

SPRING SEMESTER, 2012

Sect. 18920

**GLY 4310C
PETROLOGY OF IGNEOUS
AND METAMORPHIC ROCKS
4 credits**

PREREQUISITES:

GLY 2010 and 2010L or equivalent. One semester college chemistry and one semester college physics. Satisfactory completion of GLY 4200C, Mineralogy (C or better). All students should have these courses **before** taking GLY4310C. Students are strongly advised to take one year of college chemistry. **Students who choose to ignore prerequisites often do poorly.**

TIME AND PLACE:

LECTURE: M, W 9:00 - 10:20 PS 337

LABORATORY: W 13:30 - 15:20 PS 355

INSTRUCTOR:

Dr. David L. Warburton

Physical Sciences Building Room 356a, moving to SE 466

(561) 297-3312 FAX (561) 297-2745

E-mail Warburto@FAU.EDU

Office Hours: M -W 11 a.m. - 1 p.m. ; T-R Noon - 1 p.m

GRADUATE TEACHING ASSISTANT:

Ms. Katy Jackson

Physical Sciences Building Room 354

(561) 297-3250

E-mail: kjacks37@fau.edu

Office Hours: TBA

DATES: January 9, 2012 to April 30, 2012, excluding January 16 and March 5 to 11, 2012

COURSE DESCRIPTION:

The identification of the rock-forming minerals in thin sections. Rock textures and the interpretation of the origin and later geological history of igneous and metamorphic rocks. Discussion of chemical equilibria, and the phase rule. Laboratory investigation of selected rock samples. Lecture and laboratory.

COURSE OBJECTIVES::

This course provides geology majors with basic background in silicate mineralogy, petrology and optical petrography. Students will become familiar with textures, processes, occurrences, and principles that will allow them to describe igneous and metamorphic rocks, and interpret their origin and later geological history. The laboratory serves to familiarize students with silicate minerals, and igneous and metamorphic rocks in both hand specimen and thin section. The course provides background in one of the areas that appears on the Professional Geology license examination.

EVALUATION:

The laboratory will count 40% of your total grade. The two lecture midterms will count 15% each, or 30% of the total grade. The lecture final will count 22%. Homework will be worth 8%. All examinations must be taken on the date scheduled, beginning at the start of the class period. Any exception to this policy must be arranged in advance with the instructor, only in truly unusual circumstances. If no prior arrangement is made and an examination is missed, the student will receive a grade of zero.

EXAMINATION SCHEDULE:

There will be two midterms and a comprehensive final examination for the lecture part of the course. Exams will be announced at least one week in advance. The laboratory work will also be tested. The following is a tentative examination schedule, subject to revision.

The approximate schedule of lecture examinations is as follows - actual examination dates may vary in accordance with the above outlined policy:

First Midterm: Monday, February 6, 2012 9:00-10:20

Second Midterm: Monday, March 26, 2012 9:00-10:20

Final examination: Friday April 27, 2012 7:45 - 10:15

Lecture exams consist of a variety of questions, including true-false, multiple choice, matching, fill-ins, problems, definitions, and occasional essay or discussion questions.

The approximate laboratory examination schedule is as follows:

Lab Midterm 1 - Silicate Minerals - February 8, 2012

Laboratory Midterm 2 - Igneous Rocks - March 28, 2012

Laboratory Final - Metamorphic Rocks- April 25, 2012

LAB REPORTS:

All lab reports will be due one week after the laboratory meets unless otherwise specified. Late lab reports will be heavily penalized. Attendance at laboratory sections is **mandatory**. Anyone missing a laboratory session without a valid, verifiable excuse will be penalized 20% on that laboratory. Students arriving more than five minutes late for a laboratory session will be penalized 10% on that assignment. Students leaving the laboratory early without permission are also subject to penalty.

GRADING SCALE:

The grading scale used is as follows:

93-100 % - A	80-82.9 % - B-	67-69.9 % - D ⁺
90-92.9 % - A-	77-79.9 % - C ⁺	63-66.9 % - D
87-89.9 % - B ⁺	73-76.9 % - C	60-62.9 % - D-
83-86.9 % - B	70-72.9 % - C-	< 60 % - F

Attainment of the lowest grade average in any category will assure that your grade is not lower than the indicated grade, with one exception. **Anyone failing the laboratory examinations will receive a grade no higher than D⁺**, regardless of the overall score. For geology majors, a grade of less than C must be repeated in order to graduate. Note that this includes grades of C-.

