

FINITE ELEMENT METHOD AND APPLICATIONS FOR ENGINEERS

1	Course Title:	FINITE ELEMENT METHOD AND APPLICATIONS FOR ENGINEERS	
2	Course Code:	OTO4045	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	7	
7	ECTS Credits Allocated:	4.00	
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:	PROF. DR. MURAT YAZICI, BURSA ULUDAĞ ÜNİVERSİTESİ MÜHENDİSLİK FAKÜLTESİ, OTOMOTİV MÜHENDİSLİĞİ BÖLÜMÜ, GÖRÜKLE BURSA DR. ÖĞR. ÜY. HARUN GÜÇLÜ	
16	Contact information of the Course Coordinator:	myazici@uludag.edu.tr	
17	Website:	NONE	
18	Objective of the Course:	The aim of the course is to solve basic engineering problems using the finite element method.	
19	Contribution of the Course to Professional Development:	The professional contribution of the course is to give the student R&D competence.	
20	Learning Outcomes:		
		1	The learning outcome of the course is to gain the students the ability to use a finite element package program.
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	Introduction to Finite Element Method		
2	Fundamentals of finite elements: Direct solution method		
3	Spring and bar elements		

4	Beam elements and Truss Structures	
5	Basic finite elements: theoretical solutions of one-dimensional, two-dimensional, three-dimensional problems	
6	Introduction of Finite Element Method Package Programs used in Automotive Industry.	
7	Finite Elements and Rigid Bodies	
8	Meshing with MSC Apex	
9	Linear Static Analysis in MSC Apex	
10	Non-Linear Static Analysis in MSC Marc	
11	Linear and Non-Linear Dynamic Analysis in MSC Nastran	
12	Explicit Dynamic Analysis in MSC Dytran	
13	Introduction to Composite Modeling with MSC Digimat	
14	Composite Layup Modeling with MSC Digimat	
22	Textbooks, References and/or Other Materials:	1. Sonlu Elemanlar Yöntemine Giriş. Jacob Fish, Ted Belytschko, Nobel Yayınları. 2. Fundamentals of Finite Element Analysis. David V. Hutton, McGraw-Hill, 2003. 3. Numerical Methods for Engineers. Steven Chapra, Raymond Canale, McGraw-Hill, 2014.
23	Assesment	
TERM LEARNING ACTIVITIES		NUMBE R
Midterm Exam		1
Quiz		0
Home work-project		0
Final Exam		1
Total		2
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.
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	3	7.00	21.00
Homeworks	3	15.00	45.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	3.00	3.00
Total Work Load			113.00
Total work load/ 30 hr			3.77
ECTS Credit of the Course			4.00

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	5	5	5	4	4	3	3	3	4	4	5	5	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High		5 Very High							