Introduction to Soils in the Environment
SWS 3022
Time: Monday, Wednesday, Friday 7th period
Location: McCarty Hall C Room 100
Fall 2019

Instructor: James Bonczek, Ph.D. Soil and Water Science Department
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Office Hours: Monday, Wednesday 4:00 – 4:45 pm, Thursday 10:00-11:00.

Canvas Website: http://lss.at.ufl.edu

Course Description:

This course emphasizes soil physical, chemical, and biological properties in relation to plant growth, the environment, and the soil's place in our daily lives. The course is intended to acquaint students with the importance of soils to humans and the environment through study of their morphology, physical and chemical properties, their distribution, and their biological significance. Each student who successfully completes the course should have a practical understanding of the following:

- Properties common to all or most soils on various scales.
- Vocabulary to communicate with agricultural and environmental professionals.
- Management strategies for different soils.
- Problem solving skills to manage soils effectively.
- The importance of soils in sustaining life.
- The impact of soils on environmental quality

Course Objectives:

This course satisfies the (P) designation for the physical sciences general education requirement.

Physical Sciences (P)

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

Theses general education objectives will be accomplished through

1. Evaluation of how physical properties of soils influence the behavior, function, and productivity of soils in environmental and agricultural settings.

2. Analysis and computation of how water and chemicals move through soils.

3. Formulation and critical evaluation of hypotheses related to the interaction of soil solution constituents with the soil solid phase.

4. Identification of the major classes of soil organisms and how they influence the cycling of carbon and nutrients in soils.

5. Definition and synthesis of the fundamental elements of soil morphology and taxonomy to communicate important concepts related to soils in the environment.

Student Learning Outcomes

This course also will assess Student Learning Outcomes which can be defined as.

Student Learning Outcomes: Content and Skills

Content: Students demonstrate competence in the terminology, concepts, and methodologies used within the discipline

Communication: Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline.

Critical Thinking: Students analyze information carefully and logically from multiple perspectives using discipline-specific methods and develop reasoned solutions to problems.

The Student Learning Outcomes will be assessed through ongoing evaluation. Content will be tested using three objective exams, eight multiple choice and True/False quizzes, and 4 written homework assignments incorporating fundamental concept knowledge and computations relevant to course material. Communication will occur through discussion during assigned meeting times, web-based discussion posts, and short answer as well as computation-based homework assignments related to soil processes. Critical thinking will be assessed through computation, analysis, and application of data/results to issues related to soil management.

Course Schedule

Week 1	8/20-8/23	Introduction to Soils and Soil Function
	Reading: Chapter 1, pages 1 – 26	
Week 2	8/26-8/30	Soil Forming Processes, Factors, Horizons
	Reading:	Chapter 2, pages 52 – 56
		Chapter 4, page 97 and referenced plates (photos)
Week 3	9/2-9/6	Soil Color, Texture, Structure, and Density
	Reading:	Chapter 4, pages 96-122
	Quiz I Online due	**Wednesday 9-11**
	Homework I due	**Wednesday 9-11**
Week 4	9/9-9/13	Introduction to Soil Water
	Reading:	Chapter 5, pages 133-149 (weeks 4 and 5)
	Homework II Due	**Wednesday, 9-18**
Week 5	9/16-9/20	Soil Water Movement and Retention
	Quiz II Online Due	**Wednesday, 9-25**
	Homework III Due	**Wednesday, 9-25**
Week 6	9/23-9/27	Exam I and Preparation
	Exam Review	**Monday, 9-23**
	Exam	**Wednesday, 9-25**
	Make-up Exam	**Friday 9-27**
Week 7	9/30-10/4	Introduction to the Soil Mineral Fraction
	Reading:	Chapter 8, pages 235-255 (weeks 7 through 9)
Week 8	10/7-10/11	Reactions of Soil Aluminosilicate Minerals
	Quiz III Online Due	**Wednesday 10-16**
Week 9	10/14-10/18	Organic Matter Reactions
Week 10	10/21-10/25	Soil Acidity, Alkalinity, and pH
	Reading:	Chapter 9, pages 269-298
	Homework IV Due	**Wednesday 10-30**
	Quiz IV Online Due	**Wednesday 10-30**
Week 11	10/28-11/1	Exam II and Preparation
	Exam II Review	**Monday, 10-28**

