مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	**Instrumental Analysis**
2	**Course number**	**0343311**
3	**Credit hours**	3
	Contact hours (theory, practical)	3
4	**Prerequisites/corequisites**	**0303211**
5	**Program title**	**Chemistry**
6	**Program code**	03
7	**Awarding institution**	The University of Jordan
8	**School**	Science
9	**Department**	Chemistry
10	**Course level**	**0303211**
11	**Year of study and semester (s)**	Second 2022/2023
12	**Other department (s) involved in teaching the course**	-
13	**Main teaching language**	**English**
14	**Delivery method**	**X Face to face learning** ☐Blended ☐Fully online
15	**Online platforms(s)**	**X Moodle x Microsoft Teams** ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	2/11/2023

17 Course Coordinator:

Name: Dr. Mohammed Rasheed	Contact hours: S, T, T 11-12 am
Office number: 22	Phone number: 0796001359
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18 Other instructors:

Name: Office number: Phone number: Email: Contact hours: Name: Office number: Phone number: Email: Contact hours:

19 Course Description:

The course describes the principles of most instruments used in analytical chemistry. The course aims to show the student most of the modern instruments for analysis.

20 Course aims and outcomes:

A- Aims:

The course describes the principles of most instruments used in analytical chemistry. The course aims to show the student most of the modern instruments for analysis. This would help the student in any work in the future that needs to use instrumentation, such as medical labs, drugs manufacture, chemical product factories…..

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

CLO-1. Acknowledge the basic concepts and calibration of any Instruments.
CLO-2. Acknowledge of the principles as well as the main components of instruments.
CLO-3. Understand the principle of UV-VIS spectroscopy, atomic absorption and emission.
CLO-4. Understand the principle of chromatography especially the gas and liquid chromatography.

0303311 Instrumental Analysis								
		Student Outcomes (SO)						
		SO-1	SO-2	SO-3	SO-4	SO-5	SO-6	SO-7
Course Learning Outcomes (CLO)	CLO-1	✓						
	CLO-2	✓	✓					
	CLO-3	✓		✓				
	CLO-4	✓	✓	✓				

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction	CLO-1	**Face to Face**	Power point + VLC Player	NA	Attendance + HW + Quizzes + Exam	Skoog et al.
	1.2	Types of Analysis	CLO-1	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam	

	1.3	Analysis parameters	CLO-1	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
2	2.1	Calibration	CLO-1	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	2.2	Standard Addition	CLO-1	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	2.3	Internal Standard	CLO-1	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
3	3.1	Introduction to Spectroscopy	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	3.2	Wave parameters	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	3.3	Quantitative aspects of spectrochemical measurements	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
4	4.1	General design of optical instruments, sources of radiation,	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	4.2	Wave selectors, sample containers, radiation transducer	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	4.3	Signal processors and readouts, fiber optics, types of	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		

		instruments							
5	5.1	Sample atomization techniques,	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	5.2	Atomic absorption atomic	CLO-2	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	5.3	Absorption instrumentation, interferences in atomic absorption spectroscopy, atomic absorption analytical techniques	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
6	6.1	Measurement of transmittance and absorbance, Beer's law	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	6.2	The effect of instrumental noise on spectrophotometric analysis	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	6.3	Instrumentation	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
7	7.1	The magnitude of molar absorptivities, absorbing species,	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	7.2	Application of absorption measurement to quantitative	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		

		analysis							
	7.3	Photometric titrations.	CLO-3	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
8	8.1	General description of chromatography	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	8.2	Migration rates of solutes, zone broadening and column efficiency	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	8.3	Optimization of column performance, applications of chromatography.	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
9	9.1	Principles of gas liquid chromatography, instruments for gas liquid chromatography,	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	9.2	Gas chromatography columns and stationary phases,	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	9.3	Applications of gas-liquid chromatography (GLC), gas-solid chromatography.	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
10	10.1	Scope of HPLC, column efficiency in liquid chromatography,	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		
	10.2	Instruments for liquid chromatography,	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes +		

		partition chromatography, adsorption chromatography,					Exam		
	10.3	Ion exchange chromatography, size exclusion chromatography, thin-layer chromatography	CLO-4	**Face to Face**	PP +VLC		Attend. + HW + Quizzes + Exam		

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Quizzes	15	All	All	2 + 7 + 10-	Face to Face
Attendance	5	All	All	During Semester	Face to Face
Mid	30	All	All	5	Face to Face
Final	50	All	All	12	Face to Face

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

24 Course Policies:

A- Attendance policie: Regular attendance is essential for satisfactory completion of this course.

B- Absences from exams and submitting assignments on time:

Instructors must offer reasonable assistance in making up missed work in case the student has reasonable excuse

C- Health and safety procedures:

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NA

D- Honesty policy regarding cheating, plagiarism, misbehavior: **Students are always advised to follow the instructions of the lectures and the exam**

E- Grading policy: **Grade System**

F- Available university services that support achievement in the course:

Data Show and smart boards

25 References:

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

Textbook: **Principles of Instrumental Analysis, D. Skoog, F. Holler and S. Crouch, , Sixth Edition, Thomson/Brooks/Cole 2007**

Videos and audio from the instructor and from outside resources.

B- Recommended books, materials, and media:

26 Additional information:

Name of Course Coordinator: **Dr. Mohammed Rasheed**; Signature: ---------- Date: ----------

Head of Curriculum Committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------