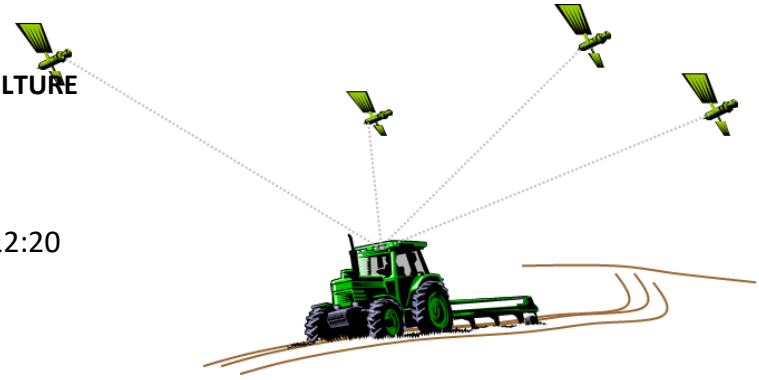

CRSS 3030: PRINCIPLES OF PRECISION AGRICULTURE
FALL SEMESTER, 2022

3 credit hours
Lectures on Monday and Wednesday at 11:30-12:20
Labs on Friday at 11:30-13:30
601 NESPAL Building, Tifton Campus
1203 Miller Plant Sciences, Athens Campus

Prerequisites
MATH 1113

Instructors
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Office Hours
Please make an appointment if you would like a face-to-face meeting. Otherwise, we are always available by phone or email.

Course Description
The course covers the principles, tools, and technologies that are important to precision agriculture. We will use the weekly laboratories to provide you with experiential learning of the materials covered during the lectures and to provide hands-on training with the tools and technologies we will be discussing.

Learning Objectives
Provide students with a good understanding of the principles of precision agriculture, the ability to analyze and evaluate spatially distributed data, the ability to design and implement precision agriculture management plans, and the experience to use key precision agriculture tools and technologies. Additional goals are to:

- extend critical thinking and problem solving abilities;
- improve written and oral communication skills; and
- learn how to create, present, and interpret maps.

Note
The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Tentative Course Outline

- Introduction
- Global Navigation Satellite Systems (GNSS)
- GNSS Guidance
- Geographic Information Systems (GIS)
- Soil Electrical Conductivity
- Soil Sampling
- Remote Sensing
- Exam 1
- Yield Monitors
- Management Zones
- Variable Rate Technology
- Exam 2
- Variable Rate Irrigation
- Profitability of Precision Agriculture
- Design Project Presentations
- Final Exam

Guest Lecturers
Experts in various aspects of precision agriculture will occasionally present lectures or provide demonstrations of products. Students will be notified in advance of appearance by guest lecturers. Attendance is mandatory during guest lectures.

Key Class Activities

Making Maps

Because maps are the key informational tools of precision agriculture, you will become proficient at making maps. You will use maps to display the variability of measured field parameters such as yield, elevation, soil electrical conductivity, pH, etc. You will be required to learn specialized mapping software to complete your assignments.

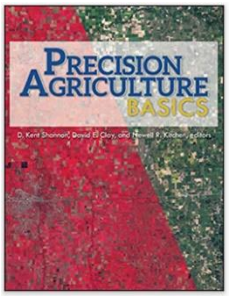
Labs and Lab Assignments
We will be conducting laboratories to provide you with experiential learning, to reinforce the materials presented during lectures, and to provide hands-on training with the technologies we will be discussing. Following some laboratories, an assignment summarizing the lab's activities and including requested materials (usually maps) will be due one week after the lab.

Design Project
You will be divided into teams of three or four. Each team will act as an agricultural consulting firm which is bidding for the contract to develop and implement a precision agriculture management plan for an agribusiness. At the end of the semester, each team will submit a written proposal with their plan and will also make an oral presentation to the agribusiness owner(s). The team's grade will be a combination of how the written report and oral presentation are scored. Again, this is an opportunity to impress. The written proposal and oral presentation will be due during the final week of class.

The team's grade will be a combination of how the written proposal and oral presentation to the client are scored. A Team Member Peer Evaluation Form will be used to determine the Design Project grade of individual team members.

