



Course Outline

ENVIRONMENTAL TECHNOLOGY

**ENVT 267A
Mining and Mineral Processing
Winter Semester, 2014**

**3 CREDITS
3 HOURS LECTURE, 3 HOURS LAB PER WEEK**

INSTRUCTOR: [Neil O'Donnell](#)

INSTRUCTOR: Neil O'Donnell
PHONE NUMBER: (780) 791-4821
E-MAIL: neil.o'donnell@keyano.ca
OFFICE NUMBER: S209G
OFFICE HOURS: (TBA)

Monday	1:00 – 2:50 pm
Tuesday	11:00 – 11:50 am
Wednesday	1:00 – 1:50 pm
Thursday	10:00 – 10:50 am
Friday	----

HOURS OF INSTRUCTION: (TBA)

Tuesday	9:00 – 10:50 am	Room S114 (ENVT Lab)
Friday	1:00 – 2:50 pm	Room S218

COURSE DESCRIPTION:

This course provides an introduction to underground and open-pit mining methods, materials handling, reclamation activities, and general mining environmental issues. In particular, the course will cover the conventional coal industry, coal bed methane, oil sands mining, diamond mining, and other resource activities in Alberta and the NWT. Emphasis will be placed on practical applications, but some understanding of basic principles is also essential. Lab work will cover a broad spectrum of interest areas, but always linked to where possible to environmental applications. Field trips may include visits to local oil sands operations to view geology and reclamation activities and possibly a visit to a coal mine in the Edmonton area.

PRE-REQUISITE:

EAS 100 and ENVT167

COURSE OUTCOMES:

Upon successful completion of this course, students will be able to:

- Establish and explain connections of course knowledge, as it applies to relevant current events, with emphasis on those of environmental concern.
- Recognize and summarize the basic geology of different ore deposit types, and their distribution in Canada.
- Distinguish the mineralogy and chemistry of different ore deposits, and assess the associated environmental issues.
- Examine historic and operating coal mines in Alberta through field trip visits and literature research.
- Examine the coal industry in Canada, the origin of coal deposits, and the different mining methods.

- Analyze the diamond mining business in Canada, especially the NWT, and associated environmental issues.
- Give examples of coal bed methane and summarize its potential in Alberta.
- Describe various environmental impact issues in mining.
- Summarize electrical generation and ore processing.
- Contrast differences in open pit, underground, and solution mining.
- List and summarize special issues related to quarries, industrial minerals, and limestone excavations.

ECO CANADA ENVIRONMENTAL COMPETENCY OUTCOMES:

The student will gain the:

- Ability to Conduct Environmental Impact Assessments (#1)
- Ability to Conduct Environmental Site Assessments (e.g., ESA—Phase 1 and Phase 2) (#2)
- Ability to Identifying and Mitigating Climate Change Impacts (#7)
- Ability to Monitor Waste Application/Disposal/Reduction Programs and Activities (#9)
- Ability to Develop Environmental Sampling, Testing, and Monitoring (#11)
- Ability to Collect Samples and Data for Environmental (#12)
- Ability to Analyze and Interpret Environmental Samples and Data (#13)
- Ability to Develop Environmental Policies, Measures, and Standards (#14)
- Ability to Liaise and Partner with Stakeholders (#15)
- Ability to Implement/Monitor Sustainable Development Strategies and Programs (#17)
- Ability to Conduct Environmental Risk Assessments (#19)
- Ability to Conduct Studies Related to Ecosystem and Habitat Preservation and/or Management of Natural Resources (#24)
- Ability to Monitor/Evaluate Effectiveness of Programs and Practices Related to Ecosystem and Habitat Preservation and/or Management of Natural Resources (#26)
- Ability to Develop Environmental Curricula and Programs (#27)
- Ability to Design/Develop Environmental Research and Development Proposals, Programs, and Projects (#30)
- Ability to Develop/Implement Environmental Communications and Awareness Programs (#34)
- Ability to Present Expert Information on Environmental Matters (#35)

ECO CANADA TRANSFERABLE COMPETENCY OUTCOMES:

The student will develop and apply skills in the following transferable competencies:

- Professional ethics & work style (#1)
- Learning & creativity (#2)
- Communicating effectively (#3)
- Collaboration (#4)
- Critical thinking & judgment (#5)
- Planning and organizing work and projects (#6)
- Leading and Influencing Others (#7)

