



مركز الاعتماد  
وإضمان الجودة  
ACCREDITATION & QUALITY ASSURANCE CENTER



**The University of Jordan**

**Accreditation & Quality Assurance Center**

## **Course Syllabus**

**Course Name:**  
**Optical Mineralogy**

1	Course title	Optical Mineralogy
2	Course number	0305211
3	Credit hours (theory, practical)	1 practical
	Contact hours (theory, practical)	3 hours
4	Prerequisites/corequisites	0345221 (Mineralogy)
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	2 <sup>nd</sup> year
11	Year of study and semester (s)	
12	Final Qualification	B Sc
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 - 10

Office phone: 22275. Mobil phone: 0777462257

Email: [nyaseen@ju.edu.jo](mailto:nyaseen@ju.edu.jo). Or [ynajel@gmail.com](mailto:ynajel@gmail.com).

#### 17. Other instructors:

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

#### 18. Course Description:

This lab introduces the student into the techniques of identifying rock-forming minerals using the polarized microscope. This achieved through the measurement of a set of optical properties of minerals; these include: form, color, pleochroism, interference colors, types of extinction, interference figures: uniaxial and biaxial minerals and the 2V angle. The theoretical basis for these properties will be given as introductions to the labs. The lab will be given for whole semester three hours weekly..

#### 1. 19. Course aims and outcomes:

<p>A- Aims:</p> <ol style="list-style-type: none"> <li>1- Introducing the concept of polarizing microscope</li> <li>2- Learn the basics of mineral optics and how to identify basic rock forming minerals in thin section using the polarizing microscope.</li> <li>3- Identifying and recognizing the optical properties of minerals.</li> </ol> <p><b>B- Intended Learning Outcomes (ILOs):</b> Upon successful completion of this course students will be able to ...</p>
1- use polarizing microscope
2- Differentiate between opaque, transparent & translucent minerals.
3- Recognize color and pleochroism.
4- Distinguish between isotropic and anisotropic minerals
5- Recognize grain or crystal form
6- differentiate between the different types of relief
7- determine the refractive index of the mineral relative to the immersion liquid
8-recognize the double refraction phenomena
9-identify the vibration direction of the mineral
10- identify the three types of extinction
11- measure the extinction angle
12- explain the term indicatrix
13- describe the interference color
14-estimate the retardation of the mineral
15-determine the birefringence by using interference color chart
16-explain the uniaxial indicatrix
17-recognize the different uniaxial indicatrix sections
18-determine the fast and slow rays of a mineral
19- identify of uniaxial interference figures and the determination of the optic sign
20- explain the Biaxial indicatrix
21- identify the Biaxial interference figures and the determination of the optic sign
22- identify the optical properties of the minerals: Quartz, Nepheline, calcite and Garnet
23- identify the optical properties of the mineral groups: Olivine, Pyroxenes and Amphiboles
24- identify the optical properties of the mineral groups: Micas and Feldspars

## 20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Polarizing microscope and polarized light	1		1	Lab report	Lab Manual
Color diaphaneity, isotropic and anisotropic minerals	2		1, 2, 3 & 4	Lab report	Lab Manual
Refractive indices and relief	3		5, 6, 7 and 8	Lab report	Lab Manual
Vibration direction and extinction	4		9, 10, 11 and 12	Lab report	Lab Manual

Retardation, interference colors and birefringence	5		13, 14 and 15	Lab report	Lab Manual
Uniaxial indicatrix and type of uniaxial sections	6		16, 17 and 18	Lab report	Lab Manual
Midterm exam	7				
Type of uniaxial interference figures and optic sign	8		19	Lab report	Lab Manual
Biaxial indicatrix and type of Biaxial interference figures	9		20 & 21	Lab report	Lab Manual
Optical properties of quartz, Nepheline, calcite and Garnet	10		22	Lab report	Lab Manual
optical properties of Olivine, Pyroxenes Amphiboles	11		23	Lab report	Lab Manual
optical properties of the mineral groups: Micas and Feldspars	12		24	Lab report	Lab Manual
Final exam	13				

### 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:  
 Power point presentations including pictures of the optical properties  
 Students will study the optical properties by their own by using the polarizing micorscop

### 22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:  
 Writing lab reports 15%  
 Theoretical mid exam 15  
 Practical mid exam 15  
 Quizzes 5%

Final theoretical 25%  
 Final practical 25%

### 23. Course Policies:

A- Attendance policies:

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

**Following the UJ regulations**

C- Health and safety procedures:

**non**

D- Honesty policy regarding cheating, plagiarism, misbehavior:

**Following the UJ 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:**

Polarizing microscopes

Representative thin sections

Accessory plates

Interference colour charts

**25. References:**

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

**Optical Mineralogy Lab Manual**

B- Recommended books, materials, and media:

<http://www.gly.bris.ac.uk/www/teach/opmin/mins.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:  
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Assistant Dean for Quality Assurance  
Course File