

**AOM 4444C (3 credits)**  
**Electrical Power and Instrumentation for Agricultural Operations Management**  
**University of Florida**

**Spring 2025** MWF 2<sup>nd</sup> period (8:30-9:20), Room 110 Frazier Rogers Hall

**Instructor:** Dr. Dan Hofstetter  
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Office hours: Monday and Wednesday 9:30am-10:30am or by appointment

**Catalog Description**

Fundamental concepts of electricity, power, instrumentation, computer control operations and selected transducers. Foundation to aid in management of agricultural processing operations.

**Pre-requisites/Co-requisites:**

*None.*

**Course Objectives**

This course introduces the student to the electrical concepts, circuits and systems that are used throughout agriculture. Topics covered include circuits, power, motors, instrumentation, control, measurements, and computers. The intention of the course is to provide the student with a foundation in electrical systems sufficient to allow them to make informed decisions in the management of agricultural operations. At the end of this course, students will be able to:

1. Explain the process of electricity transmission from the utility provider to the end user, detailing components involved in the transmission system.
2. Identify common symbols used in electrical circuit layout schematics.
3. Calculate required sizes for electrical supply wires, circuit breakers, and service entrance panels, and emergency backup generators for residential and farm buildings and operations.
4. Analyze electricity costs by calculating and comparing utility rates for residential and commercial customers for specific periods.
5. Estimate the size of solar panel arrays and battery storage capacity required to supplement or replace grid power in a residential setting, considering specific energy needs and environmental factors.

**Course Outline**

1. Module 1: Introduction and Electrical Review
2. Module 2: The Grid and Electricity Transmission
3. Module 3: Farmstead Design
4. Module 4: Homestead Design
5. Module 5: Emergency Power and Generators
6. Module 6: Rate Analysis: Residential and Commercial
7. Module 7: Renewable Energy
8. Module 8: Micro-grids
9. Module 9: Instrumentation

## Weekly course schedule of topics and assignments

Date	Topic	Assignments	
Monday, January 13, 2025	Orientation to class, class requirements		
Wednesday, January 15, 2025	Electrical tools, safety, electrical review	Assign Mod1 HW1	
Friday, January 17, 2025	Continue electrical review	Assign Mod1 HW2	
Monday, January 20, 2025	Holiday		
Wednesday, January 22, 2025	Finish electrical review, begin module 2	Assign Mod2 HW3	Mod1 HW1 due
Friday, January 24, 2025	Continue module 2, review how to tell 120/240V by wattage	Assign Mod2 HW4	Mod1 HW2 due
Monday, January 27, 2025	Continue module 2, start module 2 in-class activity	Assign Mod2 HW5	
Wednesday, January 29, 2025	Finish module 2, module 2 in-class activity		Mod2 HW3 due
Friday, January 31, 2025	Begin module 3, intro to NEC demand method, examples		Mod2 HW4 due
Monday, February 3, 2025	HW3 & 4 review, begin module 3 in-class activity #1	Assign Mod3 HW6	Mod2 HW5 due
Wednesday, February 5, 2025	Wrap-up module 3 slides, begin module 3 in-class activity #2		
Friday, February 7, 2025	Module 3 in-class activity 2		
Monday, February 10, 2025	Review for test 1		Mod3 HW6 due
Wednesday, February 12, 2025	<b>Test 1</b>		
Friday, February 14, 2025	Begin Module 4 homestead design	Assign Mod4 HW7	
Monday, February 17, 2025	Conductor sizing in-class activity 1		
Wednesday, February 19, 2025	Continue Module 4		
Friday, February 21, 2025	Continue Module 4	Assign Mod4 HW8	Mod4 HW7 due
Monday, February 24, 2025	Module 4 in-class activity 2		
Wednesday, February 26, 2025	Continue, wrap-up Module 4, in-class activity 3		

