



# EGEO-ERSC-GEOG-3003H-A: Field Methods in Environmental Geoscience

## 2022FA - Peterborough Campus

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### Instructor:

Instructor: Ian Power

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Phone Number: 705-748-1011 x6257

Office: Chemical Sciences Building F110

Office Hours: Thursdays, 1:00 to 3:00 pm

### Meeting Times:

Friday, 9 am to 2 pm (5-hour block), Environmental Sciences Building C111.3.

We will meet in ESB C111.3 just prior to 9 am, organize gear, and shortly after board the bus outside ESB/Science Complex.

**\*\*\* Buses will leave on time \*\*\***

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### Co-instructors and Teaching Assistants:

Justin Lockhart (MSc student), Teaching Assistant - [justinlockhart@trentu.ca](mailto:justinlockhart@trentu.ca)

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### Department:

Academic Administrative Assistant: Mary O'Grady

Email Address: [maryogrady@trentu.ca](mailto:maryogrady@trentu.ca)

Phone Number: (705) 748-1011 ext. 7199

Office: ESC C204

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## Description:

Students learn essential field skills, including designing a field study, mapping, and measurement techniques. The geology of Central Ontario and its mining industry are examined along with the potential for environmental impacts. Most instruction takes place during required field trips with students documenting their work in technical reports. Prerequisite: EGEO-GEOG 2001H or GEOG-ERSC 2401H or permission of instructor. Excludes EGEO-ERSC-GEOG 2000H.

The three major themes of the course are 1) **geologic investigation**, 2) **environmental assessment**, and 3) **geoscience processes**. Similarly, the three big questions we try to answer at each field site are 1) what is the geology telling us? 2) what are the environmental impacts (or potential)? and 3) what are the underlying geoscience processes that shaped this environment?

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## Learning Outcomes:

I have developed the course to address several learning outcomes. By the end of the course, a successful student should be able to:

1. Plan, design, and carry out an effective field campaign
  2. Identify and describe various rock formations
  3. Read, interpret, take bearings from, and locate features on maps
  4. Articulate the influences geological formations have on the environment
  5. Effectively analyze, discuss, and present geoscientific data in technical reports
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## Course Fees:

A maximum of \$120 to cover a field kit and transportation for field trips.

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## Texts:

**Recommended text:** Eyles, N. (2002) *Ontario Rocks: Three Billion Years of Environmental*

*Change*. Markham, Canada: Fitzhenry & Whiteside.

This textbook contains chapters on general geology and mineralogy that are helpful reviews. The majority of the text covers Ontario's geologic history, spanning 3 billion years, with some of the field sites for the course being mentioned.

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## Readings:

Refer to the textbook by Eyles for general geology and the geologic history of Ontario, which are relevant to all field exercises. Papers and reports will be posted on Blackboard for each exercise. These documents contain **valuable information and data** that can be used in your reports. Furthermore, it is expected that you will conduct secondary research to gather additional references (e.g., journal articles, reports, suitable online resources) to support your reports.

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## Assessments, Assignments and Tests:

Your grade is based on field reports, presentation, notebook, and final exam. You will write technical reports detailing the 8 field exercises and 1 laboratory exercise that are each worth 10%. Reports will include background information, objectives, methods, data and observations, discussion with interpretations and conclusions, and will be written as though for a client. **You must attend and complete the exercise to submit a report, and your best 6 of 9 reports (6 x 10% = 60%) will count towards your final grade.** Grading of reports is based on presentation, writing quality, results and observations (quantity and quality), figures (graphs/maps/diagrams/photos), interpretation and discussion, and conclusions. Your performance and work in the field are also considered in your report grades.

You will sign up to give one **presentation (10%)** near the end of the term based on **an exercise for which you have not submitted a report**. In addition, you will record observations, data, measurements, sketches, rock descriptions, etc., in your **notebook (10%)**. A **final exam (20%)** will test your knowledge of the field sites, and the geoscience concepts learnt during the course.

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## Grading:

**Graded work, Weighting, Report type, Due date:**

**Exercise 1: Glacial Drift Prospecting**, 10%, Individual, September 23

**Exercise 2: Warsaw Caves**, 10%, Partnered or individual, September 30

**Exercise 3: Marmora Geologic Sites**, 10%, Individual, October 7

**Exercise 4: Covia Nepheline Syenite Mine**, 10%, Partnered or individual, October 14

**Exercise 5: Cordova Mines Tailings Sampling**, 10%, Partnered or Individual, October 21

**Exercise 6: Leaching and Remediation Experiment**, 10%, Individual, December 2

**Exercise 7: Cordova Mines Independent Project**, 10%, Individual, November 4

**Exercise 8: Pyrite Mines or Cordova Mines Phytoremediation** (to be decided), 10%, Partnered or individual, November 18

**Exercise 9: Canada Talc Mine**, 10%, Individual, November 25

**Notebook**, 10%, Individual, November 25

**Presentation**, 10%, Individual, December 2

**Final exam**, 20%, scheduled during the exam period

### Important notes:

1) You will be graded based on your best 6 of 9 reports (6 x 10% = 60%) and present on one of the exercises (10%) that you have not submitted a report. In addition to the quality of your report, your performance and work in the field are also considered when assigning your report grades. Your remaining grades are your notebook (10%) and final exam (20%).

