality and accuracy for reports and assignments. Three hours lecture, three hours lab. **Prerequisite(s):** EGT 260.

MET 285 Selected Topics in Manufacturing Credits: 3
Typically Offered: Departmental Discretion.
Course Description: Study of selected topics in manufacturing, including the evaluation and review of specific manufacturing processes and study in a given area that combines previous manufacturing engineering courses culminating in an integrated experience through an individual technical report and presentation. **Prerequisite(s):** MET 101, MET 111, and MET 132.

MET 315 Mechanical Systems Credits: 3
Typically Offered: Fall.
Course Description: Principles of water supply and treatment, plumbing, sanitation systems, heating, ventilation and air conditioning. Two hours lecture, three hours lab. **Prerequisite(s):** EGT 220.

MET 322 Advanced Electrical Circuits for Manufacturing Credits: 4
Typically Offered: Spring.
Course Description: Analysis of series and parallel DC networks by various methods including mesh and nodal analyses, network theorems (Thevenin's, Norton's and Superposition). Analyses of AC series and parallel networks (RL, RC & RLC circuits), phasors, reactances, power, AC network theorems, sinusoidal AC voltages, currents, impedances and admittances, transformers, and circuit analysis applications using computer simulation program. Troubleshooting and maintenance are also discussed. Laboratory exercises using AC sources, dual-trace oscilloscope, frequency generator, and circuit prototyping reinforce the lecture concepts. Three hours lecture, three hours lab. **Prerequisite(s):** MET 100.

MET 324 Industrial Controls Credits: 3
Typically Offered: Fall.
Course Description: Studies of the basic principles and applications of industrial controls. Introduction to industrial control systems, solid state devices in industrial application, using thyristor devices such as SCRs and Triacs, discrete automation sensors and devices, DC and AC motors and their controls, transformers and their applications, microcontrollers control applications, and programmable logic controllers applications. Troubleshooting and maintenance for the control equipment/system are also discussed. **Prerequisite(s):** MET 322.

MET 325 Machine Parts and Mechanical Design Credits: 3
Typically Offered: Spring.
Course Description: Introduction to the design and analysis of machine elements, such as shafting, springs, screws, belts, brakes, clutches, gears, and bearings. Emphasis on materials, loads, stress, strain, deflection, and quality. **Prerequisite(s):** EGT 260.

MET 372 Programmable Logic Controllers Credits: 4
Typically Offered: Spring.
Course Description: Studies programmable logic controllers (PLC's); hardware components, memory structure, I/O modules, PLC ladder logic diagrams and basic programming functions, sequencing, contact and coil programming, fail-safe circuits and applications. Laboratory experiments feature hardware/software applications using industrial-grade PLC's of the major manufacturers interfaced with I/O devices for data acquisition and control experiments. Three hours lecture, three hours lab. **Prerequisite(s):** MET 232.

MET 390 Manufacturing Technology Internship Credits: 1-4
Typically Offered: Fall, Spring, Summer.
Course Description: Analysis, development and implementation of a project or work and study in an approved position in industry to enrich educational experience. **Prerequisite(s):** Department chairperson's approval.

MET 422 Electrical Power Technology Credits: 3
Typically Offered: Spring.
Course Description: Studies the principles and applications of various types of DC and AC generators and motors, methods of power control, using thyristor devices, solid-state AC and DC motor drives and servo mechanisms, microcontrollers control applications for motor drives, interface to programmable logic control systems, inverters, converters, and cycloconverters; principles of three-phase power systems; transformers; generation, transmission, motors/generators, and three-phase power relationships. Three hours lecture. **Prerequisite(s):** MET 322.

MET 452 Automation and Process Control Technology Credits: 4
Typically Offered: Fall.
Course Description: Studies principles of feedback control systems, compensation techniques, major types of sensors, electromechanical components and the interface between mechanics and electronics. Three hours lecture, three hours lab. **Prerequisite(s):** MET 372.

MET 462 Production Planning and Control Credits: 3
Typically Offered: Fall.
Course Description: This course covers models and techniques for designing integrated production systems to manage material, service, and information flows in response to changing market demands. Topics include forecasting, aggregate planning, operations strategy, capacity planning, supply chain management, JIT systems, lean manufacturing, materials requirement planning, inventory management, short-term scheduling, sequencing, and line balancing. **Prerequisite(s):** MET 132.