Igneous & metamorphic Petrology (Geology 307 and 307L) Syllabus, Spring 2011

Lecture MW: 12:30-13:45, Lab M: 14:00-16:45; LO 1210

## Instructor

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**Prerequisite:**

General Chemistry, Physical Geology, and Mineralogy are prerequisites for Petrology worldwide. Although no prerequisite is included in the university catalog you are supposed to either have passed those courses or teach yourself about the necessary fundamentals.

**Course objectives:**

* Identification of minerals in igneous and metamorphic rocks using a petrographic microscope
* Description and classification of igneous and metamorphic rocks using hand sample description and petrography
* Use and integration of geochemical data, phase equilibria, and petrography to infer the origin and evolution of igneous and metamorphic rocks
* Familiarity with observational science, formulation and testing of hypotheses, petrogenetic interpretation

**Required textbooks**

* An Introduction to Igneous and Metamorphic Petrology by John Winter
* An Introduction to the Rock-Forming Minerals by Deer, Howie, and Zussman (second edition).

# Required for lab

You are required to bring your **hand lens** and **textbooks** to each class. You will need your DHZ. Your hand lens will be critical for identifying rocks during lab. In addition, I strongly suggest you bring your mineralogy text – or at least store it in a drawer in class. There is a large library of mineralogy and petrology books located in the mineral cabinets. All of the reference material in the lab is for your use – just please make sure that you return them to the cabinets.

## Grading

Grading for the lecture class will be based on:

1. Three lecture exams (equally weighted): 60%
2. Homework assignments and discussion: 30%
3. Class participation/attendance: 10%

Grading of the lab portion (307L) will be based on:

1. Three exams (equally weighted): 40%
2. Lab assignments: 50%
3. Class participation/attendance (lab and field trips): 10%

# Outline of course topics and readings from text\*

1. Review of optical mineralogy and petrology (Ch. 7 of Nesse)
2. Scope of petrology (Ch.1)
3. Classification and the chemical diversity of Earth’s magmas (Ch. 2)
4. Field and hand sample characteristics of igneous rocks (Ch. 3 & 4)
5. Physical properties of magmas (handouts)
6. Phase diagrams and generation and crystallization of basaltic magmas (Ch. 5-7, 10)
7. Magmatic differentiation (Ch. 11, 12)
8. Association of magmatism and plate tectonics (Ch. 13-17)
9. Classification and petrography of metamorphic rocks (Ch. 21-24)
10. Metamorphic facies and pressure-temperature evolution (Ch 25)
11. Mineral reactions and equilibria during metamorphism (Ch. 26-27)
12. Metamorphic fluids (Ch. 30)

\* All readings from Winter except where noted.

# Readings from text

As we cover each topic listed above, please read the appropriate chapters from Winter’s text. Use them as a supplement to our discussion in class. Please read the sections on optical mineralogy in your mineralogy text to supplement your notes from class.

# Homework

Homework pertaining to the lecture portion of the course will include quantitative exercises dealing with petrology.

You should hand in your own independent and original work. Your submissions should not be copied from anyone else's. Although I encourage discussion and help among students, you should not give or receive any help which makes the assignments significantly easier (Read warnings about plagiarism at the end of this syllabus).

# Exams

Three non-cumulative lecture exams will cover material discussed in class, as well as from the chapter questions that I will hand out. Three non-cumulative lab exams will cover material from lab, primarily hand sample and thin section identification. All exams are closed book. Dates for the exams are:

Lecture:

Exam 1: Feb 23

Exam 2: April 13

Exam 3: May 16 (12:45-14:45)

Lab:

Exam 1: Feb 28

Exam 2: April 18

Exam 3: May 9 (2:00-4:00)

# Required Field Trips

The field identification of igneous and metamorphic rocks is very important for geologists. Accordingly, we will have two **required** and **fun** one day field trips:

**Apr. 16.** San Gabriel Mtns: Metamorphic basement rocks of southern California, anorthosite-gabbro-syenite layered intrusion, and Pacoima Canyon pegmatite.

**April 23.** Dish Hill, Mojave Desert: Olivine basalts, olivine basanites, and mantle xenoliths.

For the field trips, you will need a geologic hammer. Just prior to the first trip, I will give you more information.

# Microscopes

During the semester, you will use the petrographic microscope for almost every lab. During the first lab period, I will assign a microscope to each student. The microscopes should stay in the lab at all times. Do not leave them unattended at any time.

**Note:**

**This syllabus is subject to change, with either additions or subtraction of required work.**

## Class conduct

I expect all students to follow the university policy for student conduct (see <http://www.csun.edu/studentaffairs/student_conduct.html>). My philosophy is simple: I expect from you, what you expect from me. I expect you to arrive on time and be ready to participate in our course. If you need to leave early, or arrive late, then obtain permission first. Do not bring walkmen/iPods etc., or active cell phones to class. Do not consume food during class.

