

ENGR 2301

Vector Mechanics: Statics

SECTION NUMBER AND SYNONYM:

CREDITS: (3-3-0)

INSTRUCTOR:

COURSE DESCRIPTION:

Calculus-based study of the composition and resolution of forces. Vector algebra, force systems, free body diagrams; equilibrium of rigid bodies and structures; centroids, distributed loads, friction; moment of inertia.

PREREQUISITES:

1. PHYS 2425 or equivalent.
2. Concurrent enrollment or credit in MATH 2415 or its equivalent.

TEXT:

Beer, Johnston, Mazurek and Eisenberg: **Vector Mechanics for Engineers, Statics, 9th edition.**

OTHER: Scientific calculator.

METHODOLOGY: Lecture. (Much of the class time will be spent solving problems).

LECTURE: (example) MW: 9:15 - 10:25 A.M. RGC 328

OFFICE LOCATION:

PHONE NUMBER:

E-MAIL ADDRESS:

OFFICE HOURS:

APPOINTMENT HOURS:

COURSE RATIONALE: Standard calculus-based engineering statics course intended for engineering majors. This course is intended to develop the student skills in solving 2-D and 3-D static equilibrium problems for particles, rigid bodies and structures. The emphasis will be on 2-D and 3-D rigid body equilibrium, analysis of trusses, frames, machines and beams.

GRADING SYSTEM: (The grading system may vary depending on the instructor)

Two exams	50%
Final exam	30%
Homework	10%
Quizzes	10%

COURSE POLICIES:

1. Attendance Policy: [up to each instructor]
2. Withdrawals: [Instructor initiated withdrawals are discouraged. Instructor may want to include the last day of student and instructor initiated withdrawals.]
3. Incomplete Rule: see incomplete rule in the College catalog. (This section in the catalog is 3 paragraphs long.)
4. Scholastic Dishonesty: Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations, and homework.
5. Academic Freedom: Students are free to disagree with instructors on matters of opinion or personal philosophy, and will incur no penalty from doing so. However, instructors will judge student work based upon its relation to the current state of mainstream scientific fact and theory students are allowed to voice opinions, concerns, complaints and suggestions to the instructor. However, it is up to the instructor to decide how to use the students comments to meet the class's best interests.
6. Student Discipline: Matters of student discipline will be adjudicated by the instructor on a case-by-case basis, in conjunction with the Task Force Leader or Dean. Students may consult with the Office of Student Services or the Associate Dean at their campus on these matters.

7. Office with Student with Disabilities: Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office for Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester.

8. Safety Statement: Health and safety are paramount values in science classrooms, laboratories and field activities. You are expected to learn, understand and comply with ACC environmental, health and safety procedures and agree to follow the ACC science safety policy. You are expected to conduct yourself professionally with respect and courtesy to all. Anyone who thoughtlessly or intentionally jeopardizes the health or safety of another individual will be immediately dismissed from the days activity, may be withdrawn from the class, and/or barred from attending future activities. Specific safety training will take place before most activities. If you are late and miss this training, you will not be able to participate in the activity. You can read the complete ACC science safety policy at: http://www2.austincc.edu/sci_safe/.

ENGR 2301 Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. State the fundamental principles used in the study of mechanics.
2. Define magnitude and direction of forces and moments and identify associated scalar and vector products.
3. Draw free body diagrams for two- and three-dimensional force systems.
4. Solve problems using the equations of static equilibrium.
5. Compute the moment of force about a specified point or line.
6. Replace a system of forces by an equivalent simplified system.
7. Analyze the forces and couples acting on a variety of objects.
8. Determine unknown forces and couples acting on objects in equilibrium.
9. Analyze simple trusses using the method of joints or the method of sections.
10. Determine the location of the centroid and the center of mass for a system of discrete particles and for objects of arbitrary shape.
11. Analyze structures with a distributed load.
12. Calculate moments of inertia for lines, areas, and volumes.

13. Apply the parallel axis theorem to compute moments of inertia for composite regions.
14. Solve problems involving equilibrium of rigid bodies subjected to a system of forces and moments that include friction.
15. Solve problems involving dry sliding friction, including problems with wedges and belts.

[Instructor may add to objectives as appropriate]

COURSE OUTLINE/CALENDAR:

To be provided by each instructor. Can be attached as an appendix to the syllabus.

TESTING CENTER POLICY:

Engineering tests may not be given in the testing center except for make up tests.