

1. Department, Course Number, and Course Title:

CIVIL AND MECHANICAL ENGINEERING

CE/ME201 STATICS

2. Designation: Required Elective
Lower Division Upper Division

3. Course Description: Fundamental principles of statics, resolution and composition of forces, algebraic and graphic solutions, friction, center of gravity, moment of inertia.

4. Prerequisites: MATH 207 (Calculus II: Integration), PHYS 201 (General Physics: Mechanics)
Topics: Fundamental theorem of calculus; definite integral; transcendental functions; methods of integration; general physics—mechanics

5. Text and Materials: Vector Mechanics for Engineers: Statics, Seventh Edition, F. P. Beer, E. R. Johnston, Jr., and E. R. Eisenberg, McGraw-Hill, 2004.

6. Course Objectives: Students will become familiar with the basic principles of statics, and will be able to solve problems involving forces and moments applied to a body in static equilibrium, determine the centroids of lines, areas, and volumes, moments of inertia of areas and masses

Course Outcomes

- an ability to use vector methods to study forces in two and three dimensions
- an ability to replace a given system of forces and couples by a simpler equivalent system
- an ability to solve static equilibrium problems of rigid bodies in two and three dimensions
- an ability to find centroids and centers of gravity for bodies of various shapes
- an ability to find internal forces for simple structures: trusses, frames and machines
- an ability to solve problems for systems with dry friction
- an ability to find moments of inertia of areas and moments of inertia of masses
- an ability to work independently

7. Topics Covered: (in Order of Presentation)

- Statics of particles (3 sessions)
- Equivalent systems of forces (2 sessions)
- Equilibrium of rigid bodies (3 sessions)
- Centroids and center of gravity (2 sessions)
- Analysis of Structures: Trusses, Frames and Machines (2 sessions)
- Friction (3 sessions)
- Moments of inertia of areas (2 sessions)
- Moments of inertia of masses (1 session)
- Examinations (2 sessions), plus final examination (2.5 hours)

8. Class Schedule: Number of Sessions per week: 2
Duration of each session: 1 hour 40 minutes

9. Contribution of course to meeting the professional component:

This course is part of the one year (53 quarter units) of Basic Mathematics and Science.
Engineering Science: 4 units

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (abet h)
- a knowledge of how mechanical engineering integrates into inter-disciplinary systems

Skill outcomes:

- an ability to communicate effectively (abet g)
- an ability to think in a logical sequential process

Attitudes Outcome:

11. Prepared by: Anjan K. Bhaumik and Stephen F. Felszeghy

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