

Environmental Crop Nutrition

AGR 6422c (3 Credits) – Fall 2016

Instructor: John Erickson

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Course description: Study of environmentally sound crop nutrient management strategies. During this course the effects of environmental conditions and nutrient management on crop production and environmental quality will be outlined. This course is intended to bridge theoretical aspects of plant mineral nutrition and practical applicability of basic principles of fertilization.

General course objectives: 1) Discuss root growth and nutrient uptake dynamics; 2) Outline the function of nutrients in plants; 3) Present methods for assessment of crop nutrient status and diagnosis of plant deficiency and toxicity symptoms; 4) Discuss the use of irrigation and nutrient budgets for agricultural crops; 5) Outline crop nutrient concentrations and requirements for selected crops; 6) Describe interactive environmental and biological processes that control crop nutrient uptake and potential nutrient losses; 7) Outline Best Management Practices (BMP's) for Florida crops.

Prerequisites: 1) A positive attitude, an inquisitive mind, and active course participation and 2) Introductory course in crop and/or soil science.

Class Schedule: Meets period 3 (9:35 a.m. – 10:25 a.m.) on Tuesday and periods 3 & 4 on Thursday (9:35 a.m. – 11:30 a.m.) in PSF 005. We will meet at the greenhouse behind building 345 off of Archer Road on some Thursdays for lab.

Office Hours: Generally, before class is the best time to meet with the instructor, but I can be seen by appointment at other times. I strongly encourage students to meet with me if you have any questions or need clarification of course content.

Textbook: There will be no required text. I will use a number of textbooks, including those listed below. Excerpts from these texts and other additional readings from the primary literature for the course will be provided through Sakai.

- 1) Fageria, NK. 2009. *The use of nutrients in crop plants*. CRC Press. Boca Raton, FL.
- 2) Barker, AV and DJ Pilbeam. 2007. *Handbook of Plant Nutrition*. CRC Press, Boca Raton, FL.

Instructional approach: Dr. Erickson will provide nearly all instructional content via readings, lectures, homework exercises, discussions, demonstrations, and lab work. If you are having any problems with the course or need assistance, don't wait until late in the semester to contact the instructor. The sooner we begin to address the problem, the more likely you will achieve a satisfactory outcome. Students are expected to be active learners by critically evaluating readings, web content, and lectures, asking questions when needed, and participating in discussions.

Exams will be given during lecture periods as scheduled in your syllabus. They will emphasize material covered in the preceding one-third of the course, but some material will be comprehensive. Exams will be closed book (any necessary formulas/equations will be provided in the exam) and you will be expected to finish within the scheduled period.

Attendance: Student class attendance will be noted. Students are responsible for all material covered in lecture and all assigned reading and homework materials. Attendance is important for mastering course content and for successfully conducting your lab experiment. There will be no make-up exams or in-class assignments except for excused absences. Make-up work should be arranged prior to the excused absence if possible (e.g., university-sanctioned events), or immediately upon the student's return to class for unexpected excused absences (e.g., illness or death in the immediate family).

Grading: Students are responsible for all material covered in the course. There will be a total of 600 points for the class. The three exams will count 100 points each. The total point value of the six in-class and take-home assignments will be worth 150 points. You will also be required to submit a written lab report of your lab results worth 100 points and presentation (50 points) of your lab results to the class.

<u>Item</u>	<u>Points</u>
Exam 1	100
Exam 2	100
Exam 3	100
Assignments	150
Lab write-up	100
Presentations	<u>50</u>
Total	600

Assigned exercises, lab write-ups, and exams will be graded based on completeness, conciseness, clarity, effort, organization, originality and timeliness. Turning in your work late will result in a 5% reduction in credit per day late.

Students attaining the following percentages are guaranteed at least the following grades:

A 93 - 100%	A- 90 - 92%	B+ 87 - 89%	B 83 - 86%
B- 80 - 82%	C+ 77 - 79	C 73 - 76%	C- 70 - 72%
D+ 67 - 69%	D 63 - 66%	D- 60 - 62%	E <60%

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> (Links to an external site.)Links to an external site.

Accommodations for Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office, which will document the accommodation. The student is responsible for delivering the documentation and alerting the instructor to the accommodation required.

Academic Honesty, Software Use, Campus Helping Resources, Services for Students with Disabilities

Academic Honesty

In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council, or Student Conduct and Conflict Resolution in the Dean of Students Office.

(Source: 2012-2013 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

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.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,
<http://www.counseling.ufl.edu/cwc/> (Links to an external site.)Links to an external site.

Counseling Services

Groups and Workshops

Outreach and Consultation

Self-Help Library

Training Programs

Community Provider Database

Career Resource Center, First Floor JWRU, 392-1601,
<http://www.crc.ufl.edu/> (Links to an external site.)Links to an external site.

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 352-392-8565, <http://www.dso.ufl.edu/drc/> (Links to an external site.)Links to an external site.

Course Topics:

- 1) Course introduction and outline of general concepts in plant nutrition
- 2) Function of plant nutrients in plants and diagnosis of deficiency and toxicity symptoms
- 3) Root function and physiology
- 4) Irrigation management practices for improving nutrient uptake efficiency and minimizing environmental impacts of agricultural production

- 5) Nutrient uptake by plants with special reference to nitrogen
- 6) Crop nutrition and yield formation
- 7) Crop nutrition and plant diseases
- 8) Diagnostic tissue sampling
- 9) Crop nutrient concentrations and requirements for selected crops
- 10) Nutrient management and environmental quality
- 11) Best Management Practices for Florida crops