

MM 210E Strength of Materials				DEPARTMENT OF MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
4	42	14	-	-	69	-	125	4	5.0
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	MM201								
Course Contents	Stress and strain concepts. Axial load, statically indeterminate axially loaded members, thermal stress. Torsion, angle of twist, statically indeterminate torque-loaded members. Bending, eccentric axial loading of beams. Transverse shear, shear flow in build-up members. Combined loadings. Stress and strain transformation. Deflection of beams and shafts, statically indeterminate beams and shafts.								
Course Objectives	To introduce students to the fundamental aspects of stress analysis and enables them to understand internal forces and moments and their relation to the internal stresses and strains within simple elements under the influence of simple loading configurations.								
Learning Outcomes and Competences	Understanding of relationship between the loads applied to elastic bodies, and the resultant stresses, strains and deformations.								
Textbook and / or Reference	1. Mechanics of Materials, R. C. Hibbeler, Prentice-Hall Inc., USA. 2. Mechanics of Materials, F. P. Beer and E. R. Johnston, Mc-Graw Hill Comp., England. 3. Engineering Mechanics of Solids, E. P. Popov, Prentice-Hall Inc., USA.								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		50	
	Quizzes					X		10	
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam					X		40		
Instructors	Assist.Prof. Selim TURKBAS, Assoc.Prof. Ezgi GUNAY								
Week	Subject								
1	STRESS: equilibrium of a deformable body, average normal and shear stress, bearing stress.								
2	STRESS: allowable stress, factor of safety STRAIN: deformation								
3	STRAIN: normal and shear strain, MECHANICAL PROPERTIES OF MATERIALS: the tension test, Hooke's law, Poisson's ratio.								
4	AXIAL LOAD: elastic deformation of an axially loaded members, principle of superposition.								
5	AXIAL LOAD: statically indeterminate axially loaded member, thermal stress.								
6	TORSION: the torsion formula, power transmission.								
7	TORSION: statically indeterminate torque-loaded members, MIDTERM I								
8	BENDING: Shear and moment diagrams, the flexure formula.								
9	TRANSVERSE SHEAR: the shear formula, shear stresses in beams, shear flow in built-up members.								
10	COMBINED LOADING: state of stress caused by combined loading.								
11	STRESS TRANSFORMATION: plane stress transformation, general equations of plane stress transformation.								
12	STRESS TRANSFORMATION: Mohr's circle, MIDTERM II								
13	STRAIN TRANSFORMATION: plane strain, Mohr's circle.								
14	DEFLECTIONS OF BEAMS AND SHAFTS: the elastic curve, slope and displacement by integration method.								