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.
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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.	
14	Applied finite elements 2nd Midterm	
22	Textbooks, References and/or Other Materials:	* The Finite Element Method: Its Basis and Fundamentals * ABAQUS Help Tutorial * The Finite Element Method: Linear Static and Dynamic Finite Element Analysis
23	Assesment	

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	2	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		It is done with written exams (Midterm, Homework and Final).

24	**ECTS / WORK LOAD TABLE**

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
Field Studies	0	0.00	0.00
Midterm exams	2	2.00	4.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			184.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

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