

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details					
Code				Academic Year	Semester
MBT324				3	6
Title	T	A	L	ECTS	
Molecular Biotechnology III	2	0	2	5	
Language	German				
Level	Undergraduate	X	Graduate	Postgraduate	
Department / Program	Molecular Biotechnology				
Forms of Teaching and Learning	Face-to-face				
Course Type	Compulsory	X	Elective		
Objectives	This module provides in-depth knowledge in the field of white and green molecular biotechnology and introduces students to scientific thinking and the experimental background of central methods. The students acquire an in-depth theoretical and practical understanding of various techniques of protein and metabolic engineering as well as synthetic biology and are able to plan and carry out experiments independently.				
Content	Subject areas of molecular biotechnology and synthetic biology Recombinant technology and cloning strategies (planning, tags for detection and purification, shuttle vectors, targeted mutagenesis) Application examples from green and white biotechnology (e.g. Bt maize, industrial enzymes, etc.)				
Prerequisites	-				
Coordinator	-				
Lecturer(s)	-				
Assistant(s)	Research Assist.Melis Işık Toksoy, Research Assist. Ogün MORKOÇ				
Work Placement	-				
Recommended or Required Reading					
Books / Lecture Notes	D. Clark, N. Pazdernik, Molekulare Biotechnologie: Grundlagen und Anwendungen				
Other Sources	Lecture notes				
Additional Course Material					
Documents	-				
Assignments	-				
Exams	-				
Course Composition					
Mathematics und Basic Sciences	-			%	
Engineering	30			%	

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Engineering Design	-	%
Social Sciences	-	%
Educational Sciences	-	%
Natural Sciences	70	%
Health Sciences	-	%
Expert Knowledge	100	%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	30
Quiz	0	0
Assignments	2	30
Attendance	0	0
Recitations	0	0
Projects	0	0
Final Exam	1	40
Total		100

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	13	2	26
Self-Study	13	4	52
Assignments	1	10	10
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	1	2
Total Work Load			128
ECTS Points (Total Work Load / Hour)			5

Learning Outcomes

1	Having substantial knowledge about biotechnological applications
2	Having the ability to find solutions to current problems in biotechnology
3	Having In-depth knowledge of metabolism and protein engineering

Weekly Content

1	Introduction to topics of biotechnology (green, white and gray biotechnology) and synthetic biology
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2	Vectors - recombinant technology - cloning strategies (planning, "tags" for detection and purification, shuttle vectors, targeted mutagenesis)
3	Protein Engineering - Directed Evolution - DNA Shuffling - Xenobiology
4	Metagenomics
5	Environmental biotechnology (bioremediation & bioremediation)
6	Biocatalysis - Industrial biotechnological production of enzymes
7	Industrial Biotechnological Production - Biosynthetic Materials (Alcohols, Foodstuffs, Plastics, Antibiotics & Dyes)
8	Synthetic biology (construction of synthetic circuits) - metabolic engineering
9	Transgenic plants and plant biotechnology
10	Plant biotechnology
11	Transgenic animals
12	Seminar - presentation of publications from the above-mentioned subject areas
13	Seminar - presentation of 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	1	4	4
2	5	5	5	5	1	4	4
3	5	5	5	5	3	4	4

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>

Compiled by: Research Assist. Dr. Betül Uluca

Date of Compilation: 11.07.2023