



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

1. **Course:** Geology 333, Igneous, Metamorphic and Ore Rocks and Processes

Lecture Sections:

L01: MoWeFr, 12:00-12:50, ST 135

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

Office Hours: Mon 10-11am, Mon 1-2pm or by appointment

Geoscience Department ES 118, 403-220-5841, [geoscience.ucalgary.ca](http://geoscience.ucalgary.ca), [geoscience@ucalgary.ca](mailto:geoscience@ucalgary.ca)

2. **Prerequisites:** Geology 313. 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](http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html))

**Antirequisite:** Credit for both Geology 333 and 311 will not 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:

Labs	10%
Lab Midterm	20%
Lecture Midterm	15%
Final Lab Examination	30%
Final Lecture Examination	25% (To be scheduled by the Registrar)

Students must pass ( $\geq 50\%$ ) both the lab portion (labs + lab midterm + final lab exam) and the lecture portion (lecture midterm + final lecture exam) individually in order to pass this course.

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. **Course Materials:** The D2L website will be used throughout the course to make announcements and distribute lecture notes, laboratories, assignments, and other supplementary materials. Please check the course website regularly. Students are strongly encouraged to print the necessary materials and bring them to the lectures and labs.

**Recommended Textbook**

Nesse, William D., 2000. Introduction to Mineralogy. Oxford University Press. ISBN: 0-19-510691-6.

### Recommended Textbook

Winter, J.D., 2009. Principles of Igneous and Metamorphic Petrology.  
Prentice Hall. ISBN-10: 0321592573, ISBN-13: 978-0321592576

6. **Examination Policy:** Non-programmable or programmable calculators may be used on exams. Study sheets may be allowed on laboratory exams. Students should also read the Calendar, [Section G](#), on Examinations.
7. **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.

### 8. 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](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) **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](http://www.ucalgary.ca/usri)). Your responses make a difference – please participate in USRI Surveys.

Department Approval: Original Signed

Date: January 12, 2015

## GLGY 333 Lec-Lab Schedule W2015

Week	Date (M-W-F)	Topic	Lab
1	Jan 12	Course overview.	No lab
	Jan 14	Review of mineral properties	
	Jan 16	Silicates I.	
2	Jan 19	Silicates II.	1. Minerals in hand specimen
	Jan 21	Silicates III. Start of Optics I – relief, relative RI.	
	Jan 23	Optics II – polarization, ray splitting, int. colours.	
3	Jan 26	Optics III – retardation, birefringence, colour chart.	2. Petrographic microscope review
	Jan 28	Igneous processes	
	Jan 30	Igneous I – classification, phaneritic rocks.	
4	Feb 2	Igneous II – triangular diagrams, paragenetic seq.	3. Phaneritic Igneous Rocks I
	Feb 4	Igneous III – aphanitic, glassy, pyroclastic rocks.	
	Feb 6	Igneous IV – magma, Bowen's Reaction Series.	
5	Feb 9	Igneous phase diagrams I. Equilibrium xtalliz'n.	4. Phaneritic igneous rocks II
	Feb 11	Igneous phase diagrams II. Fractional xtalliz'n.	
	Feb 13	Igneous phase diagrams III. Fo-Qtz system.	
6	Feb 16	<i>Reading Week</i>	No Lab
	Feb 18	<i>Reading Week</i>	
	Feb 20	<i>Reading Week</i>	
7	Feb 23	Igneous phase diagrams IV. Plagioclase system.	5. Aphanitic Igneous Rocks
	Feb 25	Igneous processes recap	
	Feb 27	<b>Lecture Midterm</b>	
8	March 2	Metamorphic processes	6. Regional Metapelites
	March 4	Metamorphic I – bulk compositions, rxns, isograds.	
	March 6	<b>Lecture Midterm post-mortem</b>	
9	March 9	Metamorphic II – petro grid for metapelites.	LAB MIDTERM
	March 11	Metamorphic III – petrogenetic grid, migmatites.	
	March 13	Metamorphic IV – metabasites, marbles.	
10	March 16	Metamorphic V – metamorphic facies, textures.	7. Contact Metapelites
	March 18	Metamorphic VI – textures, cataclastic rocks.	
	March 20	Metamorphic VII – P-T paths.	
11	March 23	Metamorphic processes recap	8. Metabasites and Calc-silicates
	March 25	<b>Lab Midterm post-mortem</b>	
	March 27	Ore rocks I – concentration factors, igneous ores.	
12	March 30	Ore rocks II – diamonds	9. Ore Minerals
	April 1	Ore rocks III – gem deposits	
	April 3	<b>Good Friday – no lecture</b>	
13	April 6	Ore rocks IV – VMS, SEDEX, MVT deposit-types	FINAL LAB EXAM
	April 8	Ore rocks V – uranium	
	April 10	Ore rocks VI – tectonic settings	
14	April 13	Global synthesis – igneous rocks	No Lab
	April 15	Global synthesis – metamorphic rocks	