

Soils and Landscapes in Our Environment

SOIL 3600, Fall 2018 (sections A01, B01 or B02, 3 credit hours)

Department of Soil Science, Faculty of Agricultural and Food Sciences, University of Manitoba

Lecture time: M, W, F 11:30am–12:20pm
Lecture room: Room 219, Animal Science
Office hours: M 10:00-11:00am or by appointment

Instructor's name: Mario Tenuta (call me Mario!)
Email: mario.tenuta@umanitoba.ca
Phone: (204) 474-7827
Office: 309 Ellis Building

The best ways to contact me is in person after lecture, during office hours or email. If contacting by email please place SOIL 3600 in the subject line.

Credit hours: 3

Pre-requisites: None. This course is required for students in B.Sc. Agriculture specializing in Agronomy, B.Sc. Agroecology, and Minor in Soil Science. It is highly recommended for those in Physical Geography, Environmental Science and Environmental Studies.

Extra Course Fee: \$60 to cover cost of one all day field trip.

Recommended Text (reserve in Ag. Library): Brady, N.C. and Raymond Weil, 2017. *The Nature and Properties of Soils*. 14th and 15th Edition Prentice Hall.

Other References: Soil Classification Working Group. 1998. *The Canadian System of Soil Classification*. 3rd Ed. Natural Resources Canada. Ottawa. 187 p. <http://sis.agr.gc.ca/cansis/taxa/cssc3/index.html>

Course Description:

The course will provide the necessary scientific background for a comprehensive understanding of soils and landscapes, their place in agriculture and forestry and the role they play in our environment. It emphasizes soils as part of the land ecosystem, and as structured bodies of both biotic and abiotic components whose properties interact to provide form and function within landscapes. The course is an inductive examination of the terrestrial environment which includes soil, water, air and biota as a resource; its behaviour, limitations, fate and use.

Rationale:

Soils and landscapes are often the interface between human activities and those parts of the environment that we wish to use, preserve and protect. They play an important role in plant and animal production as well as in environmental health as they can be a source, sink or interacting medium for many biotic and abiotic constituents. An understanding of soil properties and reactions is therefore critical to the evaluation of how plants and animals, and some will argue, even humans, survive in the soil environment. Soil is at the centre of it all. Welcome as we journey through the wonder of Soil.

Lecture Schedule

Lecture	Date (2018)	Topic
1	Sep	5 Introduction
2		7 Function of Soils and Landscapes
3		10 Origin of Landscapes and Formation of Soils: rocks
4		12 and minerals, geologic processes, geomorphic
5		14 processes, weathering, soil forming factors and
6		17 Classification of Soils and Landscapes: The soil
7		19 profile, horizons, topography [Regisols,
8		21 Brunisols, Chernozems], Field Trip Prep.
9		24 Physical Properties of Soils: particle size, texture;
10	Oct	26 Water in Soils and Landscapes: water movement into
11		28 and through soil, soil moisture storage and losses,
12		1 water movement over and through the landscape
13		3 [formation of Gleysols, Luvisols, Vertisols, Cryosols]
14		5 Effects of physical properties on land use
		Gobble
15		10
16		12 Soil Chemistry: colloids, reactivity, cation and anion
17		15 exchange, acidity, alkalinity, salinity and sodicity.
18		17 Midterm Exam, in class
19		19 Effects and interpretation of chemical properties
20		22
21		24
22		Nov
23	29 Carbon in Soils: soil organic and inorganic carbon,	
24	31 carbon cycles, transformations [formation of Luvisols,	
25	2 Vertisols, Gleysols, Podzols, Solonchaks, Chernozems,	
26	5 Organic soils]	
27	7	
28	9 Soil Nitrogen Dynamics: cycles (stocks and flows);	
29	12 greenhouse gases, leaching and runoff	
	13-16 Fall Mid-term Break	
30	19 Soil Phosphorus and Potassium Dynamics: cycles	
31	21	
32	23 Quality and Degradation of Soil (and water and air)	
33	26 Soil erosion: wind water and tillage erosion, their	
34	28 control, impacts on soil, water and air quality;	
35	30 Soil Limitations to Land Use, CLI	
36	Dec	3 Soil contamination: organic and inorganic
37		5 contaminants, radionuclides, impacts on soil, water and
38		7 air quality
		10-21 Final Exam, TBD by University
	25 Christmas Day (have you been a good student?)	

