ENGR 2010

Division: Natural Science and Mathematics
Department: Engineering and Computer Science
Course: ENGR 2010
Title: Statics
Catalog Description:

The Statics course explores the physical conditions necessary for an object to remain stationary. Students will learn how to solve problems involving forces, moments, free body diagrams, equivalent systems, distributed loads, shear and moment diagrams, friction, center of gravity, and moment of inertia. Techniques to analyze trusses and frames will be emphasized. ENGR 2010 is the first course in a series of classes required for many s tudents majoring in engineering.

General Education Requirements: N/A
Semesters Offered: Spring
Credit/Time Requirement: Credit: 3; Lecture: 3; 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. ENGR 2010 i s the first of a four-course series in mechanics of materials. This course is often the first significant engineering class for freshman. As such emphasis is placed upon the process of problem solving and the appropriate p resentation of the solution.

The course is equivalent to those taught by engineering programs at the university.

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
- analyze and solve problems related to force moment systems which are in static equilibrium
- determine the internal forces in structural members of trusses and frames
- succeed at subsequent courses in dynamics and strength of materials.

Content:

This course includes:

- a review of relevant vector mathematics
- scalar and vector representation of forces and moments
- equilibrium of a particle
- equivalent force couple systems
- equilibrium of a rigid body
- modeling and analysis of structures and supports
- 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 aids.

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. Students must logically utilize their understanding of the physical world and their m athematical skills in the solution of engineering problems.

Key Performance Indicators:

Students will demonstrate competency of the Student Learning Outcome by:

- completion of homework according to guidelines
- tests administered in the testing center
- take-home tests
- comprehensive final exams

A significant portion of all tests will require written solving of problems with appropriate presentation. Tests w ill be evaluated by the instructor.

Representative Text and/or Supplies:

The text will be selected by the instructor with department approval. Representative texts are:

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

Optimum Class Size: 20
Maximum Class Size: 40

Signatures:

I hereby submit this course syllabus:

Brian Newbold, M.S., 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)