COE 2001R Statics
Summer 2023

Course: COE 2001 Statics, 2 credit hours

Instructor:

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Prerequisites and co-requisites*:

MATH 1552 Integral Calculus (C-or-better), PHYS 221 Physics I (C-or-better)

Course Description:

Elements of statics in two and three dimensions, free-body diagrams, distributed loads, centroids, and friction.

Textbook:

Engineering Mechanics: Statics, 9th Ed, Meriam, J.L., Kraige, L.G., and Bolton, J.N., Wiley, 2018. We will be using the WileyPlus version of this book.

Other supplemental materials:

Wiley Plus, Coursera free course support videos: Whiteman, W., Introduction to Engineering Mechanics and Applications in Engineering Mechanics. Viewable at www.coursera.org.

Course Outcomes:

Outcome 1: To teach students the basic principles underlying the equilibrium of rigid bodies in planar and 3D spaces

1.1 Students will demonstrate an ability to apply fundamental rigid-body mechanics concepts learned in calculus and physics to set up and solve engineering mechanics problems such as equilibrium and force-balance problems for single and assemblage of rigid bodies.

Outcome 2: To educate students to identify, formulate and solve engineering problems in rigid body statics.

2.1 Students will demonstrate the ability to isolate rigid bodies and to draw clear and appropriate free body diagrams.

2.2 Students will demonstrate an ability to apply skills in mathematics and physics to solve engineering mechanics problems.

2.3 Students will demonstrate an ability to identify appropriate supports and static knowns and unknowns, in both 2D and 3D structures.

2.4 Students will demonstrate that they can apply the appropriate principles referred to in Objective 1 to the solution of problems.

Topical Outline:

1. *Moments, Resultants*
   - *1.1. Moments and Couples*
   - *1.2. Moments about a Line*
2. *Equilibrium of Rigid Bodies*
   - *2.1. Free-Body Diagrams*
   - *2.2. Equilibrium in 2D and 3D*
3. *Centroids and Distributed Forces*
   - *3.1. Centroids of Composite Parts*
   - *3.2. Distributed Loads*
4. *2D Structural Applications*
   - *4.1. Plane Trusses*
   - *4.2. Frames*
5. *Internal Forces in Beams*
6. *Friction*