King Saud University

College of Sciences

Geology and geophysics Department

جامعة الملك سعود
كلية العلوم
قسم الجيولوجيا والجيوفيزياء

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Of

Optical Mineralogy

224 Geo

Dr. Bassam Abdulmutti Abu Amarah

1431- 1432 (2010/2011)

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

Institution: King Saud University
College/Department : College of Science – Geology and Geophysics Department.

A Course Identification and General Information

1. Course title and code: Optical Mineralogy – (224 Geo)
2. Credit hours : 3 credit hours (2 + 0+1)
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) (Geology Program Of Bachelor Degree)
4. Name of faculty member responsible for the course Assestant Professor / Dr. Bassam Abdulmutti Abu Amarah
5. Level/year at which this course is offered : Fourth Level/ 2nd semester 1431- 1432
6. Pre-requisites for this course (if any) : (101 Geo, and 101 phys)
7. Co-requisites for this course (if any) No Co-requisites course.
8. Location if not on main campus: University Campus in Dariyah

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course.

- The Course intends to investigate the rock forming minerals , using the polarizing microscope.

- This Course will develop student's knowledge of the P. M. techniques , and the principles behind the interaction of light with isotropic and anisotropic minerals.

1) Provide the students with knowledge of the mineral Optics .
2) Initiating cognitive skill to generate the abilities of identifying the the physical properties of minerals.
3) Skillfulness in dealing with optics characteristics to identify, interpret the mineral- bearing of the rocks, and analyzing its genesis.
4) Skillfulness in communication with others to generate the strategically scientific thinking.
5) Skillfulness in operating the computer with different types of software programs , and applying them.

2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)

1) The course content will be periodically reviewed by the instructor and the course planning committee as and when necessary.
2) By using the internet in locating the recent books, articles, and periodicals related to mineral optics.
3) Chasing all the comments and suggestions issued by the improvement and development study plan committees in geology program to run all procedures in changing and modifying the course content periodically.
4) Applying and using all the results of postgraduate scientific studies to develop 224 Geo course program.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered

Topics	No of Weeks	Contact hours
1. Introduction: nature of light, optical classification of crystals.	2	4+2
2. Mineral preparation for microscopic study.	1	(2+1)
3. Isotropic and anisotropic minerals, Polarized light	1	(2+1)
4. The polarizing microscope , index of refraction	2	(4+2)
5. interference colours and interference figures	2	(4+2)
6. Uniaxial crystal optics, biaxial crystal optics	2	(4+2)
7. The indicatrix	1	(2+1)
8. Application of the colour chart to the study of minerals	1	(2+1)
9. Mineral descriptions	3	6+3
Total Hours	15	30

2 Course components (total contact hours per semester):

Lecture:	Tutorial:	Practical/Fieldwork/Internship:	Other:
30 lectures	Hypothetical (lectures)	15 hours + 2 days fieldwork	Nil

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week) : students are expected an average of 2 – 3 learning hours per week.

30 hours Lectures, and 15 hours lab work..

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;

- The course gives a basic knowledge on optical mineralogy.

- A description of the teaching strategies to be used in the course to develop that knowledge or skill; : Teaching is conducted through lectures , practical sessions and fieldwork.

- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

- Methods include quizes , homeworks , tests and examinations.

1) The course is briefed and designed to eradicate and to develop all students achievement , and skills.
2) Describing the teaching strategies used for improving the students knowledge and skilfulness.
3) Demonstrate the course evaluating methods to evaluate learning outcome of the academic program.

a. Knowledge

(i) Description of the knowledge to be acquired

1) The student is expected to acquire knowledge in methods and procedures to identify of.mineral's Optics.
2) Acquaintance the characteristics of mineral's optics to assure the difference between minerals.
3) The student is expected to have knowledge in silicate minerals and their relationships.
4) Acquaintance of student enrollment in the course to evaluate his performance indicators.
5) Acquaintance of the student enrollment in the course to towards quality issues.
6) Acquaintance of mineral's optics theories and its impact in identifying the different minerals types.

(ii) Teaching strategies to be used to develop that knowledge

1) Teaching will be conducted through a continuous and regular lectures , practical sessions and fieldwork.
2) Encouraging the students to read all the related articles.
3) Brainstorming to be run in classroom between the students and the coarse directors.

4) To be acquaint with latest internet information.

5) To run homework scheme to keep student in touch with reading and geared thinking in knowledge of optical mineralogy.

(iii) Methods of assessment of knowledge acquired:

1) Periodical Exams (Exams, qizzes).

2) Positive chemistry should be conducted between the student and course coordinator via the oral discussion within classroom.

3) Running homework's sessions to maintain the relation between the student and scientific program, and to run lab reports to asses the acquired knowledge on the subject.

4) Oral and written exam in the lab . to test the student's ability to identify minerals under the microscope and also their optical properties.

5) Running final exam.

b. Cognitive Skills (Describing the cognitive to be developed:

1) Student shall be able to gather all the minerals optics, and information that will face the student .

2) Student shall be able to apply all optics techniques to determine the minerals'.

3) Students will be able to understand the application of physics to study crystallized materials by polarized light.

4) Student shall be able to to chose different skill in identifying minerals optics.

(ii) Teaching strategies to be used to develop these cognitive skills

1) Providing all information about mineral's optical characteristics.

1) Helping the students to run the logical analyses to solve problems by providing all information about it to identify the mineral optics.

