ENR 5270 - Soil Fertility Syllabus

The Ohio State University
Autumn 2023: Online/In-person

COURSE OVERVIEW

Instructor

Jim Ippolito, Professor of Soil Health and Soil Fertility; ippolito.38@osu.edu; Office is Room 412C Kottman Hall.

How to contact the instructor: Students email me through Carmen's email system with any questions or issues related to the course, or to set up a time to meet either face-to-face or over Teams/Zoom. Office hours are arranged or follow an open door policy.

The course content was developed by Jim Ippolito. Additional content was developed by Steve Culman, former Associate Professor and State Soil Fertility Specialist: soilfertility.osu.edu; soilhealth.osu.edu.

Course description

This course provides a broad overview of the principles of soil fertility, plant nutrition, and nutrient management in managed ecosystems. The course covers foundational information on the cycling of individual nutrients in soil, including the biotic and abiotic factors that influence these dynamics. Students are exposed to many contemporary issues around nutrient management and taught basic practical skills for managing nutrients in agricultural systems. This course has been designed to accommodate student interests from a wide range of backgrounds and disciplines.

This is a hybrid course, with face-to-face lectures (**KOTTMAN 245, T/R, 11:10-12:30**) combined with a completely online, asynchronous course that deliver contents, quizzes and assignments through OSU's Carmen system (https://carmen.osu.edu/).

Course learning outcomes

By the end of this course, students should successfully be able to:

- Describe primary factors that govern nutrient cycling and nutrient behavior in soils;
- Identify specific considerations with the cycling and management of key macro- and micro-nutrients;
- Diagnose common nutrient deficiencies in crops using a variety of diagnostic tools;

- Develop fertilizer and lime recommendations for numerous crops grown; and
- Identify soil management strategies that improve soils containing excessive macro- and micro-nutrients.

COURSE MATERIALS AND TECHNOLOGIES

Textbooks

There is no required text for this course, but several texts are recommended.

- *Soil Fertility and Fertilizers - An Introduction to Nutrient Management*, 8th Edition (2013; 2016 in paperback) by J.L. Havlin, S.L. Tisdale, W.L. Nelson, and J.D. Beaton. 2014. The *Havlin* textbook is the essential reference on soil fertility. This is a must have if you plan on working in the field of soil fertility or nutrient management in your career.
- *Tri-State Fertilizer Recommendations for Corn, Soybean, Wheat, and Alfalfa (2020)* Extension experts from The Ohio State University, Michigan State University, and Purdue University revamp the original Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa. Available as a free pdf from OSU Extension Publications: extensionpubs.osu.edu/tri-state-fertilizer-recommendations-for-corn-soybean- wheat-and-alfalfa-pdf/.
- *4R Plant Nutrition: A Manual for Improving the Management of Plant Nutrition*, The Fertilizer Institute: https://store.tfi.org/products/4r-plant-nutrition-a-manual-for-improving-the-management-of-plant-nutrition-north-american

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357); **TDD:** 614-688-8743
- **Email:** 8help@osu.edu

BASELINE TECHNICAL SKILLS FOR ONLINE COURSES

- Basic computer and web-browsing skills
- Navigating Carmen

TECHNOLOGY SKILLS NECESSARY FOR THIS SPECIFIC COURSE

- Recording, editing, and uploading video (grad students only)

REQUIRED EQUIPMENT

- Computer: current Macintosh (Mac OS) or PC (Windows OS) with high-speed internet connection

REQUIRED SOFTWARE

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found https://ocio.osu.edu/kb04733.

GRADING

UNDERGRADUATE CREDIT	POINTS
Quizzes (8 total; worth 25 points each)	200
Issues of the Week (10 total; worth 10 points each)	100
Exams (4 total; worth 100 points each. All are non-comprehensive)	400
Total	**700**

GRADUATE CREDIT	POINTS
Quizzes (8 total; worth 25 points each)	200
Issues of the Week (10 total; worth 20 points each)	200
Exams (4 total; worth 125 points each. All are non-comprehensive)	500
Total	**900**

Note on graduate student grading. Graduate students will be given the same quizzes and assignments as undergraduates. The main difference is that the 10 Issues of the Week will be worth 20 points each, with graduate students asked to expand on their answers based on their previous knowledge of soil science. Graduate students will also be given one 25-point essay on each 100-point exam, making exams for graduate students worth 125 points each.

Quizzes: Eight Carmen quizzes will be given online ~ every 2 weeks and cover the material presented since the last quiz. Students will be given one week and up to 4 chances to complete the quizzes correctly. Quizzes are open note/open book/open web, but the expectation is that students will work alone to answer all questions. **No make-up quizzes will be allowed unless arranged prior to the scheduled quiz.**

Approximately quiz due dates are listed below. Quizzes will be open to students one week prior to the due date. Your instructor will reach out both in class and via Carmen e-mail to remind you of upcoming open quizzes and due dates.

