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## Nutritional Management of Nursery Crops ORH4256

### Instructor Contact Info

Dr. Kimberly Moore  
3205 College Ave. Davie FL 33314  
954-577-6328  
954-475-4125 (fax)  
Email: [klock@ufl.edu](mailto:klock@ufl.edu)  
Office hours: upon request

**Email/phone messages:** students can expect a response within 24 hrs. M-F and within 72 hrs. on weekends. **My preferred way of communicating with students is using email.** I check my UF email frequently every day and on the weekends. If I plan to be out of the office or out of email communication, I will email the class and post an announcement on the class website.

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### Course Overview

This is an online undergraduate level course presenting techniques for determining, interpreting, and managing the nutritional status of ornamental crops in the greenhouse, nursery, or landscape. Topics that will be covered: water quality, substrate physical and chemical parameters, and irrigation/fertilization practices, meter selection and calibration, water analysis, substrate/soil analysis, report interpretation and writing, diagnosis, and recommendations. Upon successful completion of this course, students will be able to determine, interpret, and adjust water quality; substrate physical parameters; substrate chemical parameters; irrigation practices; fertilization practices.

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### Text (highly recommended)

Jones, J. Benton. 2012. *Plant Nutrition and Soil Fertility Manual 2<sup>nd</sup> Edition*. CRC Press, New York. ISBN -978-1-4398-1609-7

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### Additional Reading

Agnew, M.L., N.H. Agnew, N.E. Christians, and A. M. VanDerZanden. 2008. *Mathematics for the Green Industry*. John Wiley & Sons Inc. Hoboken, NJ.

Epstein, E. and A.J. Bloom. 2004. *Mineral Nutrition of Plants: Principles and Perspectives*. Sinauer Association Inc. Sunderland Mass.

Glass, A.D. M. 1989. *Plant Nutrition. An Introduction to Current Concepts*. Jones and Bartlett Publishers Inc, Boston. ISBN 0-86720-080-4

Marschner, H. 1995. *Mineral Nutrition of Higher Plants, Second Edition*. Academic Press, New York.

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Mengel, K. E.A. Kirby, H. Kosegarten, and T. Appeal. 2001. *Principles of Plant Nutrition*. Kluwer AC Pub., Boston.

Reed, D.W. (ed) 1996. *Water, Media, and Nutrition for Greenhouse Crops*. Ball Publishing, Batavia, IL.

Whipker, B.E., J.M. Dole, T.J. Cavins, J.L. Gibson, W.C. Fonteno, P.V. Nelson, D.S. Pitchay, and D.A. Bailey. *Plant Root Zone Management*. North Carolina State University.  
([www.nccfga.org](http://www.nccfga.org))

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## Course Prerequisites

SWS 3022, ORH 3253C, or consent of instructor

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## Acceptable Course Participation

This is an online course with weekly lectures and assignments. The week begins on Monday and ends on Sunday. Students are expected to login to the course website at least once a week (see [schedule](#)) to complete the reading assignments and watch the narrated lecture (see [course goals and assignments](#) & [assessment](#)).

All course materials will be available via the Canvas course website. Unless you have an excused absence, students are expected to participate in online discussions and chat room meetings. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluation online via GatorEvals. Guidance on how to give feedback in a professional and respectful manual is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period 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.aa.ufl.edu/public-results/>.

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## Course Goals and Assignments

Upon successful completion of this course, students will be able to: measure water quality parameters (pH, soluble salts, alkalinity); measure substrate/soil physical parameters (total porosity, air filled porosity and container capacity); measure substrate chemical parameters (pH and soluble salt); select and calibrate meters used in nutritional diagnosis; interpret water analysis reports; interpret soil analysis reports; make recommendations for improving crop growth based on data collected in the field.

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This course is divided into three modules (see [schedule](#)). Each module consists of four recorded lectures with related reading assignments and a challenge. Each week, students will be responsible for completing the reading assignment, watching the narrated presentation, and completing a discussion post (see [late assignment policy](#)).

**Discussion posts:** Discussion posts should be well written and address the issue or question being discussed. All posts should be made within in the week assigned. Discussions will be graded on the quality and timeliness of the response (see discussion grading rubric attachment under syllabus tab). Each student is expected to comment on **two classmates' posts**. Discussion posts will be accepted up to four days after the due date but will be marked down 2 points. They are worth 10 points.

**Module quiz:** The quiz will cover material discussed in the lectures in that module. It is open notes/book. It also is timed. Each quiz is worth 25 points.

**Challenge assignments:** Students will be given a crop with a nutritional problem as well as other pertinent data (water quality, fertilization and irrigation practice, substrate physical and chemical parameters) and the student will be asked to: 1) determine the nutritional problem, and 2) develop a recommendation or solution for the problem. They are worth 25 points.

