

University of Toronto Scarborough  
Department of Physical and Environmental Sciences  
EESC36H3 – Petrology  
2014 Outline

Instructor: Shari Preece

Lecture: Friday 9-12, Room 313 SW

Practical: Tuesday 13-14, Room 313 SW

Office: Portable 104, Room 109

Office Hours: Tuesday 12-13, Friday 12-13

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Email Policy: I will only answer email sent to the above address. Student email must be sent using their utoronto.ca email. I will not respond to other personal email addresses.

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**Course Description:** This course surveys the processes that produce the chemical and mineralogical diversity of igneous, sedimentary, and metamorphic rocks including: the distribution, chemical and mineral compositions of rocks of the mantle and crust, their physical properties, and their relation to geological environments. Descriptive petrology for various rocks will also be covered.

**Learning Objectives:** By the end of the course the students will be able to identify, classify, and interpret the origin of igneous, sedimentary, and metamorphic rocks. The students will have developed a good understanding of the links between plate tectonic setting and rock-forming processes. A variety of communication styles (academic rock descriptions, industry rock descriptions, written, and oral) will be developed.

**Required textbook:** Blatt, H, Tracy, R.J., Owens, B.E., 2006. Petrology: Igneous, Sedimentary, and Metamorphic 3<sup>rd</sup> Edition. W.H. Freeman and Company, New York, pp. 530.

The course textbook is available from the UTSC bookstore.

**Other Required Equipment:** Ruler, Coloured Pencils, Basic Calculator (adding, multiplying, dividing)

**Optional:** Textbook or Guide book to Minerals (text from mineralogy course will be a useful reference if you still have it).

**Grading Scheme:**

Assignment 1:	8%	Due Jan. 21
Assignment 2:	8%	Due Feb .11
Assignment 3:	8%	Due Mar. 11
Assignment 4:	8%	Due Apr. 4
Rock Project:	18%	Due Mar. 18
Term Test:	14%	Feb. 14 – Short Answer and Igneous Rock Identification (Lecture and Practical)
Rock Quiz 1:	3%	Mar. 11
Rock Quiz 2:	3%	Apr. 1
Final Exam:	30%	

**Tentative Lectures and Readings—note there may be slight adjustments to the lecture schedule as the term progresses:**

Jan. 7 and 10: Optical Mineralogy, Rock Forming Minerals, Binary Phase Diagrams

Reading: Preface, Introduction, pages 20-29 (Igneous Minerals), 361-365 (Metamorphic Minerals), 92-103 (binary Phase Diagrams)

Practical: Assignment 1

Jan. 14 and 17: Introduction of Igneous Rocks-intrusive and extrusive environments

Readings: Chapters 1, 2 pages 29-35, 3, 4 pages 70-86

Practical: Assignment 1 continued

Jan. 21 and 24: Melting and Crystallization

Readings: Chapters 5 and 6

Practical: Mineral and Textural Differences of Igneous, Sedimentary and Metamorphic Rocks, How to describe rocks

Rock Project --Rock Suite assigned this week and practical time is used to determine if the suite is igneous, sedimentary or metamorphic --start to identify minerals in rock suite

Jan. 28 and 30: Petrology of the Mantle, Igneous Rocks of the Oceanic Lithosphere

Readings: Chapters 7 and 8

Practical: Assignment 2

Feb. 4 and 7: Igneous Rocks of Convergent Margins, Igneous Rocks of Continental Lithosphere

Readings: Chapters 9 and 10

Practical: Assignment 2 continued

Feb. 11 and 14: Term Test

Reading for Practical: Pages 215-218, 245

Practical: Assignment 3

Feb. 25 and 28: Introduction to Sedimentary Rocks, Weathering, Conglomerates and Sandstones

Readings: Chapters 11, 12 pages 234-237, 13

Practical: Time to work on Rock Project descriptions

Mar. 4 and 7: Mudrocks and Carbonate Rocks

Readings: Chapters 14 and 15

Practical: Assignment 3 continued

Mar. 11 and 14: Other Types of Sedimentary Rocks, Introduction to Metamorphic Rocks

Readings: Chapters 16 and 17

Practical: Assignment 4

Mar. 18 and 21: Macroscopic Properties, Mineral Assemblages, and Equilibrium of Metamorphic Rocks

Readings: Chapters 18 and 19

Practical: Rock Project Presentations

Mar. 25 and 28: Metamorphic Reactions, Metamorphism of Mafic and Ultramafic Rocks

Readings: Chapters 20 and 21

Practical: Assignment 4 continued

Apr. 1 and 4: Metamorphism of Aluminous Clastic Rocks, Metamorphism of Calcareous Rocks

Readings: Chapters 22 and 23

Practical: Review Session

**Assignments:**

Assignment 1: Review of the Physical, Optical, and Chemical Properties of the Rock-Forming Minerals

Assignment 2: Composition and Classification of Igneous Rocks

Assignment 3: Composition and Classification of Sedimentary Rocks

Assignment 4: Composition and Classification of Metamorphic Rocks

**Rock Project:**

This is a 3 part project integrating rock identification and classification, mapping, and interpretation of rock-forming processes. Students will be assigned to a suite of rocks and accompanying maps and cross-sections.

