

DEPARTMENT OF MECHANICAL ENGINEERING  
COURSE SYLLABUS

Course Details				
<b>Code</b>	<b>Academic Year</b>			<b>Semester</b>
MAB310	3			6
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>
Material Technology II	3	1	1	6
<b>Language</b>	German			
<b>Level</b>	<b>Undergraduate</b>	✓	<b>Graduate</b>	<b>Postgraduate</b>
<b>Department / Program</b>	Mechanical Engineering			
<b>Forms of Teaching and Learning</b>	Formal			
<b>Course Type</b>	<b>Compulsory</b>		<b>Elective</b>	✓
<b>Objectives</b>	Learning about applications of material technology and properties of different engineering materials.			
<b>Content</b>	<ul style="list-style-type: none"> <li>• Hardening methods</li> <li>• Heat treatment</li> <li>• Electrical, magnetic and optical properties</li> <li>• Fracture, fatigue, creep, oxidation and corrosion</li> <li>• Corrosion prevention</li> <li>• Polymers</li> <li>• Ceramics</li> <li>• Composite materials</li> </ul>			
<b>Prerequisites</b>	-			
<b>Coordinator</b>	Assist. Prof. Dr. Mehmet İPEKOĞLU			
<b>Lecturer(s)</b>	Assist. Prof. Dr. Mehmet İPEKOĞLU			
<b>Assistant(s)</b>	TA Ahmet Uğur BATUK, TA Emre OSMANOĞLU			
<b>Work Placement</b>	-			
Recommended or Required Reading				
<b>Books / Lecture Notes</b>	<ul style="list-style-type: none"> <li>• Bargel, H.-J., 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>			
<b>Other Sources</b>				
Additional Course Material				
<b>Documents</b>				
<b>Assignments</b>				
<b>Exams</b>				
Course Composition				

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Mathematics und Basic Sciences	10	%
Engineering	40	%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences	10	%
Health Sciences		%
Expert Knowledge	40	%

**Assessment**

Activity	Count	Percentage (%)
Midterm Exam	1	30
Quiz		
Assignments	1	10
Attendance		
Recitations		
Projects	1	20
Final Exam	1	40
<b>Total</b>		<b>100</b>

**ECTS Points and Work Load**

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study			56
Assignments	1	18	18
Presentation / Seminar Preparation			
Midterm Exam	1		
Recitations	14	1	14
Laboratory	14	1	14
Projects	1	24	24
Final Exam	1		
<b>Total Work Load</b>			<b>168</b>
<b>ECTS Points (Total Work Load / Hours)</b>			<b>6</b>

**Learning Outcomes**

1	Knowledge about materials in engineering
2	Material selection based on material properties
3	Modification of material properties

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4	Knowledge about processing and production of various materials
5	Contemporary and future applications of various materials
6	
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12	

**Weekly Content**

1	Introduction
2	Hardening methods, heat treatment
3	Hardening methods, Jominy end-quench test
4	Material damage under different service conditions; fracture, fatigue, creep
5	Material damage under different service conditions; oxidation, corrosion
6	Electrical properties
7	Corrosion prevention
8	Magnetic and optical properties
9	Polymers; structural properties and processing
10	Polymers; applications
11	Ceramics; structural properties and processing
12	Ceramics; applications
13	Composite materials; structural properties and processing
14	Composite materials; applications
15	

**Contribution of Learning Outcomes to Program Objectives (1-5)**

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	5
2	5	5	5	5	5	5	5
3	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5
6							
7							
8							

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9							
10							
11							
12							
<b>Contribution Level</b>	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
<b>Compiled by:</b>	Assist. Prof. Dr. Mehmet İPEKOĞLU						
<b>Date of Compilation:</b>	09.06.2020						