1 Course Details

1.1 Calendar Description

This course is an introduction to soil resources with emphasis on management practices that will sustain the productivity of these resources and enhance the quality of the ecosystems of which they are a part. Students will develop a management plan for a farm that will take into account the roles of geological, geomorphological, biological, climatic and temporal factors on the formation, properties and uses of soils. The management plans will be placed in the broader context of provincial policies related to soil, air and water resources and local zoning regulations.

Pre-Requisites: 2.50 credits
Restrictions: ENVS*2060 or SOIL*2010

1.2 Course Description

The course will provide an introduction to the nature and properties of soil, and use this information to understand management practices that will sustain the productivity of these resources and enhance the quality of the ecosystems of which they are a part. The course will be presented in a lecture-lab-tutorial manner, with 3 lectures and a 2-hour lab-tutorial per week. The laboratory will provide an opportunity to reinforce concepts discussed in the lecture through observations, selected exercises and assigned reading. In addition, students working in groups will evaluate a parcel of land, taking into account the roles of geological, landscape, drainage, biological, climatic, and temporal factors on the formation, properties and uses of the soils that they have identified at the site.

1.3 Timetable

Lectures: MacNaughton, room 105, Tuesday and Thursday 8:30 - 9:50
Labs: Alexander Hall, Room 030, Monday 8:30 – 10:20

Alexander Hall, Room 030, Tuesday 3:30 – 5:20

Alexander Hall, Room 030, Thursday 3:30 – 5:20

Alexander Hall, Room 030, Friday 8:30 – 10:20

Alexander Hall, Room 030, Friday 2:30 - 4:20

1.4 Final Exam

08:30AM - 10:30AM (2019/12/13)

Room TBA

2 Instructional Support

2.1 Instructional Support Team

Instructor: John Lauzon
Email: lauzonj@uoguelph.ca
Telephone: +1-519-824-4120 x52459
Office: ALEX (AXEL) 219
Office Hours: By appointment

2.2 Teaching Assistants

Teaching Assistant: Anibal Castillo
Email: acastill@uoguelph.ca
Office: ALEX room 323

Teaching Assistant: Jeewan Gamage
Email: hkumara@uoguelph.ca
Office: ALEX room 109

Lab Section
3 Learning Resources

3.1 Recommended Resources

The Nature and Properties of Soils (Textbook)

The Canadian System of Soil Classification (Textbook)

3.2 Other Resources

• Other assorted papers to be listed on the course reserve, online resources listed
on CourseLink, and in the laboratory outlines.
• Please view Courselink regularly for course slide sets and other useful materials and information. The textbook can be found on the course reserve at the library

3.2 Field Trips

The major project requires a site visit to the location of the student chosen project site. This trip will be self led at a mutually agreed date for the group members. Further information on the nature of the trip is given in the project outline handout and will be discussed in class. Any costs related to the travel the study site is the responsibility of the students in the specific group.

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:
1. An introductory understand of how soils form gathered from information provided in lectures and laboratories
2. Be able to describe a soil profile from information in the lectures and laboratories as well as study of a specific field study (major project)
3. An introductory understanding of the Canadian system of classification focusing on the soil orders gathered from information provided in lectures and laboratories
4. Have an introductory understanding of the geology of Southern Ontario important for soil formation from information in the lectures and laboratories as well as study of a specific field study (major project)
5. An introductory understanding of the physical nature of soil from information in the lectures and laboratories as well as study of a specific field study (major project)
6. An introductory understanding of water behavior, availability and budgeting in soils
7. An introductory understanding of soil chemical properties (clay mineralogy, Cation exchange and pH) gathered from information provided in lectures and laboratories
8. An introductory understanding of plant macronutrient cycling in soils gathered from information provided in lectures and laboratories
9. An introductory understanding of resource use and management from information in the lectures and laboratories as well as study of a specific field study (major project)
10. Apply the knowledge and understand the implications of the knowledge gained in learning objectives 1- 9 for sound management of a soil through the compilation of the major project
11. Apply the knowledge gained in learning outcomes 1 – 9 to collect, compile and report on the nature of a selected study site through the compilation of the major project

