



RENr 210 / SOIL 210

Introduction to Soil Science and Soil Resources

In Fall 2020, SOIL 210, *Introduction to Soil Science and Soil Resources*, is being offered at Yukon University concurrent with the University of Alberta's RENr 210, *Introduction to Soil Science and Soil Resources*, as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in SOIL 210 or RENr 210 must adhere to requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in the outline; Yukon University students must be aware of, and adhere to, Yukon University's Academic Regulations, also referenced in the outline.

INSTRUCTOR: Mary Samolczyk
Instructor, Earth Sciences

OFFICE HOURS: By appointment.

OFFICE LOCATION: CNIM M105

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CLASS DAYS & TIMES: T 10:30 AM – 11:55 AM, Th 10:30 AM – 11:55 AM (online); Lab T 1:00 PM – 4:00 PM (in-person and on campus)

CLASS LOCATION: Lectures are online; Lab room T1090

COURSE DESCRIPTION:

Elementary aspects of soil formation, soil occurrence in natural landscapes, soil classification, soil resource inventory; basic morphological, biological, chemical, and physical characteristics employed in the identification of soils and predictions of their performance in both managed and natural landscapes.

Soils are natural bodies that form at the Earth's surface through the complex interaction of chemical, physical and biological processes. Soils are an integral part of terrestrial ecosystems and ecosystems are impacted by soil processes. Variability in soil characteristics will be examined both vertically within any one soil, as well as, horizontally across many soils at a landscape level. While soils of Yukon are taken as examples, the basic characteristics considered are those used to describe and predict the performance of all soils.

STUDENT LEARNING OUTCOMES AND COMPETENCIES:

Upon successful completion of this course students will be able to do the following:

- Have a clear understanding of the main concepts and rationales associated with the identification and description of basic soil and landscape features
- Be able to apply knowledge of soil characteristics to describe and classify soils under the Canadian Soil Classification System
- Have an understanding of the basic physical and chemical characteristics that govern soil behavior, and links between macro and micro levels of investigation
- Demonstrate an understanding of porosity, particle density, bulk density and the relationship between porosity and bulk density, saturated versus unsaturated flow, preferential versus uniform water flow and capillary rise
- Understand the role of soil colloids, isomorphous substitution and Cation Exchange Capacity in soils
- Have an understanding of the significance of basic biogeochemical soil characteristics to soil quality and nutrient cycling

COURSE FORMAT:

This course consists of two 90-minute lectures per week and seven three-hour laboratory sessions (unless otherwise indicated by the Instructor). The lecture schedule in the course outline details the major topics covered and when those topics will be presented throughout the course. Please note that this schedule will likely be modified during the term to accommodate lecture topics that may not be finished within the predicted lecture time. Laboratory exercises may be performed in the field (outside) on or off the College campus. The laboratory Instructor will notify students in advance of a field laboratory exercise; please check your course emails regularly. Students are advised to dress appropriately for these labs including light hiking boots, rain gear and warm clothing.

Lectures for the Fall 2020 offering of this course will be delivered remotely using the online Zoom platform. Lecture material will be delivered both synchronously and asynchronously. Students are expected to join the Zoom session so that they can ask questions in real-time and directly engage with the instructor and their peers. Students will require a computer with a stable internet connection. A headset with a microphone is recommended. Lecture sessions will be recorded and made available to students for review on the Moodle course page. Lab instruction will take place on campus using face-to-face instruction. Students will not be able to complete lab assignments remotely.

COURSE PREREQUISITES AND/OR CO-REQUISITES:

For students taking the course as SOIL 210: Students must have completed a university-level course in life or natural sciences. A university-level chemistry course is strongly recommended.

For students taking the course as RENR 210: Registration in Yukon University/University of Alberta B.Sc. in Environmental and Conservation Sciences degree program. Students must have completed a university-level course in life or natural sciences. A university-level chemistry course is strongly recommended.

REQUIRED TEXTBOOKS/MATERIALS:

Brady, N.C. and Weil, R.R. 2009. Elements of the Nature and Properties of Soils, 15th Edition (required).

COURSE WEBSITE

Students are expected to access, and stay up to date with course content, messages and announcements on the Moodle course website. Grades will be posted using the gradebook feature in Moodle. All lectures, recordings, and additional resources will be posted on the Moodle course page. When indicated by the instructor, course exams may also be completed through the Moodle course page.

YUKON UNIVERSITY ACADEMIC STANDARDS AND REGULATIONS

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/

Admissions & Registration web page.

Plagiarism

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the University.

UNIVERSITY OF ALBERTA ACADEMIC INTEGRITY AND CODE OF STUDENT BEHAVIOUR

Academic Integrity

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.governance.ualberta.ca) 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.

Code of Student Behaviour

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at:

<http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx> Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code include the following statements.

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another's substantial editorial or compositional assistance on an assignment as the Student's own work.

PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT

Students are expected to attend all lectures and labs, be engaged and courteous in all course activities, and to be on time. Please do not use cellular phones during class. Laptops are permitted for note taking and in-class work; however, please do not use laptops in class for non-class-related activities. While in the field, students must engage in safe field practices. These will be outlined by the instructor in advance of each field activity.

COURSE REQUIREMENTS/EVALUATION:

Attendance and Participation

Students are expected to attend all scheduled lecture and laboratory sections. Students are responsible to make up for all missed lecture and laboratory content on their own time. It is not possible to complete most of the laboratory exercises outside of the scheduled laboratory period; missing these laboratory exercises may result in a student receiving a grade of zero on the laboratory assignment.

