



# UNIVERSITY OF CALGARY

## DEPARTMENT OF GEOSCIENCE COURSE OUTLINE

**1. Course:** GLGY 377, Petroleum Engineering Geology

Lecture Sections: L01: TuTh, 11:00 – 12:15, ICT 121.

Lab sections: B01: Tu 8-10:50 am (ES147), B02: Tu 5-7:50 pm (ES147), B03: We 8-10:50 am (ES147), and B04: We 5-7:50 pm (ES147).

Dr. M. Georgescu, Office: ES 112, Ph. 403-210-7759, [dgeorge@ucalgary.ca](mailto:dgeorge@ucalgary.ca), Office Hours every day 13:00-14:00.

Dr. J. Bancroft, Office: ES 637, Ph. 403-220-5026, [bancroft@ucalgary.ca](mailto:bancroft@ucalgary.ca), Office Hours: TBA.

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**2. Prerequisites:** No prerequisites are necessary. See also Geology [Course Descriptions](#) of the University Calendar.

**Antirequisites:** Credit for both Geology 377 and 201 will not be allowed.

**Notes:** This course is restricted to engineering students.

**3. Grading:** The University policy on grading and related matters is described 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	25%
Midterm	30% (Will be announced in first lecture)
Final Examination	45% (To be scheduled by the Registrar)

Individual elements of the course (i.e. labs, assignments, exams) will be assigned a percentage score. Final percentage grades for the overall course will be calculated based on the grade weighting scheme indicated above, and will be converted to letter grades as follows:

Letter Grade	Percent	Letter Grade	Percent
A+	95-100	C+	65-69.99
A	90-94.99	C	60-64.99
A-	85-89.99	C-	56-59.99
B+	80-84.99	D+	53-55.99
B	75-79.99	D	50-52.99
B-	70-74.99	F	0-49.99

**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 with these regulations. See also [Section E.6](#) of the University Calendar

**5. Course Materials:** There will be no textbook required for the Geology part of the course. The textbook for the Geophysics part of the course is to be announced.

**6. Examination Policy:** *All the deferred exams are written, a combination of long and short answers.* We will provide in class full details about the material to be covered for each examination. Students should also read the Calendar, Section G, on Examinations.

**7. Writing across the curriculum statement:** N/A. See also [Section E.2](#) of the University Calendar.

**8. 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: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).
- (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: 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).  
SU Faculty Rep. Phone: 220-3913 Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca); [Student Ombudsman](#)
- (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) 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](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

### **Major Topics in the Geology Part.**

1. **Geology as part of natural sciences.** Earth internal structure and chemical composition.
2. **Minerals and rocks.** Major mineral groups with emphasis on silicates. Igneous, metamorphic and sedimentary rocks. Formation and chemical composition of these rocks.
3. **Geological time.** Principles of stratigraphy. Geological time scale and its major subdivisions. Absolute ages.
4. **Sedimentary rocks, sequences and depositional systems.** Sea-level changes and their causes. Sequence stacking patterns. Major depositional systems (eolian, fluvial, lacustrine, marine, etc).
5. **Basic elements of well-logging.**
6. **Elements of structural geology.** Faults and folds. Markers as basis for correlation.
7. **Petroleum system. Hydrocarbon formation.** Source rocks. Reservoir rocks and their characteristics. Seal rocks. Traps and their classification.

### **Major Topics in the Geophysics Part.**

8. The scalar wave equation, and its extension to elastic problems and beyond. Snell's Law and refraction. An introduction to the exploration seismic surveys. Investigations of the layered earth, and seismic data from flat layered models. Basic seismic data reduction and imaging principles. Overview of seismic interpretation for hydrocarbon exploration. Overview of other exploration methods such as gravity and magnetic surveys.

### **Major lab topics.**

Elements of topography. Minerals: properties and identification. Rocks: properties and identification. Core logging and elements of porosity and permeability. Practical exercises of geophysics.