

University of Petra

Faculty of Art & Science

Department of Chemistry



جامعة البترا

كلية الآداب والعلوم

قسم الكيمياء

Course Syllabus

Year: 2019-2020

Semester: **Second**

Course No.	Course Title	Prerequisite	Co-requisite	Credit Hours	ECTS: European Credit Transfer System
101422	Physical Chemistry Lab (2)	101323	None	3	5

Instructor's Name	E-mail	Office No.	Office ext.	Office Hours
Layla Qaddoura	lqaddoura@uop.edu.jo	7203	7203	Sun.,Tue.,Thu. 12-1, Tue.,Thu. 1-2

Course Description	This practical course is meant to build up knowledge and skills of students in basic physical chemistry, understanding the concepts of some topics as kinetics and electrochemistry. This is achieved through 10 experiments that should be performed effectively & safely, using laboratory equipments and standard scientific procedures.
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Course Objectives

1. To instill in students a sense of enthusiasm for physical chemistry, an appreciation of its application in different contexts and to involve them in an intellectually stimulating and satisfying experience of learning and studying.
2. To develop in students the ability to apply their chemical knowledge and skills to the solution of theoretical and practical problems in physical chemistry.
3. To provide students with a knowledge and skills base from which they can proceed to further studies in specialized areas of chemistry or multi-disciplinary areas involving chemistry.
4. To generate in students an appreciation of the importance of chemistry in an industrial, economic, environmental and social context.
5. To provide students with a broad and balanced foundation of chemical knowledge and practical skills.

Course Intended Learning Outcomes (ILOs) and their Alignment with Program ILOs:

Upon successful completion of this course, students are expected to achieve the following learning outcomes:

Course ILOs	Program ILOs	Teaching and Learning Method	Assessment Method
Knowledge (K)			

Demonstrate knowledge and understanding of essential facts, concepts, principles and theories, related to the titles of experiments. This includes kinetic studies and electrical conductance of strong and weak electrolytes.	K1	Lecture by teacher, Instructions, Discussion in the Lab.& Performing experiments.	Exams: Mid and Final , Lab reports, Evaluation
Intellectual Skills (I)			
Estimate chemical data by performing calculations related to experiments covered in the syllabus. This may include sketching graphs of "first degree equations" and solving algebraic equations for an unknown quantity.	I2	Lecture by teacher, Instructions, Discussion in the Lab.& Performing experiments.	Exams: Mid and Final , Lab reports, Evaluation
Practical skills (P)			
Use laboratory equipment and standard procedures safely.	P1	Lecture by teacher, Instructions, Discussion in the Lab.& Performing experiments.	Lab reports, Evaluation
Appreciate the importance of carrying out careful and precise measurements to generate reliable data.	P2		
prepare scientific reports that collect and organize data.	P4		
Transferable Skills (T)			
Communication skills, covering both written and oral communications.	T1	Lecture by teacher, Instructions, Discussion in the Lab.& Performing experiments.	Lab reports, Evaluation
Problem solving skills, relating to qualitative and quantitative information.	T2		

Assessment Methods:

Assessment method	Grade	Comments
Midterm Exam	20	-Every student should bring his own scientific calculator when entering the exam hall. Calculators are not allowed to be exchanged between students during exam.
Reports	30	
Evaluation	10	
Practical quiz	10	- Every student should also bring a graph paper, a 30 cm ruler, a pencil and an eraser when entering the exam hall.
Final Exam	30	
Total	100	-Students are not allowed to carry their mobiles inside exam lab.

Learning References:

1- **Textbook:** [Practical Physical Chemistry Manual For Chemistry 101422](#), by: Layla Qaddoura,

2- **Other Resources:** [a lecture room with data show facility.](#)

Course Schedule:

Week	Topic	Topic Details	Course ILOs	Reference
1	The bromate – bromide reaction	To obtain the rate law and the rate constant of the reaction by different methods.	All	
2	Reaction between I ⁻ and H ₂ O ₂			
3	The effect of temperature on reaction rate	To apply Arrhenius equation so as to obtain the energy of activation of the reaction.		

4	The OH ⁻ - crystal violet reaction	To study the kinetics of the reaction using spectrophotometric method.	All	Practical Physical Chemistry Manual (101422)
5	Acid hydrolysis of esters	To obtain the rate law and the rate constant of the reaction by different methods.		
6	Halogenation of acetone in water			
7	Midterm Exam	Midterm Exam		
8	Kinetic study of the reaction between persulfate and I ⁻ ions	To obtain the rate law and the rate constant of the reaction using the half life method.		
9	Dissociation constant of a weak acid by conductimetric method	To determine K _a of some weak acid using conductimetric method.		
10	Electrical conductance of strong and weak electrolytes	To identify quantitatively the difference in conductance between strong and weak electrolytes.		
11	Potentiometric redox titration of Fe ²⁺	To undergo a potentiometric titration between Fe ²⁺ and Ce ⁴⁺ so as to evaluate the reduction potential of both half cells.		

Course Policies¹

- Attendance Policy: University regulations apply to attendance.
- Academic Honesty: Academic dishonesty is an unacceptable mode of conduct, and will not be tolerated in any form at University of Petra. All persons involved in academic dishonesty and plagiarism in any form will be disciplined in accordance with University rules and regulations.

Approved by	Name
Head of Department	Dr. Abd el Monem Twaiq
Faculty Dean	Prof. Rami Abdel-Rahem

¹ Additional information may be added in this section according to the nature of the course.