

JEFFERSON COLLEGE

COURSE SYLLABUS

EGR250

ENGINEERING MECHANICS-DYNAMICS

3 Credit Hours

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Revised by: Dr. Bob Brazzle
April, 2016

Minor Revision or Update by: Fran Moore
Per Curriculum Committee Process Change: April 25, 2018

Ms. Constance Kuchar, Interim Division Chair, Math & Science
Ms. Shirley Davenport, Dean, Arts & Science Education

EGR250 Engineering Mechanics-Dynamics

I. CATALOG DESCRIPTION

- A. Prerequisites:
- PHY223 General Physics I
 - EGR228 Engineering Mechanics-Statics
 - MTH185 Calculus II
- B. 3 semester hours credit
- C. Engineering Mechanics-Dynamics is a course that applies principles of mechanics to engineering problems involving accelerated motion. An emphasis is given to three-dimensional problems using the concepts of force, mass, acceleration, work, energy, impulse, and momentum (S)
- D. Curricular alignment:
- Elective course applies toward AA or AS – Engineering emphasis degree.
 - Fulfills AS – Engineering Technology emphasis degree requirement.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Visualize and draw free-body diagrams and use them to solve dynamic motion	Classroom discussions, homework, and exams
Solve problems involving dynamic equilibrium or non-	Classroom discussions, homework, and exams
Resolve problems into rotational and linear compounds	Classroom discussions, homework, and exams
Derive the equations of motion for any type of acceleration	Classroom discussions, homework, and exams

III. OUTLINE OF TOPICS

- A. Kinematics
1. Describe rectilinear motion
 2. Compare curvilinear motion to rectilinear motion
 3. Understand normal, tangential, and cylindrical coordinates as the fundamental coordinate systems
- B. Kinetics
1. Review the equations of motion
 2. Use work energy for particles to analyze motion of particles
 3. Define power and efficiency
 4. Utilize conservation of energy as a basic postulate of dynamics
 5. Compare and contrast impulse and conservation of momentum with conservation of energy

- C. Rotation
 - 1. Analyze impact and angular momentum
 - 2. Demonstrate that fixed axis rotation is the simplest type of rotation
- D. Relative motion
 - 1. Compare absolute and relative motion
 - 2. Use relative velocity and instantaneous center of velocity to determine motion of parts of a machine
 - 3. Use methods for constructing relative acceleration
 - 4. Analyze rotating reference frames
 - 5. Define the moment of inertia
- E. 3-D Motion
 - 1. Use 3-D kinematics to outline general motion
 - 2. Analyze 3-D general motion

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. Classroom discussions
- C. Homework

V. REQUIRED TEXTBOOK

Hibbeler, R.C.; *Engineering Mechanics-Dynamics* (current edition), Prentice Hall.

VI. REQUIRED MATERIALS

Calculator

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHODS OF EVALUATION

- A. Graded homework
- B. Examinations

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (TC 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.