Laboratory Schedule

Lab	Date (2018)	Topic
1	Sept 17/19	1 st Lab Assignment (complete and submit start of next lab)
2	Sept 24/26	Field Trip Preparation
3	Sept 29	Field Trip 8:00am-4:30pm
4	Oct 1/3	2nd Lab Assignment (submit start of next lab)
5	Oct 15/17	3 rd Lab Assignment (submit start of next lab)
6	Oct 24/26	4th Lab Assignment (Submit start of next lab)
7	Oct 29/31	Interpretive Soil Report –how to prepare report
8	Nov 5/7	Oral Presentation of your Interpretive reports
9	Nov 26/28	Submit Interpretive Report

Lab Instructors:

Nazanin Ghavami Shirehjin

ghavamin@myumanitoba.ca

Theresa Adesanya

adesanyt@myumanitoba.ca

Laboratories: Monday, Wednesday 2:30 - 5:30 p.m.

Room 318 Ellis Bldg. (Junior Soils Lab)

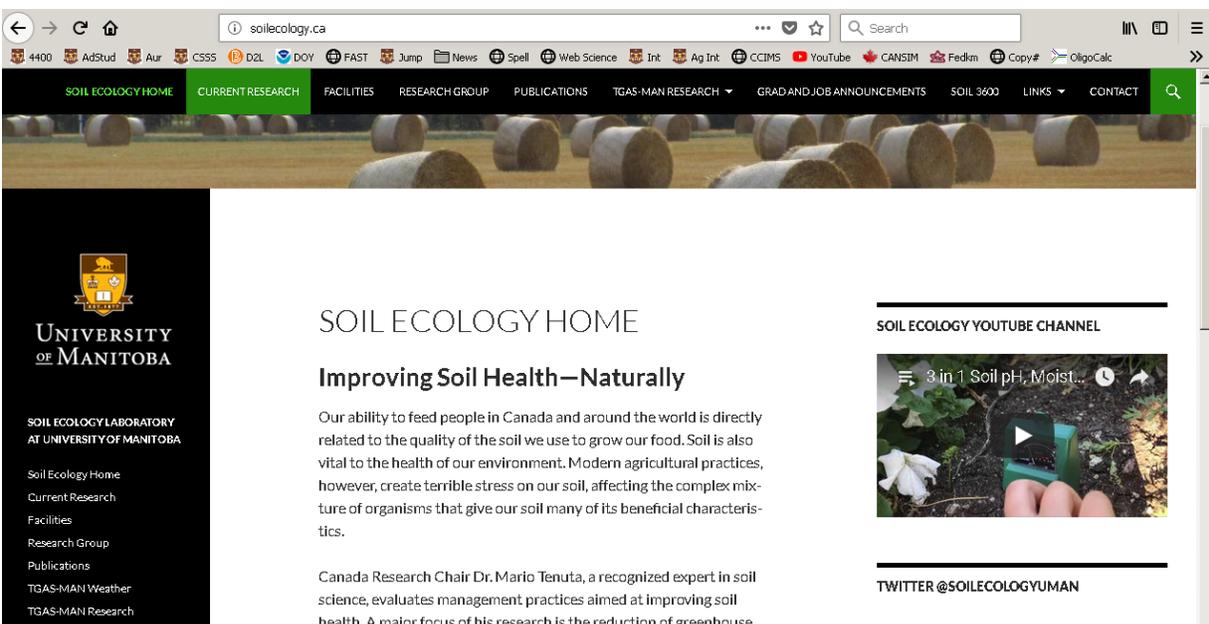
Intended Learning Outcomes:

