



### **Course Description**

This course focuses on soil nutrients and their behaviour; evaluation of soil fertility including soil testing for precision agriculture; crop response to fertilizers; the manufacture, properties, reactions, and application of fertilizer.

### **Learning Outcomes**

After the successful completion of this course, it is expected that a student should:

1. Understand the principles and practices of nutrient management for crop production.
2. Understand the implications of soil fertility management practices on agricultural sustainability and environmental protection.
3. Be able to apply their individual and collective knowledge to solving real-world nutrient management and soil fertility problems.
4. Be able to communicate their recommendations for nutrient management and soil fertility to others.

**Instructor:** Timi Ojo, PhD  
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Office hours: Mondays, 4 pm – 6 pm. Email in advance to set up an appointment

**TAs:** TBD

**Format:** The course will consist of lectures and labs offered online and synchronously, via zoom within UM Learn. In other words, students are expected to participate in online lectures and lab sessions. This format will facilitate a sustainable pace for learning, plus “live” discussion of students’ questions and assisted group work during the lab periods.

Class Times: Tuesdays and Thursdays, 8:30 – 9:45 am

Lab Sessions: Fridays, 2:30 – 3:45 pm.

**Prerequisite:** Minimum grade of C in SOIL 0420

**Course Outline** (subject to slight modifications)

Approx.

# lectures

1 ***I. Introduction and Review***

- A. Role of soil fertility for crop production
- B. Overview of nutrient use, uptake and movement

2 ***II. Effects of Soil Solids, Surfaces and Solutions on Soil Fertility***

- A. Soil inorganic solids: weathering, precipitation, dissolution of nutrients
- B. Soil organic solids: solubilization, immobilization and mineralization of nutrients
- C. Soil surfaces: adsorption and desorption of nutrients
- D. Effects of pH: acidity and alkalinity
- E. Effects of aeration: oxidation and reduction

***III. Soil Fertility and Fertilizers***

Nutrient by nutrient discussion of forms and behaviour of nutrients in soil; nutrient uptake, utilization and deficiency symptoms; fertilizer sources, properties and reactions; and fertilization practices for:

- 5 A. N
- 1 B. S
- 2 C. P
- 1 D. K
- 3 E-M. Ca, Mg, Mo, B, Cl, Cu, Zn, Mn, Fe

***IV. Soil Fertility Management - General Issues***

- 1 A. Manure management
- 2 B. Fertility evaluation, fertilizer recommendations
- 1 C. Soil fertility and agricultural sustainability
- 1 D. Soil fertility and environmental issues

**Resources and Other Materials**

There is no required textbook for the course. But, the following two materials are useful:

Manitoba Soil Fertility Guide. 2007. Manitoba Agriculture, Food and Rural Initiatives (available in Reference Material folder on UM Learn website).

Soil Fertility and Fertilizers. 2014. An Introduction to Nutrient Management (Eighth Edition). J.L. Havlin, S.L. Tisdale, W.L. Nelson, and J.D. Beaton.

Students are expected to regularly access the notices and class material posted on the UM Learn website for this course. Summary lecture notes and reference material for the laboratory assignments and term project will be posted on UM Learn. In addition, recordings for online lectures will be available via Zoom on UM Learn for streaming for a minimum of one week and a maximum of two weeks after the lecture is given. For more information about accessing UM Learn, go to: <https://centre.cc.umanitoba.ca/technology/umlearn/>.

The course notes posted on UM Learn are “skeleton” notes that provide only an outline of basic information covered in lectures. Students are expected to participate in all lectures, when this material will be discussed and expanded upon and when students can ask questions. Students are strongly encouraged to supplement and personalize their class notes for active and effective learning and studying.

### **Class Participation**

Students are expected to utilize reliable internet with sufficient capacity to handle online lectures, labs, and exams. Please note that in cases where internet access fails, students will have access to a toll-free dial-in number to support audio-only calls with zoom for teaching and learning.

To participate in lectures and labs via zoom, the Information Services and Technology (IST) office recommend installing the Zoom Desktop App as some features are not available in the browser or mobile version. Please use the links provided in the “Joining Class” document posted in the Course Introduction folder on this course’s UM Learn website. There is a link for joining lectures and a different link for joining labs. When you join the class, please ensure that you

- Mute yourself to avoid background noise and stop your video to reduce bandwidth requirements
- To ask questions, first type your request in the chat box to notify the instructor; then, when you are acknowledged by the instructor, unmute your microphone to ask your question
- If you run into problems on UM Learn, please send an email to the instructor at [Timi.Ojo@umanitoba.ca](mailto:Timi.Ojo@umanitoba.ca).

