



ENGR 2010

Division: Natural Science and Mathematics

Department: Engineering and Computer Science

Course: ENGR 2010

Title: Statics

Catalog Description:

ENGR 2010 is designed for engineering majors in their preprofessional program. This course is an introduction to forces and moments in static equilibrium, free body diagrams, and equivalent force couple systems. Analysis of trusses, frames and machines, including center of gravity, moments of inertia, and friction.

General Education Requirements: N/A

Semesters Offered: Spring

Credit/Time Requirement: Credit: 2; Lecture: 2; Lab: 0

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Prerequisites: Calculus I (MATH 1210)

Corequisites: N/A

Justification:

This course is designed as a component of the standard preprofessional curriculum in engineering, which enables the student to transfer with junior level status into a four year engineering program. Similar courses are offered in university engineering schools. ENGR 2010 is to be taken during the freshman year of the preengineering curriculum and will prepare the student for subsequent course work.

Student Learning Outcomes:

Upon successful completion of this course, students will:

- be able to apply previously studied math skills and physical principles to practical engineering problems
- have developed skill in analyzing and solving problems related to force moment systems which are in static equilibrium
- will demonstrate the ability to determine the internal forces in structural members of trusses and frames
- be prepared to take more advance courses in mechanics of solids and strength of materials.

Content:

This course includes:

- addition and subtraction of force vectors
- equilibrium of a particle
- moment of a force and equivalent force couple systems
- equilibrium of a rigid body
- structural analysis
- internal forces in structural members
- frictional forces
- center of gravity and centroids
- moments of inertia.

General Education Outcomes:

6) Apply computational skills to a variety of contexts.

Mathematical and computational skills are essential to the success of an engineering student. The student must be able to perform calculations both manually and through the use of computational software.

7) Apply scientific reasoning to a variety of contexts.

Engineering consists of the application of scientific knowledge in order to design devices and systems with a practical purpose. Thus, students must be able to utilize the discoveries of science in the solution of engineering problems.

Key Performance Indicators:

- Daily homework assignments (20%), quizzes (20%), design projects (20%), and tests (30%) will be administered -- all related to the above outcomes. These will be evaluated and recorded. Students will demonstrate solutions to assigned problems in front of the class. A final exam (10%) will also be administered and graded. These percentages are approximate.

Representative Text and/or Supplies:

- R. C. Hibbeler, *Engineering Mechanics, Statics*, current edition, Prentice-Hall.
- Beer, Johnston, Eisenberg, *Vector Mechanics for Engineers, Statics*, current edition, McGraw-Hill.

Optimum Class Size: 20

Maximum Class Size: 30

Signatures:

I hereby submit this course syllabus:

Garth O. Sorenson, MS, Associate Professor

I hereby find this course consistent with the goals and resources of the Engineering and Computer Science Department:

Garth O. Sorenson, MS, Associate Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)