

MM 550 Mathematical Theory of Elasticity				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS credit
1,2	42					146	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Cartesian tensors. Stress and strain concepts. Equation of motion. Compatibility equations. Constitutive equations for linear elastic materials. Generalized Hook’s law. Plane stress-strain problems. Applications to 2-D elasto-static problems. Elongation torsion, and flexure of rods. Stress concentration. Variational methods. Introduction to thermo-elasticity. Solution of elasticity problems by finite-difference method.								
Course Objectives	To produce engineering problem applications and solution techniques by deriving necessary equations peculiar to elastic body in continuous medium								
Learning Outcomes and Competences	Differential equilibrium equations, constitution equations and three dimensional stress-deformation correlation; forming in thought system and interpretation of physical dimensions in mind.								
Textbook and /or Reference	1. R.B. Ignaczac Hetnarski and Jozef,(2004), Mathematical Theory of Elasticity, USA,Taylor & Francis Books. 2. Chou Pei Chi, Pagano Nicholas J. (1984), Elastisite, Trabzon, KATÜ Basimevi. 3. Timoshenko S., Goodier J.N., (1969), Elastisite Teorisi, İstanbul, Arı Kitapevi Matbaası.								
Assessment Criteria					If any, mark as (X)		Percentage (%)		
	Midterm Exams				X		20		
	Quizzes								
	Homeworks								
	Projects								
	Term Paper				X		10		
	Laboratory Work								
	Other								
	Final Exam				X		70		
Instructors									
Week	Subject								
1	Cartesian tensors								
2	Stress and strain concepts								
3	Equations of motion								
4	Compatibility equations								
5	Consitutive equations for linear elastic materials								
6	Generalized Hooke’s law								
7	Plane stress-strain problems								
8	Application to 2-D elasto-static problems								
9	Application to 2-D elasto-static problems								
10	Elongation, torsion, and flexure of rods								
11	Stress concentration								
12	Variational methods								
13	Introduction to Thermo-elasticity								
14	Solution of elasticity problems by finite-difference method								