

Tentative Syllabus
HOS 3430C
Nutrition of Horticultural Crops
3 credits
Fall 2016

Coordinator: David Liu, (352) 273-4814, guodong@ufl.edu, Room 1229, Fifield Hall
Office hours: by appointment

Instructor: Jerry Sartain, Paul Fisher, Monica Ozores-Hampton, David Liu

Guest Lecturer: Rebecca Darnell, Danielle Treadwell, Jeff Brecht, Kelly Morgan, Lincoln Zotarelli

Teaching Assistant: Yucong Xie, (352) 284-1371, xieyucong@ufl.edu, Room 2229, Fifield Hall

Office hours: by appointment

Course information: This is a team-taught course. Meets on Tuesday 7th period (1:55 to 2:45 pm), and Thursday 7th and 8th periods (1:55 to 3:50 pm), Room 2316, Fifield Hall.

Course description: Study and discussion of the physiological, biochemical and environmental factors that affect nutritional status and productivity of horticultural crops, and strategies for reducing the environmental impacts of crop production.

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

1. Understand the basic concepts of plant nutrition (including plant nutrient requirement, nutrient absorption and translocation, nutrient interactions, diagnosis of plant nutritional status, and environmental impacts of fertilization and irrigation practices),
2. Apply these basic concepts to crop production, and field diagnostic of abiotic disorders,
3. Collect meaningful soil and plant samples and interpret their results,
4. Integrate fertilization and irrigation practices.

Class Format: classroom lectures, group activities, individual assignments and field tours.

Text book: Handbook of Plant Nutrition, A.V. Barker and D. Pilbeam, CRC Press (2007). (Purchase not required)

Reading/reference materials:

1. Plant Nutrition and Soil Fertility Manual, Second Edition, 2012, J. Benton Jones Jr., CRC Press
2. Marschner's Mineral Nutrition of Higher Plants, Third Edition, 2011, Horst Marschner, Academic Press

3. Growth and Mineral Nutrition of Field Crops, Third Edition (Books in Soils, Plants, and the Environment), 2010, Nand Kumar Fageria, Virupax C. Baligar, Charles Allan Jones, CRC Press
4. Plant Nutrition of Greenhouse Crops, 2009, C. Sonneveld and W. Voogt, Springer
5. Plant Nutrition Manual, 1998, J.B. Jones, Jr. CRC Press
6. Plant Nutrition Handbook II, 1996, H.A. Mills and J.B. Jones, Jr., MMP
7. Diagnostic Techniques for Improving Crop Production, 1996, B. Wolf, Food Products Press
8. Principles of Plant Nutrition, 4th ed., 1987, K. Mengel and E.A. Kirkby

Attendance/participation:

Attending class is extremely important for this team-taught course due to the information conveyed by the instructors and the in-class exercises that enhance the learning process. The instructors discuss the information once. If you are absent it is your responsibility to get the information discussed in the class from your classmate. Do not ask the coordinator to respond with a lengthy email explaining the information covered in the class or expect the coordinator to recite the information. If you attended class and would like to discuss what was presented or want to clarification about something, by all means please feel free to schedule a time with the coordinator.

- You are considered absent if you are not in your seat within 15 minutes of the scheduled start of class.
- You are considered absent if you leave class early.

You are, therefore, expected to **arrive on time, be present and participate in all teaching and learning activities.** You will credit 200 points for your attendance:

1. 200 points for 0 absence
2. 100 points for 1 unexcused absence, and
3. 0 points for 2 or more unexcused absences

UF counseling services: Resources are available on campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include: 1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling; 2. Student Mental Health, Student Health Center, 392-1171, personal counseling; 3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling; and 4) Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Accommodation: Students requesting classroom accommodation must first register with the Dean of Students Office (Students with Disabilities Office, Peabody 202 at 352-392-1261). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Further information is available from the Disability Resource Center at <http://www.dso.ufl.edu/drc/>.

Software use /copyright: 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 any individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Academic honesty: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University." We agree to comply with the new Honor Code, which specifies that "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."