**Scholar's Ignite:** The Scholar's Ignite Video Presentation is an exciting and fun assignment designed to provide an opportunity for you to generate awareness, stimulate thought, and inspire your peers with horticultural topics or ideas through a short 1-slide, 3-minute multimedia presentation. You will be required to select a topic, prepare a presentation, and present/upload your work to your peers. This assignment is like presentations and competitions held at scientific conferences and other academic institutions. This is worth 100 points.

To complete this assignment, you will be responsible for fulfilling the following tasks:

1. Select a presentation topic to research and review. The topic should develop one an idea presented in class or identify a new topic related to plant nutrition; prior approval from your instructor is required.
2. Develop a 1-slide, 3-minute presentation using computer software. Your presentations should rely upon pictures, tables, or graphs to convey your idea(s). Remember that your presentation should be developed for a diverse audience, thus presented information should be comprehensible to individuals without expertise in the subject area.
3. Upload your presentation within Canvas.

You will be graded on the following:

1. Communication style: how well did the presenter communicate the topic or information?
2. Comprehension: was the presenter clear and organized?
3. Inspiration and engagement: did the presentation inspire you?
4. Impact: did the presentation have a strong influence on your knowledge or perception?

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5. Content: was the presentation content clear and well organized with information pertinent to the subject?

Grades for all assignments will be posted seven days after the student turns them in. If the instructor cannot return the assignment within this time frame, the instructor will notify the student as to when the assignment will be graded. [\[Top\]](#)

## Assessment

See [schedule](#) for dates. The week begins on Monday and ends on Sunday. Most discussions are due Wednesday at 5 pm and other assignments need to be completed by the end of each week (Sunday 5 pm, Eastern time zone). When in doubt, please refer to the syllabus for due dates.

The accepted format for all assignments is MS Word files. If there is a malfunction with the class site or computer malfunctions occur, assignments may be emailed or sent via fax. It is the obligation of the student to inform me of such malfunctions immediately.

All grades are based on the number of points earned out of total number [of points](#) \* 100 to calculate a percentage.

[Module 1](#) – *Appraising the problem, essential elements, nutrient uptake mechanisms, and visual diagnosis*

[Module 2](#) – *Meter calibration, substrate physical, substrate chemical, water analysis (Week 6 – Meter Calibration*

[Module 3](#) – *Fertilizer, nutrient use efficiency, landscape issues, interactions* Week 12 – *Fertilizer Analysis*

## TOTAL POSSIBLE POINTS & GRADES = 380 points

Points earned/370 pts\*100 to calculate a percent

For information on current UF policies for assigning grade points, see

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

|    |           |
|----|-----------|
| A  | (95-100%) |
| A- | (90-94%)  |
| B+ | (88-89%)  |
| B  | (85-87%)  |
| B- | (80-84%)  |
| C+ | (78-79%)  |
| C  | (75-77%)  |
| C- | (70-74%)  |

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|    |          |
|----|----------|
| D+ | (68-69%) |
| D  | (65-67%) |
| D- | (60-64%) |
| E  | (0-59%)  |

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## Absences and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work in this course are consistent with university policies that can be found at:

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

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## 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."*** You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."***

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. For more information regarding the Student Honor Code, please see: <http://sccr.dso.ufl.edu/process/studnet-conduct-code/>.

## 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.

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## **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 [umatter.ufl.edu/](http://umatter.ufl.edu/) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* Visit [counseling.ufl.edu/](http://counseling.ufl.edu/) 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 [shcc.ufl.edu/](http://shcc.ufl.edu/).

*University Police Department:* Visit [police.ufl.edu/](http://police.ufl.edu/) 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; [ufhealth.org/emergency-room-trauma-center](http://ufhealth.org/emergency-room-trauma-center).

### **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 [career.ufl.edu/](http://career.ufl.edu/).

*Library Support:* [cms.uflib.ufl.edu/ask](http://cms.uflib.ufl.edu/ask) 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. [teachingcenter.ufl.edu/](http://teachingcenter.ufl.edu/)

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. [writing.ufl.edu/writing-studio/](http://writing.ufl.edu/writing-studio/)

*Student Complaints On-Campus:* [sccr.dso.ufl.edu/policies/student-honor-codestudent-conduct-code/](http://sccr.dso.ufl.edu/policies/student-honor-codestudent-conduct-code/)

*On-Line Students Complaints:* [distance.ufl.edu/student-complaint-process/](http://distance.ufl.edu/student-complaint-process/)

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## **Services for Students with Disabilities**

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://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.

