

ENGINEERING SCIENCE**EGR 100****Engineering Orientation:
Student Success I (1.5)**

This course is designed to enhance student success by addressing five primary themes: community building, professional development, academic success strategies, personal development, and orientation to the college environment. This is an interactive course with emphasis on group problem solving and experiential learning. Common examinations, field trips, and oral presentations are included as components of this course.

2 Lab Hours

EGR 101**Engineering Orientation:
Student Success II (1.5)**

A continuation of EGR 100: This course is designed to enhance student success by addressing five primary themes: community building, professional development, academic success strategies, personal development, and orientation to the college environment. This is an interactive course with emphasis on group problem solving and experiential learning. Common examinations, field trips, and oral presentations are included as components of this course.

2 Lab Hours

EGR 150**Engineering Design I with Graphics (2)**

Engineers must be able to communicate their design ideas to others. Thus, this first course in Engineering Design focuses on the improvement of communication skills. These include written, oral presentation, sketching, and computer application skills. Software programs used include Microsoft Word, Excel, and PowerPoint as well as Mathcad.

Since our world is three-dimensional, some effort is made to improve the spatial visualization ability of students. In addition, the principles of orthographic projection and descriptive geometry are learned.

Students work in teams on a series of short-term projects with the goal of recognizing and developing behaviors associated with consensus decision-making and cooperative teamwork. The steps of the engineering design process are learned.

1 Class Hour, 3 Lab Hours

EGR 151**Engineering Design II (2)**

A continuation of Engineering Design I. The bulk of this course focuses on developing skill with a computer aided drawing (CAD) program to create and manipulate three dimensional solid models. Students continue working in teams on design projects with the goal of understanding and implementing the engineering design process for problem-solving. The area of engineering ethics is investigated to create in students a realization of the importance of responsible behavior in the engineering field.

1 Class Hour, 3 Lab Hours; Prerequisite: EGR 150; Corequisite: None.

EGR 200**Engineering Orientation:
Student Success III (1.5)**

A continuation of EGR 101: This course is designed to enhance student success by addressing five primary themes: community building, professional development, academic success strategies, personal development, and orientation to the college environment. This is an interactive course with emphasis on group problem solving and experiential learning. Common examinations, field trips to industry, visits by four year engineering recruiters, and oral presentations are included as components of this course.

2 Lab Hours

EGR 201**Engineering Orientation:
Student Success IV (1.5)**

A continuation of EGR 200: This course is designed to enhance student success by addressing five primary themes: community building, professional development, academic success strategies, personal development, and orientation to the college environment. This is an interactive course with emphasis on group problem solving and experiential learning. Common examinations, field trips, visits to four year engineering schools, and oral presentations are included as components of this course.

2 Lab Hours

EGR 281**Mechanics (Statics) (3)**

Fundamental concepts of the statics of rigid bodies developed by using a vector analysis approach. Force systems, centroids and centers of gravity, analysis of structures, shear and bending moments, friction and moments of inertia.

3 Class Hours; Prerequisite: MAT 181 Calculus I and PHY 181 Physics I.

EGR 282**Mechanics (Dynamics) (3)**

Vector analysis approach to kinematics and kinetics of particles, systems of particles, kinematics and kinetics of rigid bodies, forces, mass, acceleration, impulse, momentum, work and energy techniques.

3 Class Hours; Prerequisite: EGR 281 Mechanics (Statics).

EGR 283**Strength of Materials (3)**

Elementary analysis of the strength and deformation of deformable bodies. Topics include stress-strain, torsion, bending, Mohr's circle, flexure, energy methods, and columns.

3 Class Hours; Prerequisite: EGR 281 Mechanics (Statics).

EGR 284**Materials Science (3)**

Atomic model, bonding, lattice concept, crystal types, imperfections, stress and temperature effects, phase diagrams, alloys, ceramics, polymers, composites, corrosion, electrical and magnetic properties materials

3 Class Hours; Prerequisite: PHY 182 Engineering Physics II and CHM 145 Chemistry.

EGR 285**Electrical and Electronic Circuits (3)**

(Available in ASL mode)

Units and definitions; charge, current, voltage, power, energy. Ohm's Law, active and passive elements, independent and dependent sources. Resistance, Kirchhoff's Laws, network reduction. Nodal and mesh analysis techniques, source transformation, superposition. Thevenin's and Norton's theorems, maximum power transfer. Capacitance and inductance; natural, forced, and complete response of switched R-L, R-C, and R-L-C circuits. A.C. sinusoidal steady state analysis. Ideal and practical operational amplifier circuits. Frequency response of parallel and series R-L-C circuits and filter networks. Computer aided circuit analysis using PSpice.

3 Class Hours; Prerequisite: MAT 182 Calculus II and EGR 289 Introduction to Microprocessors.

EGR 287**Engineering Design III (1)**

This course is the third course in a four course design sequence. This course is intended to prepare engineering students for the future challenges of design. Design is presented as the integration of creativity, knowledge, skills, collaboration and hard work to solve problems. Emphasis will be on achieving design solutions that are high quality, innovative, low cost, and produced quickly. The design process provides a structure in which the various phases of design occur in a logical and efficient sequence in order to arrive at the most successful outcome. This course will present the best of traditional design practices as well as several design tools. Creativity methods will be presented and creativity encouraged in the course. Group design projects with oral presentations are required as part of this course.

3 Lab Hours; Prerequisite: EGR 151; Corequisite: EGR 289.

EGR 288**Engineering Design IV (1)**

This fourth course in design is intended to prepare engineering students for the future challenges of design. Design is presented as the integration of creativity, knowledge, skills, collaboration and hard work to solve problems. Emphasis will be on achieving design solutions that are high quality, innovative, low cost, and produced quickly. The design process provides a structure in which the various phases of design occur in a logical and efficient sequence in order to arrive at the most successful outcome.

This course will present the best of traditional design practices as well as several design tools. Creativity methods will be presented and creativity encouraged in the course. Group design projects with oral presentations are required as part of this course. Students are encouraged to enter their completed design projects in regional and national competitions.

3 Lab Hours; Prerequisite: EGR 287.

EGR 289**Introduction to Microprocessors (3)**

(Available in ASL mode)

An introduction to microprocessors with digital logic, machine and assembly language programming, serial and parallel input/output, A/D, and hardware interfacing with switches, lights, etc. Projects and simulation laboratory experiences using EWB are included as part of this course.

2 Class Hours, 3 Lab Hours; Prerequisite: PHY 182; Corequisite: EGR 287 Engineering Design III.

EGR 298**Cooperative Work Experience (1-4)**

Student/s undertake/s an independent supervised work experience in industry under the guidance of a faculty member. Only one cooperative work experience course allowed per semester.

Equivalent Load: 1 Class Hour; Prerequisite: Department approval.

EGR 299**Independent Project (2-4)**

The student/s undertake/s an independent project in his/her specialty under the guidance of a faculty member. Only one independent study course allowed per semester. Special consideration will be given to design projects.

Prerequisite: Department approval.