(CE 302-001): Mechanics of Materials

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Lectures *Twice a week:* MECH 218, Tuesday and Thursday **12:30 – 1:45 pm**

Office Hours **Monday 1:00 to 3:00 pm and Thursday 3:00 – 5:00 pm**
CEC Room 3006

Textbook Mechanics of Materials, R.C. Hibbeler, 10th Ed., Pearson 2016.
ISBN-13: 978-0133254426

Course Description This course helps students to
- Understand principle of stress, strain, and stability;
- Relate the mechanical properties of elements to the structural response;
- Analyze structural elements subjected to different types of loading.

Prerequisites CE 202 Engineering Statics

Expected Outcomes (From Civil Engineering Departmental Goals) *The course contributes to the following educational outcomes as part of the objectives of the Civil Engineering Department*
1. An ability to apply knowledge of mathematics, science and engineering
2. An ability to design experiments as well as to analyze and interpret data
3. An ability to identify, formulate and solve engineering problems
4. An ability to communicate effectively, both in written and oral forms, as well as internet based communication
5. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
6. An understanding of professional and ethical responsibility

Learning Objectives *After completing this course the student shall be able to*
1. Explain principles of stress, strain, and factor of safety
2. Understand basic mechanical properties of engineering materials
3. Apply principle of superposition
4. Compute stresses due to thermal effects
5. Compute torsional stresses
6. Draw shear and moment diagrams
7. Determine bending stresses of beams
8. Compute transverse shear forces and shear flow
9. Compute forces due to combined loadings
10. Compute principle stresses using Mohr's circle
11. Compute deflection using integration method
12. Compute critical buckling loads of columns

Assignments   o The 100% grade for the assignments represents 15% of the course grade
o Assignments are due on Tuesday lecture at the start of lecture.
o Late assignments will not considered.
o Electronic submission of assignments is not accepted.
o If HW due date is an exam day you can deliver HW on next lecture day.

Web-CT   The class website is at https://learn.unm.edu/
Course materials and grades will be posted on the website

Grading
Scale

Grade	Range
A	> 90
B	80 – 89.9
C	70 – 79.9
D	60 – 69.9
F	< 60

Grading
Policy

Component	% Final Grade-CE 302
Assignments	15%
Quizzes	10%
Three mid-term exams	45%
Final exam	30%
Total	**100%**

General   - Class attendance is required.
Policy   - Instructor may choose the days for taking the rolls.
- Quizzes will be used to help determine attendance.
- Instructor may choose the days for doing a quiz.
- There will be three mid-term exams.
- Work extra problems to understand the topics.
- Do not engage in talking or disruptive behavior during the class.
- Be honest in all assignments and quizzes.

Title IX   In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education. This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: https://policy.unm.edu/university-policies/2000/2740.html

Lectures - Tentative Schedule (Subject to change at the discretion of the instructor)

Lecture #	Date	Topic
1	August 23	Chapter 1: Stress
2	August 24	Chapter 1: Stress
3	August 30	Chapter 1: Stress **(HW1)**
4	September 1	Chapter 2: Strain
5	September 6	Chapter 2: Strain **(HW2)**
6	September 8	Chapter 3: Mechanical properties of materials
7	September 13	Chapter 3: Mechanical properties of materials **(HW3)**
8	September 15	Chapter 4: Axial Load
---	**September 20**	**EXAM (1) (15 % of Total Grade) (HW4)**
9	September 22	Chapter 4: Axial Load
10	September 27	Chapter 4: Axial Load **(HW5)**
11	September 29	Chapter 5: Torsion
12	October 4	Chapter 5: Torsion **(HW6)**
13	October 6	Chapter 6: Bending
14	October 11	Chapter 6: Bending **(HW7)**
---	**October 13**	**FALL BREAK**
15	October 18	Chapter 6: Bending **(HW8)**
16	October 20	Chapter 6: Bending
---	**October 25**	**EXAM (2) (15 % of Total Grade) (HW9)**
17	October 27	Chapter 7: Transverse shear
18	November 1	Chapter 7: Transverse shear **(HW10)**
19	November 3	Chapter 11: Design of beams and shafts
20	November 8	Chapter 11: Design of beams and shafts **(HW11)**
21	November 10	Chapter 8: Combined Loading
---	**November 15**	**EXAM (3) (15 % of Total Grade) (HW12)**
22	November 17	Chapter 8: Combined loading
23	November 22	Chapter 9: Stress Transformation **(HW13)**
---	**November 24**	**THANKSGIVING HOLIDAY**
24	November 29	Chapter 9: Stress Transformation **(HW14)**
25	December 1	Chapter 12: Deflection of Beams
25	December 6	Chapter 12: Deflection of Beams **(HW15)**
26	December 8	*Review Lecture*
---	**December 15**	**FINAL EXAM – 10:00 am to 12:00 pm – Lecture Room (30 % of Total Grade)**

- Chapter numbers listed here are chapter numbers as they appear in textbook