



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF GEOSCIENCE
COURSE OUTLINE
FALL 2018

1. **Course:** Geology 431, Igneous Petrology

Lecture Sections:

L01: MoWeFr, 2:00-2:50, ST 131

Instructor, Dr. J. Cuthbertson, Office ES 520, Tel. No. 403-220-4709, e-mail address:, cuthberj@ucalgary.ca,

Office Hours: by appointment

Course website or Desire 2 Learn (D2L) course name, if applicable. GLGY 431

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

2. **Prerequisites:** Geology 323, and 333 or 311. See section 3.5.C in the Faculty of Science section of the online Calendar (www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)

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:

Weekly Labs	10%
Lab Midterm Exam	15%
Lab Final Exam	20%
Lecture Midterm Exam	15%
Lecture Final Exam	20%
Group Video Project	20%

Need to achieve a minimum of 50% in the **lab exams** (lab midterm + lab final exam) and **lecture exams** (lecture midterm + lecture final exam) separately to obtain a passing grade.

Letter Grade	Percent
A+	94-100
A	88-94
A-	83-88
B+	78-83
B	73-78
B-	69-73
C+	65-69
C	61-65
C-	56-61
D+	53-56
D	50-53
F	0-50

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. **Scheduled out-of-class activities:** none.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **Course Materials:** John D. Winter. *Principles of Igneous and Metamorphic Petrology.* (Second Edition) Prentice Hall, Inc., Upper Saddle River, New Jersey. 702 p.

Instructors will regularly use material from outside the textbook specified above to enhance student understanding.

7. **Examination Policy:** The two lab exams will involve examination of minerals, rocks and thin sections. They will be closed book exams with only some mineralogy references permitted. The two lecture exams will consist of multiple-choice questions. No aids will be allowed other than a calculator.

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

8. **Approved Mandatory and Optional Course Supplemental Fees:** n/a.

9. **Writing across the curriculum statement:** In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

10. **Human studies statement:** n/a.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- (a) **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.

- (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> [B.1](#) 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: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: 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) **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.

Lecture-Lab Schedule for GLGY 431 Fall 2018

Week	Date	Topic	Lab
1	Sept 3	<i>No class</i>	<i>No lab</i>
	Sept 5	<i>No class</i>	
	Sept 7	Course logistics; Igneous introduction.	
2	Sept 10	Igneous rock classification and textures	1. Review of mineralogy and classification of igneous rocks
	Sept 12	Chemical and physical properties of magma	
	Sept 14	Chemical and physical properties of magma	
3	Sept 17	Types of volcanoes; plate tectonic settings	2. Computational Lab
	Sept 19	Types of volcanoes; plate tectonic settings	
	Sept 21	Volcanic hazards	
4	Sept 24	Intrusive landforms	3. Textures of Igneous Rocks
	Sept 26	Phase equilibria review, binary systems	
	Sept 28	Phase equilibria: ternary systems	
5	Oct 1	Chemical petrology: major elements	4. Volcanic rocks 1
	Oct 3	Chemical petrology: trace elements	
	Oct 5	Chemical petrology: isotopes	
6	Oct 8	<i>No class – Thanksgiving Day</i>	5. Volcanic rocks 2
	Oct 10	Chemical petrology: isotopes	
	Oct 12	Time scale of magmatic processes	
7	Oct 15	Petrology and melting of the mantle	LAB Midterm Exam
	Oct 17	Layered Mafic Intrusions	
	Oct 19	Magmatic diversification	
8	Oct 22	Midterm Lecture Exam	6. Layered mafic intrusions
	Oct 24	Basalts: MORB	
	Oct 26	Basalt: OIB	
9	Oct 29	Ophiolites	7. Computational Petrology
	Oct 31	Continental flood basalts; Large Igneous Provinces	
	Nov 2	Convergent margin magmatism: island arcs	
10	Nov 5	Convergent margin magmatism: continental arcs	8. Subduction-related volcanic and plutonic rocks
	Nov 7	Convergent margin magmatism: continental arcs	
	Nov 9	Granitoid Rocks	
11	Nov 12	<i>No class – Reading Days</i>	<i>No Lab</i>
	Nov 14	<i>No class – Reading Days</i>	
	Nov 16	<i>No class – Reading Days</i>	
12	Nov 19	Anorthosites and lamprophyres	9. Granitoids
	Nov 21	Kimberlites and lamproites	
	Nov 23	Carbonatites and kamafugites	
13	Nov 26	Group video presentations	10. Alkaline Rocks
	Nov 28	Group video presentations	
	Nov 30	Group video presentations	
14	Dec 3	Group video presentations	LAB Final Exam
	Dec 5	Igneous rocks as probes of Earth evolution	
	Dec 7	Frontiers of research in igneous petrology	