

Syllabus – Spring 2024**SWS 5132 – Tropical Soils Management**

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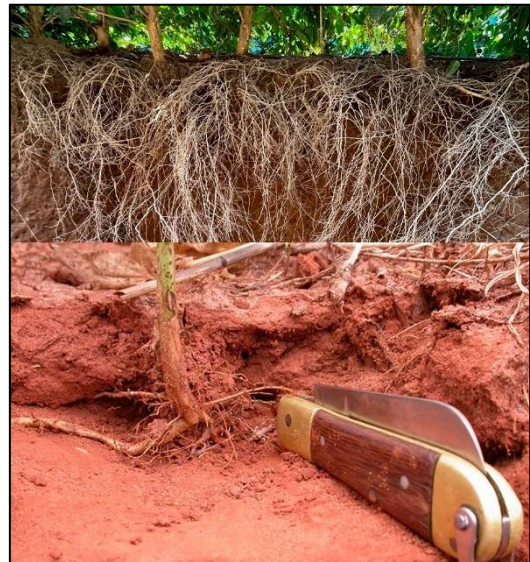
Course Credit-hours: 3
Structure Format: **On-campus** and online
Class Location & Time:
Lectures: McCarty Hall B, room 3108
When: Tuesdays (8:30-9.20) and Thursdays (8:30-10:25)
Day/location is tentative and subject to changes.

Office hours After class and by appointment

Course **SWS 3022:** Introduction to Soils in the Environment
Prerequisite **or: SWS 5050:** Soils for the Environmental Professionals
or: Equivalent course from other universities
or: Permission from instructor

Course Students must have a UF e-mail account, Internet access, and access to a computer that
Requirements meets the University of Florida computer standards.

Course How can we sustain food production increases without depleting our fragile soil and natural
Description resources or increasing climate change? In the course Tropical Soil Management (SWS 5132) we work around that question. The course is designed for students interested in principles of management of soils under tropical environments. **The overall goal is to provide students with a deep understanding of the diversity and variability of those soils, and their agronomic and ecological practical applications.** First, we focus on the basic aspects of tropical soils such as their functions in society, taxonomy classification, mineralogy, physical and biological properties, and principles of soil fertility. After, we focus on management strategies to improve food production while mitigating climate change and degradation of properties, processes, and functions of tropical soils (*e.g.*, erosion, compaction, acidification). We emphasize principles of sustainable agriculture, soil health and circular agriculture practices. The students obtain skills applicable to agriculture, soil science, soil health, agronomy, environmental science, and other related disciplines.



- Course Objectives**
1. To gain knowledge of the diversity and variability of soils in the tropics e.g., physical, chemical, and mineralogical properties.
 2. To learn strategies to improve and/or sustain soil health under tropical conditions.
 3. To learn concepts and principles of sustainable agriculture applicable to tropical soils and their implication on global challenges.
 4. To learn sustainable management practices for tropical environments.

Course Readings

Required:
 Provided power point slides.

Recommended:
 Course textbook (see below)

Additional:
 Research articles and/or book-chapters that will be provided.

Course textbook

Recommended: Sanchez P.A. 2019. Properties and Management of Soils in the Tropics, Second edition. Cambridge University Press, Cambridge, UK.
<https://doi.org/10.1017/9781316809785> ISBN: 9781107176058 (print), 9781316809785 (e version).
 All reading assignments will be available on the course website <https://elearning.ufl.edu/>

Course Schedule

The schedule is **approximate**, pace may vary. Second period is for general discussion, or if no questions, will proceed with the next topic.

Week # (W) Tuesday (T) or Thursday (R) Date	Topic	Recommended Readings Properties and Management of Soils in the Tropics 2nd Ed. (chapters in website) plus additional readings	Assignment (A); In class “quick” test (QT), Seminar (S), Take home exam (THE)
W1-T Jan-9	Course Introduction Tropical Environment	Ch1 Lecture 1 “Tropical Environment”	A#1: Read and write. Read the article in the link below, write a critical thought (1-2 paragraphs) about the subject, and bring to the next class. When writing it, answer the question: In your opinion, what is the biggest challenge in the tropics? Why? (https://doi.org/10.1038/s43016-020-0076-z)
W1-R Jan-11	Human ecology Reading	Ch 2 Lecture 2 “Human Ecology”	Due A#1. A#2 (QT#1): study the past 2 classes and be prepared to Answer (at the beginning of the next class) 2-4 questions related to Chapters 1 and 2 (past 2 classes). Questions provided in the class.
W2-T Jan-16 W2-R Jan-18	Diversity, FCC, Oxisols	Ch 3, 4, 5 Lecture 3 “Oxisols” Lecture 4 “Functional Capability Classification”	Due A#2 (QT#1): Answer 2-4 questions related to Chapters 1 and 2 (past 2 classes). Questions provided in the class.
W3-T Jan-23	Soil Mineralogy	Ch 8 Lecture 5 “Mineralogy”	
W3-R Jan-25	Soil Physics, Water	Ch 6, 7 Lectures 6 and 7 Nunes et al. 2021. Corn seedling root growth response to soil physical quality. Agronomy Journal. https://doi.org/10.1002/agi2.20705	A#3 (QT#2): study the past 2 classes and be prepared to Answer (at the beginning of the next class) 2-4 questions related to Soil Physics and Water in the tropics.
W4-T Jan-30			Due A#3 (QT#2): Answer e questions related to Soil Physics and Water classes.
W4-R Feb-1	Soil Biology	Ch 10 Lecture 8 “Soil Biology”	THE#1: Take home exam 1 handed out (related to all previous classes)

