

# Pre-Engineering (EGR)

Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

## **EGR 1100 Introduction to Engineering ..... 3 Credit Hours**

**English/ESL Placement:** Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

**Prerequisite:** MAT 1150 or high school Trigonometry.

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

This is an introductory engineering course designed to familiarize students with various engineering disciplines. Emphasis is on realization of engineering problems and methods of finding solutions, manipulation and computation of data and results, and applied engineering concepts. BILLABLE CONTACT HOURS: 3

## **EGR 2010 Engineering Programming ..... 4 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Pre- or Corequisite:** PHY 2500

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

This course will introduce the student to software techniques for solving different engineering problems utilizing a high level programming language such as C++, Java, or MATLAB. Programs will solve electrical, chemical, mechanical, biomedical, civil, industrial and computer engineering problems. Topics include decision structures, loops and files, functions, numerical differentiation, and integration techniques. BILLABLE CONTACT HOURS: 4

## **EGR 2060 Engineering Digital Circuits ..... 4 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** PHY 2500

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

Topics include data representation in a digital form; Boolean algebra; logic gates; minimization and implementation of Boolean functions; arithmetic circuits; combinational circuits; sequential circuits; latches and flip-flops; counters; finite state machine; and introduction to field-programmable gate array (FPGA) implementation. An industry standard circuit simulator will be utilized. The course will include simulation and physical projects. BILLABLE CONTACT HOURS: 4

## **EGR 2080 Engineering Microcontrollers ..... 4 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** EGR 2010 and EGR 2060

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

Topics include introduction to computing based on assembly level programming; jump, loop, and call instructions; I/O programming; addressing modes; arithmetic and logic instructions; programming in C; serial port programming; interrupts; analog to digital converter (ADC), digital to analog converter (DAC), and sensor interfacing. An industry-standard circuit simulator will be used throughout the class. The course will include simulation and physical projects. BILLABLE CONTACT HOURS: 4

## **EGR 2100 Statics ..... 3 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** MAT 1730 and PHY 2400

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

This course will cover vector description of forces and moments; two- and three- dimensional equilibrium of particles and rigid bodies, using free-body diagrams; analysis of trusses, frames, and machines; Coulomb friction; centroids and moments of inertia. BILLABLE CONTACT HOURS: 3

## **EGR 2200 Mechanics of Materials ..... 3 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** EGR 2100 and MAT 1740

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

This course will cover elastic relationships between external forces acting on deformable bodies and the associated stresses and deformations; structural members subjected to axial load, torsion, and bending; deflection of beams; column buckling; combined stresses; repeated loads; stress and strain transformation, unsymmetrical bending. BILLABLE CONTACT HOURS: 3

## **EGR 2500 Dynamics ..... 3 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** EGR 2100 and MAT 2810

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

The course will cover basic concepts and principles of dynamics with application of Newton's Laws of Motion to engineering problems; kinematics and kinetics of particles and rigid and variable-mass bodies; equations of motion, impulse-momentum, impact and work-energy principles. BILLABLE CONTACT HOURS: 3

## **EGR 2700 Engineering Circuits I ..... 5 Credit Hours**

**English/ESL Placement:** Placement into ENG 1510.

**Prerequisite:** PHY 2500

**Pre- or Corequisite:** MAT 2810

**Note:** Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.

Topics include electrical quantities and waveforms; resistance; Ohm's law; Kirchhoff's laws; network topologies; nodal and mesh analysis; Thevenin's theorem and other network theorems. Course includes solution of 1st and 2nd order linear time-invariant differential equations. An industry-standard circuit simulator will be utilized throughout the course. The course will include simulation projects and a lab. BILLABLE CONTACT HOURS: 6