FUNDAMENTALS OF FINITE ELEMENT ANALYSIS

1	Course Title:	FUNDAMENTALS OF FINITE ELEMENT ANALYSIS	
2	Course Code:	OTO5137	
3	Type of Course:	Optional	
4	Level of Course:	Second Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. MURAT YAZICI	
15	Course Lecturers:	Yok	
16	Contact information of the Course Coordinator:	myazici@uludag.edu.tr UÜ Mühendislik Fakültesi, Otomotiv Mühendisliği Bölümü, 16059 Görükle Kampüsü, Bursa.	
17	Website:		
18	Objective of the Course:	To introduce the technique of finite element method, to teach the working principles of finite element analysis programs.	
19	Contribution of the Course to Professional Development:	To gain the ability to employ finite elements in application areas. To be able to create and develop finite element models.	
20	Learning Outcomes:		
		1	Students will be able to use computer software developed on the basis of finite element method.
		2	Students will be able to evaluate alternative cases of element type, element network design and boundary conditions to construct finite element models of one, two and three dimensional structural problems.
		3	Students will be able to perform static and dynamic analysis and interpret their results using various finite element software.
		4	
		5	
		6	
		7	
		8	
		9	
		10	

21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Introduction to finite element method	

2	Basic finite elements: theoretical solutions of one-dimensional, two-dimensional, three-dimensional problems	
3	Introduction to modeling: General introduction and purposes of finite element software to be used	
4	Finite element analysis of one dimensional frame elements	
5	Finite element analysis of two dimensional shell elements	
6	Finite element analysis of two dimensional solid elements	
7	Applied finite elements 1st Midterm	
8	Modeling three dimensional problems with finite element software and creating meshes	
9	Static finite element analysis of three dimensional problems	
10	Dynamic finite element analysis of three dimensional problems	
11	Analysis and comparison of different finite element software	
12	Selecting one or more of the most preferred finite element software.	
13	Sample application with the examined finite element software and comparison of the results with the main software used.	

Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical		14	3.00	42.00
Practicals/Labs		0	0.00	0.00
Self study and preperation		5	20.00	100.00
Homeworks		2	16.00	32.00
Projects		0	0.00	0.00
Midterm Exam	2	40.00		
Field Studies		0	0.00	0.00
Midterm exams		2	2.00	4.00
Home work-project	0	0.00		
Others		0	0.00	0.00
Final Exams		1	2.00	2.00
Total	3	100.00		
Total Work Load				184.00
Total work load/ 30 hr				6.00
ECTS Credit of the Course				6.00

Total	100.00
Measurement and Evaluation Techniques Used in the Course	It is done with written exams (Midterm, Homework and Final).

23	Materials: * ABAQUS Help Tutorials * The Finite Element Method: Linear Static and Dynamic Assesment
24	**ECTS / WORK LOAD TABLE**

25	**CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	3	3	5	5	5	3	0	0	4	4	3	0	2	3	3	4
ÖK2	4	4	4	4	4	4	0	0	4	5	4	0	2	3	3	4

ÖK3	4	4	5	5	4	4	0	0	4	4	4	0	2	3	3	4

LO: Learning Objectives PQ: Program Qualifications					
Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**