

**COURSE SYLLABUS**  
**SWS 5050 DE FALL 2020**  
**Soils for Environmental Professionals**  
**3 Credits**

**Instructor:** Todd Z. Osborne-Whitney Laboratory for Marine Bioscience, 9505 N Ocean Shore Blvd. St. Augustine, FL 32080 (cell) 352-256-3826  
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**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:** pre-recorded lectures and weekly live chat session on **THURSDAY** evenings at 7pm

**Frequency:** Yearly, Fall semester.

**Textbook: Required** - “The Nature and Properties of Soils”, 2017 (15<sup>th</sup> ed). R.R. Weil  
And N.C. Brady. Prentice Hall Publishers. Upper Saddle River, NJ.

**Representative Supplemental Readings:**

Course website: lots of additional information, Home Works, Study Questions, Student Outlines visit frequently. (Address provided 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 chat session discussions. **Chat session 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). **Make-up exams are only authorized by instructor and must be 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 0-3 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/](http://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/](http://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/](http://www.dso.ufl.edu/drc/)

**SWS 5050 DE**  
**TOPIC OUTLINE BY SECTION / WEEK**

<b>TOPIC</b>	<b># LECTURES</b>
<b>I. Overview of Soils (Week 1-2)</b>	<b>5</b>
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	
<b>II. Soil Properties/Processes (Week 3-9)</b>	<b>22</b>
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
<b>EXAM # 1</b>	
<b>III. Environmental Soils and Management Issues (week 10-13)</b>	<b>9</b>
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
<b>IV. Exemplary Biogeochemical Reactions (Week 14-15)</b>	<b>6</b>
Section 14. Nitrogen	3
Section 15. Phosphorus	3

**SWS 5050 DE**  
**Topic Outline and Schedule**  
**FALL 2020**

Week 1	Section I. Introduction to Soils Chat Session 1 9/3 at 7pm	NO HOMEWORK DUE
Week 2	Section II. Soil Formation Chat Session 2 9/10 at 7pm	HOMEWORK 1 and 2 Due 6:59pm
Week 3	Section III. Physical Properties Chat Session 3 9/17 at 7pm	HOMEWORK 3 Due 6:59pm
Week 4	Section IV. Soil Water/Hydrology Chat Session 4 9/24 at 7pm	HOMEWORK 4 Due 6:59pm
Week 5	Section IV Soil Water/Hydrology Cont Chat Session 5 10/1 at 7pm	HOMEWORK 5 Due 6:59pm
Week 6	Section V. Soil Aeration Section VI. Soil Colloids Chat Session 6 10/8 at 7pm	HOMEWORK 6 Due 6:59pm
Week 7	Section VI. Soil Colloids Cont Chat Session 8 10/15 at 7pm	HOMEWORK 7 Due 6:59pm
Week 8	Section VII. Soil Solution Section IX. Soil Classification Chat Session 8 10/22 at 7pm	HOMEWORK 8 Due 6:59pm
Week 9	Section IX. Soil Classification Cont Section VIII. Soil Organisms Chat Session 9 10/29 at 7pm	HOMEWORK 9 6:59pm

# **Mid-term Exam On-Line Oct 29-Nov 02, Due Nov 02**

Week 10

Section X Soil Acidity

HOMEWORK 10 Due 6:59pm

Chat Session 10 11/5 at 7pm

Week 11

Section XI. Soil Salinity

HOMEWORK 11 Due 6:59pm

Chat Session 11 11/12 at 7pm

Week 12

Section XII. Anaerobic Soils

HOMEWORK 12 Due 6:59pm

Chat Session 12 11/19 at 7pm

## **NO CLASS 11/26 THANKSGIVING HOLIDAY**

Week 13

Section XIII. Soil Pollution

HOMEWORK 13 Due 6:59pm

Chat Session 12/3 at 7 pm

Week 14

Section XIV,XV. Nitrogen, Phos

HOMEWORK 14 Due 6:59pm

Chat Session 14 12/10 at 7pm

## **Final Exam (Take Home, Dec 12-17, Due Dec 17)**