

**DEPARTMENT OF MOLECULAR BIOTECHNOLOGY**  
**COURSE SYLLABUS**

Course Details					
<b>Code</b>				<b>Academic Year</b>	<b>Semester</b>
MBT478				4	8
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>	
Natural Substance Production	3	0	2	6	
<b>Language</b>	German				
<b>Level</b>	<b>Undergraduate</b>	<b>X</b>	<b>Graduate</b>		<b>Postgraduate</b>
<b>Department / Program</b>	Molecular Biotechnology				
<b>Forms of Teaching and Learning</b>	Face-to-face				
<b>Course Type</b>	<b>Compulsory</b>		<b>Elective</b>		<b>X</b>
<b>Objectives</b>	Having an understanding of the methods for isolation and characterization of desired substances from bacteria and plants and modification of metabolism to produce these substances efficiently.				
<b>Content</b>	Production and industrial applications of hydrolases, oxidoreductases, transferases, isomerases, lyases and ligases with biocatalytic reactions.				
<b>Prerequisites</b>	-				
<b>Coordinator</b>	-				
<b>Lecturer(s)</b>	-				
<b>Assistant(s)</b>	-				
<b>Work Placement</b>	-				
Recommended or Required Reading					
<b>Books / Lecture Notes</b>	K. Faber, Biotransformations in Organic Chemistry, Springer, 6. Auflage, Springer Verlag				
<b>Other Sources</b>	A. Behr, T. Seidensticker, Einführung in die Chemie nachwachsender Rohstoffen, Springer Verlag				
Additional Course Material					
<b>Documents</b>	-				
<b>Assignments</b>	-				
<b>Exams</b>	-				
Course Composition					
<b>Mathematics and Basic Sciences</b>					%
<b>Engineering</b>	30				%
<b>Engineering Design</b>					%
<b>Social Sciences</b>					%

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Educational Sciences			%
Natural Sciences	70		%
Health Sciences			%
Expert Knowledge			%
<b>Assessment</b>			
<b>Activity</b>	<b>Count</b>		<b>Percentage (%)</b>
Midterm Exam	1		40
Quiz	0		0
Assignments	1		20
Attendance	0		0
Recitations	0		0
Projects	0		0
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	13	3	39
Self-Study	13	6	78
Assignments	0	0	0
Presentation / Seminar Preparation	1	10	10
Midterm Exam	1	2	2
Recitations	0	0	0
Laboratory	13	2	26
Projects	0	0	0
Final Exam	1	2	2
		<b>Total Work Load</b>	<b>157</b>
		<b>ECTS Points (Total Work Load / Hour)</b>	<b>6</b>
<b>Learning Outcomes</b>			
<b>1</b>	To have knowledge about the techniques of obtaining products efficiently from bacteria and plant cells.		
<b>Weekly Content</b>			
<b>1</b>	Industrial use of natural materials - General techniques and processes for production of natural substances		
<b>2</b>	Production of natural substances from microorganisms		
<b>3</b>	Biotechnological production of aminoglycosides and steroids.		
<b>4</b>	Natural products from plants - screening, isolation, characterization		
<b>5</b>	Natural substances from plants - biotechnological production		

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6	Natural products from the sea - identification, isolation, characterization
7	Bioassays to identify biological activities - cell-based assays, -omics technologies
8	Natural products in drug discovery - Pharma Proteins, Heterologous Expression
9	Production and industrial applications of hydrolases, oxidoreductases, transferases, isomerases, lyases and ligases with biocatalytic reactions.
10	Immobilization techniques
11	Production of biopolymers, xenobiotics by using microorganisms
12	Presentations of selected publications from the above-mentioned subject areas.
13	Presentations of selected publications from the above-mentioned subject areas.

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

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	0	5	3

**Contribution Level:** 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

<https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=5707>

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