



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

**Course Name:** Analytical Chemistry laboratory

**Course Number:** 11012132

### General Course Information:

Course title	Analytical Chemistry laboratory
Course number	11012132
Credit hours	1 Credit hours
Education type	3 hours [Face-to-Face]
Prerequisites/corequisites	11011204 + 11012131 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. Ghada Idrees
Office No	
Office Phone extension number	2754
Office Hours	
Email	<a href="mailto:gada.edris@iu.edu.jo">gada.edris@iu.edu.jo</a>

### Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

### Course Description (English/Arabic):

English	Volumetric analysis including Preparation of Selected Analytical Reagents and Calibration standard, Acid-base titration; Precipitation reactions titration; compleximetric titration, redox titration and gravimetric analysis.
Arabic	التحليل الحجمي عن طريق تحضير المحاليل ومعايير الحموض و القواعد; معايرات تفاعلات الترسيب معايرات تكوين المركبات المعقدة; معايرات التأكسد و الاختزال و التحليل الوزني.

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

**1. Analytical Chemistry Laboratory manual, Isra University 2018-2019**

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

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

.1 Fundamentals of Analytical Chemistry: by Skoog; West; Holler; and Crouch, 8th Edition, Thomson, Brooks/Cole, (2004)

**Course Educational Objectives (CEOs):**

1.	To enhance the theoretical knowledge acquired in the analytical chemistry class (11012131) and to give the student the chance to apply what they have learned practically
2.	To allow the students to practice accurate and precise measurements in analytical analysis and practice different volumetric and gravimetric analytical techniques to employ them in real life problems
3.	The student will learn how to obtain data accurately and to manipulate the data correctly to be able to prepare a good report
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	Knowledge and Understanding:				
3. A1	Student will be able to describe the principle of quantitative and qualitative chemical analysis using different methods	1	a	1	k
4. B	Intellectual skills:				
5. B1	Student will be able to estimate chemical data by performing calculations and presenting the results	3	g	4	s
6. C	Subject specific skills:				
7. C1	Student will be able to dealing with balances, volumetric glassware and carrying calibration of certain volumetric glassware and will be able to employ volumetric method and gravimetric method analysis.	1,2,3	d, e	3,4	s,c
8. D	Transferable skills:				
9. D1	Student will be learn how to work individually and with partners effectively	4	f	3	c

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**\*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 (_____) program will demonstrate:	Descriptors**		
	K	S	C

1.	Describe the fundamental scientific principles and theories across the four subfields of chemistry (Organic, inorganic, analytical and physical).	✓		
2.	Identify and confirm chemical compounds structures as well as determine chemical composition	✓		
3.	Establish and concludes mechanisms of physical and chemical processes in addition to the ability of mastering qualitative and quantitative determination			✓
4.	Solve the scientific problems using different mechanisms and procedures based on critical thinking		✓	
5.	Conduct scientific experiments in chemistry			✓
6.	Commitment and interest in lifelong learning, and collaborate effectively with other people in a team			✓
7.	Prepare logical, organized and concise written reports, and oral and poster presentations that effectively communicate chemical content to other scientists.		✓	
8.	Commitment to the ethical principles of chemical research.			✓
9.	Find information about chemistry through databases and information		✓	
10.	Evaluation of calculations in chemistry experiments and information analysis using computer software.			✓
11.	Demonstrate safety laboratory techniques.		✓	

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

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

#### **✓ 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	Three Hours (face- to -face)	Second Lecture	Third Lecture	Ach. ILOs	Ach. PLOs	Descriptors**
1	Laboratory Safety Rules and Regulations			A1 & C1	a,d,e,	K, s
2	Volumetric Glassware and Balances			A1 & B1 & C1 & D1	a,d,e,g,f	s
3	Preparation of Selected Analytical Reagents and Calibration standard			A1 & B1 & C1 & D1	a,d,e,g,f	s
4	Standardization of analytical Reagents			A1 & B1 & C1 & D1	a,d,e,g,f	s
5	Sampling and Statistical Data			A1 & B1 & C1 & D1	a,d,e,g,f	s

6	Application on Acid-Base Determination of acid values in oils and fats			A1 & B1 & C1 & D1	a,d,e,g,f	s
7	Midterm Exam					
8	The Neutralizing Capacity of Antacid Tablets			A1 & B1 & C1 & D1	a,d,e,g,f	s
9	Precipitation Titration [Argentometry]			A1 & B1 & C1 & D1	a,d,e,g,f	s
10	Redox Titration [Dichromate Titration]			A1 & B1 & C1 & D1	a,d,e,g,f	s
11	Complexometric Titration Using EDTA			A1 & B1 & C1 & D1	a,d,e,g,f	s
12	Buffer Solution			A1 & B1 & C1 & D1	a,d,e,g,f	s
13	Introduction of Gravimetric Method of Analysis			A1 & C3	a,d,e,	k
14	Gravimetric Determination of Chloride			A1 & B1 & C1 & D1	a,d,e,g,f	s
15	Gravimetric Determination of Sulfate			A1 & B1 & C1 & D1	a,d,e,g,f	s
16	Gravimetric Determination of Nickel as Ni(DMG) <sub>2</sub>			A1 & B1 & C1 & D1	a,d,e,g,f	s
17	Final Exam					

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

### Teaching Methods and Assignments:

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

- (3 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
- 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	<b>M.Sc. Ghada Idrees</b>	Completed Date	<b>16/ 10 / 2022</b>
		Signature	<i>Ghada idrees</i>
Received by (Department Head)	<b>Dr. Manal Al Khabas</b>	Received Date	<b>17/10/2022</b>
		Signature	<i>Manal Al Khabas</i>