Textbooks and Teaching Materials:
A textbook is not required. Reading materials will be made available on ELC and will include benchmark research articles, manuals, and other materials.

Optional Textbook
Precision Agriculture Basics
D. Kent Shannon, D.E. Clay, and N.R. Kitchen, editors
American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America
ISBN: 978-0-89118-366-2



Grading
The grade you receive in this course will be determined from your performance on one mid-term exam, homework assignments, a team design project, a comprehensive final exam, and class participation. These factors will be weighted as follows:

- Exam 1 10%
- Exam 2 10%
- Homework Assignments 45%
- Design Project 20%
- Final Exam 15%

Active class participation is important for you to achieve the learning goals of the class.

Per Board of Regents policy, we reserve the right to drop students from the class roll who miss more than 5 class periods except in cases of illness (note from a doctor) or family emergency. Such students will be given a WF grade.

Final grades will be assigned as follows:

- A 93 and above
- 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
- F 59 and below

Up to thirty percent of the grade on written assignments (homework assignments and papers) and oral presentations will be based on quality of communication. Spelling, grammar, punctuation, and clarity of writing are evidence of written communication quality. Enunciation, voice projection, clarity and logical order of the presentation and effective use of visual aids are evidence of oral communication quality.

Policy for Late Assignments and Missed Exams and Quizzes

- Most labs will be conducted in the field and cannot be made up. They will not be offered via Zoom as they will take place outdoors. Assignments associated with lab activities that are missed will not be accepted. If you have special circumstances that prevent you from participating in a lab exercise, please let me know in advance.
- Homework assignments will be accepted up to one week beyond the due date. The penalty for submitting a late assignment is a reduction of 10% in the grade.
- Homework assignments may be submitted late without penalty in case of illness, extenuating circumstances, or if prior arrangements are made with the instructors. All late assignments are due within a week of the original due date or within a week of when a student returns from an illness.

Academic Honesty

Students are reminded that they are bound by the University's Academic Honesty Policy. We take this very seriously. A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at: https://honesty.uga.edu/

The UGA Student Honor Code states: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others."

All academic work must meet the standards contained in "A Culture of Honesty." Each student is responsible for informing themselves about those standards before performing any academic work.

For this course, all lab reports and other assignments can be discussed with your classmates but any work you turn in must be your own.

Plagiarism of online and other sources will not be tolerated. Any assignment that includes plagiarized materials will be assigned a grade of zero. A second infraction will result in referral to UGA's Office of Academic Honesty.

Definition of Plagiarism
(https://honesty.uga.edu/Academic-Honesty-Policy/Prohibited_Conduct/)
Submission for academic advancement the words, ideas, opinions or theories of another that are not common knowledge, without appropriate attribution to that other person. Plagiarism includes, but is not limited to, the following acts when performed without appropriate attribution:

- Directly quoting all or part of another person's written or spoken words without quotation marks, as appropriate to the discipline;
- Paraphrasing all or part of another person's written or spoken words without notes or documentation within the body of the work;
- Presenting an idea, theory or formula originated by another person as the original work of the person submitting that work;
- Repeating information, such as statistics or demographics, which is not common knowledge and which was originally compiled by another person;
- Purchasing (or receiving in any other manner) a term paper or other assignment that is the work of another person and submitting that term paper or other assignment as the student's own work.

Help Outside and Within the Classroom
Help is available to you should you have difficulty with this course. Please make an appointment to see the instructors if you need help.

Students with disabilities who require reasonable accommodations in order to participate in course activities or meet course requirements should contact the instructor during regular office hours or by appointment. For more information, please visit the University's Disability Resources Center at: www.drc.uga.edu or (706) 542-8719.

Mental Health and Wellness Resources
If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.

UGA has several resources for a student seeking mental health services (https://www.uhs.uga.edu/bewelluga/bewelluga) or crisis support (https://www.uhs.uga.edu/info/emergencies).

If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (https://www.uhs.uga.edu/bewelluga/bewelluga) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.

Additional resources can be accessed through the UGA App.