

**Faculty of Science Course Syllabus**  
**Department of Earth Sciences**  
**ERTH2002**  
***Introduction to Petrology***  
***Winter Semester 2023***

**Instructor(s):** Richard Cox    [richard.cox@dal.ca](mailto:richard.cox@dal.ca)    LSC (Oceanography wing - Room 4626)  
**Lectures:**    Mon, Wed and Fri 9:35 - 10:25 AM    Location: LSC common area - Room C202  
**Laboratories:** Mon and Wed    2:35 - 5:25 PM    Location: LSC - EES wing - Room 2020A  
**Tutorials:**    N/A

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**Course Description**

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.

**Course Prerequisites**

ERTH2001 and CHEM 1011/CHEM101 or CHEM 1021/CHEM102

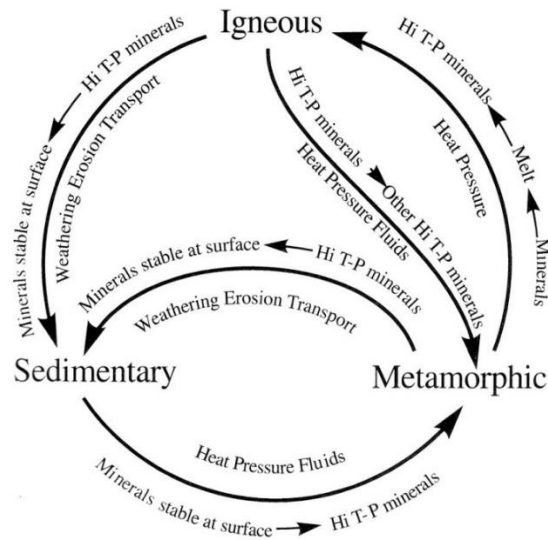
**Course Objectives/Learning Outcomes**

**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 are they grouped as they are)
  
- 2) Why bother?
  - What planet do you live on and what is it made of?
  - Do you think understanding how the planet you live on is important?
  - How old is our planet and has it remained the same?
  
- 3) Where is petrology applied?
  - Rocks essentially record the history of our planet and indeed most other planets that you may study.
  - The three core disciplines in geology – **petrology**, structure, 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 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:**

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
<b>Petrographic Reports (two x 12.5% each)</b>	25%	After Part 1 and Part 2 of course
<b>Quizzes and Lab Exercises (five x 5% each)</b>	25%	Completed on Brightspace
<b>Final Lab exam</b>	25%	(Scheduled by Registrar)
<b>Final Written Exam</b>	25%	(Scheduled by Registrar)
<b>Field Trip exercise (optional)</b>	5% (bonus marks)	TBD (weather dependant)

## Other course requirements

A field trip to examine textures and rock classification around the downtown core of Halifax will be arranged during the semester but will be weather dependant. Students will be given notice of at least two weeks in advance of this trip, which will take place on a Saturday or Sunday afternoon and will last approximately 4 hours. Attendance is optional and the exercise will be graded for bonus marks making up an equivalent of 5% of the final course mark. **Given the vagaries of the winter weather this trip may not be run.**

## 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 1<sup>st</sup> 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 2<sup>nd</sup> 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 five comprehensive quizzes which will be completed during the semester, two on igneous rocks, processes and petro-tectonics, two on metamorphic rocks, reactions and PT-paths, and one on sedimentary rocks, petrography and paleo-environments.

The Final Exams will be scheduled by the registrar by Feb 1<sup>st</sup> and will be held after classes have finished between April 13<sup>th</sup> and 25<sup>th</sup>.

### **ACCOMMODATION POLICY FOR STUDENTS**

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

[http://www.dal.ca/dept/university\\_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html](http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html)

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the **Request for Accommodation** form are available at [www.dal.ca/access](http://www.dal.ca/access).

### **ACADEMIC INTEGRITY**

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's **Policy on Intellectual Honesty** and **Faculty Discipline Procedures** is available here:

[http://www.dal.ca/dept/university\\_secretariat/academic-integrity/academic-policies.html](http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html)

### **STUDENT CODE OF CONDUCT**

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general: "The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;

- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members.”

The full text of the code can be found here:

[http://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

## COPYRIGHT

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](mailto:copyright.office@dal.ca).

## SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

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