TOPICS TO BE COVERED: (Order of Topics may vary)

	TOPICS	Labs
Week 1	Introduction; open pit and underground mining	Review of Fall field course mining items
Week 2	Basic Geology Ore Deposits	Assignment: Video – Coal Mining)
Week 3	Coal Industry Composition of Coal; Origin of Coal	Lab Assignment – Virtual Field Trip – Mining
Week 4	Coal Mining Methods; Mining Methods More Ore Deposits	Video – Ore Genesis Assignment: Report
Week 5	Diamonds, Diamond Mining Metallic Ores	Lab: Examine and describe metallic minerals
Week 6	Coal Bed Methane; Mining Vignettes (viewing Notes)	Mid-Term Exam No.1 (10%)
Week 7	Coal Industry Composition of Coal; Origin of Coal	Field trip to Coal Mine or CBM operation
Week 8	Reading Week	No classes
Week 9	Environmental Impact of Mining (1)	Participative Lab - Videos Is Venice Sinking ?
Week 10	Environmental Impact of Mining (2)	Possible Field Trip to Oil Sands Mine; or Report – Polymet Mine, Minnesota, or similar.
Week 11	Electrical Generation;); King Coal (Viewing Notes)	No Class Friday, Nov.11 – College closed.
Week 12	Ore Processing/video Enough is Enough (Viewing Notes)	Diamond Mining Lab: Report
Week 13	Quarries, Industrial Minerals, Limestone, Sand & Gravel	Fort Chipewyan Granite or alternate Report
Week 14	Guest Lecturer/Field Trip; Discussion and/or Short Report	Mid-Term Exam No.2 (10%)
Week 15	Summary & Review	
Week 16/17	Final Exam (30%)	

REQUIRED RESOURCES:

REQUIRED TEXTS TITLE	AUTHOR	PUBLISHER	ISBN
Mining Explained	11 th edition; 2012; Ed., John Cumming	The Northern Miner, Toronto	978-1-55257-147-7
No other required textbook. Handouts will be distributed as required;			
TEXTS ON THE RESERVED SHELF IN THE LIBRARY			
Various texts will be on the Reserved Shelf in the Library. These will include: <ul style="list-style-type: none"> • Mining and its environmental impact Author: Roy M Harrison; R E Hester Publisher: Cambridge : Royal Society of Chemistry, ©1994. • Coal mining in Canada : a historical and comparative overview; Author: D A Muise; R G McIntosh; National Museum of Science and Technology (Canada) • An introduction to coal technology; Author: N Berkowitz Publisher: San Diego : Academic Press, ©1994. Book : English : 2nd ed 			
RECOMMENDED TEXTS TITLE	AUTHOR	PUBLISHER	ISBN
A Traveller's Guide to Geological Wonders in Alberta	Mussieux, Ron and Nelson, Marilyn	The Provincial Museum of Alberta	0-7785-0123-X
Edmonton Beneath Our Feet	Godfrey, John D., editor	Edmonton Geological Society	0-9697107-0-4
Alberta Beneath Our Feet	Hitchon, Brian, editor	Geoscience Publishing	0-9680844-2-7
Canada Rocks The Geologic Journey	Eyles, Nick and Miall, Andrew	Fitzhenry & Whiteside, Markham, ON	978-1-55041-860-6

TOPICS TO BE COVERED: (Order of Topics may vary)**MOODLE**

Go to <http://ilearn.keyano.ca>

This course is supported through Moodle. Assignments, readings and handouts will be posted on Moodle. Login information will be provided by your instructor. For further instructions please see the Moodle handout.

EVALUATION:

Assignment	Percentage	Due Date
Mid-Term Exam 1	10%	Week 7
Mid-Term Exam 2	10%	Week 13
Videos, Viewing Notes	10%	See Schedule
Labs + Reports	40%	See Schedule
Final Examination	30%	TBA

RULES FOR LABS, REPORTS, AND ASSIGNMENTS

DUE DATES

- Due Dates usually are set for one week following a lab, video assignment, report, field trip, or presentation.
- Unless specified differently by instructor, labs, reports, and assignments will be submitted electronically via Moodle.
- If submitted on or before the Due Date – full marks; *may be extended another 7 days for reasonable cause approved by instructor.*
- Otherwise, if submitted within one week (7 days) after the Due Date – 50% of regular mark.
- More than one week late – must be handed in, but will not be marked – zero assigned.
- Any changes due to special circumstances will be communicated by instructor via Moodle.

