

Faculty of Science Course Syllabus
Department of Earth and Environmental Sciences
ERTH 4010 & ERTH 5010
Advanced Petrology
Winter 2019-2020

Instructor(s): *Yana Fedortchouk* *yana@dal.ca* *LSC 3050*

Lectures: *T, R 8:35-9:55* *LSC C212*

Laboratories: *weekly 2.5 hours, M 9:05-11:25*

Tutorials: *n/a*

Course Description

This course advances students' knowledge of modern aspects of petrology, volcanology, and geochemistry, chosen to reflect instructor and students' interests. The focus is on learning thermodynamic and computational methods as well as advanced petrographic work and field mapping for interpretation of igneous and metamorphic rocks.

Course Prerequisites

ERTH 3010 or equivalent, ERTH 3020 or equivalent, or permission of instructor.

Course Objectives/Learning Outcomes

- *Apply thermodynamics to mineral assemblages in natural rocks to examine rock-forming processes*
- *Understand principles and limitations of geothermometers and geobarometers; apply them to natural rock examples*
- *Model chemical and physical parameters of igneous rocks using modern software packages*
- *Observe, describe and interpret textures of intrusive and volcanic rocks to examine conditions of their emplacement*
- *Develop skills of critical reading of scientific literature*

Course Materials

- *Reading posted on the Brightspace: chapters from books and articles from scientific journals*

Course Assessment

Component	Weight (% of final grade)		Date
	ERTH4010	ERTH5010	
Exam	20%	15%	March 17
Assignments			
<i>Presentations and discussions (3)</i>	20%	15%	
<i>Article reviews (9)</i>	20%	15%	
<i>Theory problems and labs (9)</i>	20%	20%	
<i>Project</i>	20%	20%	March 31
<i>Lecture (only ERTH5010)</i>		15%	

Other course requirements

n/a

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies

Students must use the Student Declaration of Absence form for missed academic requirement in this course (except for the final exam). Additional information is in the supplemental syllabus.

In case of the weather-related cancelled classes, the presentations will be moved to the next class.

Collaboration and working together on assignments and projects are encouraged in this course, but no copying of each other's work is allowed. Everyone needs to complete their assignments.

Course Content

	Lecture Content	Presentations	Labs
Weeks 1 – 4	<ul style="list-style-type: none"> - Introduction to thermodynamics - Free energy and phase equilibria - Thermodynamics of solutions - Phase equilibria in igneous systems - Geothermometry, geobarometry, and mineral reactions among solid solutions 	Thermometers, Barometers	Thermodynamic problems
Weeks 5 – 8	<ul style="list-style-type: none"> - Effects of volatiles on melt equilibria - Fugacity and Activities - Thermodynamics modeling programs 	Models on diamond origin	Thermodynamic problems and practice of modeling programs
Weeks 9-12	<ul style="list-style-type: none"> - Origin and importance of kimberlite magmatism - Processes controlling natural processes of diamond formation - Alternative models of kimberlite emplacement and control on diamond distribution 	Models of kimberlite age distribution, triggers, eruption processes	Identification of kimberlites and different kimberlite facies in thin-sections with applications for exploration

Faculty of Science Course Syllabus (Section B)
ERTH4010 & ERTH5010

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>