

SYLLABUS

Code/Name	MCE 201 / Strength of Materials I
Type	Required
Credit/ECTS	3/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/2
Semester	Fall
Classroom	A203
Content	Concept of stress. Normal stress, shear stress, and stress components. Stress and strain in axial loading. Hooke's Law, Saint-Venant's Principle, deformations of members, Poisson's ratio, statically indeterminate problems, and shearing strain. Torsion of circular shafts. Stresses and deformations in a circular shaft, angle of twist, statically indeterminate shafts, and design of transmission shafts. Shear and bending-moment diagrams in the beams, bending of beams and normal stresses, bending of members made of several materials, eccentric axial loading in a plane of symmetry, shear flow and shear stresses in the beam.
Prerequisites	MEC 102 Statics
Textbooks	Primary Ferdinand P. Beer et.al., Mechanics of Materials, McGraw-Hill, 6th Ed., 2012. Supplementary Hibbeler, R. C., Mechanics of Materials, 9th ed., Prentice Hall, Pearson, 2013.
Objectives	<ul style="list-style-type: none"> • To provide the basic concepts and principles of strength of materials. • To give an ability to calculate stresses and deformations of objects under external loadings. • To give an ability to apply the knowledge of strength of materials on engineering applications
Course Outcomes	<p>In this course you will be able to:</p> <p>C01 Designs structural system components using the allowable stress approach.</p> <p>C02 Defines, formulates and solves engineering problems.</p> <p>C03 Understands basic concepts which effect behavior of the structural components and use these concepts for analyses.</p> <p>C04 Solves three-dimensional problems that can be solved only using theory of elasticity by reducing (simplifying) dimensions reasonable assumptions based on experimental studies.</p> <p>C05 Investigates systems under axial loading, shear, torsion, bending moment actions.</p>

Weekly Schedule of Topics

W	Topic
1	Stress; stress types; Factor of safety
2	Deformation; Poisson's ratio; Hooke's law
3	Stress concentration; Plastic deformation
4	Torsion; Shaft design
5	Moment of Inertia of plane sections
6	Pure bending; Stress concentration under bending
7	Unsymmetric bending; General eccentric loading
8	Shear (V) and Moment (M) diagrams
9	Design of beams for bending

10	Transverse shear stress in seams
11	Stress transformation and Mohr's circle
12	Failure criteria and applications
13	Pressure vessels
14	Engineering applications

Professional Contribution Ability to calculate stress and strain under various conditions

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	0	4	4	5	4	0	3	0	3	5
CO2	5	0	0	3	5	0	0	0	0	3	2
CO3	5	0	1	1	5	4	0	3	0	4	5
CO4	5	0	4	0	5	1	0	3	0	2	5
CO5	5	0	3	1	4	4	0	3	0	5	3

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions

- Students work in groups for presentation and assignment.
- The consequence of violation of the attendance rule is to receive a grade of **NA**.

Requirements Basic knowledge of statics

Evaluation

Midterm Exam	40%
Assignment	10%
Final Exam	60%
Total	100%

Rubric A rubric will be announced prior to presentation sessions. The rubric has 2 main parts for the grading: technical assessment (50%) and writing or presentation performance (50%)

Course Policy

1. You must attend at least 70% of the sessions including add-drop period.
2. Be in the class on time.
3. English should always be used to communicate with one another.
4. Mobile phone should be switched off and put away during the class.
5. You cannot talk to your friends during class no matter what the subject is.

Cheating & Plagiarism

- Copying or letting someone to copy your work on exams, assignments, or reports is cheating.
- Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism.
- The consequence of academic dishonesty is to receive a grade of **F** for the course.

Instructor

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