



**Course Syllabus: Soil Ecology Lab**  
**The University of Toledo**

**Department of Environmental Sciences, College of Natural Sciences and Mathematics**

**Course Number: EEES 4250/5250**

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<b>Email:</b> michael.weintraub@utoledo.edu	<b>Term:</b> Fall 2015
<b>Office Hours:</b> Tuesdays & Wednesdays 1:30-4:00PM	<b>Class Location:</b> Wolfe Hall 1230
<b>Office Location:</b> BO 3001-B	<b>Class Day/Time:</b> Thursdays 4:00-6:30 PM
	<b>Credit Hours:</b> 1

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**COURSE/CATALOG DESCRIPTION**

This course is a companion to EEES 4250/5250, Soil Ecology. You will learn the ecological significance of soil biotic and abiotic properties that mediate plant productivity, community composition, and ecosystem function. Specific goals are to examine the (1) relationships among the physical, chemical, and biological properties of soils and their influence on soil fertility; (2) linkages between soil microorganisms and their environment; (3) impacts of human activities on soil function.

**STUDENT LEARNING OUTCOMES**

At the end of this course students should be able to:

- 1) locate and interpret information on soil properties from the Web Soil Survey
- 2) determine soil texture, infiltration rate, compaction, and other basic physical properties
- 3) describe the basic procedure for measuring soil nutrient content
- 4) extract and enumerate soil invertebrates
- 5) conduct a simple decomposition experiment and interpret the results

**PREREQUISITES AND COREQUISITES**

EEES 4250/5250

**REQUIRED TEXT**

None

**OTHER REQUIRED MATERIALS**

1. Composition book for a lab notebook.
2. Read and print a copy of each Laboratory from the course website, which can be accessed from BlackBoard (<https://blackboard.utdl.edu>). Read each lab exercise before you attend the lab session. This will really help you to get through lab quickly and efficiently.
3. Proper boots and outdoor clothing for soil sampling in cold/inclement weather
4. You may wish to purchase a lab coat from the UT Bookstore



## UNIVERSITY POLICIES

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance](#).

### Academic Accommodations

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office](#).

## ACADEMIC POLICIES

**Academic dishonesty:** Academic dishonesty of any kind is prohibited. Students who violate the University's policy should expect disciplinary action. University of Toledo's academic dishonesty policy statement can be viewed at <http://www.utoledo.edu/dl/students/dishonesty.html>

## COURSE EXPECTATIONS

- Ask questions when you encounter something unfamiliar – chances are someone else has the same question
- Show up to lab on time and expect to stay for the entire time scheduled
- Follow the safety practices described below
- Read and print out the activities prior to the start of class

### Attendance:

**Attendance is mandatory**, and your presence or absence at each class will impact your grade. Success in this course is strongly correlated with attendance. In general, no provisions can be made for make-up labs. Should you have a specific date that you know you will not be in lab, let Dr. Weintraub know at least two weeks in advance for some chance of leniency. If you have an excused absence, you are responsible for all material covered in the class that you missed. An advance excuse may only be used **once**, unless there are mitigating circumstances, and must meet the guidelines outlined by UT's missed class policy (see [http://www.utoledo.edu/facsenate/missed\\_class\\_policy.html](http://www.utoledo.edu/facsenate/missed_class_policy.html) for details).

**Courtesy:** Please remember that all others in this classroom have paid for this time. Any distractions (conversations, cell phones, mp3 players, social media, shopping, etc.) deplete the value of the course to others, regardless of the distraction you cause for yourself. If you attend a class session, I ask you to stay for the entire time period. If you must arrive late or leave early, please be considerate of the others who have paid for this course and find a seat near the exit.

**All email correspondence will be sent to your UT account.**



## GRADING

Your grade is based on the mean score of your lab reports, which will vary from a simple series of questions based on each lab activity, to a formal written lab report. There will be no extra credit assignments given. Late homework will be docked 10% / day (50% off max.). A grade of incomplete (IN) is only given to students with medical reasons and with approval of the course instructor. Grades of PR (progress) are not issued under any circumstances.

If you're going to miss some class time, BE PROACTIVE about getting your assignments in –make arrangements for turning in your work in advance.

### Grading Scale:

You will be assigned a letter grade for the course. All numerical percentage marks are converted to letter grades using the following scale:

A	94% +	A-	90-93	B+	87-90
B	84-86	B-	80-83	C+	77-80
C	74-76	C-	70-73	D+	67-70
D	64-66	D-	60-63	F	Less than 60

### Collaboration in preparing reports:

In many of the exercises, you will work with one or more lab partners. You are encouraged to discuss the exercises with one another. But collaboration should not extend to the writing of lab reports for the analysis of data. **Identical or highly similar phrasing in written reports of two or more students will be viewed with suspicion**, and may be regarded as evidence of excessive collaboration, to be dealt with according to University rules regarding academic dishonesty.

### Safety in the laboratory and field:

The exercises in this laboratory were designed with safety as a top priority; you must always follow these safety precautions:

- Wash your hands thoroughly with soap and water when you enter the lab and when you are finished with lab.
- Locate the closest fire extinguisher, fire alarm, eyewash, and other emergency equipment. Familiarize yourself with how to use this equipment.
- Material Safety Data Sheets (MSDS's) are available for all chemicals used in the lab. Make yourself familiar with all chemicals, and safety protocols and risks involved.
- Wear closed-toed shoes. No open-toed shoes or sandals are permitted.
- Do not eat, drink, smoke, or apply cosmetics in the lab or field.
- Use the equipment properly. If you have any questions or problems, contact your instructor.
- Clean up spills or broken glass immediately. Report these to your instructor. Broken glass should be discarded in a special 'glass' box.
- Report all injuries—no matter how minor—immediately to your instructor.