University policy regarding "Academic Honesty" is available from the Dean of Students Office at: <http://www.dso.ufl.edu/judicial/academic.php>

Further information on academic honesty and integrity is available from the Graduate Student Handbook, p. 48, available online at: <http://gradschool.rgp.ufl.edu/students/introduction.html>

The minimum consequence for cheating and/or plagiarism is getting a zero on the assignment and possibly failing this course. Exams and written assignments should represent your own work. If you are not sure what constitutes plagiarism, please read these webpages, and ask your instructor to clarify before beginning the project.

UF policy on e-mail: Official University business email will be communicated to students using the University GatorLink email account. That is, official email will be sent exclusively to GatorLinkUserName@ufl.edu. The preferred email address recorded for all students will be the GatorLink address. This is the email address displayed in the online phonebook. Students may continue to use the forwarding mechanism to deliver their email to other mail services, if they wish. However, it is the student's responsibility to insure that the forwarding address is current so that they receive official communications from the University.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. 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/>.

Course policy on in-class cell phone use and text messaging: Cell phones should be turned off or put on vibrate mode and should not be answered during class-related activities. Cell Phone Use: Cell phone use costs 10 pts/call from class attendance! If you are to get an emergency call, tell your Instructor or TA and when call comes step out to answer the call.

Due dates: Due dates for all assignments are included in the schedule below. Unless arrangements have been made with the course coordinator. **Late points:** 5 points for one day, 10 points for two days, 20 points for three days, and no points will be credited after three days.

Credit for class activities:

Date	Activity	Due	Full credit
Quizzes (4 × 100)			400
Sep 27	Quiz 1	Sep 27	100
Oct 11	Quiz 2	Oct 11	100
Nov 10	Quiz 3	Nov 10	100
Nov 29	Quiz 4	Nov 29	100
Lab			1000
Aug 25	Lab 1 – Field tour	Aug 30	200
Sep 13	Lab 2 – Rhizosphere pH mapping	Sep 15	100
Sep 27	Lab 3 – Table of essential elements (take home)	Sep 29	100
Oct 13	Lab 4 – Practical calculations for nutrient rates (take home)	Oct 18	100
Oct 18	Lab 5 – Find your answers from EDIS	Oct 20	100
Oct 25	Lab 6 – Tour: ARL/ESTL - meet at Wallace Building #631 at 2390 Mowry Road at 1:45 PM	Oct 27	100
Nov 8	Lab 7 – Grow plants in aeroponics	Nov 10	100
Nov 22	Lab 8 – Fertigation in Citra	Nov 29	200
Final (1 × 400)			400
Class attendance			200
Total points (100%)			2,000

QUIZ REDOS: *You have the opportunity to correct your answers to the quiz and receive up to 50% of the lost points if the corrected answer sheet is turned in within two days*

Course grading:

The UF Grading policies here: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Course grading:

Points credited	Percentile	Course grade
1850-2000	100-93%	A
1790-1849	92-90%	A-
1730-1789	89-87%	B+
1650-1729	86-83%	B
1590-1649	82-80%	B-
1530-1589	79-77%	C+
1450-1529	76-73%	C
1390-1449	72-70%	C-
1330-1389	69-67%	D+
1250-1329	66-63%	D
1190-1249	62-60%	D-
0-1189	59-00%	E

Fall 2016 Course Schedule

Nutrition of Horticultural Crops – HOS 3430C

Wk	Date	Period	Type	Topic	Instructor
1	Tu. August 23	7	LEC	Welcome- Syllabus, class philosophy, expectations and questions	David Liu
	Th. August 25	PM	LAB 1 (Field Tour)	<p>1. Growers Fertilizer Corporation, 633 NW 250th Street, Newberry, FL 32669 (352) 474-6274, Jim Smith, http://www.growersfertilizer.com/ jsmith@growersfertilizer.com</p> <p>2. The Green House Nursery, 15207 W Newberry Road, Newberry, FL 32669, 352-472-3699. Mr. Justin Green, ghnursery@gmail.com; http://www.thegreenhousenurseryfl.com/</p>	David Liu
2	Tu. August 30	7	LEC	Principles of plant nutrition 1. Factors affecting crop production 2. Fertility triangle 3. Techniques used for nutritional studies	Paul Fisher
			LAB 1 due		
	Th. Sept. 1	7	LEC	Fertilizer Usage 1. World 2. USA 3. Florida	Jerry Sartain
		8	LEC	Nitrogen 1. Organic N	
3	Tu. Sept. 6	7	LEC	2. Nitrification and Factors affecting nitrification	Jerry Sartain
	Th. Sept. 8	7 8	LEC	3. Reactions of NH ₃ with the soil 4. Reactions of NH ₄ ⁺ with the soil	Jerry Sartain