2) Providing the student will all different know developed ideas for determining the minerals by using Polarized Microscope.

(iii) Methods of assessment of students cognitive skills:

1) Delegating the students ability intelling, and announcing his belief and suggestions towards mineral identification by polarized Microscope.

2) Delegating the student ability in using and dealing with Polarized Microscope>

3) Delegation the student ability in applying the basics of physics to identify minerals.

4) Delegating the students ability in dealing and in communicating with his colleagues , i.e. with each others.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

1) Prompt ing attendance of classes and laboratory sessions in required of the students.
2) Students learn to manage their time in self-study of the Course material.

(ii) Teaching strategies to be used to develop these skills and abilities

1) Positive chemistry should be conducted between the student and course coordinator via the oral discussion within classroom.
2) Running homework's sessions to maintain the relation between the student and scientific program, and to run lab reports to asses the acquired knowledge on the subject.
3) Oral and written exam in the lab . to test the student's ability to identify minerals under the microscope and also their optical properties.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

1) Methods include quizes , home work , tests and examinations.
2) Training to solve some problems in mineral optics.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

1) Writing communication skills created via writing report about certain topics related to the course contents.
2) Oral communication skills created via students presentation that will be carried out during the lectures sessions.

(ii) Teaching strategies to be used to develop these skills

1) Preparing written reports summarizing one of the topics related to the course materials or content.
2) Assigning one of student to run presentation about an issues related to the course contents.
3) Running a debate session within the lecture time concerning an issue related to the course contents.

(iii) Methods of assessment of students numerical and communication skills

1) Via written reports.
2) Via topics presentation.
3) Via the dialogue session.

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

Group work, Cooperation with others, and sharing projects.

(ii) Teaching strategies to be used to develop these skills

1. Participating in physical development activities and demonstrate an appropriate level of coordination, strength, and general physical within the course and inthe field trip.

2. Participating in physical activities and demonstrate an appropriate level of proficiency.

3. Participate in one or more team sports and demonstrate an appropriate level of proficiency.

4. Demonstrating a working proficiency in entering data on a keyboard.

5. Demonstrate success in using equipment (scientific, etc.) and tools in accomplishing the task or experiment for which the equipment is designed and in avoiding damage or injury.

6. Collective learning and shear of information.

(iii) Methods of assessment of students psychomotor skills

Within the mid-term and final exams, including the assessment of the term paper

5. Schedule of Assessment Tasks for Students During the Semester.

S.No.	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Homework's	11 - 13	5
2	Students participation in presentation discussion	During the course session	5
3	Quizzes	10 11- 13	5

4	Students Assignments	During the course session	5
5	First assessment exam		15
6	Second assessment exam		15
7	Final Exam		50
	Total		100

D. Student Support

1. Arrangements and availabilities for student's consultations and academic advice. (include amount of time faculty are available each week) - Each faculty member is instructed to put a timetable shows the time of actual teaching hours and office hours for each week. This timetable should be placed in front of the door of the academic staff member office's door.

E Learning Resource

1) Required Text(s) : • Kerr, p . Optical Mineralogy 4 th ed, mc Graw- Hill book co.
2) Essential References: • Nesse , W. D . 1991. Introduction to optical mineralogy 2 nd . ed . oxford univ. press, New York . • Shelley , D . 1985. Optical mineralogy , Elsevier sci. publisher , New York
3) Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4) .Electronic Materials, Web Sites etc 5) -Search through Google for related Topics
6) Other learning material such as computer-based programs/CD, professional standards/regulations

7) The lectures already prepared by using PowerPoint software

8) The instructor also will provide some relevant materials and learning aids.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) 1) Lecture room equipped with a blackboard, overhead projector , and internet connection. 2) The classroom with more than 30 students. 3) The lab . facilitated with a blackboard, overhead projector and seating arrangement for the students.
2. Computing resources 1) The classrooms have been equipped with data show device. And internet source..
1. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) • The lab is equipped with polarized microscope. • A workshop is equipped with the necessary equipments for preparing the mineral's slides for optic and petrology studies.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
• The student's feedback on the effectiveness Teaching will be done via a will prepared questionnaire. This questionnaire will be circulated to students. It will used for evaluating the course by students at the end of the course.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department: • In regular basis the study plan committee revises the course contents to make sure that all the content fits the outcomes of the course> • Faculty assessment of the course and effectiveness of teaching delivery.

- Periodic self- assessment of the program.

3 Processes for Improvement of Teaching *******

- Undergraduate Committee will review deficiencies based on the student evaluation, faculty input, course file, and program assessment.
- Feedback from employers and and graduating students' input are used to identify any deficiencies in students' ability in applying mineral optics knowledge.
- Organize workshop on effective teaching methods to enable instructors to improve their teaching skill.
- Teaching method will focus on students' learning and on course learning outcomes

4 Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- Undergraduate Committee will review samples of student work in this course to check on the standard of grades and achievements
- A faculty member from a reputable university will evaluate the course material and the students' work to compare the standard of grades and achievements with those at his university. This evaluator will also comment on the laboratory facilities and the adequacy of the equipment used in the lab.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Self- assessment will be carried out every two years. The external evaluation will be run every four years by invited the Evaluating Examiner by program coordinat.. The feedback received of these assessments will be used to modify studies plans courses for seeking further improvement of the course syllabus, teaching method, and delivery of course materials>