



蘇州大學
Soochow University

ENR 121 Mechanics of Materials

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course delves into the fundamental concepts of solid material mechanics, exploring the relationships between stress, strain, and temperature, as well as the mechanical properties of materials. It equips students with the analytical tools to understand and design various mechanical and load-bearing structures subjected to axial loading, torsion, and bending.

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

1. Fundamental comprehension of engineering mechanics coupled with the capability to apply this knowledge for analyzing and resolving specific problems.
2. Elementary grasp of material characteristics and mechanical deformation.
3. Proficiency in employing advanced principles from science and engineering for the design and analysis of structures, ensuring they can support loads within specified safety limits.
4. Apply mathematical models to predict material responses to external forces.

PREREQUISITES

CEN 115 Engineering Mechanics

GRADING

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

ITEM	POINTS
2 Labs	20 Points
2 Quizzes	20 Points



Midterm Exam	30 Points
Final Exam	30 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:

Ferdinand Beer, E. Johnston, John DeWolf, David Mazurek, *Mechanics of Materials*, 2014, McGraw-Hill Education.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Introduction Topic 2: Stress and Strain Analysis Topic 3: Axial Loading: Normal Stress and Strain Topic 4: Torsional Loading: Shear Stress and Strain Assessments: Lab # 1
Module 2	Topics: Topic 5: Bending: Normal and Shear Stresses in Beams Topic 6: Combined Loadings and Stress Transformation Topic 7: Elastic and Inelastic Deformation Topic 8: Thermal Stresses Assessments: Quiz # 1



Module 3	Topics: Topic 9: Tensile Response of Materials Topic 10: Shear Force and Bending Moment Diagrams Topic 11: Stresses in Beams Topic 12: Deflection of Beams Assessments: Midterm Exam
Module 4	Topics: Topic 13: Torsion of Circular Shafts Topic 14: General Stress Analysis Topic 15: Buckling of Columns Topic 16: Stress Concentrations Assessments: Lab # 2
Module 5	Topics: Topic 17: Elastic Stability Topic 18: Finite Element Analysis Basics Topic 19: Yield and Fracture Topic 20: Material Properties Assessments: Quiz # 2 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 (e.g., 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 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



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learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.