HOS 6412 – Nutrition of Horticultural Crops

Spring 2026
3 credits

Course Format

This is a 100% online, asynchronous course. Lectures, learning materials, and assessments will be published on Mondays at noon on canvas. All assessments are due at 11:59 PM on Sundays. New learning materials and new assignments will be published every week of our 14-week long semester.

Instructor

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Office hours: Wednesdays 4:00 PM to 5:00 PM

Zoom link

Pre-Requisite Knowledge

At the start of this course, students are expected to be familiar with fruit and vegetable farming systems. Additionally, students are expected to have dexterity performing basic mathematical calculations (e.g., percentages and concentrations) and unit conversions (e.g., lbs to grams, acres to hectares).

Course Description

This course focuses on the biochemical, physiological, and environmental factors that affect the nutritional status and productivity of horticultural crops. In order to deliver meaningful mastery of these contents, this course utilizes a combination of lectures, quantitative exercises, and online activities.

Course Learning Objectives

Upon successful completion of this course, students will be able to:

- Explain how chemical and physical properties of soils and substrates affect nutrient movement and availability
- Assess strengths and weaknesses of different fertilizer types, sources, and application methods
- Classify nutrients as essential, beneficial, and non-essential for plant growth
- Diagnose nutrient deficiencies and recommend corrective measures
- Create fertilizer schedules for different horticultural production systems

Course Materials

Course Website

This course has a comprehensive mini-site in canvas. Take time to familiarize yourself with the "Start Here", "Syllabus", and module tabs in the navigation menu. Digital copies of this syllabus, and other learning materials can be found there.

- E-Learning in Canvas, www.elearning.ufl.edu

Textbooks

There is no required textbook for this course. The following textbook can be used to supplement and extend lecture topics. This book is available online, free of charge, from the UF Library system.

- Handbook of Plant Nutrition — Barker & Pilbeam (ISBN 978-1-4398-8198-9)

We will refer to the following fertilization manual often during the course. This document is available online, free of charge, through the UF/IFAS Extension library.

- Vegetable Production Handbook of Florida — Agehara et al. (EDIS publication CV292)

Technology

This is an online course. Thus, access to reliable technology is paramount to student success. You will need to have access to a personal computer, web camera, and microphone to watch lectures, complete exercises, and take exams. Your camera must be turned on during exams. Please, be mindful of your appearance and surroundings.

You will also need to have access to broadband internet. Your internet connection should allow for a smooth video playback experience. If you have trouble streaming videos (e.g., from Hulu or Netflix) on your WiFi connection, you will not be able to take an online exam. Mobile phones ("Hot Spots" or data) are almost certainly not a good idea.

For assistance with technical issues, you can refer to the following resources:

- Learning-support@ufl.edu | (352) 392-HELP - select option 2 | http://elearning.ufl.edu
- Library Help Desk support http://cms.uflib.ufl.edu/ask

Spreadsheet software

Microsoft Excel 2023 (or more recent) will be required for in-class and at-home exercises. While tablet computers and web browsers are capable of running Microsoft Excel, some of the functions we will use are not available in these versions of the software. Thus, using a downloaded copy of the software in a laptop or desktop computer is strongly recommended.

Microsoft Excel is available to you free of cost through UF Apps. You can download this software to all your devices using your GatorLink credentials.

- UF Apps, https://info.apps.ufl.edu/

Attendance and Participation

This is an asynchronous course. Therefore, there is no formal course attendance. Weekly deadlines are intended to help you keep up with the course pace. Deadlines are firm. Late assignments will be graded and make up-exams will be provided only for documented emergencies as per UF's attendance policy.

Additional information about UF's attendance policy can be found here:

- Attendance policy, www.catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

This course requires frequent student participation. Students are expected to participate by asking and answering questions in the course discussion boards and quizzes. Also, there will be multiple, non-graded activities that provide opportunities for additional engagement.

Communication Guidelines

Email

Email will be the main means of communication between us. Hence, it is critical that all course-related emails are polite, professional, and as different from text messages as possible. You must use your Gator Link email. Canvas messages will not be answered. For additional recommendations, consult:

- Email etiquette, https://www.inc.com/business-insider/email-etiquette-rules.html

Response Time and Feedback

I will reply to course emails within 48 hours of receiving them (barring for an emergency). If your email is time-sensitive (for example, an issue with a timed assignment), please indicate "Time sensitive" in the email subject line. I will make every attempt to respond to time sensitive emails received during business hours in a timely manner.

Exams and homework will be graded within 14 days of the assignment closing. Since both kinds of assignments are due at the end of each module, I will prioritize exams over homework. I use assignment rubrics and the comments section to provide positive and formative feedback about student answers. Once a grade is posted, I recommend you review your submission to find my feedback. If you have additional questions about your submission, please do not hesitate to visit me during office hours.

Challenging a Grade

All discrepancies in grading must be resolved within 7 days of the grade being posted in canvas. The instructor's memory is frail. Thus, grade disputes older than 7 days old will not be entertained unless proper excuse is provided (see attendance policy).

