



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:

Instrumental Analysis in Geology

1	Course title	Instrumental Analysis In Geology
2	Course number	0305314
3	Credit hours (theory, practical)	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	Faculty	School of science
9	Department	Geology
10	Level of course	3 rd year
11	Year of study and semester (s)	2016/2017
12	Final Qualification	BSc
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	4/4/2017

16. Course Coordinator: Dr Najel Yaseen

Office numbers, office hours, phone numbers, and email addresses should be listed.

Office number: 202

Office hours: Sun, Tuesday & Thursday 9 - 11

Office phone: 22275. Mobil phone: 0777462257

Email: nyaseen@ju.edu.jo. Or ynajel@gmail.com.

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. 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.

19. Course aims and outcomes:

A- Aims:

1. to familiarise students with the various analytical techniques used in geochemical analysis, concentrating on the facilities available in the Geochemical Analysis Unit (X-Ray Diffraction (XRD), atomic absorption spectroscopy (ASS), Flam photometer
2. to familiarise student with the theoretical bases of X-Ray fluorescence spectrometry (XRF), electron microprobe analysis (EMP), inductively coupled plasma and scanning Electron Microscopy
3. to familiarise student with technique of mineral concentration including mineral separation using heavy liquids and magnetic methods.
4. to familiarise student with methods of thin section preparation and staining techniques

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...

1- write a lab report

2- make thin section for soft and hard rocks

3- identify different minerals using staining procedures

4- prepare a rock to separate different minerals with different sizes

5- use the magnetic separator to separate minerals with different magnetic susceptibility

6- use heavy liquids to separate minerals with different densities

7- explain how x -ray is produced

8- explain the x ray emission spectrum

9- describe the different parts of x-ray diffraction instrument

10- read the diffractogram and identify minerals using XRD

11- explain the x ray fluorescence

12- make elemental analysis using x ray fluorescence

13 Explain the principles of the scanning electron microscopy

14. using scanning electron microscopy

15 explain the principles of microprobe analyzers

16 explain the principle of atomic absorption spectroscopy

17 using atomic absorption spectroscopy

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
introduction	1		1		

Thin section preparation	2		2	Making thin section and writing a report	
Staining procedure	3		3	Experiment and writing a report	
Methods of rock preparation and using magnetic properties	4		4 and 5	Writing report	
Heavy liquid separation	5		6	Writing report	
Nature of x ray and x ray emission spectrum	6		7 and 8		
X ray diffraction method	7		9 and 10		
X ray fluorescence method	8		11 and 12		
Midterm exam	9				
Scanning electron microscopy	10		13 and 14		
Microprobe analyzer	11		15		
Atomic absorption spectroscopy	12		16 and 17		
Final exam	13				

21. Teaching Methods and Assignments:

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

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:
 Representing experiment results in reports
 Solving exercises
 Writing reports
 Quizzes
 exams

23. Course Policies:

A- Attendance policies:

Following the University regulations

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

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Following the University regulations

E- Grading policy:

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:

24. Required equipment:

25. References:

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

Handouts

Selected chapters from different books

B- Recommended books, materials, and media:

https://serc.carleton.edu/research_education/geochemsheets/index.html

26. Additional information:

Name of Course Coordinator: -----Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File