- Keep open flames away from flammable materials including you, your clothing and hair.
- Never taste any substance or solution. Do not put anything in lab or field into your mouth.
- Treat all live animals gently and with respect.
- Latex gloves should be used when handling preserved specimens, chemicals, etc.
- Clean and put the microscope away.
- Return all equipment and supplies to their original locations.
- Wear appropriate pants and long sleeve shirts as needed for the field.
- Wear sunscreen in the field.
- Obey all warnings and safety guidelines.

### Schedule of Topics

*Note that this schedule is tentative and subject to change*

#	DATE	TOPIC
1	August 27	Introductions, site descriptions, history of soil formation in the region, web soil survey
2	September 3	Field Trip! Site introduction
3	September 10	Field Trip! Basic soil characterization
4	September 17	Soil characterization in the laboratory
5	September 24	Earthworms
6	October 1	Soil microfauna - extraction setup
7	October 8	Soil microfauna - sample analysis
8	October 15	Protozoa extraction and analysis
9	October 22	Nematodes
10	October 29	Decomposition experiment setup
19	November 5	Decomposition experiment CO <sub>2</sub> analysis
20	November 12	Soil nutrients and microbial biomass analysis
21	November 19	Data analysis
	November 26	No Class! Thanksgiving
26	December 3	Decomposition modeling
27	December 10	Wrap-up



### General Instructions for writing a lab report:

- Submission: An electronic copy (MS Word .docx file format) is to be uploaded to the submission link in Blackboard for the appropriate lab prior to class on the due date, usually at the beginning of the lab period. **Late lab reports will be penalized 10% per day late.**
- Lab reports must be typed, with proper spelling, grammar, punctuation, etc. There is no minimum or maximum length, grading will be based on content quality (not quantity).
- Follow the lab report format given. The specific format will be discussed before the first write up is due. If you have questions, discuss them with the instructor BEFORE they are to be handed in, preferably during office hours.
- Once the grade is given, there will be no resubmissions.
- See the instructions for writing a formal lab report on the course web page

### Lab Reports

Reports need to be written in scientific format. They need to be typed and double-spaced. Proper grammar and spelling will be counted for your grade. There are many computers on campus for your use; most have a grammar and spell check function. Proofreading is an important part of the writing process. One of the best ways to do this is to read it out loud; you will catch most mistakes that the computer may not catch. Make use of the journals at the library or on-line for examples of this type of writing. Scientific writing is a different kind of writing; it should be technical and direct, not flowery. Length is not important, but the content is. It is here that you show the instructor that you have understood the exercise.

The questions included with each laboratory exercise are provided to give you some guidance in writing your lab report. Make sure that your lab report contains answers to these questions. These answers should not be a separate list but should be part of the text of your lab report.

### Report format

- *Title and byline*: Your title should be informative and let potential readers know whether or not they should read it. Your name, date and lab section should follow. This does not need to be its own page; the rest of the report can follow immediately.
- *Abstract*: This is one short paragraph. It explains your reasoning for performing the experiment, basic methods, generalized results, and explanation of result. Look in scientific journals for a better idea (e.g., Ecology, Conservation Biology). It helps to write the abstract last.
- *Introduction*: Here is where you provide the background information to the experiment and hypothesis. The introduction also explains why this subject is important to study. Most of the information here comes from outside sources and should be cited.
- *Materials and methods*: This is not the same list that is found in your lab manual or notebook. You may certainly cite the lab manual and there is no need to copy information that is already listed in the manual. If you did not invent the method yourself, the originator of the method also needs to be cited. Names and model numbers of special equipment, along with quantities of materials used should be included. An explanation of all calculations and statistics employed is placed here too.



- *Results*: This is where you present your findings: all of your charts, graphs, figures, tables and pertinent data should be included.
- *Discussion*: This is the most important part of the write up. In your discussion you explain the significance of your work. Begin by reviewing the purpose, data and original question, and then formulate a conclusion discussing the fundamental points that were demonstrated. The easiest way to do this is to make a list of points that were discussed in lab. Then expand on those points using your results, notes and the text. Did the results support or refute your original hypothesis? Why or why not? What implications are suggested? Remember, that in science it is very difficult to “prove” so be very cautious in any implications you suggest. What assumptions did you base your conclusions on, and what shortcomings do they present? Does your research lead you toward more research (did you come up with new questions)? This section can be brief, but it must include an explanation of all major points of the lab, using specific information and terms. Be sure to mention all the tests or techniques performed. The discussion is a very significant portion of your report.
- *Literature cited*: This will be in alphabetical order and single-spaced. You should list every citation referenced in the paper here. These can include textbooks, lab/lecture notes, handouts, personal communications, official world wide web sites, and journal articles.

#### **Examples of Literature Cited:**

Department of Earth, Ecological and Environmental Sciences. 2004. EEES 2160 Biodiversity Laboratory Manual, University of Toledo, Toledo, Ohio: 83 pp. (Lab manual)

Ohtonen, R., Aikio, S., and Vare, H. 1997. Ecological theories in soil biology. *Soil Biology and Biochemistry* 29:1613-1619. (Journal article)

Campbell, N. A., and Reece, J. B. 2002. *Biology*. Sixth Edition. Benjamin Cummings, Menlo Park, CA. (Book)

Department of Environmental Sciences. 2007. EEES 2160 Biodiversity Laboratory Manual. <http://www.eeescience.utoledo.edu/Faculty/Gottgens/EEES2160.htm> (web site, visited on...)