At the end of the course, students should be able to:

- know the difference between soil and dirt
- describe a soil to the Great Group level
- understand how soil forming processes result in evolution of soils
- understand physical, chemical and biological properties of soils
- know how to characterize a soil
- know the role of soil in C and N cycling in the environment
- understand how management of soils affects conditions for plant growth
- know what soil health is and how the concept is useful

Course Technology:

Course materials will be provide on-line at www.soilecology.ca. Use the menu item SOIL 3600 to access lecture powerpoints, lab instructions, soil movies, and other links. Powerpoints will be in PDF and pass word protected. The password is available to registered students and will be provided in first lecture. Password is



Please feel free to use laptops and tablets in the classroom for taking notes and for referring to slides. Please do not use them for any other purpose, including facebook, email, twitter or the million other captivating things you can find on the internet. Laptops and tablets are often distracting for students who don't use them (especially when they are being used for something other than course notes). If you find laptops and tablets distracting, please let me know. Please turn your cell phones to silent during class and keep them in your bag away from you and your desk. Our time together in lecture and laboratory is to focus in learning about Soils. Thank you!

I will occasionally email the class through UM Learn or directly. The U of M requires that you have an official university email account and that you and I use that account to communicate with you. Please make sure your U of M email account is activated and monitored. Thanks!

Recording of lectures:

Audio recording of lectures is permissible if for the purpose for you to improve your notes. Audio recording for the purpose of providing to another student is not permissible. Also, please keep in mind that the University of Manitoba and I, hold copyright over the course materials, and that course materials are meant only for your private study and research.

Expectations for students:

- come prepared for each lecture and laboratory by having slides, laboratory instructions and/or due assignments with you.
- be prepared to discuss contents of previous lectures and laboratories. Thus review your notes and slides of the previous lecture before coming to class.
- bring to class questions you have about previous material.
- listen respectfully to me, laboratory instructors and fellow class mates. Respectful listening means trying your best to grasp what others are saying and engaging with their ideas.
- treat everyone, including yourself, with respect and courtesy.
- challenge yourself in this course. This will mean different things to each of you. To some it will mean speaking more than usual, while for others it will mean listening more than usual or aiming to be on time for each class. Think about how you can challenge yourself in this course.
- have your cell phones put away and your laptops and tablets out only for course-related purposes. (See above section called “Course Technology.”)
- attend lectures and laboratories for the whole class.
- Use professional oral, written (assignments and emails) communication and body language techniques.
- be a constructive attendee at lectures and labs.
- have fun learning about soils.

Expectations for instructor and laboratory teaching assistants:

- start lecture and laboratories on time and be generally enthusiastic and positive about the material and about teaching.
- Minimize technical difficulties in projecting slides that includes getting to lecture and laboratories early to setup.
- treat everyone with respect and courtesy.
- be prepared for each lecture or laboratory by planning our time in a way that facilitates your learning. My teaching strategy can be different than many teachers, I like to have fun teaching. I love soils and am proud of it.
- be available to meet with you during my office hours as well as for 15 minutes after each lecture. As well I will respond within 24 hours to emails and requests to meet in person.
- use professional oral, written communication and body language techniques.
- have fun teaching about soils.

- return graded material to you in a timely fashion (within two weeks of your handing it in).
- challenge myself in this course. For me, this means get graded material back in a timely fashion.

Expectations for Assignments:

Please hand in your assignments at the beginning of the laboratory they are due in. Please double-space all written assignments and print them in standard 12-point font with regular (approx. 1 inch) margins. Include

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your name and the assignment's title at the top of the paper (no separate title pages please). No electronic copies please. I will consider granting you an extension if you request it at least two weeks before the due date and have a good reason for asking for an extension. Any assignments received after the start of laboratories without an extension or properly documented reason (illness, death or religious obligation, for example) will be penalized 5% per day that they are late and will not be accepted after seven days. Please use good grammar and spelling, and also proof-read your material. Assignments provided that are not to standard expected by U of M will be docked marks.

