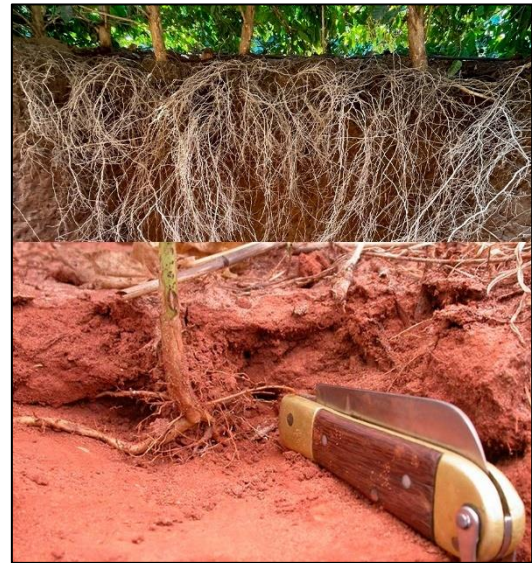


*Syllabus – Spring 2025***SWS 5132 – Tropical Soils Management**

|                            |   |
|----------------------------|---|
| <b>Instructor</b>          | Dr. Márcio R. Nunes<br>G169 McCarty Hall A<br>Office: 352-294-3127<br><a href="mailto:marcionunes@ufl.edu">marcionunes@ufl.edu</a>  |
| <b>Course Structure</b>    | Credit-hours: 3<br>Format: <b>On-campus</b> and online<br><b>Class Location &amp; Time:</b><br><u>Lectures:</u> McCarty Hall A, room 2186<br><u>When:</u> Tuesdays (9:35-10:25) and Thursdays (9:35-11:30)<br>Day/location is tentative and subject to changes.   |
| <b>Office hours</b>        | After class and by appointment  |
| <b>Course Prerequisite</b> | <b>SWS 3022:</b> Introduction to Soils in the Environment<br><b>or:</b> <b>SWS 5050:</b> Soils for the Environmental Professionals<br><b>or:</b> <b>Equivalent</b> courses from other universities<br><b>or:</b> <b>Permission</b> from instructor  |
| <b>Course Requirements</b> | Students must have a UF e-mail account, Internet access, and access to a computer that meets the University of Florida computer standards.  |
| <b>Course Description</b>  | <p>How can we sustain food production increases without depleting our fragile soil and natural 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 the principles of management of soils under tropical environments. <b>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.</b> 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 (<i>e.g.</i>, 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.</p> |



- 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 PowerPoint slides.

Recommended:  
 Course textbook (see below). Although not required, it is quite important to read the chapters of the course textbook.

Additional:  
 Research articles and/or book chapters 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) Date      | Topic  | Recommended Readings<br>Properties and Management of Soils in the Tropics 2nd Ed. (chapters in website) plus additional readings   | Assignments, Seminars, Take home exam  |
|----------------------|--|--|--|
| W1<br>Jan 13-18      | Course Introduction<br>Tropical Environment    | Ch1<br>Lecture 1 “Natural Tropical Environment”<br><br>Ch 2<br>Lecture 2 “Human Tropical Environment”  | <b>A#1:</b> <u>Read</u> the article in the link below and write a critical thought (200 words max) answering the question: <b>In your opinion, what is the biggest challenge in the tropics? Why? What would you propose as a solution?</b> You can use other articles and your experience to answer those questions.<br><a href="https://doi.org/10.1038/s43016-020-0076-z">https://doi.org/10.1038/s43016-020-0076-z</a> |
| W2<br>Jan 20-25      | Diversity, FCC, Oxisols                        | Ch 3, 4, 5<br>Lecture 3 “Soils of the Tropics”<br>Lecture 4 “Functional Capability Classification”   | <b>A#2:</b> Study the past Lectures (3-5) and prepare two (2) questions about that. Provide your <u>Answer</u> to each question.   |
| W3<br>Jan 27-Feb 1   |  | Ch 6, 7 “Soil Physics and Water”<br>Lectures 6-7   | <b>Due A#2.</b>  |
| W4<br>Feb 3-8        | Soil Mineralogy<br>Soil Biology                | Ch 8 & 10<br>Lectures on “Mineralogy” & “Soil Biology”   |  |
| W5<br>Feb 10-15      | Soil Acidity                                   | Ch 9<br>Lecture 9 “Soil Acidity and Mitigation”<br>Moraes et al., 2023. Lime incorporation up to 40 cm deep increases root growth and crop yield in highly weathered tropical soils. Eur. J. Agron.<br><a href="https://doi.org/10.1016/j.eja.2023.126763">https://doi.org/10.1016/j.eja.2023.126763</a> | <b>A#3:</b> read selected articles and prepare a short (15 min) <u>seminar</u> about soil organic carbon under tropical environments. Articles will be selected by the students or provided by the instructor.   |
| W6-7<br>Feb 17-Mar 1 | Organic Carbon                                 | Ch 11  | <b>Due A#3.</b> Seminar and discussion<br><b>Take-home exam 1</b> handed out (related to all previous classes) on Feb-20.  |
| W8<br>Mar 3-8        | Fertility Principles<br>Nitrogen<br>Phosphorus | Ch 12, 13 & 14<br>Lecture 11 “Soil Fertility Principles”<br>Lecture 12-4 “Nitrogen & Phosphorus”   | <b>Due Take home exam 1</b>  |
| W9<br>Mar 10-14      | Nitrogen<br>Phosphorus                         | Lecture 14 “Sustainable Management of Nitrogen”<br>Lecture 15 “Phosphorus Management in Florida”   | <b>A#4:</b> <u>Write</u> (1-2 paragraphs) a critical thought about N or P management in the tropics. You will share your critique with the class in the next discussion section.   |

|                      |                                |  |   |
|----------------------|--------------------------------|--|---|
| W10<br>Spring Break  |                                |  |   |
| W11<br>Mar 24-29     | Soil Health                    | Lecture 16 “Concept and Assessment”<br>Lecture 17 “Soil health: What to aspect?”<br>Lecture 18 “Soil Health in the Tropics”      |   |
| W12<br>Mar 31- Apr 5 | Soil Health & Biofortification | Lecture 19 “Soil Health-Human Health Nexus”<br><br>Lecture 20 “Biofortification as a strategy to mitigate hunger in the tropics” | <b>A#5:</b> Based on the previous lectures, write 1-page highlighting your point of view about soil health including challenges and how that relates to your research project or your work.<br><b>Due A#5 next discussion section</b> |
| W13<br>Apr 7-12      | Conservation Agriculture       | Ch 19 & 20<br>Lectures on:<br>Livestock and Agroforestry   | <b>A#6:</b> Review the previous classes and link soil fertility, soil health, and conservation agriculture in the tropics. Come to the next class and prepare to discuss your ideas.  |
| W14<br>Apr 14-19     | Circular Agriculture           | Lecture on Circular Agriculture  | <b>Due A#6 (Apr-9)</b>  |
| W15<br>Apr 20-23     | The Brazilian example          | L24 “Tropical agriculture: the Brazilian example”  | <b>Take-home exam 2 handed out</b>  |
| May-2                | Final                          |  | Take home exam 2 due (May 2)  |

**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                        |
| Assignments         | 20                        |
| Seminars            | 20                        |
| 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 about 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](mailto: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](mailto: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](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).