Quiz	Date Due
1 – Weeks 1 – 2	September 7
2 – Weeks 3 – 4	September 21
3 – Weeks 5 – 6	October 10
4 – Weeks 7 – 8	October 17
5 – Weeks 9 – 10	October 31
6 – Weeks 11 – 12	November 9
7 – Weeks 13 – 14	November 21
8 – Weeks 15 – 16	December 5

Issues of the Week (IOTW): Assignments or problem sets are intended to test the student's comprehension of the material through practical, real-world applications. Late assignments will have 10% reduction in grade per day and will not be accepted 10 days after their due date.

Approximately IOTW due dates are listed below. The IOTW will be open to students one week prior to the due date. Your instructor will reach out both in class and via Carmen e-mail to remind you of upcoming open quizzes and due dates.

Issue of the Week	Date Due
1	September 7
2	September 21
3	October 10
4	October 24

5	October 31
6	November 7
7	November 14
8	November 28
9	December 5
10	December 11

Exams: There are 4, 100 point, non-comprehensive exams for undergraduate students; there are 4, 125 point, non-comprehensive exams for graduate students. Exams for everyone will be a combination of true/false, matching, fill in the blank, calculations, very short answer, and/or short/long essay for undergraduates/graduates, respectively. Time allowed for face-to-face exams 1 through 3 is 1 hour and 20 minutes, unless an official accommodation is requested. Final face-to-face exam length is 1 hour and 45 minutes.

Exam	**Date**
1 (covers units 1-4)	September 26
2 (covers units 5A,B,C)	October 26
3 (covers units 6-8)	November 16
4 (covers units 9-12)	December 11; 12-1:45pm Kottman 245 (or on-line)

Undergraduate grading scale

630-700 points: A;

560-629 points: B

490-559 points: C

420-489 points: D

Below 420 points: E

Graduate grading scale

810-900 points: A;

720-819 points: B

630-719 points: C

540-629 points: D

Below 540 points: E

Faculty feedback and response time

We are providing the following list to give you an idea of our intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem).

- **Grading and feedback:** You can generally expect feedback within **7-14 days**.
- **E-mail:** We will reply to e-mails within **48 hours on school days**.

PARTICIPATION AND ATTENDANCE

Student participation requirements

This course is a hybrid of face-to-face and on-line distance education. Students enrolled in the face-to-face lecture are expected to attend in-person at the designated class time (**KOTTMAN 245, T/R, 11:10-12:30**).

For students participating in the distance-education (i.e., on-line) course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Logging in**: **AT LEAST ONCE PER WEEK**
  Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.)

Discussion and communication guidelines

The following are our expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: Everyone here is training to become a working professional, and a sense of professionalism should be brought to all course activities. In assignments, discussion boards, emails, etc., please write in complete sentences, use punctuation, and avoid slang. We do not expect rigid formality here, rather a sense of professionalism to maintain a relaxed and open learning environment.

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)

OTHER COURSE POLICIES

Academic integrity policy

POLICIES FOR THIS ONLINE COURSE

- **Quizzes and exams**: You must take all quizzes yourself, without any external help or communication from other people.
- **Written assignments**: Your written assignments, including discussion posts, should be your own original work.

OHIO STATE'S ACADEMIC INTEGRITY POLICY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so we recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please include both instructors in your initial email via Carmen.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*

- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Your mental health

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact the College of Pharmacy Office of Student Services in room 150 Parks Hall (614-292-5001) OR OSU Counseling and Consultation Services (614-292-5766) for assistance, support and advocacy. This service is free and confidential.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to http://ods.osu.edu for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Streaming audio and video
- Synchronous course tools

TENTATIVE COURSE SCHEDULE

Week Number	Week	Topics
1	Aug 21	Unit 1: Introduction to Soil Fertility: Yield Limiting Factors and Essential Nutrients
2	Aug 28	Unit 2: Soil-Plant Relationships
3	Sept 4	Unit 3: Soil Acidity and Alkalinity
4	Sept 11	Unit 4: CEC and Base Saturation
5	Sept 18	Unit 5A: Nitrogen Cycle
6	Sept 25	Unit 5A: Nitrogen Cycle Unit 5B: Nitrogen Fertilizers
7	Oct 2	Unit 5C: Nitrogen Management
8	Oct 9	Unit 6: Phosphorus; Autumn break
9	Oct 16	Unit 7: Potassium
10	Oct 23	Unit 8: Calcium and Magnesium
11	Oct 30	Unit 9: Iron and Zinc
12	Nov 6	Unit 10: Copper and Manganese
13	Nov 13	Unit 11: Salinity and Sodicity
14	Nov 20	Thanksgiving break – No Class???
15	Nov 27	Unit 11: Salinity and Sodicity; Unit 12: Nutrient Toxicities
16	Dec 4	Unit 12: Nutrient Toxicities or Flex time