Evaluation:

1 st Mid-term Examination	30%
Final Examination	50%
Lab Assignments (4)	12%
Interpretative Soil Survey Report	8%

Grading Scheme:

A+ Exceptional (90–100%)	C+ Satisfactory (65–69%)
A Excellent (80–89%)	C Adequate (60–64%)
B+ Very good (75–79%)	D Marginal (50–59%)
B Good (70–74%)	F Failure (<50%)

Final grades are subject of the approval of the Head of Sol Science and Associate Dean Academic of the Faculty.

Other important dates:

Please take note of the voluntary withdrawal date to receive 100% refund: **September 18, 2018** Please note that if you intend to drop the course but have not done so by **November 19, 2018**, you will be assigned a final grade. Withdrawal from courses will be recorded on your official transcript. Please refer to the [Registrar's Office](#) web page for more information. However, before considering withdrawal from this course please come and talk to me to see what I can do to assist you.

Students should acquaint themselves with the university's policy on plagiarism, cheating, exam personation, and fraud (http://umanitoba.ca/student/resource/student_advocacy/cheating_plagiarism_fraud.html). The Faculty of Agricultural and Food Sciences reserves the right to submit student work that is suspected of being plagiarized to Internet sites designed to detect plagiarism.

FYI (and, YES, this is meant to scare you away from plagiarism!), the minimum penalty for plagiarism on a written assignment is F on the paper and may result in F-DISC (discipline) in the course. This notation appears on a student's transcript. For repeat violations, this penalty can also include suspension for a period of up to 1 year.

All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community. Visit <http://umanitoba.ca/copyright> for more information.

Student Services:

The **Academic Learning Centre** (ALC; <http://umanitoba.ca/student/academiclearning/>) offers services that may be helpful to you as you fulfill the requirements for this course. Through the ALC, you may meet with a study skills specialist to discuss concerns such as time management, reading and note-taking strategies, as well as test-taking strategies. You may also meet one-on-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already

have a draft. Writing tutors can also give you feedback if you submit a draft of your paper online. Please note that the online tutors require 48 business hours to return your paper with comments. You can also talk to a member of the Academic Learning staff by calling (204) 480-1481 or by dropping in at the office, located at 201 Tier Building.

Student Accessibility Services (SAS; <http://umanitoba.ca/student/saa/accessibility/>) provides support and advocacy for students with disabilities of all kinds: hearing, learning, injury-related, mental health, medical, physical or visual. Students with temporary disabilities such as sprains and breaks are also eligible to use the services of SAS. SAS acts as a liaison between students and the faculty and staff of the University of Manitoba as well as support agencies within the province of Manitoba. Please phone: (204) 474-7423 (voice) or (204) 474-9790 (TTY) for service.

Student Counselling and Career Centre (SCCC; <http://umanitoba.ca/student/counselling/>) offers individual, couple or family counselling in individual and group formats. Please phone: (204) 474-8592 or visit SCCC at 474 University Centre.

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

Student Support Intake Assistant <http://umanitoba.ca/student/case-manager/index.html>

520 University Centre

(204) 474-8196

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service <http://umanitoba.ca/student/health/>

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are interested in information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator <http://umanitoba.ca/student/health-wellness/welcome.html>

Katie.Kutryk@umanitoba.ca

469 University Centre

(204) 295-9032

Live Well @ UofM

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site: <http://umanitoba.ca/student/livewell/index.html>

Your rights and responsibilities:

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The [Academic Calendar](http://umanitoba.ca/calendar) (<http://umanitoba.ca/calendar>) is one important source of information. View the

sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedure for more information.
- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected to conduct yourself in an appropriate respectful manner. Policies governing behavior include the:
Respectful Work and Learning Environment
http://umanitoba.ca/admin/governance/governing_documents/community/230.html
Student Discipline
http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html
and,
Violent or Threatening Behaviour
http://umanitoba.ca/admin/governance/governing_documents/community/669.html
- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>
- For information about rights and responsibilities regarding **Intellectual Property** view the policy http://umanitoba.ca/admin/governance/media/Intellectual_Property_Policy_-_2013_10_01.pdf

