

Geophysical Methods ERTH 3405: Fall 2018

Course Outline

An introduction to the tools of applied geophysics including seismology, electrical, magnetic, and gravitational surveying methods. This course aims to provide a basic understanding of how geophysical surveys are conducted and how the data is processed for a wide range of applications. Lecture two hours a week, and a laboratory three hours a week. Most of labs are computer-based geophysical practices to enhance their knowledge on modern and computer-based geophysical methods. Students will use geophysical software which comes with textbook in their labs. Prerequisites: ERTH 2105.

Lectures take place on Mondays from 18:05-20:05. Labs are either Wednesdays or Fridays from 11:35-14:25.

Instructor:

Stephen Crane: Research Scientist at Natural Resources Canada

Email: Stephen.Crane@carleton.ca (evening) or Stephen.Crane@canada.ca (daytime)

Office hours: by email appointment.

Text Book:

Introduction to Applied Geophysics: Exploring the Shallow Subsurface by
H. Robert Burger, Anne F. Sheehan, Craig H. Jones

Available at the bookstore. New versions will come with a CD-ROM containing software. This software has been loaded onto the computers in the labs so it is not necessary to get separately.

Evaluation:

Theory: 75% In class Mid-term Exam (25%), Final Exam (50%).

Labs: 25% Lab Assignments (10 in total).

The **mid-term exam** will be held on November 7th, 2:35-4:35pm. The final exam will be scheduled during the December exam period.

All lab assignments are due at the end of the lab section you are registered in. Late assignments will not be accepted without prior approval by Instructor.

Students with conflicts: for any examination must have a note from an employer or a medical certificate (see below) in order to write the exam at another date. Unless caused by illness, all conflicts **MUST** be reported to the instructor **PRIOR** to the exam date.

LECTURE SCHEDULE

Week	Date	Topics	Chapters
1	Sept 10	Introduction to Geophysical Methods, Computer Materials	1
2	Sept 17	Seismology: Theory and Fundamentals	2
3	Sept 24	Seismology: Refraction I, single subsurface interface	3: 3.1-3.2
4	Oct 1	Seismology: Refraction II, multiple interfaces, dipping interfaces	3: 3.3-3.11
5	Oct 8	NO LECTURE - Statutory Holiday	
6	Oct 15	Seismology: Reflection	4
7	Oct 22	NO LECTURE - Fall Break	
8	Oct 29	Electrical Resistivity I: Theory, Horizontal Interfaces	5: 5.1-5.5
9	Nov 5	Mid-term Exam	
10	Nov 12	Electrical Resistivity II: Vertical Contact, Field Procedures, Quantitative Interpretation	5: 5.6-5.11
11	Nov 19	Gravity I: Theory and Methods	6: 6.1-6.4
12	Nov 26	Gravity II: Effects of simple shapes, Analysis and Interpretation	6: 6.5-6.8
13	Dec 3,7*	Magnetics: Theory and Methods, Review	7

Note: Friday December 7th follows a Monday class schedule

LAB TOPIC SCHEDULE

Week	Dates	Topic
1	Sept 5,7	NO LABS this week
2	Sept 12,14	Lab Assignment 1: Introduction to Computer Materials
3	Sept 19,21	Lab Assignment 2: Seismology Theory and Fundamentals
4	Sept 26,28	Lab Assignment 3: Refraction Seismology 1
5	Oct 3,5	Lab Assignment 4: Refraction Seismology 2
6	Oct 10,12	Lab Assignment 5: Refraction Seismology Survey
7	Oct 17,19	Lab Assignment 6: Reflection Seismology
8	Oct 24,26	NO LABS - Fall Break
9	Oct 31, Nov 2	Lab Assignment 7: Electrical Resistivity 1
10	Nov 7,9	NO LABS this week
11	Nov 14,16	Lab Assignment 8: Electrical Resistivity 2
12	Nov 21,23	Lab Assignment 9: Gravity 1
13	Nov 28,30	Lab Assignment 10: Gravity 2
14	Dec 5,7	NO LABS this week

Information on Academic Accommodations

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline