

**DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY**  
**COURSE SYLLABUS**

Course Details				
<b>Code</b>	<b>Academic Year</b>			<b>Semester</b>
CHE112	1			Summer
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>
Chemistry II	2	1	2	6
<b>Language</b>	German			
<b>Level</b>	<b>Undergraduate</b>	X	<b>Graduate</b>	<b>Postgraduate</b>
<b>Department / Program</b>	Materials Science and Technology			
<b>Forms of Teaching and Learning</b>	Face to Face			
<b>Course Type</b>	<b>Compulsory</b>	X	<b>Elective</b>	
<b>Objectives</b>	Students acquire the basic knowledge of organic chemistry. They have a good understanding of the common classes of substances, the linking of structure, binding and the classification of organic compounds. Here, in addition to a deeper understanding of the chemical principles, a good understanding of the standard organic-chemical reactions with mechanistic details, the influence of the framework conditions in an organic-chemical reaction and the most important analytical methods (eg mass spectrometry, IR and NMR spectroscopy) should be developed			
<b>Content</b>	Structure and Binding of Organic Molecules, Structure and Reactivity: Introduction to Organic Molecule Reactions: Kinetics, Acidity / Basicity and Mechanisms, Functional Groups, Alkanes and Their Reactions, Nomenclature and Stereochemistry, Alcohols and Ethers and Their Reactions, Alkenes and Haloalkanes, Mass Spectrometry, IR and NMR spectroscopy for structure elucidation, alkynes and their reactions, aromatics and their reactions, reactions of carbonyl compounds, aldehydes, ketones and carboxylic acids, amines and thiols, carbohydrates, amino acids, peptides and proteins			
<b>Prerequisites</b>	None			
<b>Coordinator</b>	None			
<b>Lecturer(s)</b>	Asst. Prof. Dr. Duygu Ekinci			
<b>Assistant(s)</b>	M.Sc. Eyüp Metin			
<b>Work Placement</b>	None			
Recommended or Required Reading				
<b>Books / Lecture Notes</b>	<ol style="list-style-type: none"> <li>1. K.P.C. Vollhardt, N.E. Schore, K. Peter. "Organische Chemie"</li> <li>2. N.E. Schore. "Arbeitsbuch Organische Chemie"</li> <li>3. H.G.O Becker et al. "Organikum"</li> <li>4. R. Brückner "Reaktionsmechanismen"</li> <li>5. M. Hesse, H. Meier, B. Zeeh. "Spektroskopische Methoden in der organischen Chemie"</li> </ol>			
<b>Other Sources</b>	Google-Classroom page of the lecture			
Additional Course Material				
<b>Documents</b>	Google-Classroom page of the lecture			
<b>Assignments</b>	Google-Classroom page of the lecture			

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Exams			
<b>Course Composition</b>			
Mathematics und Basic Sciences			%
Engineering			%
Engineering Design			%
Social Sciences			%
Educational Sciences			%
Natural Sciences	100		%
Health Sciences			%
Expert Knowledge			%
<b>Assessment</b>			
<b>Activity</b>	<b>Count</b>		<b>Percentage (%)</b>
Midterm Exam	1		30
Quiz			
Assignments			
Attendance			
Recitations	5		30
Projects			
Final Exam	1		40
		<b>Total</b>	<b>100</b>
<b>ECTS Points and Work Load</b>			
<b>Activity</b>	<b>Count</b>	<b>Duration</b>	<b>Work Load (Hours)</b>
Lectures	15	2	30
Self-Study	15	6	90
Assignments	0	0	0
Presentation / Seminar Preparation	0	0	0
Midterm Exam	1	2	2
Recitations	5	10	50
Laboratory	5	2	10
Projects	0	0	0
Final Exam	1	2	2
		<b>Total Work Load</b>	<b>184</b>
		<b>ECTS Points (Total Work Load / Hours)</b>	<b>6</b>
<b>Learning Outcomes</b>			
<b>1</b>	Attaining the knowledge about basic principles of organic chemistry, organic molecular bonding, properties and reactivity; properties and behavior of organic compounds. Understanding organic synthesis and mechanisms		

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Weekly Content							
1	Atoms, molecules, bonding, polar and nonpolar molecules, intermolecular forces, solubilities, Lewis structures, resonance, acids and bases						
2	Introduction to orbitals, molecular orbital description of bonding, hybridization, structure of methane						
3	Alkanes- conformational analysis, structural isomerism and nomenclature, alkyl groups						
4	Alkenes- structure and bonding, nomenclature, E-Z notation, hydrogenation, relative stabilities.						
5	Stereochemistry						
6	Ring systems						
7	Alkyl halides, substitution reactions of alkyl halides- SN 2 and SN 1 mechanisms. Elimination reactions- E1 and E2 mechanisms						
8	Overview of substitution and elimination reactions, oxidation of alcohols, rates and equilibria, syntheses						
9	Functional Groups I						
10	Functional Groups II						
11	Functional Groups III						
12	Functional Groups IV						
13	Functional Groups V						
14	Biological Compounds I						
15	Biological Compounds II						
Contribution of Learning Outcomes to Program Objectives (1-5)							
	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	5
<b>Contribution Level</b>		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
<a href="https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&amp;curSunit=207">https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&amp;curSunit=207</a>							
<b>Compiled by:</b>		Asst. Prof. Dr. Duygu Ekinci					
<b>Date of Compilation:</b>		27.04.2022					