



Instructors:	Lectures: Djordje Grujic	dgrujic@dal.ca	
	Labs: Yana Fedortchouk	yana@Dal.Ca	
TA:	TBD		
Lectures:	<i>Mo, We and Fri</i>	<i>10:35 - 11:25 AM</i>	<i>Location: LSC common area - Room C214</i>
Laboratories:	<i>Tue</i>	<i>2:35 - 5:25 PM</i>	<i>Location: LSC - EES wing - Room B2020A</i>
Tutorials:	N/A		

Through a thorough and systematic examination of hand specimens and thin sections, and the detailed description of mineral assemblages and textures, students will be able to formally classify a wide range of igneous, metamorphic and sedimentary rock types and mineral deposits. Case studies representing the geology of Nova Scotia will also be presented.

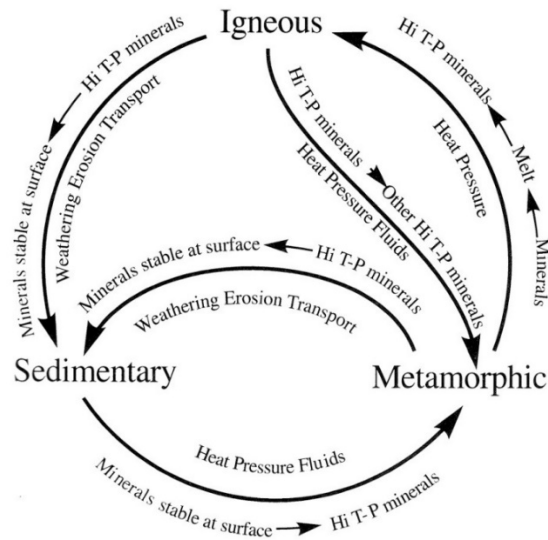
ERTH2001 and CHEM 1011/CHEM101 or CHEM 1021/CHEM102

The overall goal for this course: For the individual student to be able to classify rocks and identify and describe the broader scale processes and significance of the geological histories being recorded by these rocks. To achieve this, students will address the following questions:

- 1) How do you describe a rock? The concepts and skills required:
 - **Mineralogy** (what are these rocks made of?)
 - **Textures** (crystallinity, grain sizes, structures, etc.)
 - **Petrology** (naming and classifying rocks and why they are grouped as they are)
- 2) Why bother?
 - What planet do you live on, and what is it made of?
 - Is it important to understand the planet you live on?
 - How old is our planet, and has it remained the same?
- 3) Where is petrology applied?
 - Rocks record the history of our planet and, indeed, most other planets that you may study.
 - The three core disciplines in geology are **petrology**, structure, and stratigraphy.

- Geochemistry and the environment – the background signals that you see are controlled by the rocks and minerals that these environments are made of.

Many, if not all, geologic processes are fundamentally involved with, or influenced by, changes in the makeup of Earth Materials, i.e. rocks and minerals.



From: Nesse, 2000; Fig. 5.1

The skills required to understand petrology include:

Identification of minerals and bulk compositions in thin section, classification of rocks including full petrographic descriptions, mineral textures, zoning, reactions and micro-petrology. Professionals working in this field must be able to write this information in the form of a petrographic report.

Course Materials

Required Textbook:

Title: Earth Materials

Edition: 2nd

By: Cornelis Klein, Anthony Philpotts

Paperback ISBN: 9781316608852

Online ISBN: 9781316652909

DOI: [10.1017/9781316652909](https://doi.org/10.1017/9781316652909)

and

Nesse, William D. "Introduction to Mineralogy" (3ed) Oxford University Press. ISBN 978-0-19-982738-1

All other material will be posted on Brightspace and/or be handed out in class.

