

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				
Language		German		
Level				
Undergraduate		X	Graduate	Postgraduate
Department / Program				
Department / Program		Molecular Biotechnology		
Forms of Teaching and Learning				
Forms of Teaching and Learning		Face-to-face		
Course Type				
Compulsory			Elective	X
Objectives				
Objectives		Having an understanding of programming concepts to make mathematical models of biological systems and being able to make applications on MATLAB		
Content				
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				
Prerequisites				
Coordinator				
Coordinator				
Lecturer(s)				
Lecturer(s)				
Assistant(s)				
Assistant(s)				
Work Placement				
Work Placement				
Recommended or Required Reading				
Books / Lecture Notes		Mathematical Biology, Roland W. Shonkwiler, James Herod		
Other Sources				
Other Sources				
Additional Course Material				
Documents				
Documents				
Assignments				
Assignments				
Exams				
Exams				
Course Composition				
Mathematics und Basic Sciences				%
Engineering				%
Engineering Design				%
Social Sciences				%

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Educational Sciences			%
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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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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