

MANUFACTURING ENGINEERING TECH (MET)

Division: Mathematics, Engineering Technologies and Computer Sciences (METCS) Division

MET 201 Manufacturing Process & Mtrls (3 Credits)

This course deals with the principles, methodology, and economics of manufacturing processes with respect to materials, production operations, and quality control. The topics also include tooling, automation, maintenance, industrial organization and management, marketing, and statistics applied to manufacturing problems. Laboratory work is included.

Pre-requisites: PHY 101 with a minimum grade of C

MET 202 Modern Manuf. Systems/Robotics (3 Credits)

This course introduces the concept of computer integrated manufacturing systems through the use of a flexible manufacturing center comprised of a number of work cells. It covers communication between the individual process controllers and a factory control system. Robot operation and programming is introduced. The course also covers the mechanical aspects of material manipulation, various feedback mechanisms, and the integration of robots with other machines in the workcell. The student applies the design concept and techniques to develop a machine tool operation system. Field trips to assembly plants are included.

Pre-requisites: MET 201 with a minimum grade of C

MET 203 Engineering Materials and Proc (3 Credits)

This course introduces the student to a combination of lecture and laboratory experiences related to engineering material and processes. Engineering materials considered include, but are not limited to, metals, ceramics, and polymers. Processes and how they affect properties, include but are not limited to, the information of a part from a molten/particle state, forming, material removal, heat treatment, and additive manufacturing. Laboratory exercises involve, but are not limited to, basic machine tools, measurements, microstructure identification, and computer controlled equipment.

Co-requisites: PHY 102

MET 210 Kinematics (3 Credits)

Students learn about moving elements used in the design and analysis of basic mechanisms in machines. Topics covered in the course include velocity and acceleration analysis on a plane, design and analysis of four-bar linkages, and cams, gears, and other mechanisms using graphical and analytical methods. Laboratory work is included.

Pre-requisites: ENR 110 with a minimum grade of C

MET 211 Machines and Controls (3 Credits)

Students learn about DC and AC motors and generators and the transmission mechanisms used to drive mechanical power. The course covers transducers for position and velocity. Programmable Logic Control (PLC) Systems are introduced. The laboratory work involves the use of computer-integrated manufacturing (CIM) workcell equipment, which includes computer numerical control (CNC) machinery, robotics control systems, and vision control systems.

Pre-requisites: PHY 101 with a minimum grade of C and ELC 115 with a minimum grade of C

MET 215 Fluid Mechanics (3 Credits)

This course covers the basic concepts and applications of fluid systems, including essentials of fluid properties, fluid statics, Bernoulli's Theorem, fluid measurements, and losses through flow in pipes. The laboratory work will deal with models and operational systems as well as exercises involving the underlying principles of hydraulic and pneumatic mechanisms.

Pre-requisites: PHY 101 with a minimum grade of C

MET 221 Programmable Logic Controllers (3 Credits)

In this course, students apply the skills they learned from previous PLC courses to individually design a comprehensive project in the application of PLC's in a real life situation. A detailed report will be presented by each student.

Pre-requisites: MET 211 with a minimum grade of C

MET 225 Computer Numerical Control (3 Credits)

This course introduces computer numerical control (CNC) programming in an applied fashion using lathe, milling, and other machines in the laboratory. The course emphasizes mastery of G and M codes and focuses on the integration of computer aided design (CAD), computer aided manufacturing (CAM), and CNC. The latest release of CAM software packages and modern CNC machines are available and used by the students to complete several hands-on projects.

MET 250 Mechanical Engr. Tech. Project (2 Credits)

This course is taught in a lecture and demonstration format within the confines of a specialized laboratory. The student completes a comprehensive project which includes the various aspects of Mechanical/Manufacturing Engineering Technology. The project must encompass a wide range of topics such as design, CAD, production planning, material handling, machining, quality control and inspection.