# Course Outline Soil Science: Fall 2016

## General Information

**Course Title: ENVS\*2060, Soil Science**

**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.

**Credit Weight:** O.50

**Academic Department (or campus):** School of Environmental Science

**Campus:** Guelph

**Class Schedule and Location:**

Lectures

Thornbrough Building, room 1200, Monday, Wednesday and Friday 11:30 – 12:20

Laboratories

Alexander Hall, Room 030, Tuesday 11:30 – 1:20

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

Alexander Hall, Room 030, Wednesday 12:30 – 2:20

Alexander Hall, Room 030, Wednesday 2:30 – 4:20

## Instructor Information

Instructor Name: John Lauzon

Instructor Email: lauzonj@uoguelph.ca

Office location and office hours:

Office: Room 219 Alexander Hall, by appointment

## GTA Information

GTA Name: John Drummelsmith

GTA Email: jdrummel@uoguelph.ca

GTA office location and office hours: ALEX 304, By appointment

## Course Content

### Specific Learning Outcomes:

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

**Tentative Schedule of Labs/Seminars**

|  |  |
| --- | --- |
| Tentative week\* | Topic |
| Sept 12 | Organizational lab to develop groups for the major project |
| Sept 26 | Soil Formation and description |
| Oct 17 | Soil Physical Properties |
| Oct 24 | Water in Soils |
| Nov 7 | Chemical and Mineralogical Characteristics of Soils |
| Nov 21 | Plant Nutrients |

\*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

**Tentative Schedule of Lectures:**

|  |  |
| --- | --- |
| Tentative date\* | Topic |
| Sept 9 | Introduction |
| Sept 12 | Soil Characteristics* Composition of soils
* Soil description
* Soils in the landscape
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| Sept 16 | Additional information provided for the project. |
| Sept 19 | Soil Developments and Classification * Soil development
* Principles of soil classification
* The Canadian system of classification
* Implications for identifying land use/management options
 |
| Sept 30 | Soil Physical Properties * Texture
* Structure (bulk density, influence of mgt
* Implications for identifying land use/management options
 |
| Oct 14 | Soil Water * 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
 |
| Oct 26  | Midterm exam |
| Oct 28 | Chemical and Mineralogical Properties of Soils* Clay minerals
* pH
* Organic matter
 |
| Nov. 11 | Plant Nutrients* 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
 |
| Nov. 25 | Resource Use* Resource concepts
* Soil degradation
* Canada land inventory
* Land use
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\*Actual date is subject to change

### Course Assignments and Tests:

| Assignment or Test | Due Date | Contribution to Final Mark (%) | Learning Outcomes Assessed |
| --- | --- | --- | --- |
| Midterm Exam | Oct. 26 | 20 | 1 - 6 |
| Major Project | Nov. 25 | 40 | all |
| Final Exam | Dec. 10 | 40 | All with a focus on 7- 9 |

### Final examination date and time: December 8 at 7:00 – 9:00

## Course Resources

### Required Texts:

 **Recommended Texts:**

1. Brady, N.C. and R.R. Weil. 2017. The nature and properties of soils. 15th ed. (note the 12th – 14th ed. Are also OK) Prentice Hall. Upper Saddle River, New Jersey. A copy of the 12th – 14th editions are available on course reserve

2. Agriculture Canada. 1998. The Canadian System of Soil Classification. 3rd ed. Canada Soil Survey Committee, Research Branch, Agriculture Canada, Ottawa. Available at: http://sis.agr.gc.ca/cansis/publications/manuals/1998-cssc-ed3/cssc3\_manual.pdf

3. Other assorted papers to be listed on the course reserve, online resources listed on CourseLink, and in the laboratory outlines.

### Other Resources:

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

### 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.

## Course Policies

### 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.

### 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.

### 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.

## University Policies

### Academic Consideration:

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml).

### Academic Misconduct:

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 discourages misconduct. 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.

Detailed information regarding the Academic Misconduct policy is available in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

### Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS), formerly Centre for Students with Disabilities (CSD), as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or visit the [Student Accessibility Services website (http://www.uoguelph.ca/csd/)](http://www.uoguelph.ca/csd/).

### Course Evaluation Information:

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](https://courseeval.uoguelph.ca/) **for more information.**

### Drop period:

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III (Schedule of Dates) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/).

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/).