



**DEPARTMENT OF SOIL SCIENCE**  
FACULTY OF AGRICULTURAL AND FOOD SCIENCES  
UNIVERSITY OF MANITOBA

## **Soil 0620 - Soil Conservation and Management Course Syllabus - Winter 2025**

### **Calendar Description**

Land capability for agriculture, storage, use of water and water use efficiency; saline and alkaline soils; soil acidity; soil erosion and conservation; tillage, cropping systems and rotations; fate of biosolids, pesticides.

### **Course Objectives**

At the completion of this course, the student should be able to:

1. Explain relationships among soil, water and air as they relate to environmental quality and agriculture in Western Canada.
2. Interpret soil, climate, and landscape data for the purpose of identifying potential environmental impacts of agricultural practices, as well as the most relevant beneficial management practices to minimize those impacts.
3. Pass the Soil & Water Management section of the Prairie Province Certified Crop Advisor exam if they decide to write it.

### **How This Course Fits Into The Curriculum**

SOIL 0620 is a prescribed course in the Crop Management option of the Agriculture Diploma program. This course is designed to provide applied learning exercises in the areas of agricultural production practices, agricultural sustainability, limitations to agricultural production and environmental impacts on the environment. These topics are especially current with recent increased public awareness and scrutiny of food production practices and agricultural impacts on the environment.

### **Prerequisites And How They Apply To This Course**

The prerequisite course for the class is SOIL 0420 (Soil Resources and Productivity). The prerequisite course provides fundamental knowledge about soil and landscape properties and how they are described and reported. This knowledge will be utilized for applied learning by considering practical issues involved in soil and water management.

### **Instructor**

Dr. Henrique Carvalho, Assistant Professor, Department of Soil Science, 204-474-7842,  
[henrique.carvalho@umanitoba.ca](mailto:henrique.carvalho@umanitoba.ca)

### **Teaching Assistants (Laboratories)**

B01 - Faezeh Parastesh ([parastee@myumanitoba.ca](mailto:parastee@myumanitoba.ca))  
B02 - Jamie Wan ([wanc1@myumanitoba.ca](mailto:wanc1@myumanitoba.ca))  
B03 - Emmanuel Agyapong ([agyapone@myumanitoba.ca](mailto:agyapone@myumanitoba.ca))

## Time And Location

**Lectures** will be delivered **Mondays, Wednesday and Fridays** from **10:30-11:20 AM** in **room 350** of the **Engineering & Information Technology Complex (EITC E2)**. **Laboratories** will take place in **three** separate sections (**B01, B02, B03, pre-assigned**) on **Mondays, Wednesdays, and Fridays** from **1:00-2:15 PM**. Students are expected to attend all lectures and laboratories (attendance will be monitored). Regularly scheduled lectures and laboratories will provide for steady progress towards course objectives and learning outcomes. Laboratory locations:

B01	–	Monday 1:00 to 2:15 PM	–	Animal Science Building Room 220
B02	–	Wednesday 1:00 to 2:15 PM	–	Agriculture Building Room 130
B03	–	Friday 1:00 to 2:15 PM	–	Education Building Room 323

## Class Communication

Outside of these lectures and laboratories, students can contact the instructor and TAs by email, and the instructor and TAs will attempt to respond within 48 hours. Students' questions and concerns about course content will be addressed at the start of the next class meeting. Individual meetings with the instructors can be arranged by appointment.

Course materials and emails will be delivered by the instructor and TAs to the class via UMLearn. The Subject line of emails from students to the instructor and TAs must start with **"SOIL 0620, Last Name, topic..."**

Students are expected to regularly access their official University email account, which is the email address that will be used for all communication in this course. For full details of the Electronic Communication with Students please visit: [http://umanitoba.ca/registrar/email\\_policy/](http://umanitoba.ca/registrar/email_policy/).

## Recording Of Lectures

Students are not permitted to record lectures without the permission of the instructor.

## Course Materials

The lecture slides are available for students to download from the UM Learn course page. Each student is expected to download these slides and have them for reference during class. The PowerPoint slides constitute the primary study material for the class. The slides are made available to facilitate learning the course material and to provide an opportunity for interactive class sessions. **Review questions are provided at the end each section of lecture slides and are intended to assist students by testing their knowledge of course material prior to the exams. Students are expected to study the review questions on their own and seek clarification on any material that they do not fully understand prior to writing exams.** Class attendance is needed if students are to gain a full understanding of the course material. Students who attempt to pass this course without attending class, do so at their own risk.

**Electronic copies of the Manitoba Soil Management Guide and laboratory handouts will be provided to students.** No other textbook is required. Some reading materials will be provided to supplement the lectures for some course topics.

## Students' Rights And Responsibilities

For student resources, including student accessibility services, writing and learning support, library information, academic advisory services, student advocacy, and policies regarding student discipline, intellectual property and reporting sexual assaults, please see Schedule A posted on this course's UM Learn website.

## Description Of Examinations

**Two (2) 25-minute exams** will be held during class period at the completion Sections 2 and 4 in the course. Each exam will cover the content of the section(s) just completed. **A final exam** will be scheduled during the exam period at the end of the term and will cover all course (focusing on the fifth and final section) and the lab content.

## Missed Exams

If students know beforehand that they will not be able to attend an exam, they must contact the instructor to make alternate arrangements. Students who miss an exam without notice will receive a grade of zero on the exam.

