COURSE SYLLABUS
SWS 5050
Soils for Environmental Professionals
3 Credits

Instructor: G.A. O'Connor, 3169 McCarty A, Soil and Water Science Dept. P.O. Box 110290, 294-3167, GAO@UFL.EDU. Office hours by appointment.

Graduate Teaching Assistant:

Course Overview

The course is intended for those preparing to be professional environmentalists and who have minimal knowledge of soil science. Thus, the primary emphasis of the course is defining and describing soil properties and processes that determine the fundamental role soils play in the environment. The instructor will assign additional readings to supplement the text and to add material depth and critical thinking exercises. An optional, associated laboratory (SWS 5050L, 1 credit) and demonstration exercises experientially reinforce the concepts presented in lecture.

Part I (sections # 1-2) of the course describes soil functions and soil formation. Part II (sections # 3-9) describes/analyzes physical, chemical, and biological soil properties and processes, and soil classification. Parts III and IV (sections # 10-15) deal with specific soil types/situations where the previously described terms and processes are integrated to address environmental management issues.

Course Objectives – Students successfully completing the course will be able to:

1. Describe the soil as a dynamic multi-phased medium, and distinguish it from an inert body by characterizing various soil processes and their relationships to the environment.
2. Demonstrate a practical understanding of: a) properties common to all or most soils, b) vocabulary sufficient to communicate with others in soil science and management, c) the different management strategies required for problem soils, d) problem-solving skills to manage soil effectively, and e) an appreciation of the importance of soils in agriculture, the environment, and our daily lives.

Prerequisites: Graduate student status.

Course Format: Three hours of lecture per week.

Frequency: Yearly, Fall semester.

Textbook: Required - "The Nature and Properties of Soils", 2008 (14th ed). N.C. Brady and R.R. Weil. Prentice Hall Publishers. Upper Saddle River, NJ.

Representative Supplemental Readings:

1. "Soils and Environmental Quality", 2005. (3rd ed.). Pierzynski, Sims, and Vance. CRC Publishers.
2. Course website: lots of additional information, Home Works, Study Questions, Student Outlines – visit frequently. (Address provide in class).

Student Responsibilities:

1. Students are expected to study the appropriate text sections and suggested outside readings in anticipation of lecture coverage

2. Students are expected to actively participate in class discussions. **Class attendance and engagement is strongly recommended** (and is rewarded – see below).

3. Students are expected to demonstrate their mastery of presented material by passing written examinations and successfully completing assigned homework.

Student Evaluation:

1. Two examinations will be given; a mid-term (100 points) and a comprehensive final (200 points). M**ake-up exams are rarely authorized and must be medically justified and authenticated.** See UF policies at https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.
2. Homework sets will be assigned regularly, and will be graded (total scaled value 100 points). Late homework assignments are penalized 20% per day. **You cannot pass the course unless you complete each course requirement.**

Grading Scale:

Course grades will be determined by summing all scores and dividing by the maximum score possible (400 points) x 100 to obtain a percentage score: 100-92 = A, 91-90 = A-, 89-88 = B+, 87-81 = B, 80-79 = B-, 78-70 = C, 69-60 = D, <60 = Fail. The instructor reserves the right to **add 0-5 points to the final percentage score** on the basis of meaningful class participation, demonstrated student interest, and overall student dedication. See UF policies at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

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/**

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. The University encourages students with disabilities to follow these procedures as early as possible in the semester.

0001 Reid Hall, 352-392-8565, **www.dso.ufl.edu/drc/**

SWS 5050
TOPIC OUTLINE

	TOPIC	# LECTURES
I.	**Overview of Soils**	**5**
	Section 1. An Introduction to Soils	3
	A. Functions of soils in the environment	
	B. Soil: the interface of air, water, minerals, and life	
	Section 2. Soil Formation	2
	A. Weathering	
	B. Soil forming factors	
II.	**Soil Properties/Processes**	**22**
	Section 3. Physical properties	3
	A. Texture	
	B. Structure	
	Section 4. Soil Water and Hydrology	6
	A. Water movement	
	B. Solute transport	
	Section 5. Soil Aeration	1
	A. Aeration mechanisms and impacts	
	Section 6. Soil Colloids	5
	A. Colloid types and properties	
	B. Cation and anion exchange	
	Section 7. The Soil Solution	2
	A. Importance and Composition	
	B. Sampling	
	Section 8. Soil Organisms	3
	A. Classification and abundance	
	B. Impacts on soil properties/processes	
	Section 9. Soil Classification	2
	EXAM # 1	
III.	**Environmental Soils and Management Issues**	**9**
	Section 10. Soil Acidity	3
	A. Development	
	B. Consequences	
	C. Management	
	Section 11. Saline and Sodic Soils	2
	A. Development	
	B. Consequences	
	C. Management	
	Section 12. Anaerobic Soils	2
	A. Development	
	B. Characteristics	
	Section 13. Soil Pollution	2
IV.	**Exemplary Biogeochemical Reactions**	**6**
	Section 14. Nitrogen	3
	A. Control of N in soils/environment	
	Section 15. Phosphorus	3
	A. Control of P in soils/environment	

SWS 5050 Fall 2015
Topic Outline and Schedule

Topic	Approximate # of 50 min Lectures and Dates
O. Course Mechanics	1 = 8/24 (1)
I. Overview of Soils	
Section 1. Introduction to Soils	2 = 8/26 (1), 8/28 (1)
Section 2. Soil Formation	2 = 8/31 (1), 9/2 (1)

Labor Day, No Class Sept 7

II. Soil Properties/Processes	
Section 3. Physical Properties	3 = 9/4 (1), 9/9 (1), 9/11 (1)
Section 4. Soil Water/Hydrology	6 = 9/14 (1), 9/16 (1), 9/18 (1), 9/21 (1), 9/23 (1), 9/25 (1)
Section 5. Soil Aeration	1 = 9/28 (1)
Section 6. Soil Colloids	5 = 9/30 (1), 10/2 (1), 10/5 (1), 10/7 (1), 10/9 (1)
Section 7. Soil Solution	2 = 10/12 (1), 10/14 (1)
Section 8. Soil Organisms	3 = 10/16 (1), 10/19 (1), 10/21 (1)
Section 9. Soil Classification	2 = 10/23 (1), 10/26 (1),

Mid-term Exam 10/28

III. Environmental Soils and Management Issues	
Section 10. Soil Acidity	3 = 10/30 (1), 11/2 (1), 11/4 (1)

Home Coming, No Class Nov 6

Section 11. Soil Salinity	2 = 11/9 (1), 11/13 (1)

Veterans Day, No Class Nov 11

Section 12. Anaerobic Soils (Osborne)	1 = 11/16 (1)

Section 13. Soil Pollution 2 = 11/18 (1), 11/20 (1)

IV. Exemplary Elemental Reactions and BMPs
Section 14. Nitrogen 3 = 11/23 (1), 11/30 (1), 12/2 (1)

Thanksgiving Break - No Classes - 11/25-11/27

Section 15. Phosphorus 3 = 12/4 (1), 12/7 (1), 12/9 (1)

Last Day of Classes 12/9

Final Exam
(Take Home, Due ≤ 12/17 , 8:00 am)