

ABET Course Syllabus

Course Information, Textbook and Supplementary Materials

Course Description: This course will present the theory and applications of basic engineering mechanics, including a review of vectors, the computation of resultant forces, the equations for equilibrium of particles and rigid bodies, the computation and diagramming of internal shear and moment forces, and dry friction.

Required for: All Civil and Environmental Engineering undergraduate degree programs

Prerequisite: PHYS 151L Fundamentals of Physics I

Co-requisite: Mechanics and Thermodynamics - 4 units

Required Textbook: Engineering Mechanics: Statics (13th ed.), R. C. Hibbeler, Prentice-Hall, 2014.

Reference: None

Topics Covered	Learning Outcomes
Basic knowledge of forces and moments on and between components of a structure. Emphasis on the fundamental steps (e.g., setup, analysis, solution, discussion) of engineering problems.	 Students will understand forces and moments and analysis in the following areas of study: 1. Forces and vectors, Cartesian vector notation and operations 2. Particle equilibrium 3. Moments and force system resultants 4. Rigid body equilibrium 5. Structural analysis of trusses and frames/machines 6. Internal forces, shear/moment diagrams 7. Dry friction 8. Express force and position vectors in Cartesian vector form, determine unit vectors, vector sums, dot products, and cross products. 9. Draw and label free-body diagrams 10. Determine the resultant force acting on a particle 11. Determine the forces necessary for a particle to remain static using equations of equilibrium.
Analyzing forces and moments on a static rigid body	 Determine the moments of forces in two or three dimensions Determine force and moment resultants Determine point loads statically equivalent to distributed loads Replace supports with equivalent reaction forces Write and solve equations of equilibrium of a rigid body
Analyzing forces and moments on/between multiple static rigid bodies	 Use the methods of joints and sections to analyze truss structures Determine the forces acting between members of frames and machines composed of pin- connected members

Analyzing internal	19.	Use the method of sections to determine internal forces
forces/moments in a static rigid body	20.	Determine internal shear and bending moments using loading equations
	21.	Understand and draw shear / bending moment diagrams

CE 205

Statics

2 Units

USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Lecture and Lab Schedule								
Lecture		Lab						
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session					
2	1 hour	1	1 hour					

Relation of Course Objectives to Program Outcomes

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course contributes to the program outcomes as outlined in the adjacent table.

	Course Contribution to Program Outcomes (a-k)	√ Key
a.	An ability to apply knowledge of mathematics, science, and engineering.	
e.	An ability to identify, formulate and solve engineering problems.	✓

Prepared by: Vincent Lee, Professor Sonny Astani Civil & Environmental Engineering Kaprielian Hall, Room 230B University of Southern California Los Angeles, CA 90089-2531

Date: Fall 2014