

# ENGINEERING SCIENCE (EGR)

## **EGR 1105 Robotics: Construction and Design (4 Credits)**

Explore the multidisciplinary world of robotics, and its relevance to current humanitarian, social, and environmental concerns. Modeling fields of science and engineering, this class will be based on teamwork and cooperative problem solving in a supportive, hands on, laboratory environment. Solutions to a series of challenges will be designed, constructed, tested, and revised by students working together in groups. A standard, modular, mobile robotics system will be used to design and construct robots capable of carrying out a single task or multiple tasks related to a variety of applications. The role of science, engineering and technology in modern society will also be explored.

*Additional fees may apply*

Previous: Legacy Equivalent(s): EGR\* 105

## **EGR 1110 Introduction to Engineering (3 Credits)**

Students will be introduced to the fields of engineering and engineering analysis through design and graphics and comprehensive engineering projects. Topics include: sketching, charts, graphs, forces, thermodynamics, energy, electrical circuits, mechanisms, robotics, manufacturing technologies, and fundamentals of engineering economics. This course prepares students for the rigor of future engineering classes, to provide students with a solid foundation of basic engineering skills including conversions, graphing and statistics, and to introduce students to the different engineering majors and career options.

Prerequisite or corequisite: MATH 1610 (or "C" or higher if taken prior)

Previous: Legacy Equivalent(s): EGR\* 111

## **EGR 1115 Programming for Engineers (3 Credits)**

Introduces engineering students to structured and object-oriented programming methods. Students will examine and solve a variety of engineering problems. Students will design, code and execute modular programs using an object-oriented language such as C++ or Java. The course will include the use of abstract data types in solving classical engineering problems.

Prerequisites: C or higher in MATH 1010

Previous: Legacy Equivalent(s): EGR\* 115

## **EGR 1120 Engineering Drawing Specs (3 Credits)**

This is an introductory course in the interpretation of engineering drawings beginning with the basics of orthographic projections. Topics include: Geometric Constructions, Orthographic Drawings, Auxiliary Views, Sections, Dimensioning, Tolerances, Working Drawings, Descriptive Geometry, and an introduction to Geometric Dimensioning and Tolerancing (GDandT).

Previous: Legacy Equivalent(s): EGR\* 112

## **EGR 2098 Engineering Internship (3,4 Credits)**

This course provides an opportunity for students to gain practical experience in an industrial setting under the supervision of a faculty advisor and an industrial supervisor.

Prerequisites: Varies based on the internship placement

Prerequisite or corequisite: Varies based on the internship placement

Previous: Legacy Equivalent(s): EGR\* 299

## **EGR 2201 MATLAB for Engineers (3 Credits)**

An introductory programming course that emphasizes engineering problem solving through programming, graphing, visualization and data analysis using MATLAB tools. This class will cover basic matrix algebra, plotting, curve-fitting, built-in functions, logical functions and user-defined functions.

Prerequisites: C or higher in MATH 1610

Previous: Legacy Equivalent(s): EGR\* 201, CSC\* 267

## **EGR 2211 Engineering Statics (3 Credits)**

The main objective of this course is to develop in the engineering students the ability to analyze any problem in a simple and logical manner and to apply to its solution a few, well understood, basic principles. This course introduces the concepts of engineering based on forces in equilibrium. Topics include concentrated forces, distributed forces, forces due to friction, and inertia as they apply to machines, structures, and systems. Upon completion, students should be able to solve problems which require the ability to analyze systems of forces in static equilibrium.

Prerequisites: "C" or higher in MATH 2610, or taking MATH 2610 concurrently

Prerequisite or corequisite: MATH 2610

Previous: Legacy Equivalent(s): EGR\* 211

## **EGR 2212 Engineering Dynamics (3 Credits)**

The main objective of this course is to develop in the engineering students the ability to analyze any problem in a simple and logical manner and to apply to its solution a few, well understood, basic principles. This course introduces students to the fundamentals of engineering dynamics, including rectilinear and curvilinear motion, translations, rotation, and plane motion; work, energy, and power; and impulse and momentum. The basic principles of dynamics are applied to engineering problems. Vector methods are covered.

Prerequisites: C or higher in EGR 2211

Previous: Legacy Equivalent(s): EGR\* 212

## **EGR 2215 Thermodynamics I (4 Credits)**

This course is designed to introduce students to the First and Second Laws of Thermodynamics. Topics include: energy concepts and balances, thermodynamic properties of pure substances and ideal gases, and analysis of ideal and real processes including turbines, pumps, heat exchangers, and compressors.

Prerequisites: CHEM 1210, MATH 2600, and PHYS 2201.

Prerequisite or corequisite: MATH 2600

Previous: Legacy Equivalent(s): EGR\* 215, EGR\* 214

## **EGR 2221 Introduction to Electrical Circuit Analysis (4 Credits)**

An introduction to the techniques of analog circuit analysis. Topics include voltage, amperage, capacitance, inductance, node-voltage analysis, mesh-current analysis. Essential electrical components such as resistors, diodes, capacitors, inductors and operational amplifiers will be introduced and explored as well. The course will be supported by the use of the computer simulation programs and with lab work covering introductory circuit analysis.

Prerequisite or corequisite: C or higher in PHYS 2202, MATH 2622

Previous: Legacy Equivalent(s): EGR\* 221

## **EGR 2230 C++ for Engineering (3 Credits)**

This course approaches the C++ programming language using structured and object-oriented programming methods to examine and solve a variety of engineering problems. The course will include the use of abstract data types in solving classical engineering problems.

Prerequisite or corequisite: C or higher in PHYS 2202 may be taken concurrently, MATH 2622 and PHYS 2202 if not taken previously

Previous: Legacy Equivalent(s): EGR\* 230

**EGR 2250 Computation Methods for Engineering (3 Credits)**

This course introduces students to the application of industry standard computational tools for problem solving, graphing and analyzing engineering data, and programming of formulae, procedures, and macros.

Prerequisite or corequisite: EGR 1110 and MATH 2600

Previous: Legacy Equivalent(s): EGR\* 250