



UNIVERSITY OF
CALGARY

DEPARTMENT OF GEOSCIENCE
COURSE OUTLINE
FALL 2015

1. **Course:** GLGY 401, Physical Hydrogeology

Lecture Sections:

L01: MoWeFr, 13:00-13:50, ENA 103

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

http://geoscience.ucalgary.ca/geoscience_info/courses/f15

Aaron Mohammed, Office: ES 270, Ph. 403-220-6596, amohamme@ucalgary.ca, Office Hours: Monday, 14:00-16:30 (flexible) or by appointment- second half of the semester.

Dr. Barret Kurylyk, Office: ES 280, Ph. 403-210-5401, barret.kurylyk@ucalgary.ca, Office Hours: Monday, 14:00-16:30 (flexible) or by appointment- first half of the semester.

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

2. **Prerequisites:** Geology 353. See also Geology [Course Descriptions](#) of the University Calendar. 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)

Antirequisites: Credit for both Geology 401 and 601 will not be allowed.

3. **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:

| | |
|--------------------------|--|
| Laboratories (9) | 25% |
| Homework Assignments (4) | 15% |
| Top Hat | 10% |
| Midterm Exam | 20% (Tentatively Oct. 23, in class) |
| Final Exam | 30% (To be scheduled by the Registrar) |

Each component of the course will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will then be used to determine the course letter grade. The conversion between course percentage and letter grade is as follows:

| Grading Scale | | | | | | | |
|---------------|----------|----|----------|----|----------|----|----------|
| A+ | 94-100 | B+ | 80 - 83% | C+ | 66 - 69% | D+ | 54 - 57% |
| A | 88 - 93% | B | 75 - 79% | C | 62 - 65% | D | 50 - 53% |
| A- | 84 - 87% | B- | 70 - 74% | C- | 58 - 61% | F | <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:** There will be no mandatory activities held outside of class hours. Optional tutorial sessions may be held prior to the final exam, but these will be discussed in class prior to the examination period.

6. **Course Materials:** There is no required textbook, although the course will borrow significantly from the textbooks listed below and select portions of Fetter (2001) may be indicated for readings during the term. The textbooks will be placed on reserve in the Gallagher Library and a limited number of copies of the Fetter textbook are also available at the bookstore. It is strongly recommended that students review the material in at least one of these textbooks, or better yet, purchase a copy for their personal library.

"Applied Hydrogeology", 4th Edition, Fetter, 2001, Prentice-Hall.
"Groundwater", Freeze and Cherry, 1979, Prentice-Hall

Online Course Components: Course announcements, lecture and laboratory materials, and additional online resources will be provided on Desire2Learn (<https://d2l.ucalgary.ca>). Please check the D2L course site regularly, since students are responsible for ensuring they have the necessary materials for lectures, laboratories, and assignments.

We will use the Top Hat classroom response system to enhance learning and interaction in lectures throughout the term. Students will be required to have a portable electronic device such as a cellular telephone, tablet or laptop computer. Please see the instructor for accommodation requirements if you do not have one. Instructions for Top Hat registration will be given in class and on Desire2Learn. Your grade (as indicated above) will include a component related to in-class Top Hat participation and performance.

7. **Examination Policy:** All exams will be closed book. Only writing instruments, erasers, rulers and non-programmable calculators will be permitted on exams. No other aids will be allowed. An instructor-prepared equation sheet will be provided. Students should also read the Calendar, [Section G](#), on Examinations.
8. **Writing across the curriculum statement:** In this course, the quality of the student's writing will be a factor in the evaluation of all written work (laboratories, assignments, and exams). Students are expected to submit high quality work. In all cases, quality work must be well organized, clearly written and presented, and have all information sources properly noted. Where applicable, questions should be labelled and in order, all tables and diagrams properly labelled, assumptions clearly stated, and final answers clearly indicated (with appropriate units and significant figures). You are expected to **show all your work**, including equations and sample calculations where necessary (especially when relying on spreadsheets or computer programs to generate results). See also [Section E.2](#) of the University Calendar.

9. 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. Krebs by email krebs@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 (FOIPPA). 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 17, 2015

Preliminary schedule for GLGY 401 and 601.

| Week | Week of | Lecture Topic | Lectures | | | Laboratory |
|------|---------|---------------------------------|---------------|----------------------|---------------------|---|
| | | | Mon | Wed | Fri | Thur |
| 1 | 07-Sep | Intro & hydro cycle | | | | None |
| 2 | 14-Sep | Porosity and potential | | | A1 Out | Lab # 1: Porosity |
| 3 | 21-Sep | Darcy's Law and GW flow | | | | Lab # 2: Physical flow model |
| 4 | 28-Sep | Hydrogeologic units | | | A1 Due/A2 Out | Lab # 3: Water flow in sediments |
| 5 | 05-Oct | GW storage | | | | Lab # 4: Potentiometric surface |
| 6 | 12-Oct | GW flow equations | Thanksgiving | | A2 Due | Lab # 5: Propagation of hydraulic pulse |
| 7 | 19-Oct | Flow nets | | | Midterm Exam | Midterm tutorial |
| 8 | 26-Oct | Vadose zone | | A3 OUT | | Lab # 6: Flownet construction |
| 9 | 02-Nov | Regional GW flow | | | | No lab |
| 10 | 09-Nov | Regional flow and hydraulics | | No classes (Reading) | | Lab # 7: Groundwater flow model |
| 11 | 16-Nov | Aquifer hydraulics | A3 Due/A4 Out | | | Lab # 8: Pumping test |
| 12 | 23-Nov | Aquifer hydraulics & well tests | | | A4 Due | Lab # 9: Single well response (comp.) |
| 13 | 30-Nov | Transport | | | | Review session |
| 14 | 07-Dec | Review | | End of classes | | |