

MM 531 Applied Elasticity				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS credit
1,2	30	12				146	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Analysis of Stress;. Stress and stress state at a point,. Principal stresses,. Equations of equilibrium,. Boundary conditions. Analysis of Strain; Strain and strain state at point, Transformation of strain components, Compatability Equations. Stress-strain Relations; Generalized Hooke's Law, Formulation of elasticity problems, Strain energy, Failure Criteria. Plane Problems of Elasticity; General Theory of Plane Elasticity, Plane strain and generalized plane strain, Plane stress & generalized plane stress, Cartesian Coordinates. Problems in Polar Coordinates; General formulation, Thick-walled cylinders, Shrink and force fits, Rotating cylinders & discs, Thermal stresses, Non-axisymmetric problems, Concentrated loads-Green's function								
Course Objectives	To teach the students solution of a Plane Elasticity problems in Cartesian and Polar Coordinate systems by using basic equations and necessary boundary conditions								
Learning Outcomes and Competences	Understanding the solution method of a plane elasticity problem and using necessary elasticity equations and boundary conditions.								
Textbook and /or Reference	1) UGURAL, A. C., and FENSTER, S. K., Advanced Strength and Applied Elasticity, 4th ed., Prentice Hall, Englewood Cliffs, N.J., 2003.								
Assessment Criteria					If any, mark as (X)		Percentage (%)		
	Midterm Exams				X		30		
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam				X		70		
Instructors	Assoc. Prof. Ezgi GUNAY								
Week	Subject								
1	Stress Analysis; Stress State at a Point, Principal Stresses.								
2	Stress Analysis; Equilibrium Equations, Boundary Conditions								
3	Strain Analysis; Strain State at a Point, Transformation Of Strain Compatability Eqn's.								
4	Stress-Strain Relations: Hooke's Law , Strain Energy.								
5	Plane Elasticity Problems: Formulation of Elasticity Problems, Plane Stress and Strain Problems.								
6	Plane Elasticity Problems in Cartesian Coordinates.								
7	1. MT. Stress Function, Thermal Stress Problems.								
8	Plane Elasticity Problems in Polar Coordinates.								
9	Stress Analysis in Thick-Walled Cylinders.								
10	Shrink Fit Problems.								
11	Rotating Shafts and Disks								
12	Thermal Stress Problems.								
13	2. MT. Wedge Problems.								
14	Concentrated Force and Green's Function.								