King Saud University

College of Sciences

Geology and geophysics Department

جامعة الملك سعود

كلية العلوم

قسم الجيولوجيا والجيوفيزياء

Optical mineralogy course
(224 Geo)
Summer Course
Academic Year 1431- 1432H
(2010 – 2011)

1. Course general information:

   i. Course Director : Dr. Bassam A. Abu Amarah
   ii. Contributor : Mr. Hashim Babakur
   iii. Course Title: Optical Mineralogy.
   iv. Course Code : 224 Geo.
   v. Credit hours: 3 credit hours (2+1+0).
   vi. Level/ year the course is offered: Summer Course of the fourth year .
   vii. Course pre-requisites: Geo 101 course (Physical geology).
   viii. Group Number: . **610**
   ix. Lecture theater (room) : B 066 1 05 0140

2. Course objectives:

1- The aim of this course is to determine the optical properties of the rock forming minerals by using the polarized light microscope (P.M.). Students will have the ability to understand and to identify the rock forming minerals and its characteristics by using the polarized microscope.

2- To have the ability to determine the P. M. techniques, and to verify the interaction of light behavior of isotropic and anisotropic minerals, this will be of a great help for the students in their study of igneous, metamorphic, and sedimentary rocks.

3- To gain the basic knowledge in identifying, analyzing , and interpreting the optics of the rock-forming minerals via lectures sessions, writing reports, assignments.

4- To educate, to analyze and how to determine the optics of the different minerals, in addition, to increase students' ability and training on instrumentations and techniques.

Therefore, initially, we are expecting from our students to demonstrate their abilities to analyze, to interpret scientific data, to identify the different types of minerals by applying its optics,

their origin in rocks , and to demonstrate it either minerals in both hand specimen , or in thin section in the lab and in the field.

Subsequently, to be able to read, to locate different types of minerals to draw out its all the geological evidences in the field, and to identify their environments.

3. **Course Description (Summer Course)**:

The 224 Geo. course consists of 7 wks including 28 lectures (each lecture two hours), 15 practical hours. Subsequently, the student is expected to acquire knowledge in methods and procedures of optical mineralogy, identify minerals under the polarizing microscope and also their optical properties, and the application of physics to study crystallized materials by polarized light, as well as gaining knowledge in silicate minerals and their relationships.

4. Course Evaluation:

Student Evaluation during the course:

No.	Evaluation Tasks/tools	Week due	%Proportion of the evaluation during the course session
1	Homework	3-4	10%
2	Writing Reports	6	3%
3	First Exam	5	10%
4	Practical (Lab)Test	7	15%
5	Second Test	6 or 7	10%
6	Final Exam	8	50
7	Student Attendance+mind-setup		2%

5. Essential References and text books:

1- Kerr, p. Optical Mineralogy 4 th ed, mc Graw- Hill book co.

2- Wm. Revell Phillips, Mineral Optics principals and Techniques, W.H. FREEMAN AND COMPANY.

3- P. Gay. An introduction to crystal optics, Longman, London and Newyork,

4- Nesse, W. D. 1991. Introduction to optical mineralogy 2 nd. ed .oxford univ. press, New York .

5- Shelley, D. 1985. Optical mineralogy , Elsevier sci. publisher , New York.

6- الدكتور أحمد محمد بشادي و الدكتور ممدوح عبد الغفور حسنز المعادن تحت المجهرز الطبعة الأولى 1981م ، مكتبة الفلاح، الكويت.

7- Assigned periodicals (Journals, Reports, etc)

8- The course director will provide students with relevant materials and learning aids.

9- Internet search for the related topics, and other learning materials.

6. Course titles and outlines:

No of weeks	Lecture Time	Date	Lecture's Title	**No. Of Weeks**	**Contact hours**
1	10-12 AM 10-12 AM	*Sun 9/3/1432 12/2/2011* *Tues 11/3/1432 14/2/2011*	Introduction: nature of light, optical classification of crystals.	1	2
2	10 - 12 AM 10 - 12 AM	*sun 16/3/1432 19/2/2011* *Tues 18/3/1432 21/2/2011*	Mineral preparation for microscopic study.	1	2
3	10-12 AM 10 – 12 AM	*Sun 23/3/1432 26/2/2011* *Tues 25/3/1432 28/2/2011*	Isotropic and anisotropic minerals, Polarized light The polarizing microscope , index of refraction	1	2
4	10 – 12 AM 10 -12 AM	*Sun 30/3/1432 5/3/2011* *Tues 2/4/1432 7/3/2011*	The polarizing microscope , index of refraction Interference colours and interference figures.	1	2
5	10 – 12 AM 10 – 12 AM	*SUN 7/4/1432 12/3/2011* *Tues 9/4/1432 14/3/2011*	Interference colours and interference figures. First assessment exam.	1	2
6	10 – 12 AM 10 – 12 AM	*Sun 14/4/1432 19/3/2011* *Tues 16/4/1432 21/3/2011*	Uniaxial crystal optics, biaxial crystal optics	1	2
7	10 – 12 AM 10 – 12 AM	*Sun 21/4/1432 26/3/2011* *Tues 23/4/1432 28/3/2011*	2nd Assessment Exam. The indicatrix	1	2
8	10 – 12 AM	*Sun 28/4/1432*		1	

		2/4/2011	Mineral descriptions		2
	10 – 12 AM	*Tues 30/4/1432 4/4/2011*	***Summer Course Final exams starting and ending dates.***		

N.B.:

- *- Summer Course start date is on Sun. 24/7/1432 corresponding to 26/6/ 2011.*
- *final exams will start on 20/9/1432 – 20/8/2011 and end by 23/9/1432- 23/8/2011 .*