I expect all students to exhibit civil and professional behavior in our class, as well as on field trips. Inappropriate, disrespectful, harassing, and/or obscene discourse or behavior will not be tolerated. If you feel that there is a problem with our classroom environment, then please let me know immediately. Cheating or plagiarism will not be tolerated. If you are unclear what constitutes cheating or plagiarism, please review the section on academic dishonesty at the university website given above. Cheating or plagiarism activity will result in an F grade for the course and will be reported to the Office of Student Affairs.

Taken from “A Mini-Guide to University Policies and Practices related to Course Enrollment, Instruction, and Grades” by Pedone, V., College of Science and Mathematics, CSUN.

**APPENDIX 1: FULL TEXT OF OFFICIAL POLICIES**

**Academic Dishonesty**

The maintenance of academic integrity and quality education is the responsibility of each student within this university and the California State University system. Cheating or plagiarism in connection with an academic program at a campus is listed in Section 41301, Title V, California Code of Regulations, as an offense for which a student may be expelled, suspended, or given a less severe disciplinary sanction. Academic dishonesty is an especially serious offense and diminishes the quality of scholarship and defrauds those who depend upon the integrity of the campus programs. Such dishonesty includes:

**A. CHEATING**

Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise. Comments:

1. Faculty members are encouraged to state in advance their policies and procedures concerning examinations and other academic exercises as well as the use before examinations of shared study aids, examination files, and other related materials and forms of assistance.

2. Students completing any examination should assume that external assistance (e.g., books, notes, calculators, pagers, cell phones/cameras, PDAs, other electronic devices, conversation with others) is prohibited unless specifically authorized by the instructor.

3. Students must not allow others to conduct research or prepare any work for them without advance authorization from the instructor. This comment includes, but is not limited to, the services of commercial term paper companies.

4. Substantial portions of the same academic work may not be submitted for credit in more than one course without authorization.

**B. FABRICATION**

Intentional falsification or invention of any information or citation in an academic exercise. Comments:

1. “Invented’’ information may not be used in any laboratory experiment or other academic exercise without notice to and authorization from the instructor. It would be improper, for example, to analyze one sample in an experiment and covertly “invent’’ data based on that single experiment for several more required analyses.

2. One should acknowledge reliance upon the actual source from which cited information was obtained. For example, a writer should not reproduce a quotation from a book review and indicate that the quotation was obtained from the book itself.

3. Students who attempt to alter and resubmit returned academic work with intent to defraud the faculty member will be in violation of this section. For example, a student may not change an answer on a returned exam and then claim that they deserve additional credit.

**C. FACILITATING ACADEMIC DISHONESTY**

Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty. Comments: For example, one who knowingly allowed another to copy from his or her paper during an examination would be in violation of this section.

**D. PLAGIARISM**

Intentionally or knowingly representing the words, ideas, or work of another as one’s own in any academic exercise. Comments:

1. Direct Quotation: Every direct quotation must be identified by quotation marks, or by appropriate indentation or by other means of identification, and must be promptly cited in a footnote. Proper footnote style for any academic department is outlined by the MLA Style Sheet or K.L.Turabian’s A Manual for Writers of Term Papers, Theses and Dissertations. These and similar publications are available in the Matador Bookstore and at the reference desk of the Oviatt Library.

2. Paraphrase: Prompt acknowledgment is required when material from another source is paraphrased or summarized in whole or in part in your own words. To acknowledge a paraphrase properly, one might state: “to paraphrase Locke’s comment ...’’ and conclude with a footnote identifying the exact reference. A footnote acknowledging only a directly quoted statement does not suffice to notify the reader of any preceding or succeeding paraphrased material.

3. Borrowed Facts or Information: Information obtained in one’s reading or research which is not common knowledge among students in the course must be acknowledged. Examples of common knowledge might include the names of leaders of prominent nations, basic scientific laws, etc.

Materials which contribute only to one’s general understanding of the subject may be acknowledged in the bibliography and need not be immediately footnoted. One footnote is usually sufficient to acknowledge indebtedness when a number of connected sentences in the paper draw their special information from one source. When direct quotations are used, however, quotation marks must be inserted and prompt acknowledgment is required.

**Faculty Policy on Academic Dishonesty**

Evaluation of student performance is the exclusive province of the faculty. The faculty have the responsibility to make reasonable efforts to guarantee that work is done by the student who is to receive credit for its completion. More specifically, examinations should be appropriately proctored or monitored to prevent students from copying or exchanging information; examinations and answers to examination questions should be secured in a way that students cannot have prior access to them; the authenticity of quotations and references should be reviewed to assure the faculty member that proper credit is given for ideas and information taken from other sources, etc. Having carried out these responsibilities if, in the faculty member’s opinion, there is evidence of academic dishonesty on the part of a student, it is the faculty member’s responsibility to take action against the student as described in the options below.

