

DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY
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	Materials Science and Technology			
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: <ul style="list-style-type: none"> • 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)	Dr. Samira FATMA KURTOĞLU ÖZTULUM			
Assistant(s)	-			
Work Placement	No			
Recommended or Required Reading				
Books / Lecture Notes	G. Wedler: Lehrbuch der Physikalischen Chemie; VCH, 5. Aufl., 2004			
Other Sources	1.P.W. Atkins: Physikalische Chemie; VCH-Wiley, 4. Aufl., 2006 2.T Engel/P. Reid; Physikalische Chemie			
Additional Course Material				
Documents	-			
Assignments	-			
Exams	-			
Course Composition				

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Mathematics und Basic Sciences		60%
Engineering		40%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	25%
Quiz	1	5%
Assignments	1	15%
Attendance		
Recitations		
Projects	1	10%
Final Exam	1	45%
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.
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Weekly Content

1	Foundations of reaction kinetics
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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, electromagnetic spectrum

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

	P1	P2	P3	P4	P5	P6	P7	P8
1	3	1						

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

Program Learning Outcomes: <https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=207>

Compiled by: Res. Asst. Sami Orçun KORTUNAY

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