Assignments

Students will be assigned three in-class learning assessment assignments and one final report to be completed outside of class time. Students will be required to submit a laboratory assignment for each laboratory exercise completed. Digital or hard copies of both lecture and laboratory assignments must be submitted for evaluation to receive a grade. If a student is absent when an assignment is distributed in class, it is the responsibility of the student to make sure that they understand the assignment instructions, and if not, that they seek assistance from the instructor.

Exams

There will be three exams in this course: two (2) midterm exams and one (1) final exam. Students must write the exam on the scheduled date. If an exam is missed, a grade value of zero will be assigned. If a student anticipates they will not be able to attend a scheduled

exam, they must speak to the instructor at least a week in advance of the scheduled exam to determine the appropriate course of action.

Due Dates and Late Assignments

Lecture assignments are due at the start of the lecture on the date assigned by the instructor. Laboratory assignments will be due at the start of the following laboratory period unless otherwise indicated by the laboratory instructor. Late assignments will be graded based on the following scheme: a deduction of 10% per day up until a total deduction of 50% is reached, following that, assignments must be submitted by the start of the last lecture period or a grade of 0% will be automatically assigned. Under no circumstances will extensions be granted.

Evaluation

The course grade will be determined as follows:

Students enrolled in the course as SOIL 210:

Item	Percent
Module 1 exam	15%
Module 2 exam	15%
Final exam	20%
Laboratory exercises (7 at ~ 3.5% each)	24.5%
Learning assessments (3 at 4% each)	12%
Final Report	13.5%
Total	100%

Students enrolled in the course as RENR 210:

Item	Percent
Module 1 exam	15%
Module 2 exam	15%
Final exam	20%
Laboratory exercises (7 at ~ 3.5% each)	24.5%
Learning assessments (3 at 4% each)	12%
Final Report	13.5%
Total	100%

Assignment of grades

The total numerical score will be converted to a grade on Yukon University's letter grading system.

Grade	Percent Equivalent
A+	95 - 100
A	86 - 94
A-	80 - 85
B+	75 - 79
B	70 - 74
B-	65 - 69
C+	62 - 64
C	58 - 61
C-	55 - 57
D	50 - 54
F	Under 50%

ELECTRONIC DEVICES:

Use of electronic devices during lecture/lab is only permitted if being used for note-taking, in-class activities, or accessing course materials. Please set devices to silent when in class. The use of electronic devices during examinations is restricted, except for approved non-programmable calculators.

RECORDING OF LECTURES, LABS, ETC.:

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that lectures will be recorded using web conferencing software, and links to recordings may be posted on the class website.

FIELD WORK:

Several laboratory activities in the course will be based in the field. Some activities expected of students include hiking, digging using a shovel and walking on uneven/sloped ground. Please contact your instructor if you have any concerns about meeting these expectations. In addition, students are expected to dress according to the weather in order to be comfortable.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon University recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon University program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukonu.ca/yfnccr.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, they should contact the Learning Assistance Centre (LAC): lac@yukonu.ca.

EQUIVALENCY/TRANSFERABILITY:

SOIL 210 transfers as: FSTY 250 (3) (UNBC)

For current information on course transferability see <http://www.bctransferguide.ca>

TENTATIVE SCHEDULE OR TOPIC OUTLINE:

Week	Lecture Number	Lecture Topics	Lab Number
1	1	Course introduction	No lab
	2	Intro and definitions Soil profile description Soil constituents	
2	3	Weathering types	Lab 1 Group A– Soil characterization
	4	Factors influencing soil formation	
3	5	CLORPT, cont. Soil forming processes	Lab 1 Group B – Soil characterization
	6	Soil architecture Soil physical properties	
4	7	Soil organisms	Lab 2 Group A - Parent materials (FIELD LAB)
	8	Soil organisms	
5	9	Learning Assessment #1	Lab 2 Group B – Parent materials (FIELD LAB)
	10	MODULE 1 MIDTERM	
6	11	Canadian System of Soil Classification Soil orders: Brunisols Luvisols Podzols	Lab 3 Group A – Soil profile examination (FIELD LAB)
	12	Soil orders: Solonetzic Chernozem	
7	13	Soil orders: Regosols Vertisols Organic soils	Lab 3 Group B – Soil profile examination (FIELD LAB)
	14	Soil orders: Gleysols Cryosols	
8	15	Soil description in the field	Lab 4 Groups A and B

		Using the CSSC manual	– Independent soil profile examination and sample collection (FIELD LAB)
	16	Yukon and Whitehorse soils	
9	17	Movement of water Soil water and potential energy	Lab 5 Group A – Soil moisture content and bulk density (PART FIELD LAB)
	18	Water flow in soils	
10	19	Learning Assessment #2	Lab 5 Group B – Soil moisture content and bulk density (PART FIELD LAB)
	20	MODULE 2 MIDTERM	
11	21	Soil colloids	Lab 6 Group A – Soil grain size analysis part 1 and LOI
	22	Soil colloids cont., CEC and base saturation	
12	23	Alkalinity, acidity and salinity	Lab 6 Group B – Soil grain size analysis part 1 and LOI
	24	Biogeochemical cycles	
13	25	Biogeochemical cycles	Lab 7 Group A – Soil grain size analysis part 2
	26	Soil management	
14	27	Guest lecture	Lab 7 Group B – Soil grain size analysis part 2
	28	Learning Assessment #3	