EAS 232 Mineralogy II
2010

Course Objectives:
This course will introduce you to determinative mineralogic methods that use transmitted-light microscopy. The theory of the interaction of light with minerals will be explained. The methods you learn in the laboratory will be applied to identifying and characterizing common rock-forming minerals. You will be introduced to the concept of mineral associations, to the interpretation of textures of rocks, and to petrographic aspects of igneous, metamorphic, and sedimentary rocks. By the end of this term, you will be able to identify common rock-forming minerals in thin section, and have completed the requisite background in mineralogy necessary for your petrology coursework in the third year.

Instructor:
Thomas Stachel
Room: ESB 1-14
Tel.: 492-0865
email: tstachel@ualberta.ca

Office Hours:
Monday and Wednesday, 15:00-15:50 (or by appointment)

Lectures:
M W F
13.00-13.50
Tory B-87

Downloads:
downloads.html

Lab Sessions:

H1	Monday	14:00-16:50	ESB 3-04
H2	Tuesday	14:00-16:50	ESB 3-04
H3	Wednesday	14:00-16:50	ESB 3-04
H4	Friday	14:00-16:50	ESB 3-04

Course Mark-Weight Distribution:
50% Lecture
Midterm: 20%
Final: 30%

50% Laboratory
Labs: 20%
Lab Final: 20%
Lab quizzes: 10%

Individual components of the course will be given a numerical mark. Note that the standard letter grading system will be used for the final evaluation of course performance. The grading system will be applied using a combination of absolute achievement and relative standing in the class.

Exams:

Midterm: Wednesday, February 10, Tory B-87, 13:00-13:50
Final (tentative date): Friday, April 23, room will be assigned, 14:00-16:00

Deferred Exams Policy:

Students who are granted permission to sit a deferred final exam must do that exam on: Monday, May 17th, room to be assigned, 10:00-12:00

Strongly Recommended Text:

Nesse, W.D. (2004): Introduction to Optical Mineralogy. 3rd Edition, 348 p. Oxford University Press.

The previous edition is almost identical and may be used as well:

Nesse, W.D. (1991): Introduction to Optical Mineralogy. 2nd Edition, 335 p. Oxford University Press.

Reference Texts:

Deer, W.A., Howie, R.A. and Zussman, J. (1992): An introduction to the rock-forming minerals. 2nd Edition, 696 p. Longman Scientific & Technical.

MacKenzie, W.S., Donaldson, C.H and Guilford, C. (1982): Atlas of igneous rocks and their textures. 148 p. Longman.

MacKenzie, W.S. and Guilford, C. (1980): Atlas of rock forming minerals in thin section. 98 p. Longman.

Yardley, B.W.D., MacKenzie, W.S. and Guilford, C. (1990): Atlas of metamorphic rocks and their textures. 120 p. Longman Scientific & Technical.

Websites:

Minerals under the Microscope (University of Bristol):
http://www.gly.bris.ac.uk/www/teach/opmin/mins.html

Mineralogy Database:
http://webmineral.com/

Atlas of Igneous and Metamorphic Rocks, Minerals, and Textures (University of North Carolina):
http://www.geolab.unc.edu/Petunia/IgMetAtlas/mainmenu.html

Molecular Expressions: Introduction to Optical Microscopy, Digital Imaging, and Photomicrography: http://micro.magnet.fsu.edu/primer/index.html

Course Outline:

Lecture Topics:	**Reading in Nesse:**
Properties of light and the petrographic microscope	Chapter 1-2
Refractive index, relief, and isotropic minerals	Chapter 3-4
Anisotropic minerals. Retardation and interference colors	Chapter 5
Uniaxial optics: the indicatrix, interference figures and optic sign	Chapter 6
Biaxial minerals: biaxial indicatrix and interference figures	Chapter 7
Identifying minerals in thin section	Chapter 9
Framework silicates	Chapter 10 (pp. 129-154)
Sheet silicates	Chapter 11 (pp. 164-172)
Chain silicates	Chapter 12
Disilicates and ring silicates	Chapter 13 (pp. 226-234; 238-240)
Orthosilicates	Chapter 14
Carbonates and Phosphates	Chapter 15 (pp. 262-271; 280-284)
Oxides	Chapter 16 (pp. 300-309)
Igneous and metamorphic rocks (origin, classification, textures)	

Laboratories:

Week of	**Laboratory Topic**
January 4 and 11	*No laboratory*
January 18	Lab 1: Introduction to the petrographic microscope, refractive index and relief
January 25	Lab 2: Double refraction: the calcite rhomb
February 1	Lab 3: Interference colors and fast and slow directions
February 8	Lab 4: Uniaxial interference figures
February 15	*Reading Week*
February 22	Lab 5: Biaxial interference figures
March 1	Lab 6: Felsic igneous minerals
March 8	Lab 7: Mafic igneous minerals
March 15	Lab 8: Metamorphic minerals I (pelitic minerals)
March 22	Lab 9: Metamorphic minerals II
March 29	*Easter*
April 5	Lab Final (for H1on Monday 12th, as Monday 5th holiday)

Specialized Support and Disability Services

Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with Specialized Support and Disability Services, 2-800 Students' Union Building, 492-3381 (phone) or 492-7269 (TTY).

Miscellaneous

Policy about course outlines can be found in Section 23.4(2) of the University Calendar.

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behavior (online at http://www.uofaweb.ualberta.ca/governance/studentappeals.cfm) and avoid any behavior which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.