

**Gen Ed note:** Engineering courses satisfy the Natural Science and Technology requirement. Those marked **S** are appropriate for non-science/engineering majors.

## Engineering Core Courses

The following courses are taken in common by students in some of the majors in the college.

**EGR 105** two credits

### **Introduction to Engineering Through Applied Science I**

1.5 hours lecture, 1.5 hours laboratory  
Corequisites: PHY 111, MTH 113  
An introduction to engineering and applied science that emphasizes development of engineering problem-solving skills through work on team projects in engineering mechanics. The course applies calculus and physics problem-solving skills to projects that are directed by faculty from the Mechanical Engineering department. The course develops team work, written and oral communication skills and uses computer assisted learning.

**EGR 108** two credits

### **Introduction to Engineering Through Applied Science II**

1 hour lecture, 3 hours laboratory  
Corequisites: PHY 112, MTH 114  
An introduction to engineering and applied science that emphasizes development of engineering problem-solving skills through work on team projects in DC and AC circuits, electromagnetics, and computer measurement and control. The course applies calculus and physics problem solving skills to projects in the Computer Engineering, Electrical Engineering and Mechanical Engineering disciplines. The course develops teamwork, written and oral communication skills, and uses computer tools (Electronic Workbench and MATLAB) for analysis and simulation.

**EGR 131** 1 credit

### **Introduction to Design**

0.5 hours lecture, 1.5 hours laboratory  
Covers computer-graphic design material and develops graphic communication skills.

**EGR 232** three credits

### **Principles of Thermodynamics**

3 hours lecture  
Pre- or corequisites: CHM 152, MTH 211  
A single semester comprehensive course in thermodynamics for non-Mechanical Engineering majors. The fundamentals of classical thermodynamics are presented. The first and second laws are formulated and applied to basic engineering systems. Properties of pure substances, their calculation and measurement are explored. Formulae and concepts for evaluating efficiency are derived. The combined first and second laws are used to develop the

concepts of useful work, availability and exergy. Engineering applications are discussed and studied as time allows.

**EGR 241** three credits

### **Engineering Mechanics I: Statics**

3 hours lecture  
Prerequisites: PHY 111 or PHY 113, MTH 112 or MTH 114  
The first course in engineering mechanics, with two major objectives: first, to introduce the student to the science of engineering mechanics and second to introduce the student to the art of applying science to the solution of engineering problems. The specific vehicle or curriculum to accomplish these objectives will be a study of the statics of rigid bodies.

**EGR 242** three credits

### **Engineering Mechanics II: Dynamics**

3 hours lecture  
Prerequisites: EGR 241, MTH 211 or MTH 213  
Corequisite: MTH 212 or MNE 212  
A continuation of the study of mechanics initiated in EGR 241. Work and energy methods are emphasized. Motion in accelerating coordinate systems and dynamics of system particles lead to the discussion of rigid body dynamics in three dimensions. A number of examples of rigid body motion are discussed. Free and forced vibrations of one degree of freedom, and free vibrations of multi-degree of freedom systems, are studied. The principle of virtual work is introduced and used to briefly discuss stability of equilibrium.

**EGR 301** three credits

### **Applied Engineering Mathematics**

3 hours lecture  
Prerequisite: MTH 212 or MNE 212  
Mathematical methods useful to all engineering students. They include: elements of linear algebra, matrices, eigenvalue problems, systems of ordinary differential equations, Fourier series, partial differential equations, probability theory, mathematical statistics, and a brief introduction to complex numbers.

## Engineering Courses for all UMass Dartmouth Students

The following courses are offered by the College of Engineering as interdisciplinary courses or as courses that may satisfy distribution and science requirements.

**EGR 101** three credits **S**

### **The Technical Nature of the Human Environment**

3 hours lecture  
Three consecutive five-week mini-courses, primarily for non-engineers, designed to develop an understanding of the technical nature of structures such as buildings and bridges, transportation systems, and environmental systems. (Formerly EGR 100.)

**EGR 157** three credits **S, O**  
**Science of Engineering**

2 hours lecture, 1 hour laboratory  
Prerequisite: honors requirements (3.2 G.P.A. or by invitation)  
The scientific principles underlying the practice of various engineering disciplines. This honors-level course is for non-science and non-engineering majors.

**EGR 203** three credits **S**  
**Environmental Geology**

3 hours lecture  
A brief outline of earth's development to the present and basic materials of geology—rocks, minerals, and geological processes. The course examines how geologic processes and hazards influence human activities, the geologic aspects of pollution and waste disposal problems, etc. Prior exposure to geology or college-level math or science is not necessary.