5 Teaching and Learning Activities

5.1 Lecture

Unit 1
Topics: Introduction

Unit 2
Topics: Soil Characteristics

References: Sections 4 – 4.4 of Brady and Weil 13th to 15th ed

• Composition of soils
• Soil description
• Soils in the landscape

Unit 3
Topics: Additional information provided for the project
Soil Developments and Classification

• Soil development
• Principles of soil classification
• The Canadian system of classification
• Implications for identifying land use/management options

Unit 4
Topics: Soil Developments and Classification

References: The Canadian System of Soil Classification, 3rd edition

• Soil development
• Principles of soil classification
• The Canadian system of classification
• Implications for identifying land use/management options

Unit 5
Topics: Soil Physical Properties

References: Weil and Brady 15th ed pages 130-155, 161-175

All editions - Sec 4.0 – 4.5, 4.7 – 4.8

- Texture
- Structure (bulk density, influence of mgmt)
- Implications for identifying land use/management options

Unit 6

Topics: Soil Water

References: Weil and Brady Chapters 5.0 - 5.9 and 6.0 – 6.3, 6.6-6.7, 6.9

- Characteristics of water molecule influencing its behavior in soil
- Water potential
- Water content
- Water release curve
- Water flow
- Water available to plants
- Implications for identifying land use/management options

Unit 7

Topics: Chemical and Mineralogical Characteristics of Soils

References: Weil and Brady 8.1 – 8.3, 8.6, 8.8, 8.9, chapter 9,

Chapter 11 – 11.6, 11.8 – 11.10

Chapter 12 – 12.3, 12.7
• ChaClay minerals
• pH
• Organic matter

Unit 8
Topics: Plant Nutrients
References: Weil and Brady Chapter 13.0 -13.15

Chapter 14

• Macro versus micro nutrients
• N cycle, organic N sources, fertilizer N
• P cycle, fertilizer P
• K cycle, K fertilizer
• Deficiency symptoms
• Estimating plant/crop requirements
• Implications for identifying land use/management options

Unit 9
Topics: Resource Use

• Resource concepts
• Soil degradation
• Canada land inventory
• Land use

5.2 Lab
Topics: Organizational lab to develop groups for the major project

Topics: Soil Formation and Classification

Topics: Soil Physical Properties
Topics: Water in Soils
Topics: Chemical and Mineralogical Characteristics of Soils
Topics: Plant Nutrients
5.3 Note

Please note that the some of the weeks not used for formal labs will be used to work on the major project as required. Also note that the exact dates of laboratories may change depending on lecture scheduling. Check CourseLink for lab assignments and exact meeting dates.

5.4 Field Trips

The major project requires a site visit to the location of the student chosen project site. This trip will be self led at a mutually agreed date for the group members. Further information on the nature of the trip is given in the project outline handout and will be discussed in class. Any costs related to the travel the study site is the responsibility of the students in the specific group.

6 Assessments

6.1 Marking Schemes & Distributions

<table>
<thead>
<tr>
<th>Name</th>
<th>Scheme A (%)</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>20</td>
</tr>
<tr>
<td>Major Project</td>
<td>40</td>
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<tr>
<td>Final Exam</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
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6.2 Assessment Details

- **Midterm Exam (20%)**
  - **Date:** Thu, Oct 24, in class

- **Major Project (40%)**
  - **Due:** Thu, Nov 21, In class, my office or to your TA

- **Final Exam (40%)**
  - **Date:** Fri, Dec 13, 8:30 AM - , 10:30 AM

7 Course Statements

7.1 Grading Policies

Policy on Late Assignments:

Major reports received late will be penalized 5% per day without an adequate explanation
given before the due date. Anything received after the last class day without adequate reason(s) for being late before the due date will receive a grade of zero.

7.2 Course Policy on Group Work

The major report will be completed by groups of 3 to 4 students and a single report will be provided for each group.

7.3 Course Policy regarding use of electronic devices and recording of lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website https://www.uoguelph.ca/sas

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-
8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars