Soil Fertility (SOIL 0630) Syllabus

● *4 Credits* ● *Fall 2022*

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: Shannon Mustard and Junaid Afzal

Format: The course will consist of lectures and labs offered in person in Room 245, Ellis Building. Students are expected to participate in all lectures and lab sessions. This format will facilitate a sustainable pace for learning, 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 the 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. 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, expanded upon, and students can ask questions. Students are strongly encouraged to supplement and personalize their class notes for active and effective learning and studying.

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 promptly and provide performance feedback.

I will expect you to:

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

Class Communication

Students are expected to establish and regularly access their official University email account, which is the email address that will be used for communication about this course. For full details of the Electronic Communication with Students please visit:

http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

Cell Phones, Tablets, and Laptops - Please help to maintain a classroom environment that is conducive to learning and be respectful to your classmates and instructor. Turn your cell phone off or on mute for the lecture period; if you are expecting an emergency call, please notify the instructor at the beginning of the lecture. If you are using a tablet or laptop to take notes, please stay on task (i.e., don't check emails or surf the internet).

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

Mark Distribution

Quizzes 3 @ 5% each	= 15%	**Sept 29, Oct 18 and Nov 17 … 8:30 – 8:50 am**
Mid-term Exam	= 15%	**Nov 1**
Final Exam, including lab exam	= 40%	**TBA**

Laboratory (**beginning Friday, September 16**)

- Weekly problems	= 13.5%	**due by 11:59 pm on Mondays after lab**
- Term project report & presentation	= 16.5%	**due by 4:30 pm December 7**

Course Grading:

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

- Each of the three quizzes will be written over 20 minutes in a regular lecture slot.
- The midterm test will be written during the regular 75 minutes 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 a 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 are compulsory. All lab assignments must be completed satisfactorily by **December 7, 2022** 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 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 paragraph was intentionally included to check if you read this syllabus thoroughly or simply skimmed through it. At the start of class on the first day of the lecture, I will ask if the class read the syllabus. Simply say "thoroughly" to indicate that you read it thoroughly. 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

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 them 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.