

UNIVERSITY OF ALBERTA
DEPARTMENT OF EARTH AND ATMOSPHERIC SCIENCES
EAS 210-A1, Fall Term 2011
Engineering Earth Science

LECTURES: EAS 210-A1, MWF, 11.00–11.50, TL-B1
PROFESSOR: Dr. Jeremy Richards (ESB 3-02; Jeremy.Richards@UAlberta.ca)
OFFICE HOURS: Mondays 13:00–14:00 or any time by appointment
REQUIRED TEXTBOOK: *The Changing Earth* (Monroe & Wicander, 5th edn., Thomson)
RECOMMENDED TEXTBOOK: *Earth: An Introduction to Physical Geology* (Tarbuck, Lutgens, Tsujita, and Hicock, 2nd Canadian Edition)
REQUIRED LAB MANUAL AND LAB KIT: *EAS 210 Laboratory Manual*; Simple lab kit.
LECTURE NOTES: PDFs of PowerPoint presentations posted on e-Class.

Calendar Description

Rock-forming minerals, origins of igneous, metamorphic and sedimentary rocks; economic minerals and ore deposits; rock weathering and soil formation, mass-wasting, groundwater, deformation of the Earth's crust.

Laboratories on identification of minerals and rocks and the interpretation of topographic and geologic maps and aerial photography.

Prerequisite: Any 100-level Science course. Not available to students with credit in EAS 101, 105, 201, or SCI 100. Intended for students in Engineering programs. Restricted to students in Engineering programs.

Course Objectives

The objectives of this course are to understand the geological nature and evolution of Earth, including its origins, composition, and the history of life. Students will gain familiarity with the main rock-forming minerals and rock types that occur in the Earth's crust and mantle, sedimentary, igneous, and metamorphic processes, the deformation of rocks, and the plate tectonic theory. The evolution of life over Earth's history will also be reviewed. Laboratories will provide practice in the identification of common minerals and rocks, and in the use of geological maps.

EAS 210-A1, Fall Term 2011: LECTURE/LABORATORY SCHEDULE

		LECTURE TOPICS (TL-B1)	LABS (Tory 3-70)
W	7 Sept	Introduction to course, logistics	No labs
F	9	Origin of Earth; Earth structure and composition	
M	12	Origin of Earth; Earth structure and composition	1. Geology of the North Saskatchewan River Valley and the U of A
W	14	Atomic structure	
F	16	Mineralogy: Crystallography	
M	19	Mineralogy: Physical properties of minerals	2. Properties of minerals I
W	21	Mineralogy: Economic minerals	
F	23	Coal and hydrocarbons	
M	26	Rocks and the rock cycle	3. Properties of minerals II
W	28	Rocks and the rock cycle	
F	30	Igneous rocks and igneous processes	
M	3 Oct	Igneous rocks and igneous processes	4. Igneous rocks
W	5	Volcanic rocks and processes	
F	7	Volcanic rocks and processes	
M	10	THANKSGIVING	5. Volcanoes and an introduction to maps
W	12	Weathering and erosion	
F	14	Weathering and erosion	
M	17	Weathering and erosion	Review lab
W	19	Physical erosion and mass wasting	
F	21	LECTURE MID-TERM EXAM	
M	24	Glaciation	LAB MID-TERM (in your usual lab period)
W	26	Sedimentary rocks	
F	28	Sedimentary rocks	
M	31	Metamorphic rocks	6. Sedimentary rocks and air photos
W	2 Nov	Metamorphic rocks	
F	4	Metamorphic rocks	
M	7	Structural geology and rock deformation	No labs
W	9	Earthquakes and Earth's interior	
F	11	REMEMBRANCE DAY	
M	14	Plate tectonics	7. Metamorphic rocks
W	16	Plate tectonics	
F	18	Plate tectonics	
M	21	Geological time and evolution of life	8. Geological maps
W	23	Geological time and evolution of life	
F	25	Geological time and evolution of life	
M	28	Geological time and evolution of life	LAB EXAM (in your usual lab period)
W	30	Hydrogeology	
F	2 Dec	Hydrogeology	
M	5	Economic geology	No labs
W	7	Economic geology	
Tu	20*	LECTURE FINAL EXAM (9–11 am, location TBA)	

* Provisional.

