

# ENGIN. TECH.-MECHANICAL (ETME)

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## ETME 1010 - Robotics and Control (3 Credits)

This course provides an introduction to the field of robotics and automation. Topics include the different robot classification systems and robot arm configurations; robot end effectors, robot operating systems and kinematics. This course also introduces basic concepts of automation and artificial intelligence. Various concepts of control are introduced such as programmable logic controllers. Equipment justification is also introduced. Students will program and operate two types of robots using the robots' programming languages.  
Lecture: 2 hours, Lab: 2 hours

## ETME 1020 - Introduction to Manufacturing Processes (3 Credits)

This course provides students with insight and practical experiences in the set-up and operation of basic machines and measuring tools used in manufacturing processes. Significant emphasis is placed on dealing safely with high power machinery, materials, laboratory clothing and machine maintenance. Turning, milling, grinding, drilling and precision measurement are covered, developing students' ability to fabricate mechanical components using traditional machining. Students learn the limitations of traditional machining and prepare for understanding advanced manufacturing technology.  
Lecture: 1 hour, Lab: 4 hours

## ETME 1500 - Mechanical Systems I (3 Credits)

This course is designed to familiarize the student with components used in mechanical systems. The student will learn how to select components based on system requirements and how to implement the component into the system. Attention is given to currently manufactured components and the use of the manufacturer's sizing and mounting procedures. More specifically, the sizing and fitting of these elements based on function, power requirements, life and cost.  
Lecture: 2 hours, Lab: 2 hours

**Prerequisite(s):** ENGR 1020 and ENGR 1030

## ETME 1510 - Engineering Mechanics Technology (3 Credits)

This course is for students in the Engineering Technology Systems programs. Students are introduced to basic concepts in engineering mechanics: statics, dynamics, and the strength of materials, with a focus on technical application of the fundamentals to mechanical design. Newton's Laws are studied with emphasis on equilibrium and motion. Realistic problems are analyzed through the use of vector mechanics. Kinematic and kinetics are investigated to a level sufficient enough for students to follow and develop basic analysis of mechanisms and machines. Stress levels and strain are covered allowing for determination of acceptable analysis and design of mechanical systems.  
Lecture: 2 hours, Lab: 2 hours

**Prerequisite(s):** (MATH 1200 and MATH 1210) or (MATH 1179 and MATH 1181)

## ETME 2310 - Automation Systems (3 Credits)

This course addresses fundamental issues of automation. Topics covered include the types of automation, designing for automation, automatic assembly transfer systems, automatic feeding and orienting, and automated material handling systems. Quality and cost analysis as they relate to automation, the design and analysis of lean systems, as well as advanced topics in robotics such as vision systems technology are also discussed.  
Lecture: 2 hours, Lab: 2 hours

**Prerequisite(s):** ETME 1010 and ETEE 1800

## ETME 2500 - Mechanical Systems II (Capstone) (3 Credits)

The purpose of this course is to teach the student how mechanical components are combined and intergraded into complex working systems. The course will stress building assemblies and harnessing electrical controls to the assemblies. This course is designed to cement together the knowledge learned in previous courses within the program. Students will learn to create operational sequences, build systems from standard components, write programs to control them, apply necessary sensors and actuators, and operate and debug their assemblies.  
Lecture: 2 hours, Lab: 2 hours

**Prerequisite(s):** ETME 1010 and ETME 1500

**ETME 2930 - Industrial Materials**

**(3 Credits)**

This course is an introduction to the different material systems in material science. This course includes an introduction to the structure and properties (such as mechanical, chemical, and physical properties) of materials, specifically metals. Equilibrium phase diagrams and isothermal diagrams are also introduced. This course also introduces various techniques of materials testing such as tensile, creep, bend, hardness, impact, and fatigue testing. Also covered are various techniques of heat treatment such as annealing. This course examines the factors that influence the production and modification of materials into useful forms. Students learn about the various manufacturing processes and machinery used to convert raw materials into finished products. The course gives the student "hands on" experience with materials and processes used in industry. A lab is also utilized to demonstrate various techniques.

Lecture: 2 hours, Lab: 2 hours

**Prerequisite(s):** (MATH 1200 and MATH 1210 or MATH 1179 and MATH 1181) and ETME 1510