4	Tu. Sept. 13	7	LAB2	Rhizosphere pH mapping	David Liu
	Th. Sept. 15	7 8	LEC LAB2 due	5. Reaction of urea with soil 6. Fate of N fertilization	Jerry Sartain
5	Tu. Sept. 20	7		7. Effect of N source on plant growth,	Jerry Sartain
	Th. Sept. 22	7 8	LEC	8. Slow release N fertilizers 9. Controlled release N fertilizers	Jerry Sartain
6	Tu. Sept. 27	7	Quiz1 LAB3	Covers principles of plant nutrition and N Table of essential elements (take home)	David Liu
	Th. Sept. 29	7 8	LEC LAB3 due	Phosphorous 1. Chemistry & biochemistry in soil 2. Function in plant 3. Visual Deficiency symptoms 4. P fertilizers 5. Environmental issues with P	Monica Ozores-Hampton
7	Tu. Oct. 4	7	LEC	Potassium 1. Chemistry & biochemistry in soil 2. Function in plant 3. Visual Deficiency symptoms 4. K fertilizers	Monica Ozores-Hampton
	Th. Oct. 6	7	LEC	Calcium, Magnesium, Sulfur 1. Chemistry & biochemistry in soil 2. Function in plant	Monica Ozores-Hampton
		8	LEC	3. Visual Deficiency symptoms 4. Fertilizer sources: dolomite, lime, sulfur	

	Tu. Oct. 11	7	Quiz2	Covers all macronutrients	David Liu
	Th. Oct. 13	7 8	LEC LAB4	Nutrient Management for Container-Grown Crops 1. Fertilizer concentration and calculation Practical calculations for nutrient rates (take home)	Paul Fisher
9	Th. Oct. 18	PM	LAB5 LAB4 due	Find your answer from EDIS publications	David Liu
	Th. Oct. 20	7 8	LEC LAB5 due	Principles of Composting Compost utilization	Monica Ozores-Hampton
10	Tu. Oct. 25	7	LAB6	Tour: ARL/ESTL - meet at Wallace Building #631 at 2390 Mowry Road	David Liu
	Th. Oct. 27	7 8	LEC Lab6 due	Irrigation Scheduling Fertigation	Lincoln Zotarelli
	Tu. Nov.1	7	Quiz3	Covers fertilizer calculations, pH adjustment, organic systems, cover crops, composting	David Liu
11	Th. Nov. 3	7 8	LEC LEC	Micronutrients 1. Chemistry & biochemistry 2. Function in plant 3. Visual Deficiency symptoms 4. Micronutrient fertilizer sources: inorganic, organic, chelates	Rebecca Darnell
	Tu. Nov. 8	7	LAB7	Grow plants in aeroponics	David Liu
	Th. Nov. 10	7 8	LEC LAB7 due	1. Water fertilizer, plants, and pH 2. Importance of pH and pH adjustment	Paul Fisher
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	Tu. Nov. 15	7	LEC	Nutrient management vs. postharvest biology and technology	Jeff Brecht
	Th. Nov. 17	7 8	LEC	Best Management Practices (BMPs) and nutrient management to achieve Total Maximum Daily Loads (TMDLs) in Basin Management Action Plans (BMAPs)	Kelly Morgan
14	Tu. Nov. 22	7	LAB8 (Field Tour)	Fertigation in Citra	David Liu
	Th. Nov.24	Thanksgiving, NO class			
15	Tu. Nov. 29	7	Quiz4 LAB8 due	Covers micronutrients, BMPs	David Liu
	Th. Dec. 1	7 8	LEC	Organic Nutrient Management Cover Crops for Nutrient Management	Danielle Treadwell
16	Tu. Dec. 6	7	Review	Questions and Answers	David Liu
	Th. Dec. 8	Reading day			
	TBD	10-12:00	FINAL	Final Exam	David Liu

The quizzes and final exam are all closed book and closed notes.