Engineering (ENGR)

ENGR 1000
Introduction to Engineering
3:3:0  Fall, Spring
* Prerequisite(s) or Corequisite(s): MATH 1060 or higher

Introduces engineering-problem-solving techniques, design processes, modelling of simple structural and mechanical 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 $35 for computers applies.

ENGR 1020
Survey of Engineering
1:1:0  Fall, Spring
* Prerequisite(s): MAT 1010 or higher
* Corequisite(s): MATH 1050 or MATH 1055 recommended

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.

ENGR 1030
Engineering Programming
3:3:0  Fall, Spring
* Prerequisite(s): ENGR 1000
* Prerequisite(s) or Corequisite(s): MATH 1210

Involves modelling and analysis of electromechanical systems using Arduino projects. Includes programming in Matlab and C. 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.

ENGR 2010
Engineering Statics
3:3:0  Fall, Spring
* Prerequisite(s): MATH 1210
* Prerequisite(s) or Corequisite(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 $35 for computers applies.

ENGR 2030
Engineering Dynamics
3:3:0  Fall, Spring
* 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 $35 for computers applies.

ENGR 2140
Engineering Programming
3:3:0  Fall, Spring
* 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 $35 for computers applies.

ENGR 2160
Introduction to Materials Science and Engineering
3:3:0  Fall
* 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 $35 applies.

ENGR 2300
Engineering Thermodynamics
3:3:0  Spring
* Prerequisite(s): MATH 1220, PHYS 2210


ENGR 2450
Computational Methods for Engineering Analysis
3:3:0  Spring
* Prerequisite(s): ENGR 1030

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 $35 for computers applies.

ENGR 295R
Special Topics
1 to 3:1 to 3:0  On Sufficient Demand
* 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.