Examinations will be returned and discussed in class. If you miss a class, you may come to the instructor's office during office hours. Grades will not be posted. Overall grade distributions and class averages are posted on the examination key, which will be available on the course web pages after the examination.

Incomplete grades will be given only when a student is unable to complete the course within the semester due to unforeseen circumstances, with a considerable impact on the student's life, and beyond the student's control. Students must be passing the course when the event occurs. Such events are rare. Therefore, incomplete grades are rare.

Attendance at the laboratory sessions is mandatory, and is essential for satisfactory performance in the course.

SPECIAL COURSE REQUIREMENTS:

One hand lens (10 X) - should have a metal case - 20 X is also useful but 10 X is better for most purposes. Students should have this from the Mineralogy course.

The laboratory must be left clean and neat. Any food or drink brought into the laboratory must be disposed of properly. Failure to properly maintain laboratory cleanliness **will** adversely affect a student's grade.

Web pages for the course are located at

http://www.geosciences.fau.edu/Resources/CourseWebPages/Spring2012/GLY4310_S12/index.4310_S12.htm

An enhanced syllabus, an index page with a great deal of information, a laboratory schedule, and other documents are located at this site. Notices, including any changes in dates, etc. will be posted on the web site. Students need to check this site frequently (at least once per week).

CLASSROOM ETIQUETTE:

In order to enhance and maintain a productive atmosphere for education, personal communication devices such as pagers, beepers, and cellular telephones are to be disabled in class sessions. (University policy which applies to all classes - see http://www.fau.edu/academic/registrar/09-10_catalog/University_Catalog.htm) Any use of these devices during a quiz or examination will be considered to be cheating, and will be penalized accordingly.

Communication devices (cell phones, pages, laptop computers, etc.) must be turned off and **out of reach** during all examinations.

DISABLED STUDENTS:

In compliance with the Americans with Disabilities Act (ADA). students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) - in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter. SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) - and follow all OSD procedures.

HONOR CODE POLICY STATEMENT:

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information. see University Regulation 4.001 at

http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

TEXTBOOKS:

Required: Principles of Igneous and Metamorphic Petrology, second edition, John D. Winter, Prentice Hall, 2009. This book was listed on Amazon on November 22, 2011 for \$121.34 (new). If you buy a used copy, be sure you get the second edition.

Required: Manual of Mineral Science, Cornelis Klein and Barbara Dutrow, 23rd edition, John Wiley, 2007. ISBN: 978-0-471-72157-4. Most students will have this book from the Mineralogy course.

REFERENCE LIST

The following books are on three-hour reserve in the library. They should prove useful if you are having trouble with a particular subject area, or would like more information.

Igneous Petrology - I.S. Carmichael, F.J. Turner, and J. Verhoogan
QE 461.C37

The Interpretation of Igneous Rocks - K.G. Cox, J.D. Bell, and R.J. Parkhurst
QE 461.C68

Origins of Igneous Rocks - P.C. Hess
QE 461.H47 1989

Pyroclastic Rocks - R.V. Fischer and H.-U. Schmincke
QE 461.F55

Petrology of Metamorphic Rocks - R. Mason
QE 475.A2 M394

Metamorphic Petrology - F.J. Turner
QE 475.T89 1981

Petrogenesis of Metamorphic Rocks - H.G.F. Winkler, fourth edition
QE 475.A2 W5613 1976

COURSE OUTLINE:

Introduction to Petrology and Petrography

Silicate Mineralogy Chapters 18 and 19 of Klein and Dutrow

Nesosilicates

Sorosilicates

Cyclosilicates

Inosilicates

Phyllosilicates

Tectosilicate

Fundamental Petrologic Concepts Winter Chapter 1

Classification and Nomenclature of Igneous Rocks Winter Chapter 2

Igneous Rock Textures Winter Chapter 3

MIDTERM 1

Igneous Structures and Field relationships Winter Chapter 4

Reaction Series and Melting Behavior Winter Chapter 7

Generation of Basaltic Magma Winter Chapter 10

Mid-Ocean Ridge Volcanism Winter Chapter 13

Oceanic Intraplate Volcanism Winter Chapter 14

MIDTERM 2

Introduction to Metamorphism Winter Chapter 21

Classification of Metamorphic Rocks Winter Chapter 22

Metamorphic Facies and metamorphosed Mafic Rocks Winter Chapter 25

FINAL EXAMINATION