Even if a faculty member does not request disciplinary action against a student, he/she is encouraged to report acts of academic dishonesty to the Office of the Vice President for Student Affairs because a student may engage in such behavior in other classes, departments, or schools. If reports of alleged academic dishonesty do not reach one central office, repeated acts may go undetected and recidivism will be difficult or impossible to monitor. Communication with the Office of the Vice President for Student Affairs may also assist the faculty member in determining which option or combination of options to exercise.

Depending upon the severity of the offense and the student’s disciplinary history as it relates to acts of academic dishonesty, the faculty member may elect to exercise the following options:

1. Assign a lower or failing grade to an assignment, examination, or the entire course. In cases in which the faculty member elects to exercise the grade penalty option, the faculty member must inform the student in a timely manner that academic dishonesty was a factor in the evaluation. In cases where the sanction for an act of academic dishonesty has been the assignment of a grade penalty without a simultaneous request for formal disciplinary action and in which the student wishes to challenge the grade penalty assigned, the student may file an appeal with the Academic Grievance and Grade Appeals Board.

2. Request that the Office of the Vice President for Student Affairs notify the student that information related to the student’s alleged act of academic dishonesty within that particular class has been forwarded to the Associate Vice President for Student Affairs. Such notifications are in the form of an admonitory letter and serve to inform the student that the Office of the Vice President for Student Affairs is aware of the alleged incident and that formal disciplinary action will not be taken. The admonitory letter also apprises the student of the Student Conduct Code and of sanctions that would be levied for violations of that code, and affords the student an opportunity to meet with the Associate Vice President for Student Affairs to discuss the matter. The admonitory letter shall not be released for any purpose and shall not become part of the student’s permanent record.

3. Request disciplinary action against the student. Student discipline is exclusively the province of the Office of the Vice President for Student Affairs. In such cases, the faculty member through the department chair and school dean should submit a formal written report of the incident to the Associate Vice President for Student Affairs and request formal disciplinary action. Associate Vice President for Student Affairs is empowered to investigate all instances of academic dishonesty. The cases are resolved either through an appropriate action accepted by the student or through a disciplinary hearing. The faculty member, department chair, and school dean will be notified of the final disposition of the case. In cases where the faculty member chooses both to impose a grade penalty and requests formal student disciplinary action against the student and the student wishes to challenge the grade penalty, the student may file an appeal with the Academic Grievance and Grade Appeals Board only after the student disciplinary case has been fully adjudicated by the Associate Vice President for Student Affairs.

(The information in section was adapted with permission from the on Academic Dishonesty issued by the University of Maryland [1980] and is also taken from the Academic Dishonesty Policy approved by the Faculty Senate, May 13, 1982.)

**Penalties for Academic Dishonesty**

Pursuant to CSU Executive Order 969, all actions taken by faculty based on student academic dishonesty, including the imposition of a grade penalty, must be reported to the Office of the Vice President for Student Affairs.

Disciplinary records of any action of academic dishonesty are retained in the Office of the Vice President for Student Affairs for at least five years from the date of final adjudication. These records may be available to prospective employers and other educational institutions, in accordance with federal and state regulations. In short, a student committing any act of academic dishonesty will run a serious risk of harming his or her future educational or employment opportunities.

Students wishing to report an act of academic dishonesty should call (818) 677-2391 and ask for the Associate Vice President for Student Affairs, who will investigate such reports. Information may be provided anonymously; disciplinary action, however, cannot be taken on the basis of anonymous reports alone.

**Administrative Action on Prerequisites—Administrative Withdrawals**

While it is the student’s responsibility to drop classes, the University may withdraw a student, within the first three weeks, from a course if he or she fails to meet the prerequisite(s) or other requirements as indicated in the catalog. These prerequisites may include:

1. Completion of prior coursework.

2. Passing of qualifying examinations.

3. Class year standing.

4. Admission to, or special requirements of, special programs such as Honors or Credential.

5. Completion of prior coursework with a required minimum credit.

6. Consent of instructor.

Such an Administrative Withdrawal may be initiated only by the Associate Dean of the College, upon recommendation from the instructor.

**Class Attendance**

Students are expected to attend all class meetings. Students absent from the **first 2 meetings of a course that meets more than once a week** or who miss the **first meeting of a class that meets only once a week** lose the right to remain on the class roll and must FORMALLY WITHDRAW from the class by following University procedures and deadlines; otherwise, the instructor will assign a grade of “U” which counts as a grade of “F” in computing grade point averages.

An instructor may allow students to continue in the class if they have notified the instructor that the absence will be temporary. If no instructor was assigned to the course in advance, students must notify the department chair that their absence from the class will be temporary.