TERM MARK

- Will be determined from all the labs, reports, and assignments.
- Mark will be weighted average of all submissions.
- If 20% or more of submissions are missing, student will not be allowed to write the final exam.

GRADING SYSTEM:

Letter Grade	Description	Grade Points
A+		4
A	Excellent	4
A-		3.7
B+		3.3
B	Good	3
B-		2.7
C+		2.3
C	Satisfactory	2
C-		1.7
D+		1.3
D	Minimal Pass	1
F	Failure	0

Students intending to transfer to other institutions should strive for a ‘C-’ as a minimum.

Transfer information on each course is available at the [Alberta Council on Admission and Transfers](#).

NOTES:

Please dress appropriately for the weather on any field trips! Proper footwear is important. If the weather does not co-operate, the lab schedule will shift.

Individual components of the course will be given a numerical mark. The grading system will be applied using a combination of absolute achievement and relative standing in the class.

MISSED TERM EXAM OR LABS:

A student who cannot write a term examination or complete a lab assignment due to incapacitating illness, severe domestic affliction or other compelling reasons can apply to have the weight of the missed midterm transferred to the final. All attempts should be made to make up missed labs. Missed labs with no attempts to complete the work will be assigned a “0”. You must notify the instructor of a missed midterm or lab assignment within 48 hours. 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.

CELL PHONES: Cell phones and other electronic devices are to be turned off during class times. If you need to use one, leave the room. If you have to text someone, leave the room.

STUDENTS WITH DISABILITIES: Students who require accommodation in this course due to a disability are advised to discuss their needs with counsellors in the Registrar’s office . Please ensure that the required forms for exams are submitted to the instructor **one week** before the date of midterms or **by the last lecture class** for the final exam.

SKILL CENTRE: Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Keyano College Skill Centre.

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.

Note: Recording is permitted only with the prior written consent of the instructor or if recording is part of an approved accommodation plan.

Students should consult pp.30-31 on
<http://keyano.ca/future-student/calendar>

IMPORTANT DATES: (TBA for Winter 2014)

January 6, 2014	First day of classes
January 17, 2014	Courses dropped after this date will be designated “W”. (A withdrawal (W) is not reflected in your GPA.
February 24 – 28, 2014	Reading Week
March 7, 2014	Courses dropped after this date will be designated “WF”. (A withdrawal failure (WF) counts as a 0 in your GPA).
April 17, 2014	Last day of classes
April 22-30, 2014	Final Exams

COLLEGE POLICIES

Equality, Equity and Respect

The Keyano College is committed to providing an environment of equality, equity and respect for all people within the College community. All members of this community are considered partners in developing teaching and learning contexts that are welcoming to all. Faculty, staff, and students are encouraged to use inclusive language to create a classroom atmosphere in which students' experiences and views are treated with equal respect and valued in relation to their gender, ethnic and cultural background, and sexual orientation.

Students should consult:

<http://keyano.ca/current-students/individual-rights>

Plagiarism and Cheating

Every student expects to be treated and evaluated fairly in a course. Plagiarism and cheating robs everyone of this right.

No student may submit words, ideas or data of another student or person as his or her own in any writing, project, assignment, quiz, electronic presentation, exam etc. Any work used that is not the student's own must be clearly cited as belonging to someone else. There are penalties for using other's work and not citing it. The Student's Rights & Responsibilities document clearly outlines these penalties and the appeal process.

- No learner can obtain information from another student during an exam.
- No learner can bring unauthorized information (paper or electronic) into an exam or quiz.
- No student can submit work done in another course for grading in this course without the written prior approval of the course instructor.
- No student can submit copyright protected or commercially produced materials as part or all of an assignment without proper citation & permission.

Student Rights & Responsibilities

Students should consult pp.36-40 in the Keyano College Credit Calendar at:

<http://keyano.ca/future-student/calendar>

Specialized Supports and Duty to Accommodate

Disability Support Services: Learner Assistance Program

If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate

Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation, and defined by a number of Keyano College policies. Keyano College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.



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Winter, 2014

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3 HOURS LECTURE, 3 HOURS LAB PER WEEK**

Neil O'Donnell, Instructor

Date

Reviewed and approved by:

Louis Dingley, Chair

Date

Guy Harmer, Dean

Date

