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

<table>
<thead>
<tr>
<th>General Course Objective</th>
<th>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.</th>
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<tbody>
<tr>
<td>Prerequisites</td>
<td>Soils and Landscapes in our environment (SOIL 3600), Transport Phenomena (BIOE 2110)</td>
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<tr>
<td>Course Duration</td>
<td>January 24, 2022 to April 25, 2021</td>
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<tr>
<td>Course Credits</td>
<td>3</td>
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</tbody>
</table>
| Class Hours              | Lectures: Mondays, Wednesdays, Fridays: 9:30 am -10:20 am  
Tutorials: Tuesdays: 2:30 pm - 5:25 pm  
Classes will be conducted via Zoom (see below for links).  
Lectures will be recorded but will NOT be distributed to students.  
Remote Learning link for Mondays, Wednesdays, and Fridays:  
Join Zoom Meeting  
https://umanitoba.zoom.us/j/63867227403?pwd=ckpJe01KYU4ydnN2ckNEMy9LL2JoZz09  
Meeting ID: 638 6722 7403  
Passcode: 733088  
One tap mobile  
+12042727920,,63867227403#,,,,*733088# Canada  
+14388097799,,63867227403#,,,,*733088# Canada  
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  
Meeting ID: 638 6722 7403  
Passcode: 733088  
Find your local number: https://umanitoba.zoom.us/u/ger4sI5qBV  
Remote Learning link for Tuesdays:  
Join Zoom Meeting |
https://umanitoba.zoom.us/j/62343134472?pwd=bjRiOWE1NE1DemJiMmRWUU12citNQT09

Meeting ID: 623 4313 4472
Passcode: 904170
One tap mobile
+16473744685,,62343134472#,,,,*904170# Canada
+16475580588,,62343134472#,,,,*904170# Canada

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
Meeting ID: 623 4313 4472
Passcode: 904170
Find your local number: https://umanitoba.zoom.us/u/gdtg6KKqLE

Contact information

Instructor: Dr. Afua Adobea Mante
Assistant Professor of Soil Physical Processes,
Department of Soil Science, University of Manitoba
Email: Afua.Mante@umanitoba.ca
Office Hours: Send an email to set up appointment
Location: Online

Teaching Assistant: Ms. Takudzwa Nawu
Department of Soil Science, University of Manitoba
Email: nawut@myumanitoba.ca

Other information

<table>
<thead>
<tr>
<th>Voluntary Withdrawal Date</th>
<th>April 25, 2022</th>
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<tbody>
<tr>
<td>Midterm 1</td>
<td>March 1, 2022</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>April 5, 2022</td>
</tr>
<tr>
<td>Team Assignment due</td>
<td>April 22, 2022</td>
</tr>
<tr>
<td>Last Day of Classes</td>
<td>April 25, 2022</td>
</tr>
<tr>
<td>Final Exam Period</td>
<td>April 26 to May 3, 2022</td>
</tr>
<tr>
<td>Holiday and Closures</td>
<td>February 21, 2022 (Louis Riel Day); February 22 to February 25, 2022 (Winter break); April 15, 2022 (Good Friday)</td>
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Textbook
- 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)
Course Web Site | UMLearn

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<thead>
<tr>
<th>Course Assessment</th>
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<tbody>
<tr>
<td>Individual Assignments</td>
<td>20%</td>
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<tr>
<td>Team Assignment</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>40%</td>
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<table>
<thead>
<tr>
<th>Grading Scale for Course</th>
<th>Percentage out of 100</th>
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<tbody>
<tr>
<td>A+</td>
<td>≥ 90</td>
</tr>
<tr>
<td>A</td>
<td>85 - 89</td>
</tr>
<tr>
<td>B+</td>
<td>80 - 84</td>
</tr>
<tr>
<td>B</td>
<td>75 - 79</td>
</tr>
<tr>
<td>C+</td>
<td>64 - 74</td>
</tr>
<tr>
<td>C</td>
<td>55 - 63</td>
</tr>
<tr>
<td>D</td>
<td>46 - 54</td>
</tr>
<tr>
<td>F</td>
<td>≤ 45</td>
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Late assignments: Assignments are due one week after they are assigned. Assignments submitted after the due date will be deducted 10% per school day. Assignments will not be accepted when graded assignments have been returned.

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: Your full attention is requested during lectures and all class discussions. In accordance with university policy, all email communication for this course shall be conducted using your University of Manitoba email address only.

Copyright/ Academic integrity: Students do not have ownership rights to materials developed for the course. Posting or any other means of publishing these materials is prohibited. Refer to link below to know more about academic integrity at the University of Manitoba: [https://umanitoba.ca/student-supports/academic-supports/academic-integrity](https://umanitoba.ca/student-supports/academic-supports/academic-integrity)

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