UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF GEOSCIENCE
COURSE OUTLINE
FALL 2015

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

   Lecture Sections:

   L01: MoWeFr, 2:00-2:50, EEEL 161
   For a listing of all lab sections corresponding with this course, please see the following link:
   http://geoscience.ucalgary.ca/geoscience_info/courses/f15

   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) 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)
   Antirequisities: Credit for no more than one of Geology 431, 443, 531, will be allowed

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 Final Exam	25%
Lecture Midterm Exam	20%
Lecture Final Exam	25%
Group Video Project	20%

   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
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:** N/A

   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. **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) Student Accommodations: 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 http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Geoscience, Dr. E.S. Krebes by email krebes@ucalgary.ca or phone 403-220-5850.

   (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 24, 2015

Lecture-Lab Schedule for GLGY 431 Fall 2015

Week	Date	Topic	Lab
1	Sept7	***No class – Labour Day***	**No lab**
	Sept 9	Course logistics; Igneous introduction.	
	Sept 11	Igneous rock classification and textures	
2	Sept 14	Igneous rock classification and textures	1. Review of mineralogy and classification
	Sept 16	Field relations and the physical properties of magma	
	Sept18	Field relations and the physical properties of magma	
3	Sept 21	Phase equilibria: review, binary systems	2. Interpretation of igneous textures
	Sept 23	Phase equilibria: binary systems	
	Sept 25	Phase equilibria: ternary systems	
4	Sept 28	Chemical petrology: major elements.	3. Basalt, diabase, komatiite
	Sept 30	Chemical petrology: trace elements and isotopes.	
	Oct 2	Chemical petrology: trace elements and isotopes.	
5	Oct 5	Petrology and melting of the mantle	4. Layered mafic intrusions
	Oct 7	Magmatic differentiation	
	Oct 9	Layered Mafic Intrusions	
6	Oct 12	***No class – Thanksgiving Day***	5. Subduction-related volcanic rocks
	Oct 14	Basalts: MORB	
	Oct 16	Basalts: MORB	
7	Oct 19	Basalt: OIB	6. Subduction-related plutonic rocks
	Oct 21	Basalt: OIB	
	Oct 23	Continental flood basalts; Large Igneous Provinces	
8	Oct 26	**Midterm Lecture Exam**	7. Granite and syenite
	Oct 28	Convergent margin magmatism: island arcs	
	Oct 30	Convergent margin magmatism: island arcs	
9	Nov 2	Convergent margin magmatism: continental arcs	8. Alkaline rocks
	Nov 4	Convergent margin magmatism: continental arcs	
	Nov 6	Granitoid Rocks	
10	Nov 9	Anorthosites	**No Lab**
	Nov 11	***No class – Reading Days***	
	Nov 13	***No class – Reading Days***	
11	Nov 16	Kimberlites and lamproites	9. Computational petrology I
	Nov 18	Kimberlites and lamproites	
	Nov 20	Carbonatites	
12	Nov 23	Group video presentations	**FINAL LAB EXAM**
	Nov 25	Group video presentations	
	Nov 27	Group video presentations	
13	Nov 30	Group video presentations	10. Computational petrology II
	Dec 2	Group video presentations	
	Dec 4	Group video presentations	
14	Dec 7	Petrology and melting of the mantle re-visited	**No Lab**
	Dec 9	***No class***	
	Dec 11	***No class***	