Faculty of Earth Sciences

Department of Mineral Resources & Rocks
3rd & 4th Years Program

The Geological Society
Accredited degree courses

OPTICAL MINERALOGY

Course Name	Course ID	Prerequisites
Optical Mineralogy	***EMR*** 211	**EMR 202**

Course description

1- Elementary concepts of light, Nature of Light, Snell`s Law, Polarization of Light, and Polarizing microscope. Double refraction and index of refraction. Isotropic and Anisotropic media, Uniaxial and Biaxial Optical Indicatrix. Optical properties of isotropic, uniaxial and biaxial minerals. Accessory plates and their uses. Interference figures. Optical orientation in uniaxial and biaxial minerals.

2- Description of the essential rock-forming minerals (Quartz, alkali feldspars, plagioclase feldspars, Micas Amphiboles, Pyroxenes, Olivine, garnet, accessory minerals, nonsilicate minerals such as carbonates, sulphates, halides and oxides.

3- Laboratory work concerns techniques employed with the polarizing microscope and the use of optical properties in mineral identification

Course objectives:

Students in this course will learn about:

1- The different parts of the polarizing microscope.
2- The double refraction that characterize anisotropic minerals
3- The different optical properties of minerals
4- Identification of minerals according to their optical properties

Textbooks (to be used for the course):

1- Bashady, A.M. and Hassan, M.A. (1993). Minerals under the microscope. Al-Dar Al-Arabia for publishing, Cairo, Egypt. (in Arabic)

2- Nesse, W.D. (2004): Optical Mineralogy, 3rd edition. Oxford University Press, Oxford, NY.

Supporting Literature (Books and Websites):

1- Pichle H. and Schmitt-Riegraf C. (1997). Rock-forming minerals in Thin Section. Springer, 2 Ed.
2- Helmy, M.E. and Zaghloul, M.Z. (1986). Principles of optical mineralogy. Al Anglo Bookshop, Cairo, Egypt (in Arabic)
3- http://www.brocku.ca/earthsciences/people/gfinn/optical/222lect.htm
4-http://www.eos.ubc.ca/courses/eosc221/optics/optics.html

Expected Course Outcome:

The student can be able toknow the following:

1- Student can different various parts of the polarizing microscope.
2- Student can differentiate the optical properties of minerals.
3- Student can Identify rock-forming minerals in thin sections.