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## Tentative Schedule –

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| Week of                               | Topic and Assignments                                       | Due Date –<br>5 pm Eastern Time |
|---------------------------------------|---|---------------------------------|
| <b>Module 1</b> <a href="#">[Top]</a> |   |                                 |
| <b>Jan 5</b>                          | <b>Introduction/Appraising the Problem</b>                  |                                 |
|                                       | Reading – Chapters 1 & 5                                    |                                 |
|                                       | Lecture 1 – narrated Power Point                            |                                 |
|                                       | Introduction (10 pts)                                       | Jan 9                           |
| <b>Jan 10</b>                         | <b>Essential Elements</b>                                   |                                 |
|                                       | Reading – Chapter 3   |                                 |
|                                       | Lecture 2 – narrated Power Point                            |                                 |
|                                       | Phosphorus and algae (10 pts)                               | Jan 12                          |
|                                       | Scholar’s Ignite Topic (10 pts)                             | Jan 16                          |
| <b>Jan 17</b>                         | <b>Nutrient Uptake Mechanisms</b>                           |                                 |
|                                       | Reading – Chapter 4   |                                 |
|                                       | Lecture 3 – narrated Power Point                            |                                 |
|                                       | Arsenic (10 pts)  | Jan 19                          |
| <b>Jan 24</b>                         | <b>Visual Diagnosis/Tissue Analysis –<br/>pros and cons</b> |                                 |
|                                       | Reading – Chapter 17  |                                 |
|                                       | Lecture 4 – narrated Power Point                            |                                 |
|                                       | I just fertilized . . . (10 pts)                            | Jan 26                          |
|                                       | Module 1 Quiz (25 pts)                                      | Jan 30                          |
| <b><u>Jan 31</u></b>                  | <b><u>Challenge - Banana (25 pts)</u></b>                   | Feb 6                           |



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| Week of                                  | Topic and Assignments   | Due Date –<br>5 pm Eastern Time |
|--|---|---------------------------------|
| <b>Module 2</b><br><a href="#">[Top]</a> |   |                                 |
| <b>Feb 7</b>                             | <b>Meter calibration - Why is this important?</b>                 |                                 |
|  | Reading – Chapter 16  |                                 |
|  | Lecture 5 – narrated Power Point                                  |                                 |
|  | Training employees (10 pts)                                       | Feb 9                           |
| <b>Feb 14</b>                            | <b>Substrate – Physical properties</b>                            |                                 |
|  | Reading – Chapter 7   |                                 |
|  | Lecture 6 – narrated Power Point                                  |                                 |
|  | Melon turning yellow (10 pts)                                     | Feb 16                          |
| <b>Feb 21</b>                            | <b>Substrate-Chemical properties – Soil report interpretation</b> |                                 |
|  | Reading – Chapter 8   |                                 |
|  | Lecture 7 – narrated Power Point                                  |                                 |
|  | Same deficiencies (10 pts)  | Feb 23                          |
| <b>Feb 28</b>                            | <b>Water quality - Water report interpretation</b>                |                                 |
|  | Reading – Chapter 22  |                                 |
|  | Lecture 8 – narrated Power Point                                  |                                 |
|  | Hard water (10 pts)   | March 2                         |
|  | Module 2 Quiz (25 pts)  | Mar 6                           |
| <b><u>Mar 7</u></b>                      | <b><u>Spring break</u></b>  |                                 |

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| Week of                                  | Topic and Assignments  | Due Date –<br>5 pm Eastern Time |
|--|--|---------------------------------|
| <u><b>Mar 14</b></u>                     | <u><b>Challenge Site Visit (25 pts)</b></u>  | March 20                        |
| <b>Module 3</b><br><a href="#">[Top]</a> |  |                                 |
| <b>Mar 21</b>                            | <b>Fertilizer analysis</b>   |                                 |
|  | Reading – Chapter 19 & 20  |                                 |
|  | Lecture 9 – narrated Power Point   |                                 |
|  | Poinsettia (10 pts)  | Mar 23                          |
| <b>Mar27</b>                             | <b>Nutrient Use Efficiency</b>   |                                 |
|  | Read – Chapter 27  |                                 |
|  | Lecture 10 – narrated Power Pont   |                                 |
|  | Respect the soil (10 pts)  | Mar 30                          |
|  | AI Use in Horticulture (10 pts)  | Apr 3                           |
| <b>Apr 4</b>                             | <b>Mismanagement Issues</b>  |                                 |
|  | Read – Chapter 26  |                                 |
|  | Lecture 11 – narrated Power Point  |                                 |
|  | Growing plants without water (10 pts)  | Apr 6                           |
| <u><b>Apr 11</b></u>                     | <u><b>Scholars Ignite (100 pts)</b></u><br><u><b>Challenge – Soil report Nassau (25 pts)</b></u> | Apr 17                          |
| <u><b>April 18</b></u>                   | <u><b>Challenge me (25 pts)</b></u>  | Apr 24                          |