



**Course Syllabus**  
**According to JORDAN National Qualification**  
**Framework (JNQF)**

**Course Name:** Physical Chemistry laboratory (1)

**Course Number:** 11012242

### General Course Information:

Course title	Physical Chemistry laboratory (1)
Course number	11012242
Credit hours	2 Credit hours
Education type	Face-to-Face
Prerequisites/corequisites	11011204 + 11012241 أو متزامن
Academic Program	Bachelor
Program code	01
Faculty	Faculty of science
Department	Department of Chemistry
Level of course	2nd year
Academic year /semester	First semester 2022/2023
Awarded qualification	BSc degree of chemistry
Other department(s) involved in teaching the course	None
Language of instruction	English
Date of production/revision	2022/2023

### Course Coordinator:

Coordinator's name	Ms. Dareen Hemedat
Office No	
Office Phone extension number	2635
Office Hours	
Email	dareenhmedat@yahoo.com

### Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

### Course Description (English/Arabic):

English	Experiments in thermodynamics, thermochemistry, chemical equilibrium, solutions and phase equilibrium.
Arabic	تجارب في الديناميكا الحرارية; تجارب في الكيمياء الحرارية; تجارب في الاتزان الكيميائي; تجارب في المحاليل و اتزان الاطوار.

### Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

1. Practical physical Chemistry (1) Laboratory manual, Isra University 2018-2019

**References: Author(s), Title, Publisher, Edition, Year, Book website.**

Required book (s), assigned reading and audio-visuals:

1. Collected Manual, Department of Applied Chemical Science

**Course Educational Objectives (CEOs):**

1.	To enhance the theoretical knowledge acquired in the physical chemistry 1 (1101241) and to give the student the chance to apply what they have learned practically
2.	The students will learn some new experimental techniques that are necessary for them to become effective chemists and researchers.
3.	The student will learn how to write a lab report in a professional manner.
4.	Able to design work both individually and as part of team.

**Intended Learning Outcomes (ILO's):**

1.	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
2. A	<b>Knowledge and Understanding:</b>				
3. A1	Student will be able to recognize fundamentals of physical chemistry including chemical thermodynamics, surface chemistry and chemical equilibrium	1	1	1	1
4. B	<b>Intellectual skills:</b>				
5. B1	Student will be able to perform calculations related to experiments this may include sketching graphs and solving algebraic equations.	3	2	4	s
6. C	<b>Subject specific skills:</b>				
7. C1	Student will be able to determine physical properties of solutions and recognize fundamentals of physical chemistry including phases diagram and surface chemistry	2,3	2,3	3,4	S,c
8. D	<b>Transferable skills:</b>				
9. D1	Student will learn how to work individually and with partners effectively	4	7	3	c

**\*Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**\*\* Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

**Program Learning Outcome (PLOs):**

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (Chemistry) program will demonstrate:		Descriptors**		
		K	S	C
1.	An ability to acquire and apply new knowledge as required across different fields of chemistry, using appropriate learning strategies.	✓		
2.	An ability to identify, formulate, and solve problems by applying principles and theories of chemistry, science and mathematics based on critical thinking.		✓	
3.	An ability to develop and conduct appropriate experimentation, analyze, interpret data, and draw conclusions.		✓	
4.	An ability to apply scientific principles and theories of chemistry to serve community in health, economic and environmental sectors.			✓
5.	An ability to communicate effectively with a wide range of audiences			✓
6.	An ability to recognize ethical and professional responsibilities in the field of chemistry, and make informed judgments that consider the impact of chemistry in global, economic, environmental and societal contexts.			✓
7.	An ability to function effectively as a part of a team, take on leadership positions, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			✓

**\*\* Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

**Weekly Schedule (please choose the type of teaching)**

☐ ✓ (4 hrs Face – To - Face)

☐ Hybrid (2 Lectures Face – To - Face +1 Lecture Asynchronous)

☐ Hybrid (1 Lectures Face – To - Face +1 Lecture Asynchronous)

☐ Online (2 Lectures Synchronous +1 lecture Asynchronous)

Week	four Hours (face to face)	Second Hour (.....)	Third Hour (.....)	Ach. ILOs	Ach. PLOs	Descriptors*
Week 1	Safety rules and Laboratory Apparatus			C1	2,3	s
Week 2	Week 2: Freezing point Depression of non-electrolytes.			C1 & B1&	1,2,3 7,	s

				D1		
Week3	<b>Week 3: Chemical equilibrium of solution</b>			A1 & B1 & D1	1,2,3,7	s
Week 4	<b>Week 4: Steam Distillation</b>			C1 & B1 & D1	1,2,3,7	s
Week 5	<b>Week 5: Heat of solution from solubility.</b>			C1 & B1 & D1	1,2,3,7	s
Week 6	<b>Week 6: Determination of Critical Temperature of phenol-water system</b>			C1 & B1 & D1	1,2,3,7	s
Week 7	<b>Week 7: Midterm Exam</b>					
Week 8	<b>Week 8: Binary liquid-vapor phase diagram</b>			C1 & B1 & D1	1,2,3,7	s
Week 9	<b>Week 9: Three Component Systems</b>			C1 & B1 & D1	1,2,3,7	s
Week10	<b>Week 10: Surface tension of solutions.</b>			C1 & B1 & D1	1,2,3,7	s
Week11	<b>Week 11: Composition of complex ion in solution.</b>			C1 & B1 & A1 & D1	1,2,3,7	s
Week12	<b>Week 12: Partial Molar Volume.</b>			C1 & B1 & D1	1,2,3,7	s
Week13	<b>Week 13: Final Exam</b>					

\* K: Knowledge, S: Skills, C: Competency

### Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- (4 hrs Face – To - Face)
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

### Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20%**
- Midterm **30 %**
- Final Exam **50 %**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

### Required equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

### Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching

### Responsible Persons and their Signatures:

Course Coordinator	M.Sc. Dareen Hmedat	Completed Date	16/ 10 / 2022
		Signature	Dareen Hmedat
Received by (Department Head)	Dr. Manal Al Khabas	Received Date	17/ 10 / 2022
		Signature	