

Faculty of Agricultural and Food Sciences, Department of Soil Science, University of Manitoba
Physical Properties of Soils (SOIL 4060)
 Winter 2022 Course Information and Schedule

General Course Objective	Students will be able to understand physical properties of soils, methods for their measurement, their importance to, and strategies for managing them for improved soil physical processes for sustainable management of agroecosystems.
Prerequisites	Soils and Landscapes in our environment (SOIL 3600), Transport Phenomena (BIOE 2110)
Course Duration	January 24, 2022 to April 25, 2021
Course Credits	3
Class Hours	<p>Lectures: Mondays, Wednesdays, Fridays: 9:30 am -10:20 am</p> <p>Tutorials: Tuesdays: 2:30 pm - 5:25 pm</p> <p>Classes will be conducted via Zoom (see below for links).</p> <p>Lectures will be recorded but will NOT be distributed to students.</p> <p>Remote Learning link for Mondays, Wednesdays, and Fridays:</p> <p>Join Zoom Meeting</p> <p>https://umanitoba.zoom.us/j/63867227403?pwd=ckpJc01KYU4ydnN2ckNEMy9LL2JoZz09</p> <p>Meeting ID: 638 6722 7403 Passcode: 733088 One tap mobile +12042727920,,63867227403#,,,,*733088# Canada +14388097799,,63867227403#,,,,*733088# Canada</p> <p>Dial by your location +1 204 272 7920 Canada +1 438 809 7799 Canada +1 587 328 1099 Canada +1 613 209 3054 Canada +1 647 374 4685 Canada +1 647 558 0588 Canada +1 778 907 2071 Canada 855 703 8985 Canada Toll-free</p> <p>Meeting ID: 638 6722 7403 Passcode: 733088 Find your local number: https://umanitoba.zoom.us/u/ger4sI5qBV</p> <p>Remote Learning link for Tuesdays:</p> <p>Join Zoom Meeting</p>

<p>https://umanitoba.zoom.us/j/62343134472?pwd=bjRiOWE1NE1DemJiMmRWUUI2citNQT09</p> <p>Meeting ID: 623 4313 4472 Passcode: 904170 One tap mobile +16473744685,,62343134472#,,,,*904170# Canada +16475580588,,62343134472#,,,,*904170# Canada</p> <p>Dial by your location +1 647 374 4685 Canada +1 647 558 0588 Canada +1 778 907 2071 Canada +1 204 272 7920 Canada +1 438 809 7799 Canada +1 587 328 1099 Canada +1 613 209 3054 Canada 855 703 8985 Canada Toll-free</p> <p>Meeting ID: 623 4313 4472 Passcode: 904170 Find your local number: https://umanitoba.zoom.us/u/gdtg6KKqLE</p>	
<p>Contact information</p>	
<p>Instructor: Dr. Afua Adobea Mante Assistant Professor of Soil Physical Processes, Department of Soil Science, University of Manitoba</p>	<p>Email: Afua.Mante@umanitoba.ca</p> <p>Office Hours: Send an email to set up appointment</p> <p>Location: Online</p>
<p>Teaching Assistant: Ms. Takudzwa Nawu Department of Soil Science, University of Manitoba</p>	<p>Email: nawut@myumanitoba.ca</p>
<p>Other information</p>	
Voluntary Withdrawal Date	April 25, 2022
Midterm 1	March 1, 2022
Midterm 2	April 5, 2022
Team Assignment due	April 22, 2022
Last Day of Classes	April 25, 2022
Final Exam Period	April 26 to May 3, 2022
Holiday and Closures	February 21, 2022 (Louis Riel Day); February 22 to February 25, 2022 (Winter break); April 15, 2022 (Good Friday)
Textbook	<ul style="list-style-type: none"> • Environmental Soil Physics - Daniel Hillel -Academic Press (On reserve at the Ag. Library) • Introduction to Environmental Soil Physics - Daniel Hillel - Academic Press (On reserve at the Ag. Library)

	<ul style="list-style-type: none"> • Soil Physics - Agricultural and Environmental Application - H. Don Scott - Iowa State University Press. • Soil Physics - (Sixth Edition) - W.A. Jury, and Robert Horton - John Wiley & Sons • Soil Physics (3rd edition) - T.J. Marshall, J.W. Holmes, and C.W. Rose - Cambridge University Press • Soil Physics - L.D. Baver. W.H. Gardner, and W.R. Gardner - John Wiley & Sons. • Soil Physics with Hydrus - Radclife and Simunek
Course Web Site	UMLearn

Course Assessment	
Individual Assignments	20%
Team Assignment	10%
Midterm 1	15%
Midterm 2	15%
Final Exam	40%
Grading Scale for Course	
Letter Grade	Percentage out of 100
A+	≥ 90
A	85 - 89
B+	80 - 84
B	75 - 79
C+	64 - 74
C	55 - 63
D	46 - 54
F	≤ 45
Late assignments	<p>Assignments are due one week after they are assigned.</p> <p>Assignments submitted after the due date will be deducted 10% per school day.</p> <p>Assignments will not be accepted when graded assignments have been returned.</p>
Attendance and Participation	You are required to attend all classes and to complete all of your assigned readings and assignments. Always notify me and the TA if you are unable to attend a class.
Classroom and email conduct	<p>Your full attention is requested during lectures and all class discussions.</p> <p>In accordance with university policy, all email communication for this course shall be conducted using your University of Manitoba email address only.</p>
Copyright/ Academic integrity	<p>Students do not have ownership rights to materials developed for the course. Posting or any other means of publishing these materials is prohibited.</p> <p>Refer to link below to know more about academic integrity at the University of Manitoba:</p> <p>https://umanitoba.ca/student-supports/academic-supports/academic-integrity</p>
Course Details	Subject to change

Lectures

Main topics

1. Introductory class
2. Physical characteristics of soils
 - Assignment 1
3. Characterization of soil solid phase
 - Assignment 2
4. Soil structure
 - Assignment 3
5. Soil wetness
6. Energy state of soil water
 - Assignment 4
7. Flow of water in soil
 - Assignment 5
8. Infiltration
 - Assignment 6
9. Solute transport in soil
 - Assignment 7
10. Soil aeration and Gas transport in soils
 - Assignment 8
11. Soil temperature and Heat transport in soils
 - Assignment 9
12. Soil dynamics
 - Assignment 10
 - Assignment 11: Individual Lesson Learned Memo
 - Team Assignment

Extra topics

1. Use of modeling tools to simulate field hydrologic processes
2. Application of soil physics to waste disposal management
3. Application of soil physics to soil remediation