MATERIALS SCIENCE

1	Course Title:	MATERIALS SCIENCE	
2	Course Code:	MAK2005	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	1	
6	Semester:	2	
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:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Doç. Dr. RUKİYE ERTAN	
15	Course Lecturers:	-	
16	Contact information of the Course Coordinator:	Rukiye Ertan e-mail: rukiye@uludag.edu.tr Tel: + 90 (224) 294 06 53 Adres: Uludağ Üniversitesi, Mühendislik Fakültesi, Otomotiv Mühendisliği Bölümü, 16059, Görükle-Bursa, Türkiye.	
17	Website:		
18	Objective of the Course:	To gain knowledge and skill about structure of materials, basic phase diagrams and mechanical properties used in automotive engineering applications.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	To be able to define interatomic bonds of engineering materials.
		2	To be able to define crystal structure types of materials
		3	To be able to Explain Crystallographic directions and planes.
		4	To be able to list crystal imperfections.
		5	To be able to define tensile test results.
		6	To be able to show the cooling curves and two alloy basic phase diagrams.
		7	To be able to calculate the amount of phases in basic phase diagrams.
		8	To be able to define heat treatment of steels
		9	To be able to define microstructure and general properties of polymers.
		10	To be able to define composite materials.
21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	Basic Definitions and Concepts. The Structure of Atom	

2	Atomic Bonding (Metallic, Ionic, Covalent and van der Waals Bonds.) Atomic Diameter and Coordination Number	
3	Structure and types of crystal. Bravais lattices and atomic packing factor. Crystallographic directions and planes.Crystal Defects	
4	Mechanical Tests of Materials	
5	Diffusion and industrial applications.	
6	Show the cooling curves and two alloy basic phase diagrams.	
7	The Fe-C Phase diagram.	
8	The solution of the problems of the Fe-C phase proportions.	
9	Production of cast iron and steel	
10	Heat treatment of steels.	
11	Strengthening mechanisms	
12	Non-ferrous metals and their alloys	
13	Automotive Materials	
14	Materials.	

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	10	2.00	20.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	8.00	8.00
Others	0	0.00	0.00
Final Exams	1	15.00	15.00
Total Work Load			85.00
Total work load / 30 hr			2.83
ECTS Credit of the Course			4.00

2- Malzeme bilgisi ve muayenesi, Temel Şavaşkan, Derya Kitabevi, 1999.
MBEAE matbaası-Gebze 1987.
4- Malzeme Bilimi ve Mühendislik Malzemeleri, Çeviren:
5- Malzeme bilgisi ve malzeme muayenesi, A.Halim Demirci, Alfa Kitabevi, 2004.
Kitabevi, 2004.

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	1	10.00
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**

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	1	0	0	4	2	0	2	0	0	0	0	0
ÖK2	0	0	5	4	1	0	0	4	2	0	2	0	0	0	0	0
ÖK3	0	0	5	4	1	0	0	4	2	0	2	0	0	0	0	0
ÖK4	0	0	5	4	1	0	0	4	2	0	2	0	0	0	0	0
ÖK5	0	0	5	4	1	0	0	4	2	0	2	0	0	0	0	0
ÖK6	0	0	5	4	1	0	0	4	2	0	2	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK10	0	0	0	0	0	0	0	0	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**				