

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details					
Code				Academic Year	Semester
NWI402				4	8
Title	T	A	L	ECTS	
MATLAB for Biosciences	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	Having an understanding of programming concepts to make mathematical models of biological systems and being able to make applications on MATLAB				
Content	Differential equations: Population dynamics, predator-prey model, Michaelis-Menten kinetics, epidemic models. Image processing: Cell counting. Stochasticity: Diffusion, oxygen transport. Genetics: Sequence alignment, construction of phylogenetic trees. Neurophysiology: Synaptic transmission. Cellular automata.				
Prerequisites					
Coordinator					
Lecturer(s)					
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					%
Engineering					%
Engineering Design					%
Social Sciences					%
Educational Sciences					%

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Natural Sciences	100		%
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	14	2	28
Self-Study	14	3	42
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	15	15
Recitations			
Laboratory	14	2	28
Projects	1	20	20
Final Exam	1	15	15
		Total Work Load	148
		ECTS Points (Total Work Load / Hour)	6
Learning Outcomes			
1	Students will be able to make mathematical models of biological systems		
Weekly Content			
1			
2			
3			
4			
5			

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6	
7	
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10	
11	
12	
13	
14	
15	

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

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

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

P01 Working with modern scientific sources.
P02 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.
P03 Having theoretical and practical skills in the area of biotechnology.
P04 Having foreign language skills to follow the worldwide advancements in the field of biotechnology and to be able to discuss them with foreign colleagues.
P05 Having computational skills for research data analysis purposes.
P06 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.
P07 Having knowledge about work occupational work and safety.

Compiled by:

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