

16:375-573 SOIL ECOLOGY  
MTh (10:55-12:15), HSB106  
Fall, 2009

**Course Objectives:**

- To gain an understanding of the biological processes occurring in soil
- To evaluate the impact of the processes on total ecosystem stability and function

**Instructor:** Robert L. Tate III  
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**Office Hours:** Wednesday & Friday, 10:00-11:30

**Methods:** The material included in the lectures has been selected and arranged to provide an understanding of the processes occurring in soil. Basic soil biological processes will be discussed and illustrated with "real world" examples. Slides presented in the lecture will be made available on the course website prior to the lecture. Optimal understanding of the lectures will be achieved if the information provided online is reviewed prior to the lecture. Purchase of the textbook is recommended, but not required. Reading from the optional text have been selected to provide a deeper understanding of the soil ecosystem than can be provided by two, eighty minute lectures per week. The readings corresponding to the lecture topics are indicated on the course schedule.

The primary teaching method for this course is the lecture since that procedure appears to be the best means of presenting a mass of material in the time that we have been allotted to study this subject together. This does not mean that I expect you to sit passively and record all which has been said. Interaction during the lecture is an obligatory part of the learning process. Therefore, questions are welcome, if not mandatory. They will help you to clear up any misconceptions you have gained from my presentation. Your questions will also be my indicator of how clearly the subject matter has been presented and whether we are proceeding at the proper pace for optimal learning.

**Textbook:** Tate, R. L. (2000) Soil Microbiology, 2<sup>nd</sup> Edition. John Wiley & Sons, NY. The text is available at the Douglas-Cook Bookstore or online.

**Grades:** Grades will be based on exams as follows:

2 Exams @ 100 points each	200 points
Final Exam	200 points
Critical Analysis Report	100 points
Total:	500 points

All examinations will be cumulative. The critical analysis report will be due 10 December during class. Details of the requirements for the critical analysis report will be provided in class on 1 October 2009.

**Tentative Lecture Schedule:**

<b>DATE</b>	<b>TOPIC</b>	<b>READING</b>
Sept. 3	Why Soil Microbiology?	
Sept. 8	The Soil System	1
Sept. 10	The Soil System	
Sept. 14	Soil Biological Systems	2
Sept. 17	Soil Biological Systems/Microbial Diversity	3
Sept. 21	Soil Microbial Diversity/Energy in Soil	
Sept. 24	Energy in Soil	4
Sept. 28	Energy in Soil/Abiotic Limitations	5
Oct. 1	Abiotic Limitations/Review	
<b>Oct. 5</b>	<b>Exam 1</b>	
Oct. 8	Abiotic Limitations (Water)	
Oct. 12	Abiotic Limitations	
Oct. 15	Enzymes in Soil	6
Oct. 19	Enzymes in Soil	
Oct. 22	Microbial Interactions	7
Oct. 26	Rhizosphere	8
Oct. 29	Review	
<b>Nov. 2</b>	<b>Exam 2</b>	
Nov. 5	No Class	
Nov. 9	Introduction to Biogeochemical Cycles	9
Nov. 12	Carbon Cycle	10
Nov. 16	Principles of N/P/S Cycles	11/15
Nov. 19	Principles of N/P/S Cycles	
Nov. 23	Nitrogen Fixation	12/13
Nov. 30	Nitrogen Fixation	
Dec. 3	Nitrogen Fixation/Denitrification	14
Dec. 7	Denitrification	
Dec. 10	Conclusion/Review	

**Final Exam: December 18 (Friday) 8:00-11:00 AM**