

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

**Agricultural Operations Management 5435
Advanced Precision Agriculture
Fall, 2020 (Class Number 23212, 28467)**

Catalog Description:

AOM 5435 Advanced Precision Agriculture. F. Credits: 3. Prereq: Graduate student standing or permission of instructor. Principles and applications of technologies supporting precision farming and natural resource data management planning. Global positioning system (GPS), geographic information systems (GIS), variable rate technologies (VRT), data layering of independent variables, automated guidance, Internet information access, computer software management.

Prerequisite: This course is intended for graduate students in the Colleges of Agricultural and Life Sciences, Natural Resources and Environment, and Engineering. Advanced undergraduate students may take the course with permission of the instructor. Students should be computer literate.

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

Class Hour : M 10:40 AM – 12:35 PM (4th-5th periods), Lectures will be delivered synchronously at these times using Zoom. Recorded lectures will be available later.

Laboratory Hour: W 10:40 AM – 12:35 PM (4th-5th periods), Lab exercises will be conducted online using pre-recorded videos, which can be viewed asynchronously. Your presence may be required when a GPS receiver is handed out.

Course homepage: <https://elearning.ufl.edu>. Course lecture notes, lab handouts, and other course related materials will be available on the course website.

Office Hours: 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 Publishing: 1-800-522-7448, Order no. FP404NC, On-line: https://www.deere.com/en_US/services_and_support/manuals/john-deere-publishing.page).

Course Objectives: This course covers information and 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 the principles and applications of the Global Navigation Satellite System (GNSS),
3. Describe what yield monitoring system is,
4. Identify current remote sensing technologies,
5. Become familiar with GIS (Geographic Information Systems) software and be able to utilize it,
6. Explore principles and applications of variable rate technologies,
7. Be able to identify sensing technology for precision agriculture, and
8. Apply precision agriculture to a real situation.

After learning these technologies, if time permits, more in-depth topics will be covered such as yield calculation and yield map generation, soil property measurements (spectrophotometer and other devices), comparison of yield and soil test results, sensors for site-specific application, VRT system calibration and map generation based on recommended equations, economics and profitability of precision agriculture, development of site-specific management plans, etc.

Quizzes will be given every two weeks on Mondays during the semester, starting **September 14**. Quizzes are given at the end of the class using Honorlock. Quizzes cannot be made up.

Homework will be available on the course website after each chapter, only for the self-study purpose, and will not be submitted nor graded. These will be useful for preparing quizzes and tests.

Laboratory assignments will be handed out for every laboratory session. Laboratory assignments should be typed. Lab assignments are due at the beginning of the class.

Late submission policy: All assignments are due at the beginning of the class. Thereafter a 10% reduction per business day.

Grading will be based on the following items and weights:

Test 1 (Oct. 14):	20%	91.0 – 100%	A	76.0 – 79.9%	C+
Test 2 (Dec. 9):	20%	89.0 – 90.9%	A-	72.0 – 75.9%	C
Quiz:	15%	86.0 – 88.9%	B+	69.0 – 71.9%	C-
Lab assignment:	15%	83.0 – 85.9%	B	66.0 – 68.9%	D+
Term Project:	30%	80.0 – 82.9%	B-	62.0 – 65.9%	D
				59.0 – 61.9%	D-
				Below 58.9%	E

Term project: Project topics will be discussed during class. Each student will present his/her work during a class period at the end of the semester. The following are important due dates for the project.

- Project outline: Monday, September 21 (50 pts) – Title, significance, and objectives.
- Progress report: Monday, October 19 (100 pts) – Up to “Materials and Methods” in Coversheet along with revised title, significance, and objectives.
- Final written report: Monday, November 23 (75 pts) – Full report
- Presentation: Wednesday, December 2 (25 pts)

Attendance at lectures and laboratory hours is required.

Physical presence requirement: You are required to meet as a class in a physical location (i.e., west side of the Frazier Rogers Hall) for one of the lab exercises. This will happen only once during the semester. Proper time and date will be determined later to accommodate all your availability.

Grades and Grade Points: For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/graduate/regulations/#text>.

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/graduate/regulations/#text>.

Online Course Privacy Related Issues: This course will be 100% online. Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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.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/>.

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.

Academic Honesty: UF students are bound by The Honor Pledge which states, “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. On all work submitted for credit by students 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.” The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Honor Code](#). Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

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 Resources: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources.

Health and Wellness

- *U Matter, We Care:* If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) 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 the Student Health Care Center website](#).
- *University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- *Sexual Assault Recovery Services (SARS):* Student Health Care Center, 392-1161.
- *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; [Visit the UF Health Emergency Room and Trauma Center website](#)

Academic Resources

- *E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- *Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support:* 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.
- *Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Career Resource 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 Student Complaints: <http://www.distance.ufl.edu/student-complaint-process>

