

Mechanical Engineering Technology (MEC)

Courses

MEC-104. Statics. 3 Credits.

LECT 45 hrs

This course provides an analysis of force systems acting on particles and rigid bodies; equilibrium in two and three dimensions; trusses, frames and machines; and friction, centroids and moment of inertia of areas.

Prerequisites: MAT-110, ENR-119 and ENR-124 or MAT-110 and ENR-132 or MAT-123.

MEC-109. Manufacturing Process for Engineering Technology. 4 Credits.

LECT 45 hrs LAB 45 hrs

This course is a study of the methods of prototyping including an introduction to precision measurements, elementary theory of cutting and machining methods with emphasis on the proper operation of the manual lathe and the vertical mill. The course will also provide the student with an introduction to the Computer-Aided Manufacturing (CAM) and the related field of Computerized Numerical Control (CNC). Topics include machine setup, CNC code, both manual and computer assisted, tool offsets and tool changing.

Additional Fees: Course fee applies.

MEC-110. Materials for Engineering Technology. 4 Credits.

LECT 45 hrs LAB 45 hrs

This course covers metallic, plastic and ceramic materials that are important to manufacturing. Topics include: molecular and microscopic structures in relationship to material properties, testing of mechanical and thermal properties with reference to ASTM standards, equilibrium diagrams and physical metallurgy emphasizing steel and aluminum, heat treatment of steel, molding and forming methods for plastics. A brief study of ceramics and composites is included.

Prerequisites: MAT-007 or equivalent

Additional Fees: Course fee applies.

MEC-117. Mechanical Prototyping. 2 Credits.

LECT 22.5 hrs LAB 22.5 hrs

This course is a study of the methods of prototyping including an introduction to precision measurements, elementary theory of cutting and machining methods with emphasis on the lathe operation, milling, drilling and grinding. This course runs for eight weeks.

Additional Fees: Course fee applies.

MEC-118. Computer Integrated Manufacturing (CIM). 2 Credits.

LECT 22.5 hrs LAB 22.5 hrs

This course is a study of the methods of Computer-Aided Manufacturing (CAM) and the related field of Computerized Numerical Control (CNC). Topics include machine setup, CNC code, manual and post processed programs, rapid prototyping, tool offsets, and tool changing. This course runs for eight weeks.

Prerequisites: MEC-117 or industrial experience

Additional Fees: Course fee applies.

MEC-141. Strength of Materials for Engineering Technology. 3 Credits.

LECT 30 hrs LAB 45 hrs

This course studies the mathematical determination of stress and deflection for materials having applied loads of normal, shear, torsion, bending or combinations of these. The rational design of mechanical components, such as fasteners, weldments, tanks, shafts, beams and columns, to satisfy stress, deflection and stability criteria are studied. Also included are Mohr's circle and strain gauge techniques. This course is intended for Engineering Technology students; Engineering Science students should take ENR-230, Engineering Strength of Materials.

Prerequisites: MEC-104 and MAT-110

Additional Fees: Course fee applies.

MEC-155. Mechanical Components. 4 Credits.

LECT 45 hrs LAB 45 hrs

This course develops the fundamentals of sketching, blueprint reading, dimensioning, tolerances, preferred sizes and fits, and evaluating product quality. It also introduces students to the theory of function of mechanical elements such as linkages, cam bearings, gears belt and chain drives, springs, brakes, clutches, welds, keys, fasteners and power screws.

Prerequisites: MAT-007 or equivalent.

MEC-204. Dynamics for Technology. 2 Credits.

LECT 30 hrs

This course provides an understanding of the mathematics of the motion of particles and rigid bodies, and of the relation of forces and motion of particles. Upon successful completion of this course, students will describe the motion of particles and rigid bodies as functions of time and position, develop their equations of motions due to applied forces, and determine post impact behavior.

Prerequisites: MAT-110, MEC-104

Corequisites: PHY-111.

MEC-209. Introduction to Advanced Manufacturing And CNC Programming. 3 Credits.

LECT 30 hrs LAB 30 hrs

A continuation in the manufacturing process using Computer Numerical Controlled (CNC) milling and turning. Students will learn about and develop advanced manual CNC programs as well as computer-assisted programs (post-processed) derived from CAD (Computer Aided Drafting) drawings. The CNC programs will focus mainly on operations involving three axis milling machines and two axis lathes, but will also touch on operations involving advanced fixture setup and control. Topics will include spindle controls, tool changes, linear and circular interpolation, drilling and tapping, subroutines, and G&M codes. In addition, the course will cover a variety of advanced manufacturing techniques in additive manufacturing (3D Printing), EDM (Electrical Discharge Machining), and reverse engineering techniques using scanners and the CMM (Coordinate Measuring Machine).

Prerequisites: ENR-117 and ((MEC-117 and MEC-118) or MEC-109)

Additional Fees: Course fee applies.

MEC-229. Cooperative Work Experience-Mechanical Engineering Technology. 3 Credits.

COOP 45 hrs

Registration is only upon written recommendation of advisor. This course is a field experience in the laboratory facilities of an industrial firm. It is designed for students in the Mechanical Engineering Technology program to obtain industrial experience as a supplement to college studies prior to career employment. Seminar evaluation visitations are included. Completion of 25 technical credits required to enroll.

Prerequisites: Permission of department chair.

MEC-235. Kinematics. 3 Credits.

LECT 30 hrs LAB 45 hrs

This course is a study of moving elements as used in the design and analysis of basic mechanisms in machines. Velocity and acceleration analysis on a plane, design and analysis of 4-bar linkages, cams, gears and other mechanisms using graphical and analytical methods are studied.

Prerequisites: MAT-110

Corequisites: PHY-111

Additional Fees: Course fee applies.

MEC-236. Machine Design. 4 Credits.

LECT 45 hrs LAB 45 hrs

This course is the rational design and selection of machine elements considering their economics and manufacturability. The principles of strength of materials and mechanics are applied to the design of bearings, shafts, gears, springs, brakes and other elements of importance in mechanical systems. Consideration of service criteria, operating environment and cost. Emphasis is placed on developing a systematic design philosophy.

Prerequisites: MEC-141

Additional Fees: Course fee applies.

MEC-291. Special Topics in Mechanical Engineering Technology. 3 Credits.

LECT 45 hrs

This course is an examination of selected topics or issues in Mechanical Engineering Technology. Topics may differ each time the course is offered. Students should consult the department chair for further information.

Prerequisites: An introductory course in Mechanical Engineering Technology.

MEC-292. Special Topics in Mechanical Engineering Technology. 3 Credits.

LECT 45 hrs

This course is an examination of selected topics or issues in Mechanical Engineering Technology. Topics may differ each time the course is offered. Students should consult the department chair for further information.

Prerequisites: An introductory course in Mechanical Engineering Technology.