## Laboratory Assignments

**There will be 9 laboratories and 7 laboratory assignments. Laboratory assignments are designed to be completed during the laboratory session and handed in at the end.** They will be graded and returned the following week. Lab exercises involve interpretation of environmental information and its application to a case farm. **For the most part, the concepts will be covered previously in the lectures and students should have their lecture notes on-hand during the lab to refer to the material when needed. During some of the lab periods, students will perform calculations and should have a calculator.** The lab assignments will utilize a real farm as a case study; this is meant to provide context for the exercises and improve proficiency in the application of environmental information for addressing issues in soil conservation and management.

## Late or Missed Lab Assignments

**Laboratories must be submitted at the end of the day on the day of the laboratory period in order to accommodate timely feedback of grades and comments.** If students know beforehand that they will not be able to attend a laboratory session, they should contact the instructor to make alternate arrangements. Students who do not submit a laboratory assignment at the end of the day of their lab period will receive a grade of zero on that exercise. Missed laboratory exercises can be made up with an excused absence provided it is completed prior to the distribution of marks to the class for that lab.

## Course Evaluation

Student performance will be based on laboratory assignments, two mid-term exams and a final exam.

<b>Mid-term Exams (2) .....</b>	<b>30%</b>	<b>Tentative Dates: Feb 5 and Mar 21 (10:30 - 10:55 AM)</b>
<b>Laboratory Assignments (7) .....</b>	<b>35%</b>	
<b>Final Exam .....</b>	<b>35%</b>	

## Letter Grade Equivalency

**A+**( $\geq 90\%$ ); **A**(85-89%); **B+**(75-84%); **B**(70-74%); **C+**(65-69%); **C**(60-64%); **D**(50-59%); **F**(<50%)

## Lecture and Laboratory Content and Tentative Schedule

Date	Day	Class Topic	Lab Topic
<b>Section 1: Agricultural Land Resource</b>			
Jan 6	M	Soil Order and their Productivity Limitations	No Lab
Jan 8	W	Landscape Impacts on Productivity	No Lab
Jan 10	F	Ag Capability and Soil Management Decisions	No Lab
Jan 13	M		L0 – Case Farm Introduction [B01]
<b>Section 2: Agricultural Climate Resource</b>			
Jan 15	W	Weather-climate, FFDs, Heat Units, Probability	L0 – Case Farm Introduction [B02]
Jan 17	F		L0 – Case Farm Introduction [B03]
Jan 20	M	Precipitation, Soil Moisture, and Risk	L1 – Soil Resources [B01]
Jan 22	W		L1 – Soil Resources [B02]
<b>Section 3: Water Management</b>			
Jan 24	F	Crop Water Demand/Use/Balance, Moisture Management	L1 – Soil Resources [B03]
Jan 27	M	<b>Experiential Learning – Class Cancelled</b>	No Lab
Jan 29	W		No Lab
Jan 31	F	Surface Water Issues, Riparian Zones	No Lab
Feb 3	M		L2 – Ag Capability [B01]
Feb 5	W	<b>1<sup>st</sup> Mid-Term Exam (Sections 1 and 2)</b>	L2 – Ag Capability [B02]
Feb 7	F	Groundwater Issues	L2 – Ag Capability [B03]
Feb 10	M	Soil Salinity/Sodicity and Management	L3 – Temperature Risk [B01]
Feb 12	W		L3 – Temperature Risk [B02]
Feb 14	F	<b>Review 1<sup>st</sup> Mid-Term and Prep for 2<sup>nd</sup> Mid-Term</b>	L3 – Temperature Risk [B03]
Feb 17	M	<b>Winter Term Break</b>	No Lab
Feb 19	W	<b>Winter Term Break</b>	No Lab
Feb 21	F	<b>Winter Term Break</b>	No Lab
Feb 24	M	Drainage and Irrigation	L4 – Water and Moisture Risk [B01]
Feb 26	W	Irrigation Suitability	L4 – Water and Moisture Risk [B02]
<b>Section 4: Nutrient Management</b>			
Feb 28	F	Nutrient Cycling, Balance, Fertilizer Use	L4 – Water and Moisture Risk [B03]
Mar 3	M		L5 – Drainage and Irrigation [B01]
Mar 5	W	Productivity, Target Yield, Manure	L5 – Drainage and Irrigation [B02]
Mar 7	F		L5 – Drainage and Irrigation [B03]
Mar 10	M	Manure Management	L6 – Manure Management [B01]
Mar 12	W		L6 – Manure Management [B02]
<b>Section 5: Soil Management Issues</b>			
Mar 14	F	Soil Degradation/Soil Erosion	L6 – Manure Management [B03]
Mar 17	M	Water Erosion Risk and Management	L7 – Erosion Risk [B01]
Mar 19	W	Wind Erosion Risk and Management	L7 – Erosion Risk [B02]
Mar 21	F	<b>2<sup>nd</sup> Mid-Term Exam (Sections 3 and 4)</b>	L7 – Erosion Risk [B03]
Mar 24	M	Tillage Erosion Risk and Management	Review Laboratories
Mar 26	W	Soil Organic Matter and Its Management	Review Laboratories
Mar 28	F		Review Laboratories
Mar 31	M	Soil Structure Issues and Management	<b>Review 2<sup>nd</sup> Mid-Term, Prep For Final</b>
Apr 2	W	Soil Health	<b>Review 2<sup>nd</sup> Mid-Term, Prep For Final</b>
Apr 4	F		<b>Review 2<sup>nd</sup> Mid-Term, Prep For Final</b>
<b>Apr 7 - 17</b>		<b>Final Exam (To Be Scheduled)</b>	

\*Experiential Learning Dates: January 23<sup>rd</sup>, 27<sup>th</sup>, and 28<sup>th</sup>.

\*Voluntary Withdrawal Date: March 17<sup>th</sup>.