

**Agricultural and Biological Engineering Department
University of Florida**

Agricultural Operations Management 4434

Precision Agriculture

Spring, 2020

Class number 10654 (Section 2C12)

Class number 10655 (Section 3E82)

Catalog Description:

AOM 4434 Precision Agriculture. *Credits: 3. Prereq: Junior standing.* Principles and applications of technologies supporting precision farming and planning for natural resource data management. Global positioning system (GPS), yield monitoring and mapping, remote sensing, geographic information system (GIS), variable rate technologies (VRT), data layering of independent variables, Internet information access, and computer software for management.

Instructor: Dr. Wonsuk "Daniel" Lee
Frazier Rogers Hall, Room 207
(352) 294-6721
wslee@ufl.edu
<https://abe.ufl.edu/people/faculty/wonsuk-lee/>

Teaching Assistants

Oscar Castillo, ocastilloromero@ufl.edu
Xue Zhou, zhoux3@ufl.edu

This course is intended for students with upper division standing in the Colleges of Agricultural and Life Science, Natural Resources and Environment, and Engineering. In addition to having Junior standing, students should be experienced in using MS Windows, a web browser, a word processor, a presentation tool, and a spreadsheet.

Lecture Hours: Mon 12:50 PM – 2:45 PM (Period 6-7), Rogers Hall 129

Laboratory Hour: Rogers Hall 211 & various other locations

Section 2C12: Tue 1:55 PM – 3:50 PM (Period 7-8)

Section 3E82: Thu 1:55 PM – 3:50 PM (Period 7-8)

Course homepage: <https://elearning.ufl.edu/>.

Office Hours: My door is open to students at any time. You are welcome to visit me whenever I am available, or by appointment.

Text: *The Precision-Farming Guide for Agriculturists*, by Morgan and Ess, Deere & Company, **2017. 4th Edition (ISBN: 0-86691-435-8**, John Deere Publications: 1-800-522-7448, Order no. FP404NC, On-line: https://www.deere.com/en_US/services_and_support/manuals/john-deere-publishing.page).

Course lecture notes will be available in the E-Learning course website.

Course Objectives: This course covers information and *state-of-the-art* technologies that are used for precision farming and their applications. In this course we would like to:

1. Describe what precision agriculture is and why it is needed,
2. Explain basic principles and applications of the Global Navigation Satellite System (GNSS),
3. Become familiar with Geographic Information System (GIS) and be able to utilize it,
4. Understand how soil sampling is used for precision agriculture,
5. Describe what yield monitoring/mapping system is,
6. Identify current remote sensing technologies, and
7. Explore principles and applications of variable rate technologies.

Attendance at lectures and laboratory exercises is required.

Homework will be assigned after each chapter is finished and will be due at the beginning of the class.

Laboratory assignments will be handed out every laboratory session. Lab assignment is due at the beginning of the lab period.

Quizzes will be given every Monday at the end of lecture. The quiz problems are from the previous week's lecture, lab exercise, homework, and DIY quiz. Quizzes cannot be made up.

DIY Quiz: After Monday's lecture each week, you are required to upload 3 quiz problems with answers from the same week's lecture in the E-Learning Chat room. They will be due by 10:00 AM Monday in the following week. The question format should be similar to the homework problems. See an example at the end of this syllabus.

Every week two best quiz problems will be selected and given a 20% extra credit for the DIY quiz. A 10% extra credit will be given to the first upload. You can upload them starting at 3:00 PM Monday. No late submission is accepted for DIY Quiz.

Late submission policy: Homework, lab and all other assignments are due at the beginning of the class. Thereafter 10% reduction/business day. See the detailed guidelines at the end of the syllabus.

Test dates: Test 1: Monday, **February 3**
Test 2: Monday, **March 16**
Test 3: Monday, **April 20**

Grading will be based on the following items and weights:

Tests (3):	15% each	91 – 100%	A	72 – 76%	C
Quiz:	20%	89 – 91%	A-	69 – 72%	C-
DIY Quiz:	10%	86 – 89%	B+	66 – 69%	D+
Homework:	10%	82 – 86%	B	62 – 66%	D
Lab assignment:	15%	79 – 82%	B-	59 – 62%	D-
		76 – 79%	C+	Below 59%	E

Grades and Grade Points: For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

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/ugrad/current/regulations/info/attendance.aspx>.

Online Course Evaluation Process: 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.ua.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.ua.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 honesty and integrity." 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://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

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: 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc. 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. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

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, www.counseling.ufl.edu
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>.

Student Complaints:

- Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.
- Online Course: <http://www.distance.ufl.edu/student-complaint-process>

Format of DIY quiz: The format of DIY quiz is below.

DIY Quiz-Lecture date

Questions:

1. Question 1...
2. Question 2...
3. Question 3...

Answers:

1. Answer 1...
2. Answer 2...
3. Answer 3...

Example

DIY Quiz-Jan 14

Questions:

1. What are the three objectives for precision agriculture?
2. What does SSCM stand for?
3. What geodetic datum do GPS receivers use primarily?

Answers:

1. Reduce waste, increase profits, and maintain the quality of the environment
2. Site-specific crop management
3. WGS84 and NAD83

Assignment submission guidelines – The following rules will be strictly enforced!

- Submit on time, i.e., “at the beginning of the class”!
- I will collect them at the beginning of the class, and put them in my “Red” & “Blue” folders.
- After I close the “Red” and “Blue” folders, if your submission is not in the folder, it means your submission is late.
- Since Monday’s lecture starts at 1:55 pm, one-day late submission starts from the time when the folders are closed until 1:55 pm the next day (24-hour period).
- Example 1: If your assignment is due Monday and you submit it at 2 pm on Monday, your submission is considered to be 1-day late (10% deduction). (I am sorry about this strict rule, however have to enforce the rule fairly for all of you.)
- Example 2: If your assignment is due Monday and you submit it at 3 pm on Tuesday, your submission is considered to be 2-days late (20% deduction).
- Please **staple** your submission. If not stapled, there will be a **20% deduction** from the full credit. Please remember that you are not the only one who is submitting an assignment, and “non-stapled” submission may be lost and mixed together with others.
- In case you submit your assignment under my office door, please **write down the time and date** of your submission (i.e., time stamp). If you don’t have a time stamp, it is considered to be submitted when I find it.
- No email submission is allowed.
- If you show any extra efforts on your assignments and activities during lectures and lab exercises, there is a **high potential for an extra credit** and high impact on your final grade.