

MECHANICAL ENGINEERING (ME)

ME 110 Engineering Foundations

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: MA 330 (may be taken concurrently) and PHY 330 (may be taken concurrently)

Engineering problem solving is explored through hands-on experiences which emphasize the development of critical thinking skills and fundamental technical skills. Students are introduced to modern engineering tools for use in future coursework and are supported in their concurrent engineering coursework.

ME 120 Engineering Statics

5 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 110 and MA 340

Newton's first and second laws are applied to particles and rigid bodies, including trusses and frames. Internal forces and moments are examined. The role of friction is considered. Laboratory experiences support key topics.

ME 250 Mechanics of Materials

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 120

Normal and shear stress and strain, torsion, and bending of beams and columns are explored and the resulting deformation is determined. Laboratory experiences support classroom theory.

ME 252 Engineering Dynamics

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 120

Force, mass and acceleration, and energy and momentum methods are used to explore kinematics and the kinetics of particle and rigid body motion.

ME 260 Engineering Circuits w Lab

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: MA 340 and PHY 340

Introduction to AC and DC circuits with application of Ohm's Law and Kirchoff's Laws to basic circuit components including resistors, capacitors, and inductors. Steady-state and transient behaviors are examined along with applications of sensors used in mechanical systems.

ME 280 Engineering Machine Design

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 250

Theory and techniques from ME 250 are applied to design and analysis of machine components, including threaded fasteners, shafts, springs, and gears. Design constraints such as producibility and maintainability, fatigue, materials selection, safety, and cost are considered.

ME 380 Engineering Control Systems

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 252 and ME 260

Free and forced vibration problems for damped and undamped systems are analyzed and modeled, with applications to typical mechanical, hydraulic, pneumatic, and thermal systems. Feedback control is considered. Mathematical models are explored using MATLAB and Simulink.

ME 390 Engineering Thermodynamics

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: MA 340 and PHY 340

A study of the first and second laws of thermodynamics and their application to energy systems for power generation and refrigeration. Properties of pure substances and ideal and real gases are evaluated and applied.

ME 399 Pre Co-Op

2 Class Hours, 2 Quarter Credit Hours

In this course, students will be introduced to and prepare for their upcoming co-operative experience opportunity. This course will focus on building career skills and cover resume writing and interview preparation and etiquette. Additionally, students will learn how to research co-operative opportunities and the general procedure of how their co-op will run. Students will prepare for their co-op interviews and learn how to choose an experience based on their technical and personal experience-based skills.

ME 400 Fluid Mechanics

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 390

Laminar and turbulent behaviors of Internal and external fluid flow are explored through continuity, energy, and momentum approaches. Laboratory applications support theoretical analysis of fluid motion.

ME 430 Engineering Heat Transfer

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 400

Conduction, convection, radiation and energy conservation, fins, steady-state and transient problems are integrated with thermodynamics and fluid mechanics in the analysis of thermal systems, including heat exchangers.

ME 435 Mechanical Engineering Capstone Prep

4 Class Hours, 4 Quarter Credit Hours

Prerequisites: ME 496

First of a two-course sequence in which student teams identify and define a professional-level problem and then determine its solution through the application of engineering skills such as project management, defining constraints, ethics, cost analysis, research methods, application of engineering codes and standards, and oral and written communication.

ME 445 Mechanical Engineering Senior Capstone

5 Class Hours, 2 Lab Hours, 6 Quarter Credit Hours

Prerequisites: ME 435

Students complete the projects started in ME 435, culminating in a working prototype or simulation (as appropriate). A comprehensive written report and oral presentation are required to demonstrate the solution to the problem.

ME 496 Co-Op

35 Class Hours, 12 Quarter Credit Hours

Prerequisites: ME 399

Co-Op is a full-time work experience in a position related to the student's program of study. Enrollment in this course maintains full-time student status.

ME 499 Co-Op Reflection

1 Class Hours, 1 Quarter Credit Hours

Prerequisites: ME 399 and ME 496

In this course, students will reflect on their Co-Op experience and how to best apply it in their upcoming Senior Capstone Project and their careers. This course culminates in a presentation-based reflection.