AOM4642
ENVIRONMENTAL SYSTEMS FOR AGRICULTURAL STRUCTURES
FALL 2025

1. **Catalog Description:** *3 credits.* Effects of the environment on plant and animal production, processing operations, and quality of stored produce. In addition, this course addresses the selection of building materials and sizing of components of environmental systems in agricultural structures to enhance more efficient agricultural production, processing, and storage.

   This course is a study of agricultural structures and the environment within these structures. The first part of the course focuses on understanding the components of the environment, the impact of these components on building usage, and how to control the environmental variables of the building. The second part of the course will focus on studying the types of structures used for plant and animal production and storage of agricultural produce. General building design issues, building codes, and types of building construction are also covered.

2. **Instructor:** Dr. Ying Zhang
   a. Office location: 103 Frazier Rogers Hall
   b. Telephone: 352-294-6864
   c. E-mail address: yingzhang409@ufl.edu
   d. Course site: Canvas e-Learning
   e. Office hours: M&W 4th and 5th Periods (10:40 am – 12:35 pm) or by appointment

   To contact the professor, please email her, and she will respond. IMPORTANT: Please allow up to 48 hours for a response, excluding weekends or holidays.

3. **Meeting Times and Locations:**
   T, R 3rd Period (9:35 am – 10:25 pm), ROG 0110
   T 8th Period (3:00 pm – 6 pm), ROG 0110. We have field trips planned for this course. The afternoon class hours are booked for field trips. If no field trips are scheduled, we will have a lecture or discussion session from 3 pm to 3:50 pm.

4. **Pre-requisites and Co-requisites:** MAC1147 and 3 credits of physics

5. **Course Objectives:**
   Students, upon completing this course, will be able to:
   a. Describe relationships between environment in structures and animal housing and plant and produce storage
   b. Identify measurement devices used for monitoring environmental conditions
   c. Identify key components of environmental systems, buildings, and building codes
   d. Determine and calculate environmental conditions using psychrometrics
   e. Evaluate construction methods and building material characteristics

6. **Class/Laboratory Schedule:** Listed assigned meeting times.

7. **Material and Supply Fees:** None

8. **Required Textbooks:**
   There is no required textbook for this course. Handouts and online material will be provided to you that will serve as a text.

9. **Recommended Reading:** None

10. **Computer skills requirements:**
    Minimum technical skills needed for success in the course include:
    1. Using the Canvas learning management system
    2. Creating and submitting files in commonly used word processing program formats
    3. Using spreadsheet programs
    4. Using presentation and graphics programs.

11. **Hardware and Software Requirements:**
    Access to and ongoing use of a computer is required for all students. Students should have access to a laptop computer with internet for course meetings. Students will need Microsoft Office products installed on their computers.

12. **Course Plan:**
    Week 1 **Measuring Environmental Conditions**
    Week 2 **Heat Transfer**/Lecture/ HW1
    Week 3 **Reading the Psychrometric Chart & Solving Problems Using the Psychrometric Chart**/Lecture/HW2
    Week 4 **Insulation**/ Lecture/ HW3
    Week 5 **Structures for Plant Production & Alternative Agriculture**/Lecture & Greenhouse Tour/HW4/Exam 1
    Week 6 **Storing Fresh Produce**/HW5
    Week 7 **Environmental Modification**/Lecture/HW6
    Week 8 **Livestock Housing**/ Lecture & Dairy Unit Tour/HW7
    Week 9 **Standards, Codes & Loads on Structures**/Lecture/Exam 2
    Week 10 **Building Materials: Concrete & Concrete Masonry**/ Lecture/Group Presentation 1
    Week 11 **Building Materials: Steel**/ Lecture/Group Presentation 2
    Week 12 **Building Materials: Wood**//Lecture
    Week 13 **Building Materials: Wood Frame Construction**/ Lecture/Group Presentation 3
    Week 14 **Types of Structures: Hay, Silage and Grain Storage**/Lecture
    Week 15 **Types of Structures: Fences**/Lecture/ Term Group Presentation

13. **Attendance, Expectations, and Exam Make-up Policy:** Attendance (on time) at lectures is expected from all students at all times and will be recorded at every class meeting. No make-up exams will be given except for valid medical reasons or unless prior arrangements have been made. Additional information and UF policies related

to attendance, expectations, and make-up exams can be found in the Undergraduate Catalog.