Course Assessment

Component	Weight (% of final grade)	Date
<i>Petrographic Reports (two x 10% each)</i>	20%	<i>After Part 1 and Part 2 of course</i>
<i>Quizzes and Lab Exercises (three x 10% each)</i>	30%	<i>Completed on Brightspace</i>
<i>Analysis Project (EMPA via remote access)</i>	15%	<i>Analysis Week (see below)</i>
<i>Final Lab exam</i>	15%	<i>(Scheduled by Registrar)</i>
Final Written Exam	20%	(Scheduled by Registrar)
<i>Field Trip exercise (optional)</i>	5% (bonus marks)	<i>TBD (weather dependant)</i>

A field trip will be organized during the semester to examine textures and rock classification around the downtown core of Halifax. However, the trip will be weather-dependent, and students will be notified at least two weeks in advance. The trip will take place on a Saturday or Sunday afternoon and will last approximately 4 hours. Attending the trip is optional, but it will be graded for bonus marks, making up an equivalent of 5% of the final course mark. Due to the uncertainties of winter weather, the trip may not be held.

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

Attendance at lectures and labs is mandatory. Assignments, quizzes, etc. handed in late without reasonable and documented cause will be deducted 10% after the deadline and a further 10% per day. Assignments handed in more than 5 days late will not be graded.

Course Content

Lectures will be held in parallel with the labs and the course will be divided into three sections.

Part 1a: Igneous rocks

Introduction to igneous rock classifications, igneous rock textures and the paragenesis of common igneous rocks using a petro-tectonic foundation. Lectures and in-class practical exercises.

Part 1b: Igneous rocks (4 labs including the 1st petrographic report)

Introduction to igneous rock classifications, igneous rock textures and the paragenesis of common igneous rocks using petrographic methods and analytical data.

Part 2a: Metamorphic rocks

Introduction to metabasites: facies, minerals and reaction textures, introduction to metapelites: facies, minerals and reaction textures, and the PTt paths and histories recorded by common metamorphic rocks. Lectures and in-class practical exercises.

Part 2b: Metamorphic rocks (4 labs including the 2nd petrographic report)

Analysis of metabasites and metapelite, including grades of metamorphism, deformation textures, facies, minerals and reaction textures and assembling the PTt histories of metamorphic events using petrographic methods and analytical data.

Part 3: Sedimentary rocks (2 labs and 2 weeks of lectures)

Introduction to sedimentary petrography in clastic and carbonate rocks. Classifications, textures, paleo-environments and depositional histories.

Two petrographic reports, which are in the form of case studies with a strong emphasis of the geological history of Nova Scotia, are incorporated into the existing core petrology concepts of the course. These case studies may involve analysis of igneous rock suites, magmatic history, petro-tectonics, metamorphic rock suites, PT-paths, etc.

There will be three comprehensive quizzes which will be completed during the semester, one on igneous rocks, processes and petro-tectonics, one on metamorphic rocks, reactions and PT-paths, and one on sedimentary rocks, petrography and paleo-environments.

The registrar will schedule the Final Exams by Feb 1st and will be held after classes have finished between April 13th and 25th.

Student Resources and Support

University Policies and Programs

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

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

Classroom Recording Protocol:

https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html

Dalhousie Grading Practices Policies:

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

Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html

Sexualized Violence Policy: https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html

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

Learning and Support Resources

General Academic Support – Advising (Halifax): https://www.dal.ca/campus_life/academic-support/advising.html

General Academic Support – Advising (Truro): <https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html>

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

On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html

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

Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.html>

Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803:

<https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

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

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

LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html>

Dalhousie Libraries: <http://libraries.dal.ca/>

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

Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>

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

Human Rights and Equity Services: <https://www.dal.ca/dept/hres.html>

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

Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Safety

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

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

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

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

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits.

Service	Support Provided	Location	Contact
General Academic Advising	Help with <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties 	Killam Library Ground floor Rm G28 <i>Bissett Centre for Academic Success</i>	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca

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All members of the Dalhousie community are expected to comply with their obligations under Canadian copyright law. Dalhousie copyright policies and guidelines, including our Fair Dealing Guidelines, are available at <http://www.dal.ca/dept/copyrightoffice.html>. Copyright questions should be directed to the Copyright Office at copyright.office@dal.ca.