

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	Academic Year			Semester
MBT453	4			7
Title	T	A	L	ECTS
Biomathematics	2	2	-	6
Language	German			
Level	Undergraduate	X	Graduate	Postgraduate
Department / Program	Molecular Biotechnology			
Forms of Teaching and Learning	Face-to-face			
Course Type	Compulsory		Elective	X
Objectives	Ability to describe biological processes with mathematical models.			
Content	Main mathematical models for biological systems.			
Prerequisites	-			
Coordinator	-			
Lecturer(s)	Asst. Prof. Dr. Neşe Aral Sözüner			
Assistant(s)	-			
Work Placement	-			
Recommended or Required Reading				
Books / Lecture Notes	Mathematical Biology, Roland W. Shonkwiler, James Herod			
Other Sources	-			
Additional Course Material				
Documents	-			
Assignments	-			
Exams	-			
Course Composition				
Mathematics und Basic Sciences	80			%
Engineering				%
Engineering Design				%
Social Sciences				%
Educational Sciences				%
Natural Sciences	20			%

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Health Sciences			%
Expert Knowledge			%
Assessment			
Activity	Count		Percentage (%)
Midterm Exam	1		40
Quiz	-		-
Assignments	-		-
Attendance	-		-
Recitations	-		-
Projects	1		20
Final Exam	1		40
		Total	100
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	13	2	26
Self-Study	13	3	39
Assignments	-	-	-
Presentation / Seminar Preparation	-	-	-
Midterm Exam	1	15	15
Recitations	13	2	26
Laboratory	-	-	-
Projects	1	20	20
Final Exam	1	15	15
		Total Work Load	141
		ECTS Points (Total Work Load / Hour)	6
Learning Outcomes			
1	Ability to build mathematical models for biological systems.		
Weekly Content			
1	Linear regression and Interpolation		
2	Differential Equations		
3	Population dynamics		
4	Disease spread and Epidemics		
5	Enzyme Dynamics		
6	Biological Oscillators		

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7	Lotka-Volterra Systems
8	Chaotic Systems
9	Diffusion and Random Walks
10	Game Theory, Nash Equilibrium and Evolution
11	Cellular Automata
12	Information Theory and Genome
13	Self Organization

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

	P1	P2	P3	P4	P5	P6	P7	P8
1	4	5	5	5	5	5	1	-

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

OBS LINK:

Compiled by: Asst. Prof. Dr. Neşe Aral Sözener

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