ENGINEERING MATERIALS

1	Course Title:	ENGINEERING MATERIALS	
2	Course Code:	MAK2006	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	4	
7	ECTS Credits Allocated:	3.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. ALİ BAYRAM	
15	Course Lecturers:	Öğr. Gör. Dr. Kurtuluş YİĞİT	
16	Contact information of the Course Coordinator:	bayram@uludag.edu.tr 0224 2941956	
17	Website:		
18	Objective of the Course:	To gain knowledge and skills about mechanical properties and improving of basic materials used in engineering applications	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	To be able to explain general properties of pure iron
		2	To be able to draw iron-carbon phase diagram
		3	To be able to calculate amount of phases on iron-carbon phase diagram
		4	To be able to give examples which is in accordance with nomenclature of stells and to be able to explain these
		5	To be able to interpret the effect of alloy and concomitant elements of steel
		6	To be able to comprehend the aim of heat treatments
		7	To be able to plan a heat treatment procedure
		8	To be able to list aluminium alloys
		9	To be able to plan heat treatments of aluminium alloys.
		10	To be able to comprehend properties and application areas of nonferrous metals and polymers To be able to select material depending on application area
21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	Introduction to engineering materials. Pure iron and properties of pure iron	
2	Iron-carbon phase diagram	
3	Iron-carbon phase diagram, example problems	

4	Nomenclature of steels. Effect of alloy and concomitant elements of steel	
5	Heat treatment of steels.	
6	Heat treatment of steels. Quenching.	
7	Martensite formation	
8	Repeating courses and midterm exam	
9	TTT Diagrams	
10	Hardenability concept. Jominy quenching test. Tempering, martempering, austempering of steels.	
11	Surface hardening of steels.	
12	Aluminium alloys and heat treatments of aluminium.	
13	Copper and alloys.	
14	Polymers	

22	Textbooks, References and/or Other Materials:	1. Materials Science and Engineering 2. William D. Callister Jr., John Wiley & Sons, Inc., 2007. 3. Introduction to Materials Science for Engineers 4. James F. Shackelford, Prentice Hall International Inc., 1996. 5. Mühendislik Malzemeleri, Önemli Endüstriyel Malzemeler ve Isıl İşlemler 6. Halim Demirci, Aktüel yay., 2004. 7. Malzeme Bilgisi II Çev.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	2	6.00	12.00
Others	1	12.00	12.00
Final Exams	1	10.00	10.00
Total Work Load			90.00
Total work load/ 30 hr			3.00
ECTS Credit of the Course			3.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Quiz	0	0.00
Final Exam	1	50.00
Contribution of Term (Year) Learning Activities to		50.00
Contribution of Final Exam to Success Grade		50.00
Measurement and Evaluation Techniques Used in the		

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	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK2	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK3	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK4	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0

ÖK5	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK6	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK7	5	4	4	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK8	5	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK9	5	4	4	1	1	1	1	1	1	1	1	1	0	0	0	0
ÖK10	5	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

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