

MM602 FINITE ELEMENT ANALYSIS				MECHANICAL ENGINEERING DEPARTMENT			
Semester	Methods of Education					Credits	
	Lecture	Recit	Lab.	Other	Total	Credit	ECTS Credit
1-2	42	-	-	146	188	3	7.5
Language	Turkish						
Compulsory / Elective	Optional						
Prerequisites	-						
Course Contents	Discretization of the domain. Interpolation polynomials. Simplex, complex, and multiplex elements. Interpolation polynomials in terms of global and local coordinates. Formulation of element characteristic matrices and vectors. Variational approach. Assembly of element matrices and vectors and derivation of system equations. Assemblage of element equations. Incorporation of the boundary conditions. Solution of finite element equations. Higher-order and isoparametric formulations. Numerical integration. Applications to static and dynamic analysis of solids and structures, steady and unsteady heat transfer and fluid mechanics problems.						
Course Objectives	Formulation and description of the solution steps of the engineering problems by learning of the finite element method.						
Learning Outcomes and Competences	General review of the numerical methods, learning of the solution techniques of the finite element method, preparation of the engineering problems to be solved in FEM, conversion of these system of equations to the computer environment.						
Textbook and /or References	Text Book: J.N.Reddy, An Introduction to the Finite Element Method, , McGraw-Hill.						
Assessment Criteria					If Any, Mark as (X)		Percentage
	Midterm Exams				X		40
	Quizzes				-		-
	Homeworks				X		10
	Projects				X		25
	Term Paper				-		-
	Laboratory Work				-		-
	Other				-		-
	Final Exam				X		25
Instructors	Assoc. Prof. Dr. Ezgi GÜNEY						
Week	Subject						
1	Integral formulations and general knowledge about variational Boundary value problems and boundary conditions Weak formulations, potential energy functions in one dimensional problems Weak formulation, potential energy functional in two dimension One dimensional problem definitions in finite element methods Bending on beams Truss systems Final projects-Problem definitions and descriptions for solution procedures Interpolation functions and two dimensional problems in finite element method Triangular elements, plane elasticity problems Plane elasticity problems Torsion problem Mesh generation, numerical integration Representation of the final projects						
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