

Engineering 235
Engineering Mechanics-Statics

Units: 3

Prerequisites: PHYS 230 and MATH 140

Instructor: Arthur Gerwig

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(Put Engr235 in subject line)

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TEXT *Vector Mechanics for Engineers -Statics* Beer, Ferdinand P. and Russell E Johnston, Jr. 8th Edition, New York: McGraw-Hill, 2007

OUTSIDE ASSIGNMENTS

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments. All assignments are to be completed in a professional and legible manner. The requirement for all homework and test solutions is that it be presented in a clear and sequential format.

QUIZZES/EXAMS

All students must take all examinations. No make up quizzes/exams are given. A missed quiz/exam will result in a zero score unless prior arrangements with the instructor, prior to the date of examination, have been approved.

CALCULATORS

Programming of calculators is encouraged, but only to verify answers obtained doing hand calculation. This, however, is restricted to **working** programs that you have created **yourself**. Programming your calculator with equations and/or problem solutions is not acceptable. You are responsible to show **all** steps required to solve the assigned problems.

HOMEWORK

Homework is to be turned in at the start of class. Full credit will not be awarded to late homework. No exceptions.

GRADES

Grades are determined by the number of accumulated points earned throughout the semester. Letter grades are based on a curve that fluctuates from test to test, dependent upon the groups' performance.

PROJECT

There will be one project due towards the end of the semester (Due date: TBD). The project will be assigned and completed by groups of two.

ATTENDANCE

Since much of the material on tests will come from the lectures, it is essential that lectures be attended. If a lecture is missed, it's your responsibility to obtain the missed material from a fellow student. If you know in advance, as a courtesy, drop me an email to let me know you will be out, especially if you will miss more than one class. While in class, if you carry a cell phone, make sure it is set not to ring.

CONTENT

- Vector Algebra
 - Vectors in Cartesian and Polar Coordinate Systems
 - Dot Products
 - Cross Products
 - Triple Vector Products
 - Forces as a Vector
 - Resultant of Forces

- Equilibrium of a Particle
 - Equilibrium of a particle in 3-D space

- Equilibrium of a rigid body
 - Internal and external forces
 - Moment of a force
 - Couples
 - Equivalent system of forces
 - Equilibrium in 2-D
 - Equilibrium in 3-D

- Centroids and Centers of Gravity
 - Centroids
 - First moments of areas and lines
 - Centroids of solid bodies
 - Distributed loads on Beams

- Structures
 - Analysis of trusses by the method of joints
 - Analysis of trusses by the method of sections
 - Analysis of machines

- Forces in Beams and Cables
 - Various types of loading and support
 - Shear and bending moment in a beam
 - Shear and bending moment diagrams
 - Cables

- Friction
 - Analysis of friction
 - Wedges and screws
 - Belt friction

- Moment of inertia
 - Moment of inertia of area
 - Moment of inertia of volumes
 - Moment of inertia of masses
 - Product of inertia
 - Mohr's circle for moment and products of inertia

FINAL GRADE DETERMINATION

Tests (3)	55%
Final	35%
Project/Homework/Quizzes	10%
Attendance and classroom participation	

SLO'S:

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Student learning outcomes (SLOs) are general skills, knowledge, or masteries which students are expected to have after completing a course or program of study at Palomar College. SLOs are developed for every course and program offered at Palomar. The College has also identified a set of General Education/Institutional Learning Outcomes.

SLO's for ENGR 235 ENGINEERING MECHANICS, STATICS

Successful students will be able to apply basic knowledge of geometry, calculus and physics to solve problems in vector mechanics.

Successful students will be able to correctly solve a vector mechanics problem and generate a Shear-Moment diagram.