DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
NWI202	2			4
Title	**T**	**A**	**L**	**ECTS**
Physical Chemistry II	3	1	1	6

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	Building on a deep understanding of the subject, students should be able to: • to discuss the phase behavior of real systems, processes at electrodes, and chemical equilibria based on molecular and thermodynamic concepts. • Have a basic understanding of chemical kinetics and reaction dynamics. • to master the most important experimental techniques for the measurement and evaluation of physical-chemical quantities and processes.					
Content	Theory: reactions in water; Electrochemistry; reaction kinetics; Atmospheric chemistry. Practical course: Melting diagram of binary mixtures, pH-dependence of a solvolysis reaction, birefringence of light by nematic liquids, viscosity of liquids, heat of evaporation, cane sugar inversion, viscosity of gases, decomposition of diacetone alcohol, charge transport in electrolyte solutions, pH balance of buffer ¬lösungen, Nernst distribution set, mixing behavior of liquids, quantum mechanics					
Prerequisites						
Coordinator						
Lecturer(s)	Asist Prof.Dr. Sibel Özenler					
Assistant(s)						
Work Placement						

Recommended or Required Reading	
Books / Lecture Notes	G. Wedler: Lehrbuch der Physikalischen Chemie; VCH, 5. Aufl., 2004
Other Sources	P.W. Atkins: Physikalische Chemie; VCH-Wiley, 4. Aufl., 2006 T Engel/P. Reid; Physikalische Chemie

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		% 60

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Engineering		% 40
Engineering Design		% 0
Social Sciences		% 0
Educational Sciences		% 0
Natural Sciences		% 0
Health Sciences		% 0
Expert Knowledge		% 0

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	% 20
Quiz	0	% 0
Assignments	0	% 0
Attendance	0	% 0
Recitations	1	% 30
Projects	1	% 10
Final Exam	1	% 40
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	15	2	30
Self-Study	15	5	75
Assignments	2	6	12
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	15	1	15
Laboratory	15	2	30
Projects			
Final Exam	1	2	2
		Total Work Load	**166**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	Building on a deep understanding of the subject, students should be able to discuss the phase behavior of real systems, processes at electrodes, and chemical equilibria based on molecular and thermodynamic concepts.
2	
3	
4	

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

5	
6	
7	
8	
9	
10	
11	
12	
Weekly Content	
1	Foundations of reaction kinetics
2	Basics, complex kinetics and approximation, activation energy and catalysis
3	postulates of quantum mechanics, Schrödinger equation, simple quantum chemical models
4	Quantum-mechanical approximation, atomic structure
5	Chemical bond
6	Electromagnetic spectrum
7	
8	
9	
10	
11	
12	
13	
14	
15	

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

	P1	P2	P3	P4	P5	P6	P7
1	3	1					
2							
3							
4							
5							
6							
7							
8							

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

9							
10							
11							

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High
Compiled by:	
Date of Compilation:	08.03.2021