

MM 515 Mathematical Theory of Plasticity				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS credit
1,2	12	30				146	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Physical principles. Yield criterion. Plastic stress-strain relations. Two measures for strain-hardening. Exremum principles. Plastic potential. Elasto-plastic problems. Plane strain. Plane deformation problems and its applications to shear lines and elasto-plastic wave propagation. Geometrical effects. Anisotropic plasticity.								
Course Objectives	Mechanics of deformable bodies involves the study of stress, strain, and temperature distribution in a solid or fluent body subjected to mechanical and termal loading.								
Learning Outcomes and Competences	Students are provided by the knowledge of formulation and analysis of the basic boundary/initial-value problems at the proper level of mathematical methods that enable them to understand the general underlying principles.								
Textbook and /or Reference	1. Khan, A.S. and Hnang, S., (1995). Continuum Theory of Plasticity. John Wiley. 2. Maugin, G.A., (1992). The Thermomechanics of Plasticity and Fracture. Cambridge. 3. Lubarda, V.A., (2001). Elastoplasticity Theory. CRS.								
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									
Week	Subject								
1	Physical Principles								
2	Yield Criterion								
3	PlasticStress-Strain Relations								
4	Two Measures for Strain-Hardining								
5	Extramum Principles								
6	Plastic Potential								
7	Elasto-Plastic Problems								
8	Elasto-Plastic Problems								
9	Plaine Strain								
10	Plane Deformation Problems								
11	Plane Deformation Problems Applied to Shear Lines and Elasto-Plastic Wave Propagation								
12	Plane Deformation Problems Applied to Shear Lines and Elasto-Plastic Wave Propagation								
13	Geometrical Effects								
14	Anisotropic Plasticity								