
East Carolina University
Department of Industrial Technology
Study Guide (Syllabus)

ICEE 2010, Integrated Collaborative Engineering Environment III

General Information:

Credit Hours: (4, 0) 3 lecture hours per week. 2 hour laboratory

Catalog Description: Covers advanced topics in engineering fundamentals in particle and rigid body dynamics. Lab covers application of engineering software to analyze engineering problems.

Prerequisites: ICEE 1020

Corequisites: MATH 2172, PHYS 2350

Other: N/A

Course Coordinator: Dr. Keith Williamson

Resource Requirements:

Required Textbooks:

- Engineering Mechanics: Dynamics, 9th Edition. R.C. Hibbeler Prentice Hall 2001 ISBN: 0130200042.

Course Competencies:

Upon completion of this course each student will be able to:

1. Analyze particle and rigid body dynamics.
2. Analyze dynamic forces on design elements including force, acceleration, momentum, and work-energy.
3. Apply knowledge of differential equations to the solution of mechanics problems.
4. Use analytical software to solve engineering analysis equations applied to dynamic forces.

Professional Expectations:

In achieving the course competencies, each student is expected to:

- Be Responsible: The most important characteristic for a successful engineering career is to take responsibility for your assignments and produce results. Be prepared, complete reading, homework assignments, and projects on or before due dates and appear for and complete all quizzes, tests and the final exam. Don't be a burden on your class mates or your professor.
- Build Teamwork and collaboration: Work with your classmates to learn collaboratively and develop the teamwork essential for success in an engineering career.
- Participate and be an Active Learner: Be on time, ask questions, and participate positively in each class and lab session.
- Develop professional work Habits: Keep work area neat and clean, and use and take proper care of equipment.
- Be Honest: Cheating, plagiarism, etc. of any type are not allowed and are grounds for receiving an "F" in the course.
- Be Prepared and Complete Assignments in a Timely Manner: Be prepared for your classes and bring needed materials. Assignments must be completed and submitted for grading when they are due.

Computer Applications:

The course includes two software tools that are essential design components for success in engineering. The first is use of an three dimensional modeling software to solve engineering problems. The second involves software that designs and analyzes instrumentation systems involved in control of fluid and thermal systems. In addition, students will learn to use mathematical software (MathCAD and MatLab) to analyze calculus based equations related to analysis of dynamic forces and fluid / thermal systems.

Laboratory Facilities and Equipment Usage:

This course employs an engineering lab for exercises in materials and processes analysis. In addition, a computer lab is used for development of skills in the use of spreadsheet software to analyze capital equipment investments and develop business plans. Students will perform and receive grades on experiments that support course competencies. Open lab hours will give students maximum opportunity for completing experiments and assignments.

Course Outline:

Topics covered in this course include:

| ICEE III | |
|--|--|
| <u>Engineering concepts in dynamics</u> | |
| 1. | Kinematics of a Particle. |
| 2. | Kinetics of a Particle: Force and Acceleration. |
| 3. | Kinetics of a Particle: Work and Energy. |
| 4. | Planar Kinematics of a Rigid Body. |
| 5. | Planar Kinetics of a Rigid Body: Force and Acceleration. |
| 6. | Planar Kinetics of a Rigid Body: Impulse and Momentum. |

Student Assessment:

Students will be evaluated based on the combination of class activities. The final grade will be assessed with the following criteria:

| Grading | | Assessment | |
|----------------|---------------|-------------------|------|
| A | 90% or better | Quizzes | 10 % |
| B | 80% or better | Exams | 40 % |
| C | 70% or better | Lab assignments | 35 % |
| D | 60% or better | Projects | 15 % |
| F | Less than 60% | Total | 100% |

Assignments must be completed and submitted for grading when they are due.

ATTENDANCE: Required

DISABILITY POLICY: East Carolina University seeks to fully comply with the Americans with Disabilities Act (ADA). Students requesting accommodations based on a covered disability must go to the Department for Disability Support Services, located in Brewster A-114, to verify the disability before any accommodations can occur. The telephone number 252-328-6799.