

<b>Course name:</b> MCE507- Finite Elements Method In Stress Analysis		<b>Department:</b> Mechanical Engineering						
<b>Semester</b>	<b>Methods of Education</b>							<b>Credit (ECTS)</b>
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	
1	42	42		40	42	20	186	7.5
<b>Language</b>	English							
<b>Compulsory/Elective</b>	Elective							
<b>Prerequisites</b>	None							
<b>Course Contents</b>	Introduction to the finite element analysis, Development of truss equations, Logic of a computer program for truss analysis, Development of beam equations, Plane frames, Development of plane stress and plane strain equations, Axisymmetric elements, Three dimensional stress analysis							
<b>Course Objectives</b>	Teaching of the displacement-,stress- and strain analysis for trusses, plane frames and plates. To give the logic of the commercial computer analysis programs							
<b>Learning Outcomes and Competences</b>	1.Understands the importance of the finite element method in engineering 2.Can analyze truss systems with help of computer software 3.Can create plane stress and strain equations in plane case 4.Can manage three-dimensional stress analysis 5.Can make a finite element stress analysis of simple mechanical systems.							
<b>Textbook and /or References</b>	1-A First Course in the Finite Element Method, D.L.LOGAN 2-Concepts and Applications of Finite Element Analysis, R.D.COOK 3-Methode der finiten Elemente in der Festigkeitslehre, H.G.Hahn							
<b>Assessment Criteria</b>			<b>If any, mark as (X)</b>		<b>Percentage (%)</b>			
	Midterm Exams		X		30			
	Quizzes							
	Homeworks		X		10			
	Projects				20			
	Term Paper							
	Laboratory work							
	Other							
Final Exam		X		40				
<b>Instructors</b>	Prof. Dr. Osman Yiğit							
<b>Week</b>	<b>Subject</b>							
1	Introduction to the finite elements method							
2	Stiffness matrix for truss element, Vector transformations							
3	Development of truss equations							
4	Solution of system equations							
5	Logic of computer program for truss analysis							
6	Example problems for trusses							
7	Development of beam equations							
8	Plane frames							
9	Example problems for beams and plane frames, midterm examination							
10	Triangular element for plane stress and plane strain							
11	System equation for the plane stress- and plane strain situations							
12	Axisymmetric elements							
13	Axisymmetric elements							
14	Three dimensional stress analysis							