

ENGR 2302

Vector Mechanics: Dynamics

SECTION NUMBER AND SYNONYM:

CREDITS: (3-3-0)

INSTRUCTOR:

COURSE DESCRIPTION:

Calculus-based study of the dynamics of rigid bodies. Includes Newton's second law, work and energy, and impulse momentum methods. Emphasis on two and three dimensional kinematics and dynamics applied to a broad class of engineering problems.

PREREQUISITES:

1. ENGR 2301 or equivalent.
2. MATH 2415 or equivalent.

TEXT:

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

OTHER: Scientific calculator.

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

LECTURE: (example) TTh 5:40 - 6:55 P.M. RGC 328

OFFICE LOCATION:

PHONE NUMBER:

E-MAIL ADDRESS:

OFFICE HOURS:

APPOINTMENT HOURS:

COURSE RATIONALE:

Standard calculus-based engineering dynamics course intended for engineering majors. This course is intended to develop the student skills in solving dynamics problems of particles and rigid bodies in two and three dimensions using Newton's second law, work-energy

and impulse-momentum methods.

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 2302 Course Outcomes

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

1. Express dynamic quantities as vectors in terms of cartesian components, polar coordinates, and normal-tangential coordinates.
2. Compute mass moments of inertia for systems of particles and rigid bodies.
3. Solve kinematic problems involving rectilinear and curvilinear motion of particles.
4. Solve kinetic problems involving a system of particles using Newton's Second Law.
5. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving particles and systems of particles.
6. Solve kinematic problems involving the translation and rotation of a rigid body.
7. Solve kinetic problems involving planar translation and rotation of rigid bodies.
8. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving rigid bodies in planar motion. [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.