



UNIVERSITY OF CALGARY  
FACULTY OF SCIENCE  
DEPARTMENT OF GEOSCIENCE  
COURSE OUTLINE

1. **Course:** GOPH 549, Field School -- Summer 2018

Instructor Name	Email	Phone	Office	Hours
<i>B01: ( T 17:00 - 18:30 in SA 121)</i>				
Brandon Karchewski	brandon.karchewski@ucalgary.ca	403-220-6678	ES 108	By appt
Kristopher Innanen	k.innanen@ucalgary.ca	210-6837	ES218	TBA
Rachel Lauer	rachel.lauer@ucalgary.ca	403-220-7923	ES 276	By appt

Lecture Sections: none

B01: August 20-August 25 Location: Castle Mountain and Environs

B02: August 26-August 31 Location: Castle Mountain and Environs

T01: September 4-25 - Tuesdays, 17:00 - 18:30 SA 121

T02: September 4-25 - Tuesdays, 18:30 - 20:00 SA 119

**Course Site:**

D2L: GOPH 549 B01-(Summer 2018)-Field School

**Department of Geoscience:**

Office: ES 118

Phone: 403 220-5841

Email: geoscience@ucalgary.ca

**Note:**

Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

**Prerequisite(s):** Geophysics 355, 453 and 457, admission to the Major or Honours program in Geophysics and consent of the Department.

**Notes:** This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course. Data collected will be processed during Fall Term tutorials.

Owing to the resources and logistics involved in field school, withdrawal from the course without permission of the Department will only be allowed prior to the field portion.

Last date to withdraw from GOPH 549 by section (students will require consent of the Department to drop this course after the drop date):

August 21st for B01, August 27th for B02.

Last date to withdraw with penalty: September 4th

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Field performance & participation	35	Aug 20-31
Field assignments	15	Aug 20-31
Final report & oral exam	35	Sep 21
Tutorial attendance & participation	10	Sep 4-25
Team evaluations	5	Sep 4

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	58%	56 %	50 %

Final percentage grade calculated from weighting scheme will be rounded to the nearest integer percentage and then converted to a letter grade using the chart above.

This course has a non-registrar scheduled final component.

Each piece of work (e.g. lecture and lab exams, lab assignments, project) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade. The conversion between course percentage and letter grade is given below.

The field performance and participation grade component will be assessed from field participation rubrics (to be posted on D2L) evaluated by TAs and/or instructors on each field day, as well as the quality of notes taken in field books. Field books will be evaluated based on quality and relevance of notes, as well as legibility. DO NOT remove pages from your field notes or re-write field notes after leaving the field. Only your original field notes will be evaluated. A rubric for field book evaluation will be posted on D2L. It is highly recommended that you review the rubric prior to arriving at field school so that you will know what we expect from your field notes.

The field assignments grade component will be based on a set of posters completed in teams after each day's field activities. The details of the assignments will be explained in the field, and they will have a rapid feedback cycle, with greater weight given to work completed toward the end of field school when more feedback has been provided.

At the end of the field activities, all students will be assigned a data set to analyse based on one or more of the methods encountered during field school. Students will analyse the data and write a report that presents a defensible model for interpreting the data, and discusses the key geophysical features of the data. Further details will be provided on D2L and in the field.

The final report & oral exam grade component will be based on the evaluation of this report, and performance in an oral exam involving questions about the report, and field school theory and practice in general.

The tutorial attendance and participation grade component will be assessed by the instructors based on a student's progress and engagement in tutorials and office hours when working on the report after field school. Instructors will be present at the tutorials to answer questions and provide feedback on report progress, but it is each student's responsibility to ensure that they demonstrate their engagement during the tutorials. One should not assume that simply attending the scheduled tutorials is sufficient to receive full participation marks.

The team evaluations grade component will be based on a combination of peer feedback forms filled out by teammates as well as instructors and TAs following field school. Remember that instructors and TAs are part of your team, and their opinion of your contribution to each day's activities carries equal weight to that of your peers.

The course involves use and manipulation of computer programs written in the programming language Matlab in the field and during the tutorials. Matlab codes and instructions for using the codes, in the form of preliminary exercises, are published on D2L roughly 1 month prior to the start of the field component. Students are expected to have worked through these exercises and to be familiar with the workings of the codes at the time their field course begins.

You must receive a passing grade in each of these components to pass the course.

#### 4. Missed Components of Term Work:

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself/themself with these regulations. See also [Section E.3](#) of the University Calendar.

#### 5. Scheduled out-of-class activities:

There are no scheduled out of class activities for this course.

A safety briefing will be held prior to departure on August 20th and August 26th.

#### 6. Course Materials:

Recommended Textbook(s):

Telford, W.M., Geldart, L.P. and Sheriff, R.E., *Applied Geophysics, 2nd Edition*: Cambridge University Press, 1990 .

Lecture notes from GOPH 355, 419 and 457 may be helpful. Additional reference material will be provided on D2L.

#### 7. Examination Policy:

No aids are allowed on tests or examinations. There will be no written Exams in this course, but there will be an oral exam held during the final tutorial period on Tue Sep 25. Further information on the format of the oral exam will be provided during tutorial and via D2L.

Students should also read the Calendar, [Section G](#), on Examinations.

#### 8. Approved Mandatory and Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

#### 9. Writing across the Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also [Section E.2](#) of the University Calendar.

#### 10. Human studies statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

#### 11. Reappraisal of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar

2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

#### 12. OTHER IMPORTANT INFORMATION FOR STUDENTS:

a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy

website ([Mental Health](#)).

