

## Faculty of Science Course Syllabus

### Department of Earth Sciences

ERTH 4003 - Winter 2024

### Seminar: Field Camp Preparation

Subtitle: The Geology of the North American Cordillera

*Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.*

*Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.*

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<b>Instructor:</b>	<i>Mike Young</i>	<i>mike.young@dal.ca</i>	<i>Room 2055A LSC</i>
<b>Seminars:</b>	<i>Th 5:35 – 7:25pm</i>		<i>Room 2055 LSC</i>
	The class will meet weekly throughout the winter term.		
<b>LMS:</b>	Microsoft Teams		

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### Course Description

Field geology is the science and technique of recognizing, describing and interpreting geologic features in the field. It comprises more than just putting lines on a map, although lines on a map are necessary, and we will spend a good deal of time doing this. Field geology involves working out

- Stratigraphy, the sequence and conditions of formation of rock units;
- Structure, the three-dimensional geometric arrangement of rock units; and
- Geologic history, the "interpreted story" of geologic events that produced the observed stratigraphy and structure.

The three are closely interrelated, and in the very interesting cases are completely inseparable.

This winter term seminar course is intended as an introduction to and preparation for EARTH 4004: Advanced Field Geology. Field geologists who are familiar with their field work assignment (**cognitive preparation**), with the area of the field work (**geographical preparation**) and the kind of event in which they will participate (**psychological preparation**), are typically more productive, efficient, and confident during the field campaign. This seminar class aims to address all three components of preparation with emphasis on the cognitive preparation – the local and regional geology of field school. Class readings and assignments will be directly relevant to the field projects and concepts emphasized at Field School. The readings will be drawn from key journal articles and book chapters.

### Attendance and Participation

Class attendance and field trip participation are mandatory for credit. Both of EARTH 4003 and EARTH 4004 must be completed to receive a grade. All students will be responsible for reviewing and presenting topical papers in class. Classroom discussions will be a primary educational tool in this course, and participation will constitute a portion of the course grade. On a rotating basis, students will be responsible for leading discussions on assigned readings.

**General Topics:**

- Field Safety, Living and Working Together, Travel & Camp Logistics, Field Attitude
- Indigenous lands and natural resources. Concepts to explore include Indigenous groups of southwest US, and traditional place names in and around field school sites.
- Geology and Tectonics of western North America
- Proterozoic, Paleozoic and Mesozoic sedimentary environments of southwest US
- Compressional tectonics, fold-and-thrust belts, and magmatic arcs (Late Paleozoic to Mesozoic Orogenesis: Antler, Sonoma, Sevier, and Laramide Orogenies)
- Extensional tectonics contrasting low-angle and high-angle fault systems (Basin and Range extension and associated magmatism and basin-fill deposits)
- Wrench Tectonics (Eastern California Shear Zone)

**Class Format:**

The 2-hour class will generally be divided into two parts. The first 30 minutes will be discussion/presentation of the assigned readings led by various students, and the last 60 minutes will be a lecture introducing the weekly topic and assignment. Papers, book chapters and other texts will be distributed in class and via MS Teams along with discussion topics, specific questions to address, and a list of students who will lead different topics of the discussion. Assignments will be due Tuesdays at 10pm to allow time for assessment, feedback and modification of the Thursday seminar.

**Course Assessment**

Credit can only be given for this course if EARTH 4003.015 and 4004.045 are completed in consecutive terms. Together, these are project-based courses. Many of the projects will be done with partners, or in groups, but each person will hand in their own final piece of work for most of the projects. Most projects will be graded using a rubric and will consider not only accuracy and thoroughness of field data, but also neatness, completeness, and presentation (i.e., professionalism).

In EARTH 4003.015 there will be weekly or bi-weekly assignments of either a written summary of the assigned readings, or a map analysis with a stratigraphic or structural section. Additionally, one student or a group of students will present a short summary of the assigned reading each week and lead a class discussion. All students will be expected to contribute to the discussion. There will be a term paper and presentation.

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|------------------------------------------------------|------|
| • Summaries of weekly readings. Top 6 of 7 summaries | 50%  |
| • In-class presentation and discussion.              | 10%  |
| • Quiz (compass, plotting, stereonet, rock ID)       | 15%  |
| • Term poster, due ~April 15 <sup>th</sup>           | 25%* |

*\*poster will be presented during field school*

The best 6 of 7 summaries of weekly readings will be counted. Late submission of the summaries will not be accepted since they will be the subject of the class discussions. Late submission of the term paper will be docked 10% per day. If ill and unable to submit an assignment, students are encouraged to contact the instructor before the due date to make arrangements for late submission or a make-up assignment.

**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)	

**By participating in this course, students understand they must complete EARTH 4004.045: Advanced Field Geology in the spring 2024 term which runs from April 25 to May 22 entirely in the southwest US (Nevada, Utah, Arizona, California).**

**Schedule subject to change. Announcements will be made via email and/or Teams.**

Week	Date	Lesson Topic(s)	Reading/Assessment
1	Jan 11	Geology of SW US	Unit 7 Geol SW, Athabasca
2	Jan 18	Attend BGC employment session	None
3	Jan 25	Geology of SW US II	Dickenson paper
4	Feb 3	Precambrian of NA and SW US	Mineral Potential of Gold Butte region
5	Feb 10	Field School Logistics	1 recipe each
6	Feb 16	Indigenous Peoples of Mohave region	Indigenous groups in field school region
Reading Week			
7	Feb 29	Fold and Thrust Belts in the Mesozoic	Map analysis and cross section
8	Mar 7	Cenozoic - Basin and Range I	TBA
9	Mar 14	Cenozoic - Basin and Range II	Time series chart of Monarch Canyon
10	Mar 21	Field Safety and Rules	None
11	Mar 28	Sedimentology in the field	None
12	Apr 4	Quiz	

## 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](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](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](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](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](https://www.dal.ca/academics/important_dates.html)

### **University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](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](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](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](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](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](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](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](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](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>