W5-T Feb-6	Soil Acidity	Ch 9 and Lecture 9a “Soil Acidity”	
W5-R Feb-8		Lecture 9b “Soil Acidity Mitigation” Moraes et al., 2023. Lime incorporation up to 40 cm deep increases root growth and crop yield in highly weathered tropical soils. European Journal of Agronomy. https://doi.org/10.1016/j.eja.2023.126763	Due Take home exam 1 A#4 (S#1): read selected articles and prepare a short (15 min) <i>seminar</i> about soil organic carbon under tropical environments. Articles will be selected by the students or provided by the instructor.
W6-T Feb-13	Organic Carbon	Ch 11 Lecture 10 “Soil Organic Carbon”	
W6-R Feb-15			Due A#4 (S#1). Seminar and discussion
W7-T Feb-20			Due A#4 (S#1). Seminar and discussion
W7-R Feb-22	Fertility Principles	Ch 12 Lecture 11 “Soil Fertility Principles”	A#5: Read and write (1-2 paragraphs) a critical thought about N or P in the tropics. The articles will be provided by the instructor and your review will be shared and discussed in Feb-27 class (N) and Feb-29 (P) .
W8-T Feb-27	Nitrogen	Ch 13 Lecture 12 “Nitrogen”	
W8-R Feb-29	Phosphorus	Ch 14 Lecture 13 “Phosphorus”	Due A#5. The students will share and discuss the thoughts about N and P.
W9-T Mar-5			
W9-R Mar-7	Soil health – concept and assessment	Lecture 14 Nunes et al. 2021. The soil health assessment protocol and evaluation applied to soil organic carbon. Soil Sc. Soc. Am. Journal. https://doi.org/10.1002/saj2.20244open_in_newISSN0361-5995	Write 2-3 paragraphs related to the soil health lecture.
Spring Break			
W10-T Mar-19	Soil health – under temperate conditions	Karlen et al. 2019. Soil health assessment: Past accomplishments, current activities, and future opportunities. Soil and Tillage Research. https://doi.org/10.1016/j.still.2019.104365	A#6: Based on the lecture delivered on Oct-24 and Oct-26, write a 2 pages text highlighting your point of few about the soil health concept and definition, challenges and how that relates to your research project.
W10-R Mar-21	Soil health in the tropics	Lecture 15	
W11-T Mar-26	Conservation Agriculture in the tropics: principles	Lecture 16 “Principles of Conservation Agriculture in the tropics” Scientific articles that are going to be shared with the students.	Due A#6 A#7: Based on the past two classes, identify problems related to conservation agriculture and propose solutions.
W11-R Mar-28			
W12-T Apr-2	Conservation Agriculture in the tropics: problems and solutions	Lecture 17 “Soil profile stratification under no-till in the tropics” Scientific articles that are going to be shared with students.	Due A#7
W12-R Apr-4			
W13-T Apr-9			
W13-R Apr-11	Soils under livestock systems	Ch 18 Lecture 18 “Livestock” Present and discuss the solutions for each problem (case studies) previously distributed	
W14-T Apr-16	Soils under agroforestry	Ch19 Lecture 19 “Soils under Forestry and Agroforestry”	
W14-R Apr-18	Circular Agriculture	L20 “Circular Agriculture”	
W15-T Apr-23	Tropical agriculture: the Brazilian example	L21 “Tropical agriculture: the Brazilian example”	Take home exam 2 handed out
May-3	Final		Take home exam 2 due (May-3)

Course Assessment and Grading

Student learning is assessed based on 2 take home exams (open book, closed mouth), a short paper organized as a Science Policy Forum article (< 1500 words, with abstract text, references and 2 tables or figures), plus class participation.

Assignments turned in late results in a loss of 5 points per day of the maximum points unless late turn-in is caused by excused absences.

Assignment	Percentage of Final Grade
Take home exam 1	25
Take home exam 2	25
Seminars	15
In class quick test	10
Other assignments	15
Class participation	10
Total	100%

Percent	Grade
93.0-100	A
90.0-92.9	A-
88-89.9	B+
83-87.9	B
80-82.9	B-
78-79.9	C+
73-77.9	C
70-72.9	C-
60-69.9	D
<60	E

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/regulations/info/grades.aspx>

Attendance and Make-Up Work

On-campus or virtual attendance for the 28 class periods is mandatory unless excused according to university policy

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://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/evals>. 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/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students at 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. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.
<https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.