

**SWS 4116 (online) – Environmental Nutrient Management (3 credits)**  
**Fall 2024**

**Course description**

The course will cover the basic principles of plant nutrition, fertilizer use, and environmental management of nutrients. Essential plant nutrients will be examined in relation to their function and deficiency symptoms in plants and their chemistry in the soil. The course will cover the properties and use of fertilizers for supplying plant nutrients, chemical reaction of fertilizers in soils, and agronomic and economic criteria for determining fertilization. The class will cover environmental issues with the overuse of fertilizers, best management practices to reduce impact of conventional agriculture on environment, soil and plant tissue testing, and sustainable agriculture and organic farming.

**Prerequisite:** SWS 3022 – Introduction to Soils in the Environment

**Instructor**

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**Teaching Assistant**

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**Course goals**

- a. To understand the chemistry of essential elements in the soil in relation to their functions in plant nutrition.
- b. To learn about the different types of fertilizers, when and how to use appropriately.
- c. To recognize the impact of conventional agriculture including use of fertilizer and amendments on water and air quality.
- d. To identify best management practices (BMPs) and practices used in sustainable agriculture and organic farming.

**Course learning objectives**

1. Identify essential elements, their functions in plant, and deficiency symptoms.
2. Classify and categorize the different sources of fertilizer materials and the suitability of their use in various soils and cropping systems.
3. Solve for fertilizer application rates and fertilizer formulation.

4. Discuss the environmental impacts of agriculture, and the use of fertilizers and amendments.
5. Compare practices used in organic farming and sustainable agriculture.

### **Textbook**

The following textbook is **Recommended**: Soil Fertility / Edition 2 by Boyd Ellis and Henry Foth. 1996; ISBN 1566702437, Taylor & Francis publishers.

### **Course format**

All lecture materials are posted on the class website. We will be meeting for chat time every Tuesday starting August 27, 2024 (unless otherwise indicated on Canvas Calendar) from **5:30-to 6:30 pm ET** using Zoom (<https://ufl.zoom.us/j/95015945529>). The chat will be used to go over calculations and answer any questions you may have on homework, quizzes and class materials. Attending chat time is highly recommended, but not mandatory.

### **Chat sessions**

Chat sessions are audio visually recorded for students in the class for future reference and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### **Grading**

This class has required **Homework (HW), discussion posts, quizzes, and exams**. Your grade will be determined with accumulated points on various assignments as listed below. All assignments are submitted within Canvas. Please do not email any assignment. Quizzes are normally available over a 3-day period whereas exams are available over a 4-day period. Some discussions need only one post while others need one initial post and at least 2 replies or further discussions. Expectations and rubric for discussions are clearly presented on the class website. For information on current UF policies for assigning grade points, see:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

### **Attendance and make-up work**

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/UGRD/academic-regulations/attendance-policies/>

## Grading system

### Grade breakdown

Item	Points	Percentage
9 HW assignments	120	24%
5 Discussions	75	15%
6 Quizzes	135	27%
Exam 1	85	17%
Exam 2	85	17%
<b>Total</b>	<b>500</b>	<b>100%</b>

### Grade scale

Letter	Points
A	≥ 460
A-	≥ 440
B+	≥ 420
B	≥ 400
B-	≥ 380

Letter	Points
C+	≥ 360
C	≥ 340
C-	≥ 320
D	≥ 300
E	< 300

## Additional information

### Online course evaluation process

Student assessment of instruction is an important part of efforts to improve teaching and learning. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.a.ufl.edu/students/>. Students will be notified when the evaluation opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.a.ufl.edu/public-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 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 Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TA in this class. 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.

### 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.

### Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### In-Class Recording

- Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.
- A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.
- ***Publication without permission of the instructor is prohibited.*** To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

## Campus Resources

### **Health and Wellness**

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

*GatorWell Health Promotion Services:* For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

### **Academic Resources**

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

*Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

*Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).

*On-Line Students Complaints:* [View the Distance Learning Student Complaint Process](#).

