



# SYLLABUS: ENR 5263

## SOIL HEALTH AND BIOLOGY OF SOIL ECOSYSTEMS

### SPRING SEMESTER – 7 WEEK SESSION 1

#### COURSE OVERVIEW

##### Instructor

Instructor: Richard P. Dick  
Email address: dick.78@osu.edu  
Phone number: 614.247.7605  
Office hours: by appointment

##### Course meetings

Days: Mon, Tues, Wed, Fri Time: 12:45-2:15 pm

##### Course description

A comprehensive study of soil microbial communities and their role in providing ecosystems services.  
Prerequisites: ENR 3000 or grad standing

##### Course learning outcomes

- Understand basic microbial ecology of soils as basis for a holistic understanding of soil health
- Synthesize research from peer reviewed journals and develop scientific writing skills.

#### COURSE MATERIALS AND TECHNOLOGIES

##### Textbooks

##### REQUIRED

- Principles and Applications of Soil Microbiology, Gentry et al. 2021. Elsevier

##### RECOMMENDED

- The Nature and Property of Soils. N.C. Brady & R.R. Weil. 2005. 15<sup>th</sup> edition. Prentice Hall, Upper Saddle River, NJ.

##### 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 and support for urgent issues is available 24x7. **Phone:** 614-688-HELP (4357); **Email:** [8help@osu.edu](mailto:8help@osu.edu); **TDD:** 614-688-8743

#### GRADING AND FACULTY RESPONSE

| ASSIGNMENT CATEGORY   | POINTS (%) |
|---|------------|
| Midterm 1 (short answer/definition and discussion questions)  | 22         |
| Midterm 2 (short answer/definition and discussion questions)  | 22         |
| Term Paper (some aspect of soil microbial ecology/management) | 34         |
| Final Exam (short answer/definition and discussion questions) | 22         |
| <b>Total</b>  | <b>100</b> |

As a 5000-level course, ENR 5263 serves both undergraduate and graduate students. There will be no differential expectations in work required or grading between undergraduate and graduate students.

## Late assignments

Late term paper assignments will be penalized by 10% (Late assignment excused for documented emergencies).

Exams can be taken later for documented emergencies and prearranged conflicting professional or other critical commitments.

## Grading scale

|             |              |
|-------------|--------------|
| 93–100: A   | 77–79.9: C+  |
| 90–92.9: A- | 73–76.9: C   |
| 87–89.9: B+ | 70 –72.9: C- |
| 83–86.9: B  | 67 –69.9: D+ |
| 80–82.9: B- | 60 –66.9: D  |
|             | 50-59.9: D-  |
|             | <50: E       |

## Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course.

- **Grading:** Exams and term paper generally expect feedback within **10 days**.
- **E-mail:** I expect to reply to e-mails within **24 hours on school days**.

## PARTICIPATION AND ATTENDANCE

Attendance and participation are very important for your success in this course. If you have a situation that might cause you to miss class, discuss it with me *as soon as possible*.

## OTHER COURSE POLICIES

### Academic integrity policy

#### POLICIES FOR THIS COURSE

- **Quizzes and exams:** You must complete the midterm and final exams yourself, without any external help or communication.
- **Written assignments:** Your written assignments, including discussion posts, should be your own original work. You are encouraged to ask a trusted person to proofread your assignments before turning in--but no one else should revise or rewrite your work. **GenAI is not allowed** (See below).
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never make your results or your library research look more successful than it was. Intellectual honesty is vital to an academic community and for my fair evaluation of your work. All work submitted in this course must be your own, completed in accordance with the University's academic regulations. You may not engage in unauthorized collaboration or make use of ChatGPT or other AI composition software. Students must obtain permission from me before using AI composition software (like ChatGPT) for any assignments in this course. Using these tools without my permission puts your academic integrity at risk.
- **Collaboration and informal peer-review:** The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

## 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 I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

**Use of Artificial Intelligence: Literature Review and Writing the Term Paper** - Given that a major learning goal is to improve your ability to read and synthesize scientific literature, understand the issues related to science publishing, and enhance your writing/communication skill, the use of generative artificial intelligence (GenAI) tools (e.g. GenAI platforms such as Copilot or ChatGPT, writers aids like Grammarly, or translation platforms such as Google Translate) **is NOT permitted in this course**. Any use of GenAI tools for term paper work in this class may therefore be considered a violation of Ohio State's [Academic Integrity](#) policy and [Code of Student Conduct](#) because the work is not your own. The use of unauthorized GenAI tools will result in referral to the [Committee on Academic Misconduct](#). If I suspect that you have used GenAI on the writing assignment for this course, I will ask you to communicate with me to explain your process for completing the assignment in question.

If you feel you need to use GenAI for translation, please contact me first. If you have any other questions regarding this course policy, please contact me.

**If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my 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 contact me.

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](http://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.

### Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at [titleix.osu.edu](http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu). Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit [equity.osu.edu](http://equity.osu.edu) or email [equity@osu.edu](mailto:equity@osu.edu).

### Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via



the Office of Student Life Counseling and Consultation Services (CCS) by visiting [ccs.osu.edu](http://ccs.osu.edu) or calling (614) 292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614.292.5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1.800.273.TALK or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).

### **Diversity**

OSU affirms the importance of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

### **ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately to have a private discussion. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, as soon as possible arrange for us to discuss your accommodations. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307, 098 Baker Hall, 113 W. 12<sup>th</sup> Ave.

### **COURSE SCHEDULE**

| <b>Week</b> | <b>Topics, Readings, Assignments, Deadlines</b>   |
|-------------|---|
| <b>1</b>    | <b>Soil as an ecosystem for soil microorganisms and basics of soil health</b><br><b>Soil as an ecosystem for soil microorganisms (continued)</b><br><b>Soil aggregation and soil biology</b><br><b>Overview of major groups of soil microorganisms</b>  |
| <b>2</b>    | <b>Holiday, no class</b><br><b>Soil bacteria – diversity and ecology</b><br><b>Soil bacteria – diversity and ecology (continued)</b><br><b>Cyanobacteria and algae - ecology</b>  |
| <b>3</b>    | <b>Soil fungi– diversity and ecology</b><br><b>Soil fungi– diversity and ecology (continued)</b><br><b>Soil fungi– diversity and ecology (continued)</b><br><b>Viruses and prions – ecology</b>   |
| <b>4</b>    | <b>Biodiversity: Does it matter for soil health?</b><br><b>Biogeochemistry: Carbon cycling &amp; decomposition</b><br><b>Biogeochemistry: Carbon cycling &amp; decomposition (continued)</b><br><b>Biogeochemistry: Redox reactions</b>   |
| <b>5</b>    | <b>Classical soil microbiology methods</b><br><b>Classical soil microbiology methods (continued)</b><br><b>Molecular methods to study soil microorganisms</b><br><b>Molecular methods to study soil microorganisms (continued)</b>  |
| <b>6</b>    | <b>Molecular methods to study soil microorganisms (continued)</b><br><b>Manipulating beneficial soil microorganisms: bioremediation, plant growth promotion</b><br><b>Manipulating beneficial soil microorganisms: plant disease biocontrol</b><br><b>Using soil microbial properties to assess soil health</b> |
| <b>7</b>    | <b>Final exam will be given according to the university’s published final exam schedule</b>   |