

ENGR 2022: Statics

This course is required for all engineering majors.

Course Coordinator:

Tarek Abdel-Salam

Catalog Description:

Covers the following topics: equilibrium of particles, addition and resolution of forces, equivalent system of forces, equilibrium of rigid bodies, centroid and moment of inertia, structural analysis, internal forces, friction, and virtual work.

Course Structure:

Two 75-minute lectures per week (three credits)

Prerequisites:

PHYS 2350

Required Materials:

1. Engineering Mechanics: Statics. 11th Edition. R.C. Hibbeler Prentice Hall 2007 (ISBN-10: 0132295660, ISBN-13:9780132295666)
2. Fundamental Of Engineering Supplied-Reference Handbook (p) NCEES, 7th edition, National Council of Engineering Examiners , ISBN: [1-932613-19-6](#).

Students are expected to have a laptop computer per engineering program requirements, with Microsoft Office software installed.

Course Learning Outcomes:

Upon completion of this course, students shall be able to:

- Resolve forces into components
- Formulate static force problems
- Draw particle and rigid-body free body diagrams
- Solve 2-D and 3-D particle and rigid-body equilibrium problems
- Apply statics and force diagrams and methods to analyze simple trusses and beams
- Analyze static forces in friction.
- Analyze centroids and centers of gravity for various shapes.

Lecture Topics

- General Principles: fundamental concepts, units, numerical calculations
- Force Vectors: vector operations
- Equilibrium of a Particle: condition for equilibrium, Free body diagram
- Three Dimensional Force System
- Force System Resultants: moment of a force, moment of a couple
- Force System Resultants: force and couple system, simple distributed loading
- Equilibrium of a Rigid Body; conditions for equilibrium, equilibrium in two dimensional
- Equilibrium of a Rigid Body; Two and three force members, equilibrium in three dimensions
- Internal Forces
- Friction
- Center of Gravity and Centroid
- Moments of Inertia
- Virtual Work
- Exams and review

Relevant Program Outcomes:

Graduates of the Engineering Program will demonstrate

- a) an ability to apply knowledge of mathematics, science and engineering.
- e) an ability to identify, formulate, and solve engineering problems.

Professional Component Content:

Math/Science: 0; Engineering: 3 credits; General Education: 0

Assessment Requirements:

Targeted Exam Questions

- Application of physics of mechanics (outcome a)
- Solution of engineering problems(outcome e)

Student Course Survey

Last Review:

Jan 30, 2008 by Tarek Abdel-Salam