For more information about using Zoom in UM Learn, go to: <https://umanitoba.ca/about-um/tools-working-remotely/zoom>

### **Mark Distribution**

Quizzes 3 @ 5% each	= 15%	<b>Sept 30, Oct 19 and Nov 18 ... 8:30 – 8:50 am</b>
Mid-term Exam	= 15%	<b>Nov 2</b>
Final Exam, including lab exam	= 40%	<b>TBA</b>

Laboratory (online, **beginning Friday, September 17**)

- Weekly problems = 15% **due at the end of each lab period**
- Term project report = 15% **due by 4:30 pm December 8**

## Course Grading:

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<b>A+</b>	=	90 – 100
<b>A</b>	=	80 – 90
<b>B+</b>	=	75 – 80
<b>B</b>	=	70 – 75
<b>C+</b>	=	65 – 70
<b>C</b>	=	60 – 65
<b>D</b>	=	50 – 60
<b>F</b>	=	< 50

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- Evaluative feedback will be given to students prior to the voluntary withdrawal deadline (Nov 22, 2021).
- Each of the three quizzes will be written over a 20 minute period in a regular lecture slot.
- The midterm test will be written during the regular 75 minute lecture period.
- The final exam will be two-hours in length and will include lab material.
- Failure to write a midterm or final exam at the scheduled time will result in a grade of zero, except in properly documented cases of medical emergency.
- Detailed instructions for each exam and assignment will be provided.
- Grammar, spelling and composition will be evaluated and considered as part of the grading criteria for tests and assignments.
- Attendance, participation and completion of weekly assignments in the laboratory is compulsory. All lab assignments must be completed satisfactorily by **December 8, 2021** to receive a passing and complete grade.

**Academic Integrity**

Academic integrity helps all of us, improving the quality and long term value of learning, as well as maintaining a good reputation and public confidence in individual students and graduates, as well as students, staff, our Faculty, our university, and our profession.

The University of Manitoba regards acts of academic misconduct in quizzes, tests, examinations, laboratory reports or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence. Penalties range from a grade of zero for the assignment or examination, failure in the course, to expulsion from the University. Examples of misconduct include, but are not limited to:

- a) Plagiarism – the presentation or use of information, ideas, sentences, findings, etc. as one's own without appropriate attribution in an assignment, test or final examination.
- b) Cheating on quizzes, tests or final examinations – the circumventing of fair testing procedures or contravention of exam regulations. Such acts may be premeditated/planned or may be unintentional or opportunistic.

- c) Inappropriate collaboration – when a student and any other person work together on assignments, projects, tests, labs or other work unless authorized by the course instructor.
- d) Duplicate submission – cheating where a student submits a paper/assignment/test in full or in part, for more than one course without the permission of the course instructor.
- e) Personation – writing an assignment, lab, test, or examination for another student or the unauthorized use of another person’s signature or identification in order to impersonate someone else. Personation includes both the personator and the person initiating the personation.
- f) Academic fraud – falsification of data or official documents as well as the falsification of medical or compassionate circumstances/documentation to gain accommodations to complete assignments, tests, or examinations

This line was intentionally included to check if you read this syllabus thoroughly or simply skimmed through. At the start of class on the first day of lecture, I will ask if the class read the syllabus. Type “thoroughly” followed by your initials in the chat. Now back to the serious stuff.

If you have any questions about how to make sure that you’re complying with the University’s expectations for academic integrity in this course, please contact the instructor for this course.

For more information about the U of M’s commitment to academic integrity, go to:

<http://umanitoba.ca/student-supports/academic-supports/academic-integrity>

For more information about the U of M’s Student Discipline By-Law, go to:

[https://umanitoba.ca/admin/governance/governing\\_documents/students/student\\_discipline.html](https://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html)

### **In Case of Illness**

Students who are unable to meet a course requirement due to medical circumstances are currently not required to submit medical notes. However, students are required to contact their instructor or academic advisor by email to inform of the missed work and to make arrangements for extensions, deferrals, or make-up assignments. Please follow these guidelines if you are unable to meet an academic requirement for your courses.

- Contact your instructor for term work such as a class, quiz, midterm/test, assignment, lab;
- Contact an advisor in your faculty/college/school of registration for a missed final exam (scheduled in the final examination period);
- Inform your instructor/advisor as soon as possible, do not delay. Note for final exams, students must contact within 48 hours of the date of the final exam; and
- Email your instructor/advisor from a U of M email address, and include your full name, student number, course number, and academic work that was missed.

**Other Student Resources**

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 - Policies and Resources for Students** posted on this course's UM Learn website.

**Expectations**

You should expect me to:

- i. Come to class well prepared to teach and start/end on time.
- ii. Encourage questions and discussions during and after class
- iii. Return graded assignments and exams in a timely manner and provide performance feedback.

I will expect you to:

- i. Read and understand the information in this syllabus
- ii. Attend lectures and notify me ahead of time if you cannot be present for an exam
- iii. Ask questions and participate in class discussions.