Part 1: Identification of minerals and textures present in the rock suite. The students will use this information to determine if the rock suite is igneous, sedimentary or metamorphic (Check with instructor on Jan. 24 that this is correct). Once this is determined, the students will do formal rock descriptions and classify the rock suites. The rock classifications will be transferred to the map and cross-section they are given.

Part 2: Feb. 11 the students will be given a paper with a topic in petrology written on it. The students need to research that topic and use it to interpret the petrologic origin of their rock suite, map and cross-section. The students will produce a pamphlet summarizing the petrology of their rock suite that will be distributed to their classmates. The pamphlet will be in the format of a museum or national park handout and will be submitted electronically for grading via Blackboard. A detailed rubric for the pamphlet will be given out on Feb. 11.

Part 3: Each student will give a 10 minute presentation on the petrology of their rock suite. Presentations will be on March 18 and 21.

### **General Information about Submitted Work (Assignments, Projects and Tests)**

**Grading:** Your assignments must be done on the assignment handout with your name and student number filled out. Rulers should be used to draw straight lines, drawings should be coloured with coloured pencils, and all work needs to be shown in calculations. Examples will be given of how to do rock drawings and rock descriptions. Rubrics will be given for the Rock Project. Evaluation of assignments takes into account neatness and accuracy of drawings, labelling of drawings, and correctness and clarity of writing. Quality and content are both considered in grading. Your work will be graded by Dr. Preece. If you have a question or problem with the grade you receive, consult the Dr. Preece within 7 days of receiving your grade. Your grade may be revised up or down based on the review.

**Handing In Assignments:** It is your responsibility to hand in assignments to Dr. Preece. Students who mail assignments in, place work on the floor outside an office, or slip assignments under a door, do so at their own risk.

**Late assignments:** The late penalty is assessed as follows: 1 day 10%, 2 day 20%, 3 day 30%, 4 day 40%, 5 day 50%, 6 day and after 100%. The only exception is when an extension has been granted (see below).

**Extensions:** Requests for an extension on an assignment must be in writing in advance of the due date. Supporting documentation must be presented for all extensions. If the extension is for a medical reason, a verification of student illness form must be completed by a physician and the original form must be submitted to Dr. Preece. Photocopied forms will not be accepted. The form is available at: [http://www.utsc.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.utsc.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf) Extensions are granted at the discretion of Dr. Preece, and may be granted for other significant reasons if appropriate documentation is presented. The following website contains information about supporting documentation for all extensions and petitions. [http://www.utsc.utoronto.ca/~registrar/current\\_students/petitions#VSI](http://www.utsc.utoronto.ca/~registrar/current_students/petitions#VSI)

**Absence from term test or quiz:** If a term test or quiz is missed a letter documenting the reason for your absence, along with supporting documentation, must be hand delivered to Dr. Preece at the earliest opportunity. If the reason is acceptable a makeup test or quiz will be written within 5 days of the missed test/quiz. If the reason is not acceptable a grade of zero will be assigned for the test/quiz. If the extension is for a medical reason, a verification of student illness form must be completed by a physician

and the original form must be submitted to Dr. Preece. Photocopied forms will not be accepted. The form is available

at: [http://www.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf)

Makeup tests/quizzes are granted at the discretion of Dr. Preece, and may be granted for other significant reasons if appropriate documentation is presented. The following website contains information about supporting documentation for all extensions and petitions.

[http://www.utoronto.ca/~registrar/current\\_students/petitions#VSI](http://www.utoronto.ca/~registrar/current_students/petitions#VSI)

**Deferred Final Exam:** If for some reason you cannot write the final exam you must follow the University procedures outlined at: [http://www.utoronto.ca/~registrar/current\\_students/deferred\\_exams](http://www.utoronto.ca/~registrar/current_students/deferred_exams)  
There are serious consequences to deferring a final exam and I would encourage all students to read this document.

**Academic Integrity (modified from M. Meriano EESC13H3F):** Assignments will be checked for plagiarism. Even if practical work is done in a group the assignment must be done individually. The University Calendar has a detailed discussion and outline of the policy on plagiarism and academic integrity. The University of Toronto's Code of Behaviour on Academic Matters, <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>, outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. If you are unclear about what constitutes plagiarism or cheating, talk to your course instructor as the sanctions for plagiarism and cheating can be severe.

Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids.
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.

In academic work:

- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <http://www.utoronto.ca/academicintegrity/>).

**Lost or misplaced assignments:** Please keep a photocopy of your work and make more than one electronic copy of your work. Excuses are not accepted in the case of lost or misplaced work.

**References:** You are required to use the APA style for referencing. Students may be required to submit their written work in electronic form and have it checked for plagiarism.

**Accessibility (modified from M. Meriano EESC13H3F):**

All students are welcome in this course. If you have a disability/health consideration that may require accommodations, please feel free to approach Dr. Preece and/or the AccessAbility Services Office so any course adaptations can be established early in the term. Please note that colour blindness should be disclosed so appropriate measures can be put in place for the microscope portion of the course. All inquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca). Students are encouraged to review the Calendar for information regarding all services available on campus.