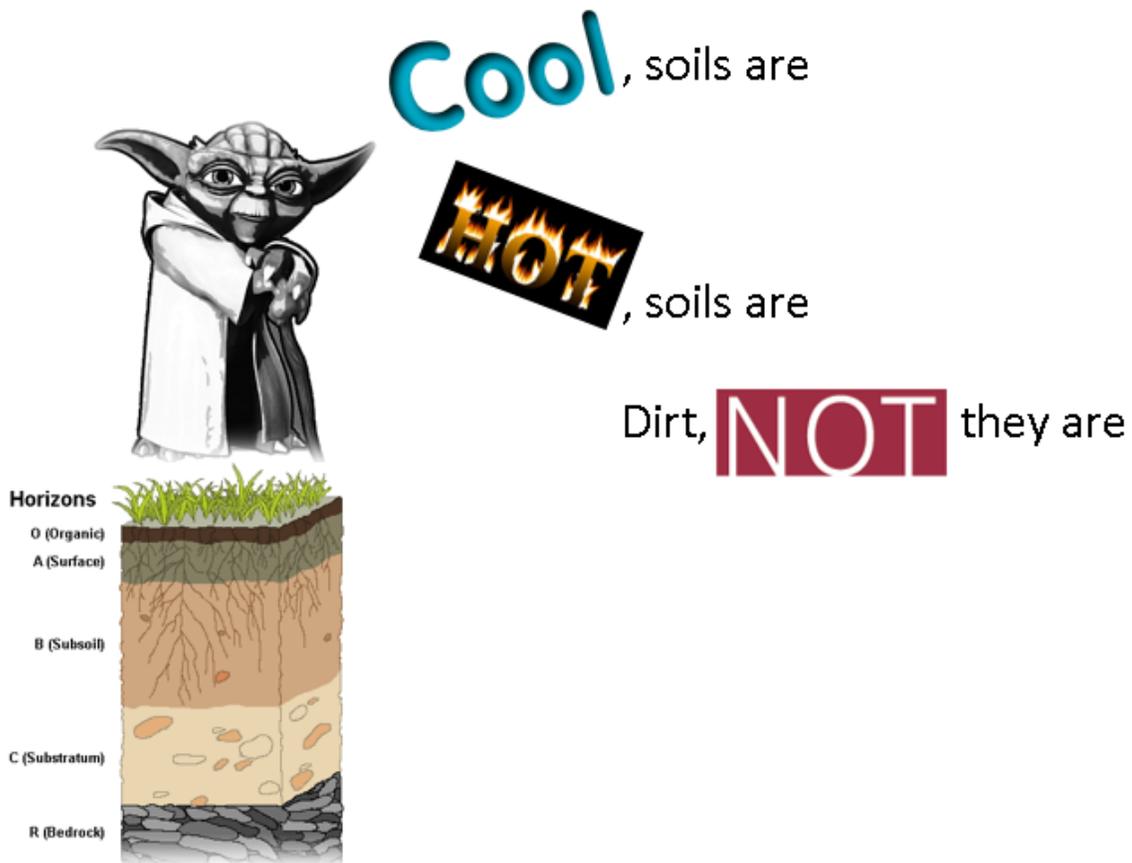
For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/>

Contact an **Academic Advisor** within your faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

Disclaimer: The course syllabus template available on-line from U of M Academic Support for WOMN 2000 Fall 2013 and developed by Jocelyn Thorpe was used as a guide in generating this course outline. I have checked over most links and phone number for student resources provided here.



Cool, soils are

HOT, soils are

Dirt, **NOT** they are

Horizons

- O (Organic)
- A (Surface)
- B (Subsoil)
- C (Substratum)
- R (Bedrock)