2) Partnered reports are graded with higher expectations than reports written by individuals and must include an Authors' Contribution statement.

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## Grade Total by Withdrawal Date:

Grade total is 30% prior to November 8, 2022, which is the final date for withdrawal from Fall-term courses.

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## Schedule:

### Week-by-week schedule (subject to weather and site access):

**September 9** - Exercise 1: Glacial Drift Prospecting following lectures on 1) Course organization, 2) Safety induction, 3) Ontario geology, and 4) Exercise 1 prep talk

**September 16** - Exercise 2: Warsaw Caves

**September 23** - Exercise 3: Marmora Geologic Sites

**September 30** - Exercise 4: Covia Nepheline Syenite Mine

**October 7** - Exercise 5: Cordova Mines Tailings Sampling

**October 14** - Exercise 6: Leaching and Remediation Experiment

**October 21** - Exercise 7: Cordova Mines Independent Project

**October 28** – *Reading week*

**November 4** - Exercise 8: Pyrite Mines *or* Cordova Mines Phytoremediation (to be decided)

**November 11** - Exercise 9: Canada Talc Mine

**November 18** - Continuation of Exercise 6: Leaching and Remediation Experiment; lab cleanup and preparation of leachates for analysis; start bonus X-ray diffraction activity

**November 25** - Review for final exam; petrography, hand specimens, and complete bonus X-ray diffraction activity; also flexible week in case an exercise needs to be reschedule due to weather or other reason.

**December 2** - Student presentations

**Final Exam** - scheduled during exam period

**Bancroft field trip** - An optional, non-graded, field trip to the Bancroft area will be scheduled on a Saturday or Sunday in either September or October.

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## Course Guidelines:

### Report Submission:

***You must attend and complete the exercise to submit a report.*** Reports are due by 7 pm on the days listed in the Grading section. Family emergencies and extended periods of illness will be given special consideration on a case-by-case basis. It is highly recommended that you attend all classes and field trips. Your best 6 reports will be used for your final grade; thus, you may eliminate a low grade by completing an extra report. Your presentation will be on an exercise that you do not submit a report.

### Late Policy:

Reports will ***not be accepted*** after the time they are due and ***late submissions will receive a ZERO grade.*** However, each student may request **one extension** (*free of penalty*) and hand in their assignment 3 days after the due date (see Grading section) by 7 pm. You cannot request an extension on your presentation. The extension must be requested by email prior to the deadline. Family emergencies and extended periods of illness will be given special consideration on a case-by-case basis.

### Report Bonus:

You can receive a bonus of **10% on one of your reports** by attending a talk for the Trent School of the Environment Seminar Series and including a paragraph amended to one of your reports that summarizes the seminar's key points. Seminars and dates are advertised on the TSE website and social media accounts.

## SafeAssign:

Reports must be submitted electronically on Blackboard, which uses the plagiarism-checking software SafeAssign. Further information about SafeAssign will be provided on the class LearningSystem/Blackboard site.

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## University Policies:

### Academic Integrity

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from failure on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's *Academic Integrity Policy*. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more: [www.trentu.ca/academicintegrity](http://www.trentu.ca/academicintegrity).

### Access to Instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and documentation from a regulated health care practitioner and feels that they may need accommodations to succeed in a course, the student should contact the Student Accessibility Services Office (SAS) at the respective campus as soon as possible.

### Sharing and Distribution of Course Content

Students in this class should be aware that classroom activities (lecture, seminars, labs, etc.) may be recorded for teaching and learning purposes. Any students with concerns about being recorded in a classroom context should speak with their professor. If a student shares or distributes course content in any way that breaches copyright legislation, privacy legislation, and/or this policy, the student will be subject to disciplinary actions under the relevant Academic Integrity Policy, the Charter of Student Rights & Responsibilities, or the Policy on the Protection of Personal Information, at a minimum, and may be subject to legal consequences that are outside of the responsibility of the university.

### Student Absenteeism, Missed Tests and Examinations

Students are responsible for completing all course requirements, including attending classes and meeting assignment deadlines as specified on their syllabus.

Adjustments and deferrals to dates for participation, assignment submissions, tests, midterms and final examinations are not automatic. It is the student's responsibility to email their

instructor immediately if they are unable to fulfill academic requirements.

Courses delivered remotely may involve student participation in scheduled (synchronous) classes via web-based platforms, such as Zoom. Students unable to participate (i.e., by video and/or audio) should email their instructors to request alternative arrangements for participation in these scheduled (synchronous) classes.

Students are required to be available for all tests, midterms and exams that are listed in their course syllabus and scheduled by their instructor or the Office of the Registrar. Depending on their program, the instructor or the chair/director may decide on alternative arrangements for exams and tests. Normally a doctor's note or supporting documentation is not required; however, when a student's success in the course or program is in jeopardy as determined by the instructor or chair/director, documentation may be requested.

Specific SAS accommodations can be implemented for students registered with Student Accessibility Services (SAS), but it is the responsibility of the student to make these arrangements in advance as per SAS guidelines, and to discuss accommodations of due dates with their instructors.

Students can notify the Office of the Registrar of their wish to observe cultural or religious holidays during scheduled examination periods by the deadline set in the Academic Calendar. Personal travel plans are not acceptable reasons for missing tests or exams.

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