Friday, February 28, 2025	Module 5 emergency power and generators	Assign Mod5 HW9	Mod4 HW8 due
Monday, March 3, 2025	Module 5 in-class activity 1		
Wednesday, March 5, 2025	Continue Mod5 activity 1, Mod 5 in-class activity 2	Assign Mod6 HW10	
Friday, March 7, 2025	Begin Module 6 calculate your bill		Mod5 HW9 due
Monday, March 10, 2025	Continue Mod6 commercial demand billing		
Wednesday, March 12, 2025	Review for test 2		Mod6 HW10 due
Friday, March 14, 2025	<b>Test 2</b>		
Monday, March 17, 2025	Spring Break		
Wednesday, March 19, 2025	Spring Break		
Friday, March 21, 2025	Spring Break		
Monday, March 24, 2025	Begin Module 7 renewable energy	Assign Mod7 HW11	
Wednesday, March 26, 2025	Continue Module 7	Assign Mod7 HW12	
Friday, March 28, 2025	Continue Module 7		
Monday, March 31, 2025	Continue Module 7		Mod7 HW11 due
Wednesday, April 2, 2025	Wrap-up Module 7		Mod7 HW12 due
Friday, April 4, 2025	Begin Module 8 micro-grids		
Monday, April 7, 2025	Continue Module 8		
Wednesday, April 9, 2025	Wrap-up Module 8, Mod8 in-class activity	Assign Mod 8 HW 13	
Friday, April 11, 2025	Begin Module 9 Instrumentation		
Monday, April 14, 2025	Continue Module 9	Assign Mod9 HW14	
Wednesday, April 16, 2025	Continue Module 9		Mod8 HW13 due
Friday, April 18, 2025	Continue Module 9, demo instrument, YOLOv5		

Monday, April 21, 2025	Review for test 3		Mod9 HW14 due
Wednesday, April 23, 2025	<b>Test 3</b>		
Friday, April 25, 2025	No class (reading days)		

This syllabus is subject to change depending on student progress and scheduling.

**Texts:** None, required readings and other materials will be provided.

### **Grading**

Tests:	3 @ 100 pts each	300 pts
Homework:	14 @ 10 pts each	140 pts
Attendance:	40 @ 2 pts each	80 pts
Total points		520 pts

520-479 pts	=	A
478-468	=	A-
467-453	=	B+
452-427	=	B
426-416	=	B-
415-405	=	C+
404-375	=	C
374-364	=	C-
363-349	=	D+
348-323	=	D
322-312	=	D-
<312	=	E

**Class participation is expected.**

### **Grades and Grade Points**

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

### **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/UGRD/academic-regulations/attendance-policies/>.

### **Online Course Evaluation Process**

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. 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/>.

### **Academic Honesty**

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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 Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code website for more information. If you have any questions or concerns, please consult with the instructor or TAs in this class.

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: (New Link: <https://policy.ufl.edu/regulation/4-040/> )

### **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.

### **Accommodations for Students with Disabilities** such as:

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the [“Get Started With the DRC”](#) webpage on the Disability Resource Center site. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### **Campus Helping Resources**

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

## Whole Gator App

The Whole Gator and website and app connects UF students with resources dedicated to supporting overall health and well-being. In addition to many of the resources below it also has strategies to practice self-care. <https://one.uf.edu/whole-gator/topics>

## Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto: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).
- 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](#).
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273- 4450.
- Student Success Initiative, <http://studentsuccess.ufl.edu>.

## Academic Resources

- E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392- 4357 or via e-mail at [helpdesk@ufl.edu](mailto: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. Call 866-281-6309 or email [ask@ufl.libanswers.com](mailto:ask@ufl.libanswers.com) for more information.
- [Teaching Center](#): 1317 Turlington Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- [Writing Studio](#): Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers.

- Academic Complaints: Office of the Ombuds; [Visit the Complaint Portal webpage for more information.](#)
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): [View the Student Complaint Procedure webpage for more information.](#)

Student Complaints:

- Residential Course: <https://www.ombuds.ufl.edu/complaint-portal/>
- Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>

Additional information

Instructors may choose to clarify in their syllabus their teaching philosophy, expectations for classroom behavior, utilization of e-learning, and other information that will help students succeed in the course.