

HOS 3281C - Principles of Organic and Sustainable Crop Production

Spring 2026

In-person, 3 credits

Class	Time and location
Lectures	<ul style="list-style-type: none">Monday, Wednesday & Friday 10:40 - 11:30 AM1306/1308 Fifield Hall
Team-based hands-on class project	<ul style="list-style-type: none">Time to be announced and confirmed in class during the semesterHorticultural Sciences Teaching Farm (1703 IFAS Research Drive, 32611) on UF campus

Instructor

Xin Zhao, Professor, Horticultural Sciences Department, 2464 Hull Road Building 0711, Room 164, 352-273-4773, zxin@ufl.edu

Teaching Assistant

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Office Hours

11:30 am - 12:15 pm on Monday, Wednesday & Friday. We also encourage students to call or email the instructor and TAs directly if there are any questions or concerns. Please also feel free to email us to request an in-person appointment or an online appointment via Zoom. For class-related communications, please use email within E-learning.

Course Description

This course encompasses biological, social, and economic components of organic farming systems and sustainable agriculture. This course discusses organic agriculture policy and regulations and emphasizes principles, concepts, cultural practices, techniques, marketing, and holistic approaches of organic crop production and sustainable farming systems.

Course Learning Objectives

Upon successful completion of this course, students will be able to:

- Analyze how a farm functions as an agroecosystem.
- Evaluate the sustainability of farming operations including organic production.
- Apply a working knowledge of the regulatory procedures and requirements of certified organic production.
- Develop soil and nutrient management plans for organic and sustainable crop production that optimize nutrient cycling and minimize environmental degradation.
- Develop pest management plans that emphasize proactive systems approaches and minimize curative control measures.
- Apply holistic management to farming system establishment and development that

targets long-term sustainability.

- Develop communication, teamwork, and leadership skills by designing and conducting hands-on class projects with peers.

Course Prerequisites

Junior or Senior standing

Textbooks

There are no required textbooks for this course. Book chapters, journal articles, websites, videos, and other materials will be collectively used. The E-learning (Canvas) portal (<http://elearning.ufl.edu/>) is used in this course to post lectures, assignments, reading materials, useful websites, video clips, study guides, quizzes, and grades, etc. This is an in-person course, please note that having access to the materials posted in the E-learning portal is not an excuse for missing classes.

Lecture Format

1. Invite announcements relating to student club activities and any other departmental, college or campus activities related to agriculture and the content of this course.
2. Invite students to share popular press clippings of current events related to organic and sustainable agriculture.
3. Briefly review previous material.
4. Present the current material.
5. In class questions and discussions are encouraged and expected.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. <https://helpdesk.ufl.edu/> | 352-392-4357

Weekly Course Schedule

Week	Day	Date	Topic
1	M	1/12	Welcome, syllabus, and course introduction
	W	1/14	The need for sustainable agriculture
	F	1/16	How do we define and develop sustainable agriculture? Concepts, principles, and challenges
2	M	1/19	<i>No class (Martin Luther King Jr. Day)</i>
	W	1/21	Agroecology: Science and foundation; Applying agroecosystem principles to farming

	F	1/23	Incubator Farm project work on the Teaching Farm
3	M	1/26	Business planning and enterprise budgets (Dr. Derek Farnsworth)
	W	1/28	Holistic management and toolboxes
	F	1/30	Organic agriculture overview: History, concepts, and regulations; Organic agriculture growth and consumer trend; Is organic farming sustainable?
4	M	2/2	Organic certification 101 and organic system plan
	W	2/4	Organic transition; Regenerative Organic Certified; Real Organic Project; Certified Naturally Grown
	F	2/6	Incubator Farm project work on the Teaching Farm
5	M	2/9	Incubator Farm project work on the Teaching Farm
	W	2/11	The living soil (I) - Soil properties and processes: Physical
	F	2/13	Exam #1
6	M	2/16	The living soil (II) - Soil properties and processes: Chemical
	W	2/18	The living soil (III) - Soil properties and processes: Biological
	F	2/20	Incubator Farm project work on the Teaching Farm
7	M	2/23	Soil health principles, assessment, and management
	W	2/25	Principles of soil quality and fertility management; NOP rules; The nutrient cycle: N – Does it differ between organic and conventional
	F	2/27	Incubator Farm project work on the Teaching Farm
8	M	3/2	The nutrient cycle: C, P, and K; Essential plant nutrients
	W	3/4	Improving nutrient availability and use efficiency; Organic fertilizers and calculations
	F	3/6	Incubator Farm project work on the Teaching Farm
9	M	3/9	Animal manure and compost
	W	3/11	The new era of composting and compost application; Biostimulants
	F	3/13	Incubator Farm project work on the Teaching Farm
	M	3/16	<i>Spring Break</i>

10	W	3/18	<i>Spring Break</i>
	F	3/20	<i>Spring Break</i>
11	M	3/23	Incubator Farm project work on the Teaching Farm
	W	3/25	Cover crops and green manure
	F	3/27	Crop rotation
12	M	3/30	Exam #2
	W	4/1	Intercropping and companion planting; Farmscaping and biodiversity enhancement
	F	4/3	Incubator Farm project work on the Teaching Farm
13	M	4/6	Conservation tillage and introduction to organic no-till systems
	W	4/8	Applying integrated pest management to organic production; NOP regulations on insect, disease, and weed control
	F	4/10	Postharvest handling and food safety
14	M	4/13	Discussion with Florida Organic Growers (Dr. Juan Carlos Rodriguez)
	W	4/15	Breeding for organic crop production; Precision agriculture, AI, and organic agriculture innovations
	F	4/17	Incubator Farm tour
15	M	4/20	Introduction to organic livestock and poultry production; The organic debate
	W	4/22	Advancing long-term sustainability of organic farming; Final thoughts on building resilient and sustainable food systems
	F	4/24	<i>Reading Day</i>
16	Cumulative Final Exam on Friday, May 1, 7:30 - 9:30 AM		

Grading Policy

Course grading is consistent with [UF grading policies](#).

