



UNIVERSITY OF CALGARY

DEPARTMENT OF GEOSCIENCE COURSE OUTLINE FALL 2017

1. **Course:** Geophysics 351 (GOPH 351), Introduction to Geophysics

Lecture Sections:

L01: MoWeFr, 13:00-13:50, EDC 179

For a listing of all lab sections corresponding with this course, please see the following link:

http://geoscience.ucalgary.ca/geoscience_info/courses/f17

2. **Instructor:** Dr. J. Dettmer, Office: ES 212, Ph. 403-220-4606, e-mail: jan.dettmer@ucalgary.ca
Office Hours: Mo We 2:00 – 4:00 pm or by appointment

Geoscience Department ES 118, 403-220-5841, geoscience.ucalgary.ca, geoscience@ucalgary.ca

3. **Prerequisites:** Geology 201, and 202 or 203; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219; Physics 211 or 221, and 223. See also Geology Course Descriptions of the University Calendar.

Antirequisites: Credit for both Geophysics 351 and 359 will not be allowed.

4. **Description:**

This course provides an introduction to important geophysical concepts and methods that are used to study the Earth and solve various geoscientific problems. Topics include tectonics on a sphere, isostasy, gravity and magnetism, heat flow, radioactivity and geochronology, earthquake seismology, reflection and refraction seismology.

5. **Learning Objectives:**

By the end of this course, students should be able:

1. **to explain** the physical basis for geophysical phenomena and processes (heat generation and transfer, seismic waves, magnetism, gravity);
2. **to interpret** physical properties of the Earth from geophysical measurements (e.g., thickness of the crust and lithosphere, age of the Earth and its components, earthquake hazard, potential drilling locations from seismic data);
3. **to apply** geophysical inference to deduce basic physical properties and structure of the Earth;
4. **to calculate** relative motions of plates on a sphere, steady-state geotherms, satellite orbital parameters, earthquake magnitude and location, overburden thickness from seismic refraction observations;
5. **to perform** error analysis for basic geophysical calculations such as geochronological age estimation and seismic velocity determination;
6. **to communicate** important geophysical concepts in written and oral form.

6. **Course Materials:**

Fowler, C.M.R. (2005). *The Solid Earth: An Introduction to Global Geophysics*, 2nd edition. Cambridge. *Required textbook*. Available at the bookstore.

Other materials: posted on D2L.

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

| | |
|----------------------|--|
| Lab Assignments (10) | 30% |
| Term tests (3) | 30% (in class) |
| Final Examination | 40% (To be scheduled by the Registrar) |

Each piece of work, e.g., assignment or exam(s), submitted by the student will be assigned a percentage score. The score for the exam(s) and the average score for the assignments will be combined with the weights indicated above 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 lower number P in the A to D+ percent ranges below can be determined from the formula $P = 10 * GPV + 43$, where GPV is the grade point value of the letter grade.

| Letter Grade | GPV | Percent | Letter Grade | GPV | Percent |
|--------------|-----|---------|--------------|-----|---------|
| A+ | 4.0 | 90-100 | C+ | 2.3 | 66-70 |
| A | 4.0 | 83-90 | C | 2.0 | 63-66 |
| A- | 3.7 | 80-83 | C- | 1.7 | 60-63 |
| B+ | 3.3 | 76-80 | D+ | 1.3 | 56-60 |
| B | 3.0 | 73-76 | D | 1.0 | 50-56 |
| B- | 2.7 | 70-73 | F | 0.0 | 0-50 |

Scores within 0.5% of the upper boundary of a percent range (e.g., 79.5%) may or may not be rounded up at the discretion of the instructor (a decision will be made based on the student's performance in the course). For percent grades on a boundary, the higher grade will be chosen (e.g., 73% is a B, not a B-).

8. **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 with these regulations. See also [Section E.6](#) of the University Calendar
9. **Examination Policy:** Students are permitted to bring a single-sided, hand-written crib sheet on standard letter-sized paper into the midterm and final exams. Students should also read the Calendar, [Section G](#), on Examinations.
10. **Writing across the curriculum statement:** In this course, the quality of the student's writing in laboratory reports and exams will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

11. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **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
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: Students with Disabilities: <http://www.ucalgary.ca/pubs/calendar/current/b-1.html> and Student Accessibility Services: <http://www.ucalgary.ca/access/>
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, 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 also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca
and science3@su.ucalgary.ca;
Student Ombuds Office: 403-220-6420 Email: ombuds@ucalgary.ca; <http://ucalgary.ca/provost/students/ombuds>
- (g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

- (h) U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI Surveys.

Department Approval: ORIGINAL SIGNED

Date: August 8, 2017