

MECHANICAL ENGINEERING TECH (ME)

Course Descriptions

ME 100. Measurement, Materials and Safety. 3 Credit Hours.

This course prepares students for the National Institute of Metalworking Skills (NIMS) Measurement, Materials and Safety credentialing examination. Students will learn foundational skills for the metalworking industry including the basics of metal cutting, measurement, safety and shop math. Additional hours required.

Prerequisites: Departmental approval or Work Keys Applied Mathematics Level 4, or, Reading Proficiency or Work Keys Reading for Information Level 4

Corequisites: ME 154

ME 101. Welding Technology. 3 Credit Hours.

The major objective of this course is to provide a comprehensive coverage of current welding practices. A variety of welding processes will be covered including shielded metal-arc, gas shielded-arc, resistance and other special techniques intended specifically for welding sophisticated metals. Additional lab hours required.

Prerequisites: Reading Proficiency

ME 111. Job Planning, Benchwork & Layout. 3 Credit Hours.

This course prepares students for the National Institute of Metalworking Skills (NIMS) Job Planning, Benchwork Layout credentialing examination. Students will build upon skills learned in the Measurement, Materials Safety class.

They will learn additional foundational skills for the metalworking industry including the basics of benchwork, layout, hole making operations, grinding, shop trigonometry and introductory geometric dimensioning and tolerancing. Additional hours required.

Prerequisites: Reading Proficiency or departmental approval

Corequisites: ME 100

ME 120. Manual Machining I. 3 Credit Hours.

This course prepares students for the National Institute for Metalworking Skills (NIMS) level 1 milling, grinding and drill press skills examinations. Students will build upon skills learned in the Measurement, Materials Safety class and the Job Planning, Benchwork Layout course. They will learn additional skills for the metalworking industry including the safe set up and operation of milling machines, drill presses and grinders. Some of the projects required for NIMS credentialing will be incorporated as lab projects. Additional hours required.

Prerequisites: ME 111 with a minimum grade of "C" or departmental approval, and Reading Proficiency

ME 121. Computer Integrated Manufacturing. 3 Credit Hours.

This course applies principles of robotics and automation. Students will use CNC equipment to produce actual models of their three-dimensional designs. Fundamental concepts of robotics used in automated manufacturing and design analysis are included.

Prerequisites: EGR 145 and EGR 147 with minimum grades of "C" or department approval

ME 133. Production Control. 3 Credit Hours.

Students will gain an understanding of the tools, techniques and processes used to plan, schedule and track materials through the complete value chain in a manufacturing environment. Topics will include both manual and computer assisted methods including Materials Requirements Planning, Shop Floor control, Lean Manufacturing and "Just in Time" techniques. (Credit is only allowed for either ME 133 or IE 133.)

Prerequisites: Reading Proficiency

ME 140. Introduction to Robotics. 3 Credit Hours.

This course is a historical overview of the use and development of robotics.

Topics to be studied include specific types and application of industrial robots, the effects of industrial robots and technology on employers and employees, and the programming and functioning of robotic simulators. Additional lab hours required.

Prerequisites: Reading Proficiency

ME 151. Manufacturing Processes I. 3 Credit Hours.

Teaching theory and manipulative skills in the basic processes of manufacturing lathes, milling machines, shapers, drill presses, welding, foundry, sheet metal, precision instrument reading, and hand tools. Additional lab hours required.

Prerequisites: Reading Proficiency

ME 154. Mechanical Blueprint Reading. 2 Credit Hours.

This course covers drawing understandings, sheet sizes, information in title blocks, revision blocks, and tolerance blocks. Students will learn how to use measuring instruments as they pertain to blueprints. Additional hours required. (Credit is only allowed for either ME 154 or ME 546.)

Prerequisites: Reading Proficiency

ME 200. Manual Machining II. 3 Credit Hours.

This course prepares student for the National Institute for Metal Working Skills (NIMS) level I Turning Between Centers and Chucking credentialing assessment. Students will build upon skills learned in the Measurement, Materials Safety and the Job Planning, Benchwork Layout courses. They will learn additional skills for the metalworking industry including fundamental operations performed on a lathe. Some of the projects required for NIMS credentialing will be incorporated as lab projects. Additional hours required.

Prerequisites: Reading Proficiency or departmental approval

Corequisites: ME 120

ME 210. Robotics Subsystems and Components. 3 Credit Hours.

A continuation of Introduction to Robotics (ME 140) covering more advanced programming on ROBOT simulators (i.e., application of motion, voice, light, and sound sensors). Typical robot subsystems and components such as electronic (feedback devices, controls, microprocessor interfacing), hydraulic, pneumatic and mechanical drive mechanisms are covered with regard to their functions and operational principles. Additional lab hours required.

Prerequisites: ME 140 or EE 242 with a minimum grade of "C" or department approval and Reading Proficiency

ME 211. Programmable Logic Controllers. 3 Credit Hours.

This course presents the fundamentals of ladder logic (or relay logic) used on modern industrial controllers. Basic elements such as timers, counters, and sequences are studied, as well as traditional methods of applying them to machine control. Students will program and perform laboratory experiments with programmable logic controllers, such as the Allen Bradley SLC-100 controllers and interface them to various input and output devices. An industrial robot also is available in class for lab experiments. Use of IBM/Allen Bradley personal computer interface software will be covered as well. Additional lab hours required.

Prerequisites: ME 140 with a minimum grade of "C" recommended and Reading Proficiency

ME 212. Introduction to Computer Numerical Control (CNC) Machining. 3 Credit Hours.

This course prepares students for the National Institute for Metalworking Skills (NIMS) level 1 Computer Numeric Control (CNC) Milling examinations. Students will build upon skills learned in the Measurement, Materials Safety class and the Job Planning, Benchwork Layout course. They will learn additional skills for the metalworking industry including the safe set up, operation and basic programming of Computer Numeric Controlled milling machines. They will work on the project required for NIMS credentialing. Additional hours required. Prerequisites: Reading Proficiency or departmental approval
Corequisites: ME 120

ME 230. Introduction to 3-D Solid Modeling for Design. 4 Credit Hours.

Introduction to 3-D Solid Modeling for Design teaches the use of 3D solid modeling CAD packages. Instruction includes how to use a 3D CAD package to develop solid models in order to generate assemblies and 2D drawings. This course focuses on Solidworks or Inventor. (Credit is only allowed for either ME 230 or ME 535.) Prerequisites: EGR 100 with a minimum grade of "C" or Department approval and Reading Proficiency

ME 237. Programmable Logic Controllers II. 3 Credit Hours.

This course is a continuation of the study of Programmable Logic Controllers. Students will cover topics including comparators, variables, subroutines, and human machine interfaces. Additional lab hours required. Prerequisites: EE 236 or ME 211 both with minimum grades of "B" or department approval, and Reading Proficiency

ME 249. Materials and Metallurgy. 3 Credit Hours.

This course is a survey of the sources, preparation, properties and uses of engineering materials. Topics include the following the iron-carbon system, ferrous metallurgy, nonferrous metallurgy, ceramics, plastics, elastomers, composites, and finishes. Practical laboratory activities are performed to clarify and enhance text material. Additional lab hours required. Prerequisites: Reading Proficiency

ME 254. Electricity and Controls. 3 Credit Hours.

A basic course in AC-DC electricity and controls for non-electrical students. Study of DC, AC and magnetic circuits used for electric motor drives and transformers introduction to solid state and electromagnetic controls. Laboratory experiments parallel classroom material covered. Additional lab hours required. Prerequisites: Reading Proficiency