

## **COURSE SYLLABUS**

Course Details									
Code				Acad	Academic Year			Semester	
MAB207	3207				2		3		
Title					Α	L	ECTS		
Material Technology				3	2		6		
Language	German							_	
Level	Undergraduate 🗸 Graduate				Postgraduate				
Department / Program	Mechatronics Enginee	ering							
Forms of Teaching and Learning									
Course Type	Compulsory		1	Ele	Elective				
Objectives	To gain knowledge a engineering	about the	basics of ma	aterial tec	hnology	y and	their ap	plications in	
Content	<ul> <li>Structures of atoms and molecules</li> <li>Materials in engineering</li> <li>Metals as engineering materials</li> <li>Crystal structures</li> <li>Phase diagrams</li> <li>Microstructure</li> <li>Mechanical properties of materials</li> <li>Mechanical testing methods</li> </ul>								
Prerequisites									
Coordinator	Assist. Prof. Dr. Mehmet İPEKOĞLU								
Lecturer(s)	Assist. Prof. Dr. Mehmet İPEKOĞLU								
Assistant(s)	TA Halil İbrahim TANRIVERDİ								
Work Placement									
Recommended or Required Re	eading								
Books / Lecture Notes Other Sources	<ul> <li>Bargel, HJ., G. Schulze, "Werkstoffkunde", Springer, 1999.</li> <li>Bergmann, W., "Werkstofftechnik Teil I: Grundlagen", 5. Auflage, Carl Hanser, 2003,</li> <li>Bergmann, W., "Werkstofftechnik Teil II: Anwendung", 3. Auflage, Carl Hanser, 2002.</li> </ul>								
Additional Course Material									
Documents									
Assignments									
Exams									
Course Composition									



## **MECHATRONICS ENGINEERING COURSE SYLLABUS**

Mathematics un Sciences	d Basic	10	%	
Engineering		60	%	
Engineering Desi	ign		%	
Social Sciences			%	
Educational Scie	nces			%
Natural Sciences		30	)	%
Health Sciences				%
Expert Knowledg	ge			%
Assessment				
Activ	ʻity	Cou	nt	Percentage (%)
Midterm Exam		1		30
Quiz				
Assignments		1		10
Attendance				
Recitations				
Projects		1	20	
Final Exam		1		40
			100	
ECTS Points and	d Work Load			
ECTS Points and Activ	d Work Load <sup>r</sup> ity	Count	Duration	Work Load (Hours)
ECTS Points and Activ Lectures	d Work Load <sup>,</sup> ity	Count 14	Duration 3	Work Load (Hours) 42
ECTS Points and Activ Lectures Self-Study	d Work Load 'ity	<b>Count</b> 14 14	Duration 3 4	Work Load (Hours) 42 56
ECTS Points and Activ Lectures Self-Study Assignments	d Work Load <sup>,</sup> ity	Count 14 14 1	Duration           3           4           18	<b>Work Load (Hours)</b> 42 56 18
ECTS Points and Activ Lectures Self-Study Assignments Presentation / So Preparation	d Work Load	Count           14           14           14           1	Duration 3 4 18	Work Load (Hours) 42 56 18
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam	d Work Load ity eminar	Count 14 14 1 1	Duration           3           4           18	Work Load (Hours) 42 56 18
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations	d Work Load	Count           14           14           1           1           1           1           1           1           1           1	Duration           3           4           18           2	Work Load (Hours) 42 56 18 28
ECTS Points and Activ Lectures Self-Study Assignments Presentation / So Preparation Midterm Exam Recitations Laboratory	d Work Load	Count           14           14           1           1           1           1           1           1           1           1	Duration           3           4           18           2	Work Load (Hours) 42 56 18 28
ECTS Points and Activ Lectures Self-Study Assignments Presentation / So Preparation Midterm Exam Recitations Laboratory Projects	d Work Load	Count 14 14 1 1 1 1 14 14	Duration         3         4         18         2         2         24	Work Load (Hours) 42 56 18 28 28
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam	d Work Load	Count 14 14 1 1 1 1 14 14 1 1 1	Duration         3         4         18         2         2         24	Work Load (Hours) 42 56 18 28 28
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam	d Work Load	Count         14         14         1	Duration           3           4           18           2           24           Total Work Load	Work Load (Hours) 42 56 18 28 28 24 168
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam	d Work Load	Count         14         14         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         ECTS Point	Duration         3         4         18         2         2         24         Total Work Load         tts (Total Work Load / Hours)	Work Load (Hours) 42 56 18 28 28 24 24 6
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam	d Work Load	Count         14         14         1         1         1         1         1         1         1         1         1         1         1         1         1         ECTS Point	Duration         3         4         18         2         2         24         Total Work Load         tts (Total Work Load / Hours)	Work Load (Hours) 42 56 18 28 28 24 24 6
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam	d Work Load	Count 14 14 14 14 1 1 1 1 1 1 1 1 1 1 1 ECTS Poin out material technology	Duration         3         4         18         2         2         24         Total Work Load         tts (Total Work Load / Hours)	Work Load (Hours) 42 56 18 28 28 24 168 6
ECTS Points and Activ Lectures Self-Study Assignments Presentation / Se Preparation Midterm Exam Recitations Laboratory Projects Final Exam Learning Outco 1	d Work Load iity eminar eminar somes Knowledge ab Perspectives a	Count 14 14 14 14 1 1 1 1 1 1 1 1 1 1 ECTS Poin out material technology bout the basics and various app	Duration         3         4         18         2         2         24         Total Work Load         tts (Total Work Load / Hours)         lications of materials science	Work Load (Hours) 42 56 18 28 28 24 168 6



## **MECHATRONICS ENGINEERING**

**COURSE SYLLABUS** 

4	Learning about and differentiating between materials in engineering								
5	Learning material properties as basis of material selection								
6	Learning about mechanical test methods								
7									
8									
9									
10									
11									
12									
Weekly Conter	nt								
1	History of mate	erials science, r	materials in engir	neering, classif	ication of materia	als			
2	Atomic structu	re, bonds, bon	ds in different m	aterials					
3	Crystal structu	Crystal structure, unit cells, crystallographic directions and planes, Miller indices							
4	Irregularities ir	n crystal structu	ure, 0-1-2 dimens	sional crystal d	efects				
5	Solid state diffusion								
6	Phase diagram	Phase diagrams							
7	Microstructure								
8	Mechanical pro	Mechanical properties, stress-strain							
9	Relationship be	Relationship between microstructure and mechanical properties							
10	Elasticity, plast	Elasticity, plasticity, viscoelasticity							
11	Tensile test	Tensile test							
12	Ductility, brittleness								
13	Hardness, hardness measurement								
14	Hardness measurement, hardness-strength relationship								
15	15								
Contribution of Learning Outcomes to Program Objectives (1-5)									
	P1	P2	P3	P4	P5	P6	P7		
1									
2									
3									
4									
5									
7									
-									



## **MECHATRONICS ENGINEERING**

	coι	IRSE	SYL	LAB.	US
_					

9							
10							
11							
12							
Contribution Lev	Contribution Level1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
Compiled by:		Assist. Prof. Dr. Mehmet İPEKOĞLU					
Date of Compila	tion:	09.06.2020					