

ENVT 266 – 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

Dr. Danna Schock

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Office Hours

Monday through Thursday: 1:00 pm – 2:00 pm, or by appointment

Friday 11:00 am – noon, or by appointment

Hours of InstructionLecture

Tuesdays and Fridays 9:00 am – 10:20 pm Room CC267

Lab

Wednesdays 9:00 am – 11:50 am Room S114

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

Other requirements

1. Hard copy of completed current WHMIS course certificate for first lab (online resource)
2. Hard copy of completed, signed plagiarism course certificate. No assignments will be accepted until this requirement is met.
3. Dedicated lab coat (full lab coats that go to the knees) for Biology lab (CC 234) and ENVT lab (S114)

4. Moodle (<http://ilearn.keyano.ca>). The course outline, lecture notes and other resources will be made available on Moodle.
5. Keyano College email address. I will not correspond with students using their personal email addresses for a plethora of liability, security and confidentiality reasons.

Course Outcomes

Students that successfully complete this course will be able to:

1. Identify, assess, minimize, and mitigate environmental degradation that can occur during extraction and utilization of natural resources.
2. Locate and utilize key pieces of legislation and guidelines related to environmental impact assessments, monitoring, and reclamation in the province of Alberta.
3. Develop an assessment and related reclamation plan for a hypothetical resource development project in the province of Alberta.
4. 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, completing a risk assessment, designing and conducting the experiment, analyzing the data, and presenting the results in a formal presentation and formal written report.

Evaluation

Item	Percent	Due Date
Midterm	25%	Tuesday 26 February 2019
Research experiment	35%	Proposal due Fri 1 Feb by 4 pm (10%) Class presentation week of 1 April (5%) Final paper due Fri 12 April by 4 pm (20%, includes 5% for assessment of overall project management)
Soil microbes assignment	5%	Due Fri 8 Feb by 4 pm
Final Examination (cumulative)	35%	set by Registrar
<i>Total</i>	<i>100%</i>	

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	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	
	Progression	C-	60 – 63.9	
Poor	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.
	Minimum Pass	D	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

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

Please Note:

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.

Schedule of Topics

Topic 1	<p>Overview: Reclamation in ecological and legal contexts, defining reclamation objectives and how those objectives determine what will constitute a “successfully reclaimed site”.</p> <p>Themes introduced in this topic will be revisited and developed throughout the rest of the semester through the use of case studies, articles from the primary scientific literature, and government reports.</p>
Topic 2	<p>Scientific Inquiry and Reclamation: the use of scientific methodology, including experimental/sampling design and data analysis, in assessment and reclamation projects.</p> <p>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.</p>
Topic 3	<p>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, pivots on appropriate soil quality.</p>
Topic 4	<p>Upland re-vegetation: application of ecological principles for the purpose of meeting different objectives including reclamation of overburden dumps and urban brown sites.</p>
Topic 5	<p>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.</p>
Topic 6	<p>Contaminated sites: evaluation of the nature and extent of contamination including ecotoxicological assays, identifying point vs non-point sources, underground contaminants, decontamination techniques.</p>
Topic 7	<p>Assessing “success” of reclamation activities: Special attention to monitoring strategies, timescale considerations, and the importance of stakeholders, site history, and jurisdictions.</p>

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 and therefore 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. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

Before entering the lab, students are responsible reviewing the lab manual and relevant Safety Data Sheets for the purpose of evaluating risks associated to health. Some hazards used in the laboratory may have additional risks to those with pre-existing medical conditions.

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.

Please note that students who miss two or more labs, for any reason, automatically fail this course because too much material will have been missed. There are no 'make-up labs' in ENVT 266.

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

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

Accessibility Services (CC167) supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934

Skill Centre (CC119) provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

Wellness Services (CC260) offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Test Anxiety. Individual appointments can be made by calling 780-791-8934.

Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.