LABORATORY WORK

Laboratory work will be conducted weekly in your lab section, starting in the second week of classes. You must attend the lab section you registered in. Attendance is mandatory. Bring your lab manual to every lab. Read the introductory material at the beginning of your lab manual for more information on labs.

The lab will run for 3 hours per week at the time and place designated for your lab section. The lab assignment for each week must be handed in before or at the end of that lab session.

An eClass site will be used to post this course outline, TA introductory PowerPoint presentations, lab grades, and links to websites with additional study material.

The lab component is worth 50% of your course grade. There will be two lab exams, a mid-term lab exam, and final lab exam, weighted at 20% of the course mark each. A participation mark worth 10% will be assessed based on your lab attendance, interaction with group members and TAs, and the quality of your weekly lab assignments.

Lab issues: The Lab Coordinator is Lisa Budney (780-288-0109, lbudney@ualberta.ca; Tory 3-34 or ESB 1-06A). She is familiar with all aspects of the lab, and you should deal with her **first** as far as any issues are concerned, if they cannot be resolved with your TA. If you must miss a lab period, or need to make arrangements for SSDS accommodations, contact her to discuss alternatives. TAs cannot provide students with excused absences or make arrangements for students to attend other lab sections.

COURSE MARK-WEIGHT DISTRIBUTION AND GRADING:

Mid-term exam	20%	50-minute exam conducted in class on October 22.
Mid-term lab exam	20%	During regular lab periods week of October 25.
Final lab exam	20%	During regular lab periods week of November 29.
Lab participation	10%	
Final exam	30%	2-hour exam scheduled per university exam schedule. Final exam will be cumulative (i.e., will cover the full term).

Distribution of Grades and Grade Assignment: A letter grade will be assigned for your efforts and achievement in the course. Grades will be based upon your earned percentage of cumulative marks and the overall grade distribution. Your final mark will thus reflect a combination of absolute achievement and relative standing in the class. The GFC-recommended grade distribution (GFC Policy Manual §61.3) is used as a guideline only, and the actual grade distribution will vary from year to year depending on cohort performance.

FINAL EXAM

Provisional: Tuesday 20 December, 2011, from 0900–1100 hours; location TBA.

Note that the date of the final exam given here is tentative. The Registrar's Office publishes a final exam schedule later in the term, and it is your responsibility to ensure that you confirm the times and places of all your exams.

DEFERRED EXAM POLICY (See Calendar §23.3 and §23.5.6 for details)

Term Exams:

A student who cannot write a term examination due to incapacitating illness, severe domestic affliction, or other compelling reasons (which exclude simple inconvenience) can apply in writing to the Instructor for an excused absence. Such an application must be made “to the instructor within two working days following the scheduled date of the term work or term exam missed, or as soon as the student is able, having regard to the circumstances underlying the absence” and must be supported by a Statutory Declaration (*in lieu* of a medical statement form) or other appropriate documentation (Calendar §23.3.1). The Instructor may decide either to allow the student to sit a deferred exam (on dates shown below), or to waive the exam and adjust the weighting of the remaining work to 100%.

Deferral of term work is a privilege and not a right; there is no guarantee that a deferral will be granted. Misrepresentation of facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

Final Exams:

A student who cannot write a final examination due to incapacitating illness, severe domestic affliction, or other compelling reasons (which exclude simple inconvenience) can apply in writing to sit a deferred exam on dates shown below. Such an application must be made to the student’s Faculty office “within two working days following the scheduled date of the exam missed, or as soon as the student is able, having regard to the circumstances underlying the absence” and must be supported by a Statutory Declaration (*in lieu* of a medical statement form) or other appropriate documentation (Calendar §23.3.2).

Deferral of final exams is a privilege and not a right; there is no guarantee that a deferral will be granted. Misrepresentation of facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

Students who are granted permission to sit a *deferred mid-term exam* must do that exam on:

Saturday, November 5, 2011, from 1000–1200 hours, in Tory 3-50.