Written Communication

Effective written communication is essential for student and professional success. Whether you go on to become a horticulturist, an accountant, or a CEO, written communication will be a critical skill in your toolbox. Thus, I place great emphasis on coaching and participating in professional, context-specific written communication. Proper spelling, grammar, and punctuation are expected in all course

assignments. You are encouraged to use the resources provided by the UF Writing Studio to develop or enhance your writing skills. Free one-on-one tutoring (live and on-line) is available to enrolled students.

- UF Writing Studio, 302 Tigert Hall, 846-1138**,** www.writing.ufl.edu/writing-studio/

Course Grading Structure

1. Quizzes (10 points)

The purpose of this assessment is to evaluate student retention of weekly lecture materials. Every Monday at noon, a 6-question multiple choice quiz will become available in canvas. Quizzes will be available until the following Sunday at midnight. Each quiz will be worth 1 point, and there will be 14 quizzes during the semester. Each quiz will be timed to 10 minutes, and it can be taken as many times as you desire. The highest grade you score in each quiz will be recorded in the gradebook. Your four lowest quiz grades will be dropped. You can refer to personal notes or any reference materials to complete the quiz. However, you must work individually, and you must refrain from using generative AI sources.

2. Homework (15 points)

The purpose of these assessments is to develop practical skills in the context of plant nutrition. There will be three homework assignments; each assignment will be graded out of 5 points. Homework assignments will be open for 7 calendar days. Each homework will take 2 hours to complete. Students can refer to personal notes, textbooks, online tutorials, and other sources, but they must work individually. Homework assignments will be submitted through canvas and processed with originality-checking software. The sum of your homework scores will be used to compute the final grade.

3. Exams (45 points)

The purpose of these assessments is to evaluate student content retention and ability to synthesize information. You will be evaluated through three cumulative exams administered in canvas with HonorLock. Exams will be open for 24 hours on the indicated dates. Once you open the exam, you will have 2 hours to complete it. Exams can only be taken once. Each exam will be graded out of 15 points. Exams will include short-answer, long-answer, and calculation questions focused on the most-recent 5 weeks of lecture material. Exams #1 and #2, and #3 will test your knowledge, quantitative skills, and critical thinking. Exam #3 will also test your ability to diagnose nutrient deficiencies. There will be no dropped exams. The sum of your exam scores will be used as your exam grade.

Assessment	Date
Exam #1	02/09/2026
Exam #2	03/30/2026
Exam #3	04/27/2026

Practice exams will be available a week before each exam. Students can track their learning in each module using the provided practice exam and practice exam answers.

4. Fertilizer schedules (30 points)

The purpose of these assessments is to develop mastery of spreadsheet software use for plant nutrition applications. These assignments will test your logical and quantitative skills to formulate three fertilizer schedules: one for row crops, one for hydroponic crops, and one for fertigated crops. I will provide templates and demonstrate the necessary calculations and formulas in lecture videos. You will apply and extend this knowledge to formulate a fertilizer schedule that meets crop nutritional requirements while minimizing wasteful use of fertilizers. Each fertilizer schedule will be graded out of 10 points. The sum of your scores will be used to compute your final grade.

Grading Scale

Grade	Points	Percentage
A	92 – 100	92 – 100
A-	< 92 - 90	< 92 - 90
B+	< 90 - 87	< 90 - 87
B	< 87 - 83	< 87 - 83
B-	< 83 - 80	< 83 - 80
C+	< 80 - 77	< 80 - 77
C	< 77 - 73	< 77 - 73
C-	< 73 - 70	< 73 - 70
D+	< 70 - 67	< 70 - 67
D	< 70 - 67	< 70 - 67
D-	< 67 - 63	< 67 - 63
S	< 60	< 60

Grading Policy

Course grading is consistent with UF grading policies.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF. Please contact UMatterWeCare for additional and immediate support.

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.

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.

Student Complaints

You can file and resolve any complaints about your experience in this course in the following site:

- Student complaints in online courses, www.distance.ufl.edu/student-complaint-process

Weekly Course Schedule

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Week of	Topic	Assessment	Due date
	Module 1: Water and soil		
Jan 12	Week 1: Introduction and cation exchange		
Jan 19	Week 2: Soil acidity and alkalinity		
Jan 26	Week 3: Adjusting soil pH		
Feb 2	Week 4: Soil organic matter and water		
	Module 2: Fertilizers		
Feb 9	Week 5: Introduction to fertilizers	Exam #1	02/09/26
Feb 16	Week 6: Fertilizer application		
Feb 23	Week 7: Fertilizer calculations	Homework #1: Relative yield	03/01/26
Mar 2	Week 8: Using spreadsheets for fertilizer schedules		
Mar 9	Week 9: Hydroponic production	Fertilizer schedule for row crops	03/13/26
Mar 16	Spring Break		
Mar 23	Week 10: Fertigation	Homework #2: AlkCalc	03/29/26
	Module 3: Nutrient uptake and deficiency		
Mar 30	Week 11: Nutrient uptake and nitrogen (part 1)	Exam #2 Fertilizer schedule for hydroponic crops	03/30/26 04/05/26
Apr 6	Week 12: Nitrogen (part 2) and the S.O.A.P. method		
Apr 13	Week 13: Phosphorus and potassium	Fertigation schedule	due 04/19/26
Apr 20	Week 14: Other macronutrients and micronutrients	Homework #3: Diagnosis flowchart	04/26/26
Apr 27	Finals week	Exam #3	04/27/26