Engineering (ENGR)

ENGR 1000. Introduction to Engineering WE. (3 Credits)
Introduces engineering-problem-solving techniques, design processes, modelling of simple engineering systems using CAD, and systems analysis in Excel. Emphasizes engineering design procedures by incorporating group projects and presentations.
Course Lab fee of $11 for computers applies.
Lab access fee of $45 for computers applies. Software fee of $50 applies.

ENGR 1020. Survey of Engineering. (1 Credit)
Introduces the various areas of engineering to pre-engineering majors and others interested in learning more about the contributions engineers make to our modern society. Includes a brief history of engineering and discussions about what engineers really do. Discusses professional ethics, responsibilities, and career opportunities. Includes lectures, guest speakers, and in-class exercises.
Lab access fee of $45 applies.

ENGR 1030. Engineering Programming. (3 Credits)
Pre- or Corequisite(s): MATH 1210
Involves modelling and analysis of electro-mechanical systems using projects. Applies scientific principles to solve and model engineering problems. Involves developing and writing programs to gather data, guide, and control electro-mechanical devices to achieve predefined objectives.
Course fee of $11 for supplies/materials applies.
Lab access fee of $45 applies.

ENGR 2010. Engineering Statics. (3 Credits)
Prerequisite(s): PHYS 2210
Teaches principles of engineering mechanics as applied to bodies at rest. Discusses the concepts of position and force vectors, free body diagrams, equilibrium, center of gravity, centroids, distributed loading, friction, area and mass moments of inertia. Applies principles learned in the analysis of trusses, frames and machines.
Lab access fee of $45 for computers applies.
Canvas Course Mats $85/McGraw applies.

ENGR 2030. Engineering Dynamics. (3 Credits)
Prerequisite(s): ENGR 2010, MATH 1220, and PHYS 2210
Teaches principles of engineering mechanics as applied to bodies in motion. Studies kinematics and kinetics of particles and rigid bodies. Develops the concepts of force and acceleration, work, energy, impulse, momentum, impact, and vibration. Utilizes theory and methodology developed in the solution of practical engineering problems.
Lab access fee of $45 for computers applies.
Canvas Course Mats of $85/McGraw applies.

ENGR 2140. Mechanics of Materials. (3 Credits)
Prerequisite(s): ENGR 2010 and PHYS 2210
Studies behavior of materials under axial, torsional, flexural, transverse shear and combined loading conditions. Analyzes nature of stress and strain for ductile and brittle materials, stress and strain diagrams, stress concentration, and failure of materials. Includes analysis of repeated and dynamic loading, and basic design techniques related to above topics.
Lab access fee of $45 for computers applies.
Canvas Course Mats $85/McGraw applies.

ENGR 2160. Introduction to Materials Science and Engineering. (3 Credits)
Prerequisite(s): CHEM 1210
Introduces students to properties of materials from macro and micro point of view. Includes failure analysis of materials, altering properties of materials, and fracture mechanics. Introduces properties of solid materials and their behavior as applied to engineering.
Lab access fee of $45 applies.

ENGR 2300. Engineering Thermodynamics. (3 Credits)
Prerequisite(s): MATH 1220, PHYS 2210
Covers static pressure, phase diagrams, equations of state, and mass balance. Studies laws of thermodynamics and their application in engineering problem solving. Includes analysis of open and closed systems, steady state, and unsteady flow problems. Studies heat engine, refrigeration, and other important thermodynamic cycles. Discusses the concept of Entropy and Entropy balance.
Lab access fee of $45 applies. Software fee of $50 applies.

ENGR 2450. Computational Methods for Engineering Analysis. (3 Credits)
Pre- or Corequisite(s): MATH 2250
Discusses computational and symbolic methods for the solution of complex engineering problems. Discusses computer representation of numbers and algorithm error analysis. Covers the solution of algebraic and differential equations. Includes the use of modern software tools.
Lab access fee of $45 for computers applies.
Canvas Course Mats $85/McGraw applies. Software fee of $50 applies.

ENGR 295R. Special Topics. (1-3 Credits)
Prerequisite(s): Permission of Department Chair
Presents various engineering topics. Examines current technology, techniques, processes and equipment. Includes oral and written reports. May be repeated for a maximum of 3 credits toward graduation.