Agricultural and Biological Engineering Department
University of Florida

Agricultural Operations Management 5435
Advanced Precision Agriculture
Fall, 2018 (Class Number 10732)

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, field sensors and computer software for precision farming.

Instructor: Dr. Wonsuk "Daniel" Lee
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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.

Class Hour : M 10:40 AM – 12:35 PM (4th-5th periods), Frazier Rogers Hall Room 211
Laboratory Hour: W 10:40 AM – 12:35 PM (4th-5th periods), Frazier Rogers Hall Room 211/282, and various other locations

Course homepage: https://elearning.ufl.edu. Course lecture notes will be available in the course website.

Office Hours: My door is *always* 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 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 lecture notes will be available in the E-Learning course website.

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 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.

During the second half of the course, 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 approximately 6 to 8 times at random during the semester. Quizzes cannot be made up. Quizzes are given at the beginning of the class. If you are not present at the time it is handed out, you are not allowed to take it.

Homework will be available in 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 every laboratory session. Laboratory assignments should be typed. Lab assignments are due at the beginning of the class. No late submissions will be accepted.

Grading will be based on the following items and weights:

Test 1 (**Oct. 10**):	20%	91 – 100%	A	76 – 80%	C+
Test 2 (**Dec. 5**):	20%	89 – 91%	A-	72 – 76%	C
Quiz:	15%	86 – 89%	B+	69 – 72%	C-
Lab assignment:	15%	83 – 86%	B	66 – 69%	D+
Term Project:	30%	80 – 83%	B-	62 – 66%	D
				59 – 62%	D-
				Below 59%	E

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

- Project outline: Monday, September 17 (50 pts) – Title, justification, and objectives.
- Progress report: Monday, October 15 (100 pts) – Up to "Materials and Methods" in Coversheet
- Final written report & presentation: Monday, November 19 (100 pts) – Full report

Attendance at lectures and laboratory hours is required.

Academic Honesty: Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code. 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."

Use of Library, Personal References, PC Programs and Electronic Data Bases: These items are university property and should be utilized with other users in mind. Never remove, mark, modify nor deface resources that do not belong to you. If you're in the habit of underlining text, do it only on your personal copy. It is inconsiderate, costly to others, and dishonest to use common references otherwise.

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: I hope to establish a class relationship and encourage dialog so that students feel comfortable discussing academic problems directly with me. In addition, 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. Counseling & Wellness Center, 3190 Radio Road, 392-1575, www.counseling.ufl.edu.
2. Student Mental Health Services, Student Health Care Center, 392-1575, shcc.ufl.edu/services.
3. Career Resource Center, 6861 Reitz Union Drive, 392-1601, www.crc.ufl.edu.
4. Submitting a written complaint: https://registrar.ufl.edu/writtencomplaints

Students with Disabilities: 0001 Reid Hall, 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.