



蘇州大學
Soochow University

CEN 291 Introduction to Civil Engineering Mechanics

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This course is designed to introduce students to the fundamental principles of mechanics as applied to civil engineering. It covers the analysis of static structures such as beams, trusses, and cables, as well as dynamic systems involving particles and rigid bodies. The course emphasizes the conservation of energy, collisions of particles and particle systems, kinematics of particles, and the dynamics of both particles and rigid bodies. Additionally, the course explores D'Alembert's principle, Principles of Superposition and Redundant Forces and their applications.

Upon Completion of this Course, students will be able to:

1. Develop an understanding of statics and the analysis of structures such as beams, trusses, and cables;
2. Learn about the principles of dynamics, including conservation of energy, impulse and momentum, and angular momentum;
3. Analyze the motion of particles and the behavior of rigid bodies;
4. Apply D'Alembert's principle to solve problems in civil engineering mechanics;
5. Interpret and utilize the concepts of equilibrium and stability in civil engineering structures;
6. Perform calculations and simulations to predict the behavior of structural elements and dynamic systems;
7. Understand the implications of material properties on the mechanical behavior of structures.



PREREQUISITES

MAT 160 Integral Calculus; PHY 113 Introduction to Physics II

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
2 Assignments	20 Points
2 Quizzes	20 Points
Midterm Exam	25 Points
Final Exam	35 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

1. Russell C. Hibbeler, *Engineering Mechanics: Dynamics*(13th ed), 2012, Pearson.
2. Peter Ogrodnik, *Fundamental Engineering Mechanics*, 1997, Prentice Hall.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
---------------	--------------



Module 1	Topics: Topic 1: Static Equilibrium and Its Conditions Topic 2: Force Systems and Their Representation Topic 3: Analysis of Simple Machines and Structures Topic 4: Elasticity and Deformation of Materials Assessments: Assignment #1
Module 2	Topics: Topic 5: Stress, Strain, and Failure Criteria Topic 6: Static Analysis of Trusses Topic 7: Static Analysis of Beams and Frames Topic 8: Introduction to Energy and Work Assessments: Quiz #1
Module 3	Topics: Topic 9: Impulse and Momentum Principles Topic 10: Angular Momentum and Its Conservation Topic 11: Collisions of Particles and Particle Systems Topic 12: Kinematics of Particles: Motion, Path, Velocity, and Acceleration Assessments: Assignment #2 Midterm Exam
Module 4	Topics: Topic 13: Dynamics of Particles: Forces and Motion Topic 14: Dynamics of Rigid Bodies: Translation and Rotation Topic 15: D'Alembert's Principle and Virtual Work Topic 16: Principles of Superposition and Redundant Forces Assessments: Quiz #2
Module 5	Topics: Topic 17: Vibration Analysis and Damping Topic 18: Buckling of Columns and Stability Topic 19: Structural Response to Dynamic Loads Topic 20: Impact and Response Spectrum Analysis Assessments: Final Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.



Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors



蘇州大學
Soochow University

and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.