

ENGR 211 : STATICS

Transcript title

Statics

Credits

4

Grading mode

Standard letter grades

Total contact hours

40

Lecture hours

40

Prerequisites

MTH 251 and PH 211.

Course Description

Analyzes forces induced in structures and machines by various types of loading.

Course learning outcomes

1. Present all work in a professional manner - communication skills are essential.
2. Draw a free body diagram of an object.
3. Calculate resultant vectors from a system of forces and moments.
4. Write and solve equations of equilibrium for statically determinate objects.
5. Apply statics concepts to trusses, frames and machines.
6. Compute internal forces - draw shear and moment diagrams for a beam.
7. Solve common engineering problems using established evaluation techniques, methods and processes.

Content outline

- Introduction to engineering and mechanics
- Newtonian gravitation
- Scalars and vectors
- Components in two dimensions
- Components in three dimensions
- Dot products
- Cross products
- Forces
- Equilibrium
- Free-body diagrams
- Two and three dimensional force systems
- Two dimensional description of the moment
- The moment vector
- Moment of a force about a line
- Couples
- Objects in equilibrium - two and three dimensional applications

- Two and three force members
- Statically indeterminate objects
- Trusses - method of joints
- Method of sections
- Frames and machines
- Distributed loads
- Axial force
- Shear force
- Bending moment
- Relations between distributed load
- Pressure and center of pressure

Required materials

The course will require a statics textbook.