

MM 413 Introduction To Finite Element Analysis				DEPARTMENT of MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
7	42	0	15	16	2	-	75	3	3.0
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	-								
Course Contents	Finite elements of spatial or/and material regions. Simplex, complex, and multiplex elements. Interpolation polynomials and their expressions in local and global coordinates. Element characteristic matrices and vectors. Direct approach. Variational approach. Weighted residual methods. Coordinate transformations. Ensembling of element matrix and vectors for obtaining system equations. Solution of ensembled finite element equations.								
Course Objectives	Learning of main concepts of FE method and applications on the main engineering problems.								
Learning Outcomes and Competences	Course gives the main formulations for the solution outlines of the engineering problems. Solution techniques and their applications will be performed on pc environment.								
Textbook and /or Reference	Saeed Moaveni, Finite Element Analysis/Theory and Application with ANSYS,Prentice Hall, Fourth Ed.,1999. J.N. Reddy, An Introduction to the Finite Element Method, McGraw-Hill, Second Ed.,1993.								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		40	
	Quizzes					X		3	
	Homeworks					X		7	
	Projects					X		10	
	Term Paper								
	Laboratory Work								
	Other								
Final Exam						X		40	
Instructors	Assoc.Prof. Ezgi GUNAY								
Week	Subject								
1	Energy methods								
2	Minimum total potansial energy formulation– 1 dimensional problems								
3	Minimum total potansial energy formulation– 1 dimensional problems								
4	Truss systems, introduction to preparation of final projects								
5	Application of any commercial finite element code								
6	One dimensional elements and applications with code								
7	One dimensional problems: Heat transfer and solid mechanics								
8	Definitions on the two dimensional triangular and rectangular elements								
9	Applications on the two dimensional triangular and rectangular elements								
10	Applications on the two dimensional heat transfer equations								
11	Applications on the two dimensional solid mechanics problems								
12	Applications on the two dimensional fluid mechanics problems								
13	Three dimensional elements								
14	Representations of final projects and related discussions								