

Course Syllabus

1	Course title	Instrumental Analysis In Geology	
2	Course number	0305314	
3	Credit hours	1 practical	
	Contact hours (theory, practical)	3 practical	
4	Prerequisites/corequisites	0303106	
5	Program title	Environmental and applied Geology	
6	Program code		
7	Awarding institution	The University of Jordan	
8	School	School of science	
9	Department	Geology	
10	Course level	3 rd year	
11	Year of study and semester (s)	Spring 2023/2024	
12	Other department (s) involved in teaching the course	None	
13	Main teaching language	English	
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date	4/4/2017 revision 8/2/2024	

17 Course Coordinator:

Name: Dr Najel Yaseen	Contact hours: Thursday 11:30 – 14:30 pm
Office number: 202	Phone number: 22275
Email: nyaseen@ju.edu.jo	



18 Other instructors:

Non

19 Course Description:

As stated in the approved study plan.

This lab aims at introducing the geology student into the techniques of instrumental analyses and identification of Earth's material i.e minerals, rocks, water chemistry etc; This lab will be given for the whole semester 3 hours a week and every lab will be preceded by an introduction on the theoretical basis of the different techniques; The techniques include: X-Ray diffraction, X-Ray fluorescence, Flame photometer, Atomic Absorption Spectroscopy, Inductively Coupled Plasma, Mineral Separation using gravimetric and magnetic methods. Staining techniques; and Scanning Electron Microscopy.

20 Course aims and outcomes:

A- Aims:

1. to familiarise students with the various analytical techniques used in geochemical analysis.
2. to familiarise student with technique of mineral concentration including mineral separation using heavy liquids and magnetic methods.



B- Students Learning Outcomes (SLOs):

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

SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)
SLOs of the course									
1- make thin section for soft and hard rocks			X			X	X		
2- identify different minerals using staining procedures			X		X	X	X		
3- Mechanical preparation of rocks			X			X	X		
4- use the magnetic separator to separate minerals with different magnetic susceptibility			X		X	X	X		
5- use heavy liquids to separate minerals with different densities			X		X	X	X		
6- explain how x-ray is produced			X			X	X		
7- explain the x ray emission spectrum			X		X	X	X		
8 read the diffractogram and identify minerals using XRD			X		X	X	X		
9 make elemental analysis using x ray fluorescence			X		X	X	X		
10 explain the interaction between energy and matter			X		X	X	X		
11-use the principles of the scanning electron microscopy			X		X	X	X		
12 explain the principles of microprobe analyzers			X		X	X	X		



13 explain and use of atomic absorption spectroscopy			X		X	X	X		
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21. Topic Outline and Schedule:

Week	lab	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1	Introduction		Face to face				
2	2	- identify different minerals using staining procedures	1	Face to face Lab			Writing Report	
Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
3	3	Mechanical preparation of rocks	3	Face to face Lab			Writing report	
4	4	use the magnetic separator to separate minerals with different magnetic susceptibility	4	Face to face Lab			Writing report	
5	5	use heavy liquids to	5	Face to face			Writing report	

		separate minerals with different densities		Lab				
6	6	-explain how x -ray is produced - explain the x ray emission spectrum read the diffractogram and identify minerals using XRD	6 7 8	Face to face Lab			Writing report	
7	7	make elemental analysis using x ray fluorescence	9	Face to face Lab			Writing report	
8	8	Midterm exam						
9	9	explain the interaction between energy and matter explain the interaction between energy and	10 11	Face to face Lab			Writing report	

		matter						
10	10	explain the principles of microprobe analyzers	12	Face to face Lab			Writing report	
Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
11	11	explain and use of atomic absorption spectroscopy	13	Face to face Lab			Writing report	
12	12.1	Final 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
Midterm exam	30	1, 2,3,4,5,6,7,8	1,2,3,4,5,6,7	7	
Lab reports	15	2,3,4,5,6,7,8,9,10			
Activities	5	(1-5), 6, 10 11			
Final exam	50	All topics	1-13	12	



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 policies: **the University regulation**

B- Absences from exams and submitting assignments on time: **The university regulation**

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy: **(could be modified)**

0 - 39 F

40 - 44 D-

45 - 49 D

50 - 54 D+

55 - 59 C-

60 - 64 C

65 - 69 C+

70 - 74 B-

75 - 79 B

80 - 84 B+

85 - 89 A-

90- 100 A

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

25 References:

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

WILLIAM D. NESSE (2012): Introduction to MINERALOGY . chapter, 8& 9.

Handouts

B- Recommended books, materials, and media:



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26 Additional information:

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Name of Course Coordinator: ----- Najel Yaseen -----Signature: ----- Date: ---10/2/2024----- -----
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----