- b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208).
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).
- Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Sr. Instructor of the Department of Geoscience, Dr. Rudi Meyer by email [rmeyer@ucalgary.ca](mailto:rmeyer@ucalgary.ca) or phone 403-210-7848. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.
- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). Student Ombudsman, Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

## Geophysics 549 - Course Description and Tentative Itinerary

Dr. Kris Innanen

Dr. Brandon Karchewski

Dr. Rachel Lauer

### Location:

Castle Mountain Resort and Pincher Creek, Alberta: All field components except for the seismic reflection surveys will take place on the grounds of the Castle Mountain Resort, where staff and students will be staying for the duration of field school. The seismic reflection survey will take place at a site that is approximately 20-30 minutes away from the resort with shuttles provided by instructors, staff and/or teaching assistants. Safety meetings will be held each morning to explain important features of each field site related to hazard awareness.

### Dates of Travel and Study:

Schedule details provided on D2L.

### Group Work:

Students will work in groups of 3-4, as assigned by the instructors on the first day. Much of the work will be graded as a group, but there will be a number of places where individual effort will be factored into the grading scheme (e.g., participation, field book quality, etc.). We will go over this early in the field school so everyone is fully aware of the grading procedure and can aim to do as well as possible with it in mind.

### Field School Scope

Exercises for this field school will focus on three key learning outcomes: 1) familiarity with equipment in common use in field methods in geophysics, 2) conceptual understanding of what is being measured by each piece of equipment and 3) algorithms for processing gathered data into meaningful output. Further details are provided in the Roadmap document posted on D2L.

### What to bring

1. You must bring a 4 5/8" x 7" spiral bound rite-in-rain field notebook (#303, 313, 353) – Everyone must have one, we will be checking and grading your notebook. The bookstore has stock of these. NOTE: It is highly recommended to fill in the first page (name, purpose of field notes, etc.) immediately after obtaining the field book so that you do not forget.
2. 5 days worth of dry clothes, long pants and shirtsleeves, appropriate for outdoor wear, walking through tall grass, working with equipment above and in the ground. Note: Long pants are required for field work, no shorts.
3. Appropriate footwear (sturdy hiking boots/work boots; steel toes a plus). If they are waterproof or resistant, so much the better. It is never a bad idea to have an extra pair of dry socks per day.
4. Comfortable and durable backpack, large enough for laptop, notebook, pens/pencils, lunch, water.
5. 1 or 2 large water bottles. You should aim to be consuming roughly 3L of water per day to stay properly hydrated.
6. Sun protection: hat, UV sunglasses, sunscreen. Note that you should consider clothing (ideally UPF rated) as your first line of defense against UV, and sunscreen as a second resort for areas that you are unable to protect with clothing.
7. Rain/wind protection: waterproof, windproof jacket, gaiters if you want.
8. Cold protection: toque, gloves, fleeces, jacket. Avoid cotton clothing as if it gets wet and cold, it will be undesirable.
9. Insect protection: bug spray with DEET. Again, you should consider long pants and long sleeved shirts as your first line of defense here, and bug spray as a backup. Be sure to check yourself after each field excursion for ticks (for more information on tick removal and health concerns related to ticks, see the Alberta Health page [here](#)).
10. A friendly and professional attitude: GOPH 549 has developed a very good relationship with the staff at Castle Mountain, and we would like to be able to return to this site into the foreseeable future. This requires that the staff's experience with GOPH 549 students be professional and agreeable (as well as vice versa). Please comport yourselves as representatives not just of yourselves, but also of many past and future U of C geophysics classes.

\*\* A note on weather - you can expect to experience expect long hours in any temperature from -5°C to +35°C with a combination of sun/rain/snow, you must be prepared for this. We have experienced the full range of these conditions at Castle Mountain in late August.

What not to bring:

1. Cell phones. You can bring them to Castle Mountain, but there is a 100% prohibition on use of cell phones for communication or internet use while in the field. They may be used for photos or as calculators, but be prepared to be challenged on your use of these devices by instructors, TAs and staff. It is not difficult to tell what a phone is being used for, even from quite a distance. Improper or unsafe use of phones may lead to you being sent home.
2. Alcohol. The hostel is a dry zone. Castle Mountain has a licensed restaurant where students may socialize in the evenings, but alcohol in any other place or time is prohibited. Violation of this will result in you being sent home. Do Not Bring Alcohol to the field school.

What to discuss with your instructors:

1. Special medical conditions or requirements (e.g., medication, allergies, etc.)
2. Special dietary restrictions (allergy related or otherwise).
3. Any questions/concerns that you have about field activities. Do not hesitate to keep the lines of communication open. We are happy to answer your questions.

**Department Approval:** Electronically Approved **Date:** 2018-07-26 16:59

**Associate Dean's Approval for out of regular class-time activity:** Electronically Approved **Date:** 2018-07-27 08:54

## Course Outcomes

- Apply concepts from geophysical theory (acoustic and elastic wave theory, potential field theory, electromagnetic wave theory) to interpret data gathered from field surveys.
- Develop and implement algorithms to process the data obtained from field investigations.
- Operate several types of geophysical survey equipment (seismic reflection, seismic refraction, electrical resistivity tomography, ground penetrating radar) with assistance from instructors, teaching assistants and/or technical support staff.
- Develop a defensible model of subsurface features based on the collection, processing and interpretation of geophysical data.
- Contribute effectively to a geophysical surveying team both to perform field surveys and to complete team deliverables reporting on the results.
- Communicate the development of geophysical data processing algorithms and the associated background theory.
- Write a scientific report on the analysis of geophysical data and the interpreted result