## MODULE AND LECTURE SCHEDULE

- Any change(s) to the following schedule will be announced in canvas ahead of time
- Chats occur every Tuesday from 5:30 until 6:30 pm ET using zoom (<https://ufl.zoom.us/j/95015945529>).
- HW assignments: due on Sundays at 11:59 pm ET
  - Can submit one day late with a 10% penalty
- Discussion assignments:
  - First post due on Fridays at 11:59 pm ET
  - Replies/final posts on Mondays at 11:59 pm ET
- Quizzes are available Saturdays 6 am ET through Monday at 11:59 pm ET
- Exams are available Saturdays 6 am ET through Tuesday at 11:59 pm ET

Week	Module	Subject	Textbook chapter	Assessment	Due date
				<i>Bonus discussion 1</i>	Monday 8/26
1 (8/22)	Review	Chemistry and calculations review		HW 1	Sunday 9/1
	1	History of soil fertility	1	Discussion 1	Monday 8/26
2 (8/26)	2	Introduction to soil fertility and plant nutrition a. Essential elements, macronutrients, micronutrients b. Nutrient movement and uptake by roots	1	Quiz 1 (Module 2)	Tuesday 9/3
3 (9/2)	3	Nitrogen chemistry and environmental issues a. Functions in plants and deficiency symptoms b. Chemistry & biochemistry in soil c. Environmental issues with N	6	HW 2	Sunday 9/8
4 (9/9)	4	Nitrogen Fertilizers	11.1	Quiz 2 (Modules 3, 4)	Monday 9/16
	5	Nutrient content in fertilizers The Florida Fertilizer Label		HW 3	Sunday 9/15
5 (9/16)	6	Phosphorus chemistry and environmental issues a. Functions in plants and deficiency symptoms b. Chemistry & biochemistry in soil	7	HW 4	Sunday 9/22
6 (9/23)	7	Environmental issues with P Phosphorus fertilizers	11.2, 11.3, 11.4	Discussion 2 Quiz 3 (Modules 6, 7)	Monday 9/30 Monday 10/7
		<b>Exam 1 (Modules 2 -7)</b> <b>Chat for exam review/questions:</b> <b>Tuesday Oct. 1 @ 5:30 – 6:30 pm ET</b>			<b>Tuesday 10/8</b>

Week	Module	Subject	Textbook chapter	Assessment	Due date
7 (9/30)	8	Potassium a. Functions in plants and deficiency symptoms b. Chemistry & biochemistry in soil c. K fertilizers	8	HW 5	Sunday 10/13
8 (10/7)	9	Soil fertility evaluation	13	Discussion 3	Monday 10/21
9 (10/14)	10	Fertilizer application rates calculation		HW 6	Sunday 10/20
10 (10/21)	11	Calcium, magnesium, sulfur a. Functions in plants and deficiency symptoms b. Chemistry & biochemistry in soil c. Fertilizer sources: lime, sulfur	9	HW 7  Quiz 4 (Modules 8, 11)	Sunday 10/27 Monday 10/28
11 (10/28)	12	Micronutrients a. Functions in plants and deficiency symptoms b. Chemistry & biochemistry in soil c. Micronutrient fertilizers	10	HW 8  Quiz 5 (Module 12)	Sunday 11/3 Monday 11/4
12 (11/4)	13	Nutrition of turfgrass in Florida (Guest speaker: Dr. Rowland)			
		<b>Exam 2 (Modules 8-12)</b> <b>Chat for exam review/questions:</b> <b>Tue. Nov 5 @ 5:30 – 6:30pm ET</b>			<b>Tuesday 11/12</b>
13 (11/11)	14	Environmental issues Trace elements Climate change greenhouse gases		Discussion 4	Monday 11/18
14 (11/18)	15	Fertilizer formulations calculations a. Rules of working with fertilizers b. Mixed fertilizers c. Fertilizer application methods	14	HW 9	Sunday 11/24
15 (11/25, 12/2)	16	Sustainable Agriculture & Organic Farming		Discussion 5	Monday 12/2
Bonus	17	Nutrition of palm trees in Florida (Guest speaker: Dr. Broschat)		Discussion 6 (Bonus)	Monday 12/9
				Quiz 6 (Modules 14-16)	Tuesday 12/3
		<b>Last chat Tuesday Dec. 3, 2024</b> <b>Classes end Dec 4</b>			