Course Grading Structure

All tentative due dates will be indicated in E-learning during the second week of the semester.

Exams (320 points)

There are three exams in the semester. Exam #1 and Exam #2 are each worth 100 points, and the cumulative Final Exam is worth 120 points. Matching, true or false, multiple choice, short answer, calculation, case study, and essay questions may be included in the exams. Under the

circumstances of having a true emergency that does not allow the student to complete the exam as scheduled, a make-up exam can be requested. Official written documents need to be provided to the instructor about the emergency situation. The format of the make-up exam is at the instructor's discretion.

Quizzes (120 points)

There are eight online open-book quizzes in the semester. Each quiz is worth 15 points. Multiple choice, true or false, matching, calculation, and short answer questions may be included in the quizzes. Students will take the online quizzes in the E-learning portal. Each quiz is timed for 30 minutes and it can be taken twice with the highest score recorded as your grade. Students can refer to lecture slides, handouts, personal notes, and other reference materials, but each student must work individually and independently. Under the circumstances of having a true emergency that does not allow the student to complete the quiz as scheduled, a make-up quiz can be requested. Official written documents need to be provided to the instructor about the emergency situation. The format of the make-up quiz is at the instructor's discretion.

Writing Assignments (160 points)

There are four writing assignments with each worth 40 points.

- Assignment 1: A case study of a commercial farm as an agroecosystem
- Assignment 2 (group assignment): Incubator Farm budgeting and marketing
- Assignment 3: Soil fertility and soil health in sustainable and organic farming
- Assignment 4: Case studies of management practices used for organic crop production

All writing assignments should be submitted electronically in the E-learning portal. They are expected to be in neat, legible format with grammar, punctuation, and spelling errors at a very minimum. Depending on the specific task, students will have 1 to 3 weeks (or longer) to complete the assignment. Late submissions will receive a score of zero unless there is a true emergency situation where written documentation is required.

Incubator Farm Class Project (200 points)

Each group of 4-5 students will assume the role of an aspiring and beginning farmer to start and operate an experimental Incubator Farm at the Horticultural Sciences Department Teaching Farm by addressing specific holistic management goals identified. This student-driven project is designed to provide an experiential learning opportunity for students to integrate key concepts, principles, and practices learned in the course in the exploration of understanding and developing organic and sustainable agriculture and food systems. Peer evaluations of each member's contribution to completion of the group project will be considered in calculating each member's Incubator Farm project final grade. Specific instructions on conducting and assessing the Incubator Farm class project activities and detailed information about using field production resources and tools in a professional manner will be posted in the E-learning portal and discussed during the first two weeks of class.

Class Participation (40 points)

A simple reflection sheet will be used to evaluate student's participation in the learning community throughout the semester. Each reflection sheet is worth 10 points and a total of 4 reflection sheets need to be completed in the course based on the instructions posted in E-

learning by the specified deadlines.

Assignment Type	Point Value	Percent of Final Grade
Exam #1	100	11.9
Exam #2	100	11.9
Cumulative Final Exam	120	14.3
Quizzes (8 × 15 points)	120	14.3
Writing Assignments (4 × 40 points)	160	19.0
Incubator Farm Class Project	200	23.8
Class Participation (4 × 10 points)	40	4.8
	Total points = 840	100%

Grading Scale

All points earned in the course will be summed to calculate your final grade. Letter grades will be based on the performance of each student relative to the following standard percentages:

Grade	Points	Percentage (%)
A	781 - 840	93 - 100
A-	756 – 780.9	90 – 92.9
B+	731 – 755.9	87 – 89.9
B	697 – 730.9	83 – 86.9
B-	672 – 696.9	80 – 82.9
C+	647 – 671.9	77 – 79.9
C	613 – 646.9	73 – 76.9
C-	588 – 612.9	70 – 72.9
D+	563 – 587.9	67 – 69.9
D	529 – 562.9	63 – 66.9
D-	504 – 528.9	60 – 62.9
E	<504	<60

Please feel free to discuss your grades with the instructor at any time during the semester.

Attendance and Make-up Policy

Attendance in this class is mandatory. However, you are allowed one unexcused absence during the semester without any influence on your final grade. More than one unexcused absence will

result in a deduction in your final course grade by a third of a letter for each absence after one (for example, a grade of B+ would decrease to a B, a grade of A would decrease to an A-, with 2 or more unexcused absences). All students are encouraged to actively participate in class discussions and other class activities. You are required to attend every lecture and complete quizzes, exams, and assignments by the posted deadlines. Absences will be excused and late assignments will be graded only for acceptable reasons for absence following the university attendance policies.

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/>

Campus Health and Wellness Resources

Visit <https://one.uf.edu/whole-gator/topics> for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact [UMatterWeCare](#) for additional and immediate support.

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.

Library Resources and Services:

Search and locate trustworthy information for writing assignments and class projects using library resources. Through the library you can find farm production guides, recommended sources for agricultural statistics, and trainings for citation management among other resources. Use the Library Research Guide to Horticultural Sciences (<https://guides.uflib.ufl.edu/horticulture>) or contact your subject specialist librarian to enhance your information literacy skills.