Course name: MCE 513 Finite Element Methods							**Department:** Mechanical Engineering	
Semester	**Methods of Education**							**Credit (ECTS)**
	Lecture	Recitation /(study)	Lab	Project/Field Study	Homework	Other	Total	7.5
Fall	42	30		80	40	23	225	

Language	English
Compulsory/Elective	Elective
Prerequisites	None
Course contents	Introduction. General procedure of FEM. Element interpolation function, shape functions. Isoparametric element concept. Discretization. Techniques for nonlinear analysis. Integral formulation and variational methods. Computer programs for applications. Miscellaneous applications.
Learning Outcomes and Competences	Students will: 1. understand fundamental principles of FEM 2. be familiar with ts application fields 3. improve their computer skills by using FEM-system programs 4. be able to use FEM for analysis of miscellaneous engineering problems
Textbook and /or References	1. A First Course in the Finite Element Method, D.L.Logan 2. Concepts and Applications of Finite Element Analysis, R.D.Cook 3. The Finite Element Method: Its Basis and Fundamentals, O.C Zienkiewicz , R.L Taylor, J.Z. Zhu

Assessment Criteria		**If any, mark as (X)**	**Percentage (%)**
	Midterm Exams	X	30
	Quizzes		
	Homeworks	X	10
	Projects	X	20
	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	40

Instructors	Asst. Prof. Dr. Fatih Göncü
Week	**Subject**
1	Introduction: basic concepts, field problems, history
2	General procedure of FEM: steps
3	Assembling the elements, how to treat boundary conditions
4	Application of procedure to spring systems
5	Application of compute r programs for FE analysis
6	Element interpolation function, shape functions
7	Isoparametric element concept
8	Discretization of a region
9	Application of FEM to two dimensional problems
10	Techniques for nonlinear analysis
11	Integral formulation
12	Variational methods
13	Applications to various problems
14	Applications to various problems