Students who are granted permission to sit a *deferred final lab exam* must do that exam on:

Saturday, January 14, 2012, from 1000–1200 hours, in Tory 3-50.

Students who are granted permission to sit a *deferred final exam* must do that on:

Saturday, January 21, 2012, from 1000–1200 hours, in Tory 3-50.

PAST (OR REPRESENTATIVE) EVALUATIVE MATERIAL

Examples of previous exam questions will be posted on the course website, and will be discussed in class prior to the exams. Students may not have copies of previously graded lab assignments because this puts the student in violation of the Code of Student Behaviour (§30.3.2(2)a).

TEXTBOOK AND LABORATORY MATERIALS

Required textbook: *The Changing Earth* (Monroe & Wicander, 5th edn., Thomson)
(\$150.95 + GST; EAS section of University Bookstore, lower floor).

Required Lab Kit:

Clear glass plate (\$1.50), white streak plate (\$0.75), 10X magnifier (\$3.25); magnet (\$1.35)
(available at University Bookstore, upper floor).

Additional materials: Notepaper, pens, pencils, coloured pencils, erasers, a metric ruler, calculator, and a protractor should be taken to labs.

FORMAL NOTICES

GFC POLICY ON COURSE OUTLINES

“Policy about course outlines can be found in Section 23.4(2) of the University Calendar” (GFC 29 SEP 2003). The General Faculties Council, in approving these guidelines, expects a common sense approach to their application and understands that circumstances might develop, during a term, where a change to the course outline as set out in Section 61.6(a) of the GFC Policy Manual, makes sense to all concerned. Such changes shall only occur with fair warning or general class consent.

ACADEMIC STANDARDS

“The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.ualberta.ca/secretariat/appeals.htm) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.” (Section 23.4(2) of the University Calendar; GFC 29 SEP 2003.)

All forms of dishonesty are unacceptable at the University. Any offense will be reported to the Senior Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism, and misrepresentation of facts are serious offenses. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for **cheating** on any examination will include **a disciplinary failing grade** (no exceptions) and senior students should expect a period of suspension or expulsion from the University of Alberta.

See www.ualberta.ca/tie for more information on Academic Standards. Remember that it is the student’s responsibility to be aware of the contents of the Code of Student Behaviour. Ask the Instructor or Lab Coordinator if you have questions about acceptable collaborations, cheating, etc.

EXAMS

Your student photo I.D. is required at exams to verify your identity. Students will not be allowed to begin an examination after it has been in progress for 30 minutes. Students must remain in the exam room until at least 30 minutes has elapsed. Electronic equipment cannot be brought into examination rooms.

CELL PHONES

Cell phones are to be turned off during lectures, labs, and seminars. Cell phones are not to be brought to exams.

RECORDING

Recording is not permitted except as part of an approved accommodation plan, which requires the prior written consent of the Instructor.

SPECIALIZED SUPPORT AND DISABILITY SERVICES

Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with Specialized Support and Disability Services, 2-800 Students’ Union Building, 492-3381 (phone) or 492-7269 (TTY).

Remember to provide the Instructor and Lab Coordinator with copies of your Letter of Introduction early in the term so that your exam needs can be met come exam time.

ACADEMIC SUPPORT CENTRE

Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Support Centre (2-703 Students’ Union Building).

DISCLAIMER

Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus.

ABOUT YOUR INSTRUCTOR:

Jeremy Richards (Jeremy.Richards@UAlberta.CA)

My office is at the west end of the 3rd floor of the Earth Sciences Building (room ESB 3-02) — if my door is open, feel free to stop by with any questions you may have, in or out of “office hours”; or you can make a specific appointment by phone (780-492-3430) or e-mail (Jeremy.Richards@UAlberta.ca).

My research interests focus on the origin of mineral deposits, especially of metals such as copper and gold, and sustainable development of mineral resources. These interests take me and my graduate students all over the world, including various parts of Canada (Canada is one of the world’s top suppliers of minerals). On the way we see some spectacular geology, and I hope to be able to impart some of the excitement of the geological world to you during the course of our lectures.



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