14. Grading:

Component	Total Points	Percentage of Final Grade
Homework Assignments (5)	100 each	15%
Field Trip Assignments (2) & Group Presentations (2)	100 each	15%
Exam 1	100	20%
Exam 2	100	20%
Term Group Presentation (1)	100	20%
Attendance	3 each	10%

Students who have questions about their grades should contact their professor by email. Do NOT contact the TA about grades assigned. Grade is typically posted within one week of the deadline in Canvas.

Homework Assignments (100 pts. each). Each homework assignment will be worth 100 points, and there will be 7 homework assignments during the semester. Each student must work individually. For the final course grade, homework assignments will be weighted at 20%.

Group Presentations (100 pts. each). Each group presentation will be worth 100 points, and there will be 3 assignments during the semester to develop teamwork and presentation skills. For the final course grade, group presentations will be weighted at 20%.

Exams (100 pts. each). In exams, students will be asked to analyze different agricultural systems using engineering principles. Each exam will consist of a mix of multiple-choice, short-answer, and computational questions. Each exam will be weighted at 20% for the final course grade.

Term Group Presentation (100 pts.). In the middle of the semester, a term group assignment will be released. Students will be assigned to groups randomly to collaborate on the group assignment. Students need to pick a course-related agricultural system and conduct a literature review to summarize the terminologies, standards, status, and applications related to the system. The group presentation will be weighted at 20% for the final course grade.

The group performance will be evaluated with the following rubric:

Total	Category	16-20	10-15	5-9	0-4
20	Team Contribution	Excellent	Good	Fair	Need to improve
20	Creativity	Exceptionally clever and unique in showing deep understanding	Thoughtfully and uniquely presented	A few original touches enhance the project	Shows little creativity, originality and/or effort
20	Understanding of Content	Shows a sophisticated understanding of the themes in the course content	Shows an understanding of the major themes of the course content	Displays a somewhat limited understanding of the course content	Does not show an understanding of the course content
20	Grammar	No grammatical or mechanical mistakes in the project	A few grammatical/mechanical mistakes which are not distracting	Several grammatical/mechanical mistakes which are distracting	Many grammatical/mechanical mistakes throughout the project
20	Overall quality and completion	Project is engagingly organized and presents material that meet the assignment requirements	Project is somewhat organized, complete the basic requirements	Project is disorganized and incomplete	Project is incomplete and not easy to follow

All of the categories will be evaluated based on team presentation and report quality except for Team Contribution. Teamwork Contribution will be assessed separately for each student with the following Self and Peer Assessment table.

Write your name and the date and write the names of your group members in the numbered boxes. In the "Yourself" box, assign yourself a value for each listed attribute. Finally, do the same for each of your group members and total all of the values. Provide any additional comments in the box at the end of the assessment form.

Values: 1=Strongly disagree 2=Disagree 3=Neither disagree or agree 4=Agree 5=Strongly agree

Attribute	**Yourself**	**1.**	**2.**	**3.**
Was dependable in attending group meetings				
Willingly accepted assigned tasks				
Contributed positively to group discussions				
Completed work on time or made alternative arrangements				
Helped others with their work when needed				
Did work accurately and completely				
Worked well with others				

Overall was a valuable member of the team				
Column Totals				

Comments:

15. Grading Scale:

A [100.00 – 93.00%]
A- [92.99 – 90.00%]
B+ [89.99 – 87.00%]
B [86.99 – 83.00%]
B- [82.99 – 80.00%]
C+ [79.99 – 77.00%]
C [76.99 – 73.00%]
C- [72.99 – 70.00%]
D+ [69.99 – 67.00%]
D [66.99 – 63.00%]
D- [62.99 – 60.00%]
E [59.99 – 0.00%]

For information on current UF policies for assigning grade points, see the Grades and Grading Policies section of the UF Undergraduate Catalog.

16. Assignments: Assignments will be marked down for a sloppy presentation and, if excessive, they may be returned ungraded. All assignments must be typed and are due one week from when assigned. Assignments must be submitted via Canvas by 11:59 PM of due date. Assignments submitted late, but before 5:00 PM on the day following the due date, will be marked down 10 points. Assignments returned late, before 5:00 PM on the second day following the due date will be marked down 50 points. No assignments will be accepted after 5:00 PM on the third day following the due date.

17. **Academic Policies & Resources:** To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: https://go.ufl.edu/syllabuspolicies. Instructor-specific guidelines for courses must accommodate these policies.