COMPUTER AIDED ENGINEERING

1	Course Title:	COMPUTER AIDED ENGINEERING	
2	Course Code:	MAK4114	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	2	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. NECMETTIN KAYA	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	necmi@uludag.edu.tr 224-2941979 U.Ü. Müh. Mim. Fak., Makine Mühendisliği Bölümü Bursa	
17	Website:	http://homepage.uludag.edu.tr\~necmi\bdm.htm	
18	Objective of the Course:	The aim of this course is to provide students with the knowledge of computer aided techniques in engineering area. Students will learn the fundamentals of computer based applications, how to apply CAE concepts in mechanical engineering design problems and have the theoretical knowledge and practical experience to meet the expectations of industry regarding CAE techniques.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Understand the concepts of CAE regarding theoretical knowledge, be able to apply CAE techniques to design and design evaluation phases
		2	Learn the fundamentals of finite element method and be able to use it to stress and deflection analysis of machine design problems using CAE techniques
		3	Learn the fundamentals of computer aided optimum design techniques and be able to use CAE techniques for the optimization of machine components
		4	Be able to prepare projects and be able to work in teams and learn how to take different roles in team work and share the knowledge with team mates
		5	Be able to prepare and present the CAE projects
		6	
		7	
		8	
		9	
		10	
21	Course Content:		
	Course Content:		

Week	Theoretical	Practice
1	Introduction, lecture plan, computer laboratory rules and information about softwares.	
2	Techniques of model preperation	
3	Introduction to finite element method (FEM)	
4	One dimensional FE (truss) problems	
5	One dimensional FE (beam) problems	
6	Two dimensional FE problems	
7	Three dimensional FE problems	
8	Statics and non –linear FE analysis	
9	Frequency analysis	
10	Topology optimization	
11	Repeating courses and midterm exam	
12	Shape optimization	
13	Size and topography optimization	
14	Project presentations	

22	Textbooks, References and/or Other Materials:	1. Basics of the Finite Element Method, Paul E. Allaire, WCB Publishers. 2. The Engineering Design Process, A .Ertaş, J. J. Jones, John Wiley & Sons 3. Altair Hyperworks Tutorials
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	25.00
Quiz	0	0.00
Home work-project	1	25.00
Final Exam	1	50.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		50.00
Contribution of Final Exam to Success Grade		50.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	**ECTS / WORK LOAD TABLE**

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	14	3.00	42.00
Homeworks	1	3.00	3.00
Projects	1	25.00	25.00
Field Studies	0	0.00	0.00
Midterm exams	1	10.00	10.00
Others	0	0.00	0.00
Final Exams	1	15.00	15.00
Total Work Load			151.00
Total work load/ 30 hr			5.03
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	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	3	3	0	0	0	2	0	0	0	0	0	0	0	0	0
ÖK3	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**