

# MECHANICAL ENGINEERING TECHNOLOGY (ME)

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## 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.**

Welding Technology provides comprehensive coverage of current welding practices. A variety of welding processes will be covered including arc-welding, Oxyacetylene welding, MIG welding, and TIG welding. (Credit is only allowed for either ME 101 or WEL 150.)

Prerequisites: Reading Proficiency

### **ME 110. HVAC Operator I. 3 Credit Hours.**

HVAC Operator I teaches the basic operation, maintenance, and troubleshooting of heating, ventilating and air conditioning (HVAC) equipment including air, closed water stream, and control systems. Students will study the dynamic equipment components of various systems with special emphasis upon preventive maintenance. This course prepares the student to take the EPA Section 608 Certification.

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 setup 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 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 154. Mechanical Blueprint Reading. 2 Credit Hours.**

Mechanical Blueprint Reading covers mechanical drawings and introduces Geometric Dimensioning and Tolerancing (GDT). Topics include extracting specifications from the drawing, understanding basic symbols, and interpreting the drawings for producing parts.

Prerequisites: Reading Proficiency or concurrent enrollment in RDG 079

### **ME 200. Manual Machining II. 3 Credit Hours.**

This course prepares students for the National Institute for Metalworking 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 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 Numerical 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 setup, operation, and basic programming of Computer Numerical 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.

Prerequisites: EGR 100 with a minimum grade of "C" or Department approval and Reading Proficiency

### **ME 231. Introduction to Rapid Prototyping. 3 Credit Hours.**

Introduction to Rapid Prototyping examines the various Rapid Prototyping Processes such as Stereolithography (SLA), Fused Deposition Modeling (FDM), and others as they become available. Laboratory activities will involve hands-on practice orienting, slicing, and editing solid model files in order to generate three-dimensional SLA and FDM physical models.

Prerequisites: ME 230 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.**

Materials and Metallurgy is a survey of the sources, preparation, properties and uses of engineering materials. Topics include 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.

Prerequisites: Reading Proficiency