

ME 301 - Mechanical Systems I
Fall 2024-2025
Syllabus

COURSE	Bekir Bediz		
INSTRUCTOR	Mechatronics Engineering Office: FENS 2080	E-mail: Office Hour:	bbediz@sabanciuniv.edu Tuesday 14:00-15:00
COURSE ASSISTANT	Ata Alipour Ghassabi Mechatronics Engineering Office: FENS 1100	E-mail: Office Hour:	ata.alipour@sabanciuniv.edu Thursday 15:40-16:40
	Andisheh Choupani Mechatronics Engineering Office: FENS G064	E-mail: Office Hour:	achoupani@sabanciuniv.edu Monday 15:00-16:00
COURSE SCHEDULE	<u>Lecture:</u> Monday : 11:40 - 12:30 @ FENS L056 Tuesday : 10:40 - 12:30 @ FENS G032	<u>Recitation:</u> Thursday : 16:40 -17:30 @ FENS L035, 2019	
REFERENCES	Students are recommended to follow the references occasionally: <ul style="list-style-type: none">• F. Beer, E. R. Johnston, J. T. DeWolf, D.F. Mazurek, Mechanics of Materials - SI, McGraw-Hill Education, USA.• Egor P. Popov, Mechanics of Materials, Prentice Hall.• R.C. Hibbeler, Mechanics of Materials, Prentice Hall, New Jersey, USA.• Warren C. Young, Roark's Formulas for Stress and Strain, McGraw-Hill, New York.		
OBJECTIVES:	This course introduces the fundamental principles and methods of structural mechanics. Topics covered include: stresses and strains in structural elements, states of stress (shear, bending, torsion), statically indeterminate systems, displacements and deformations, deflections with simple loadings, superposition techniques, thermal stresses, combined stresses, Mohr's circle, combined loadings, buckling, energy methods, elastic stability, and approximate methods. At the end of the course student must demonstrate the ability to <ul style="list-style-type: none">• describe the fundamentals for mechanics of materials• calculate the loadings on components and drawing internal force/moment diagrams• calculate part stresses under various (axial, bending, torsion, etc or combined loading) cases and making design choices• calculate thermal stresses, deformations and safety of components• calculate stresses in pressurized vessels and principal stresses• design for static and dynamic failures• calculate deformation and strains of beams		
PREREQUISITES:	A passing grade in ENS 204: Mechanics is required.		
COURSE CONTENT	<ul style="list-style-type: none">• Introduction - Concept of Stress• Stress and Strain - Axial Loading• Torsion• Bending and Shear Stresses in Beams• Deflection of Beams• Combined Loading• Eccentric Loading		

GRADING POLICY Homework (Take-home Exam) (15%), Midterm I (25%), Midterm II (25%), Final Exam (35%)

- There will be 2 midterm exams (around 90 minutes) throughout the semester.
- Students who miss any two exams will get N/A from the course.
- One make-up examination, covering the whole course material, will be given during the Finals Week for the students who miss any of the exams due to a valid excuse approved by the faculty/medical center. All examinations will be closed book and notes. The necessary formula will be provided to the students.
- There will be around 5 take-home exam during the semester. Each one of them will have equal weight in overall grading. The take-home exams will affect your overall grade using the below approach:

$$\text{weighted exam average grade} = \frac{(0.25 \times \text{Midterm I} + 0.25 \times \text{Midterm II} + 0.35 \times \text{Final})}{0.85}$$

$$r = \frac{\text{submitted take-home exam (THE) average grade}}{\text{weighted exam average grade}}$$

$$\text{THE Grade} = \begin{cases} \text{THE average} & \text{if } r \leq \text{thr 1} \\ \text{THE average} \times (\text{thr 2} - r) & \text{if } \text{thr 1} < r < \text{thr 2} \\ 0 & \text{if } r > \text{thr 2} \end{cases}$$

where threshold 1 and threshold 2 will be determined based on the curve distribution.

- All solutions must be written in a professional manner. You may lose points for poorly written answers.
- No extra exam/project/etc. will be given to increase your grade at the end of the semester.
- If your attendance is less than 50%, you will fail the course automatically.
- Oral exam (that will be recorded) will be given to students whose exam answers seem suspicious.

DISCLAIMER

- Time conflict requests can be accepted; however, students who are registered to the course with time-conflict override accept responsibility for any inconvenience that might occur due to missed content and/or exams. No make-up will be available for missed course content.

ACADEMIC
INTEGRITY

Students are expected to be familiar with and comply with Sabanci University Academic Integrity Statement. Any form of academic dishonesty (plagiarism, copying/using other people's work, attending classes/exams on behalf of other people, *etc.*) will be penalized with a failing grade for the related assignment, quiz, or exam and disciplinary actions will be taken.