

ENVT 266A, Land Reclamation*3 credits, 3 hours lecture, 3 hours lab*

Reclamation objectives, practices and assessment strategies will be discussed as they relate to planned components of resource extraction activities, and as they relate to post-hoc reclamation initiatives. The focus of this course is on methods of prevention, control, and remediation of altered or degraded land as a result of human activities. This includes, but is not limited to, the decommissioning of base metal and oil sands mine sites, pipelines, and redevelopment of urban brownfields. A significant portion of the course involves synthesizing concepts from throughout the ENVT program in the form of independent projects. A heavy emphasis is placed on student-directed learning. This capstone course is taken in a student's final semester of the ENVT Diploma program.

*Prerequisites and/or co-requisites**ENVT 252, ENVT 262, SOILS 210, and STAT 151***Instructor**

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Tuesday 9:00 – 11:00

Wednesday 9:00 – 11:00

Thursday 10:00 – 11:00

Hours of Instruction

Tuesday 2:00 – 3:50 Lecture

Thursday 9:00 – 9:50 Lecture

Friday 9:00 – 11:50 Lab

Required Resources

There are no required textbooks for this course.

Primary scientific literature, best-practices guidelines, websites and NGO publications will be identified, applied and/or provided, as required during the course. Sources related to reclamation, Phase I and II assessments, land capability classification, ecosite classification, reclamation species selection, and other related topics will be covered.

Other supplies and requirements

Each student must have their own laboratory coat that is designated for use in the ENVT lab (S114) as well as their own laboratory coat that is designated for the Biology lab (234). This course is supported through Moodle. Assignments, readings, handouts, etc., will be posted on Moodle. It is expected that you will be regularly visiting the course page and that you are able to send and receive messages through Moodle. You must ensure your account is operational and that you are familiar with how to navigate Moodle by the end of the first week of classes.

Similarly, you must ensure your KEYANO email is operational and you must check it. No alternate email addresses may be used.

Course Outcomes

Upon successful completion of this course, the student shall be able to:

- identify, assess, minimize, and mitigate environmental degradation that can occur during extraction and use of natural resources
- locate and use key pieces of legislation and guidelines related to environmental impact assessments, monitoring, and reclamation in the province of Alberta
- develop an assessment and related reclamation plan for a hypothetical resource development project in the province of Alberta
- conduct an individual experiment related to land reclamation with guidance from the course instructor and other Keyano College personnel. This includes choosing an appropriate topic, designing and conducting an individual experiment, analyzing data, and presenting results in a formal presentation and formal written report

Evaluation

Clearly outline what the students must do in order to pass or complete the course.

Assignments	10%
Research Experiment (proposal, design, execution and delivery)	30%
Midterm Exam	25%
Final Exam (cumulative)	35%
Total	100%

A grade of C- is required for progression or transfer.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory Progression	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor Minimum Pass	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

Topic	Discussion
Topic 1	Overview – reclamation in ecological and legal contexts, defining reclamation objectives and how those objectives determine what will constitute a successfully reclaimed site Themes introduced in this topic will be revisited and developed through the rest of the semester through the use of case studies, articles from the primary scientific literature, and government reports
Topic 2	Scientific inquiry and reclamation – the use of the scientific method including experimental/sampling design and data analysis in assessment and reclamation projects. After the initial introduction of these concepts, we will continue to build upon them throughout the semester particularly through the use of case studies and independent research projects.
Topic 3	Soil movement, care, storage and change – application of ecological principles for the purpose of meeting reclamation objectives, with special recognition that all aspects of reclamation, however defined, pivot on appropriate soil quality
Topic 4	Upland re-vegetation – application of ecological principles for the purpose of meeting different objectives, including reclamation of overburden dumps and urban brownfield sites.
Topic 5	Wetlands – application of ecological principles for the purpose of meeting reclamation objectives, including fulfilling requirements of government issued Operating Approvals and improving water quality of process-affected water destined for return to the hydrologic cycle.
Topic 6	Contaminated sites – evaluation of the nature and extent of contamination, including ecotoxicological assays, identifying point vs non-point sources, underground contaminants, and decontamination techniques.
Topic 7	Assessing ‘success’ of reclamation activities – special attention paid to monitoring strategies, timescale considerations, and the importance of stakeholders, site history, and jurisdictions.

Please Note:

Date and time allotted to each topic is subject to change.

Performance Requirements**Student Responsibilities**

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

Laboratory Safety

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports**Counselling and Accessibility Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Nancy Serediak, Instructor

Louis Dingley, Chair

Date Authorized

Vincella Thompson, Dean

Date Authorized

Signed copies to be delivered to:

Instructor

Registrar's Office