	Exam II	**Wednesday, 10-30**
	Make-up Exam	**Friday, 11-1**

Week 12 11/4-11/8 Soil Morphology and Classification
Reading: Chapter 3, pages 58-93
Homework V Due Wednesday, 11-13

Week 13 11/11-11/15 Carbon Cycling

Week 14 **Thanksgiving (one Lecture)**

Week 15 11/25-11/29 Carbon and Nutrient Cycling
Reading: Chapter 8, pages 261-263
Quiz V Online Due Wednesday, 12-4

Week 16 12/2-12/6 Exam III and Preparation

Exam II Review	**Monday, 12-2**
Exam II	**Wednesday, 12-4**
Make-up Exam	**Friday, 12-6**

Textbook:

Brady, N.C. and Weil, R.R. Elements of the Nature and Properties of Soils. 3rd Edition New Jersey: Pearson Prentice Hall. ISBN – 0-13-501433-6

Evaluation of Grades

Grading will be based on three in-class examinations, homework assignments, quizzes, and written questions posed during lecture. Opportunities for bonus points also will be provided throughout the semester.

Assignment	**Point Value**	**Percentage of Grade**
Exams	**600**	**60%**
Homeworks	**150**	**15%**
Quizzes	**150**	**15%**
Lecture Questions	**100**	**10%**
TOTAL	**1000**	**100%**

Extra Credit: Several in-class bonus questions will be posed throughout the semester and allow students to accumulate up to a 1% bonus factored into the overall grade based on the number of correct written responses.

Letter Grade	Numerical Grade*	GPA Points
A	92-100 %	4.0
A-	90-91.9	3.67
B+	86-89.9	3.33
B	83-85.9	3.0
B-	79-82.9	2.67
C+	77-78.9	2.33
C	72-76.9	2.0
C-	70-71.9	1.67
D+	66-69.9	1.33
D	63-65.9	1.0
D-	59-62.9	0.67
E	<59	**0**

*Multiply the Numerical grade by 10 to determine points need to achieve a given letter grade.

The homeworks, quizzes, and lecture questions are explained below. They can have a significant positive impact on your overall grade. Please do not discount their importance.

BASIC COURSE REQUIREMENTS:

1. **Exams** consist of objective and interpretive multiple choice and true/false questions. Study guides and review sessions will be provided prior to each exam. Each exam is worth 200 points.

2. **Homeworks** will address current and historic topics of soils in the environment as well as basic assignments related to class lectures and problem solving. There are 5 homework assignments; due dates are indicated above. Submission will be on the course management site; emailed assignments are not permitted. **One homework drop is permitted.**

3. **Quizzes** will be conducted online in the course management system. Each quiz usually will consist of 10 questions randomly selected from a large bank of questions. You may take the quiz 3 times during the prescribed period indicated in the course schedule above. There are 5 total quizzes. Each quiz counted toward your overall grade is worth 30 points for a total of 150 points**. A comprehensive quiz will be offered at the end of the term. The grade on this quiz will replace 1 missing quiz grade.**

4. **Lecture Questions** will be provided prior to the commencement of each lecture. These questions will be answered during the course of the lecture, therefore, attendance is required. Students may miss 6 lecture question assignments without penalty. **Students who are late for class will incur a 50% penalty for that day's lecture questions.**

GENERAL POLICIES

Lecture notes will be posted on the course management site following each lecture.

Homework submissions: All work is expected to be the product of each individual member of the class. Assignments submissions must be clearly presented **and the product of each individual student's work**. **Copying information verbatim from the web, books, articles, etc. requires proper attribution, but is discouraged.**

Late Work: Submission of assignments is expected on time. Late work will not be accepted. Please do not email late work to the instructor.

Make-up Exams: Contact the instructor or teaching assistant as early as possible if you must legitimately miss a scheduled exam. If an emergency arises immediately before an exam, notify the instructor or teaching assistant as soon as the emergency is resolved. Make-up exams are scheduled as indicated in the course schedule above.

This is a large class. Students are expected to arrive and be prepared to commence on time. Please be considerate to the instructor and your fellow students and avoid talking, texting, or other disruptive behavior. **Use of electronic devices of any kind is not permitted in class.** Students also are expected to remain in class for the duration of the lecture. If you must leave early, inform the instructor prior to commencement of class.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* **www.counseling.ufl.edu/cwc/**

Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Training Programs
Community Provider Database

- *Career Resource Center,* First Floor JWRU, 392-1601, **www.crc.ufl.edu/**