

AOM 4461
Sustainable Agricultural Systems
Agricultural Operations Management
The University of Florida

Spring 2018 MWF 2nd period, Room 110 Frazier Rogers Hall

Instructor: Dr. Wendell A. Porter, P.E.
Lecturer and Undergraduate Advisor
Rogers Hall, Rm 113, 352-392-1864 x113
Office hours: Open door and by appointment

Catalog Description

Minimizing energy and costs in agricultural and natural resource systems and industries. Students explore ways to enhance sustainable systems by improving efficiency. Topics include agricultural machinery, pumps, motors, fans, refrigeration, lights and construction methods. Credit: 3 hours

Pre-requisites/Co-requisites:

Senior standing and 1st year physics.

Course Objectives

Students will be able to calculate efficient operational plans for agricultural and natural resources facilities. Topics that students will analyze include:

- Agricultural machinery
- Lighting
- Ventilation systems
- Electric motors
- Internal combustion engines (stationary and non-stationary)
- Pumps
- Refrigeration systems
- Building systems and technology

Students will learn to analyze efficient operation and couple the results with economic analyses to reduce fixed costs. Reduction of fixed costs will be shown to increase profitability and sustainability.

Course Outline

1. Review of current energy and water issues affecting the nation, the South east and Florida.
2. Energy overview of diverse agricultural operations such as nurseries, cattle ranches, row crops and groves.
3. Efficient operation of non-stationary agricultural machinery.
4. Upgrading lighting technology to minimize cost and maximize efficiency
5. Ventilation systems for both plant and animal needs will be analyzed and optimized for efficient operation.
6. Electric motor systems for agricultural uses will be presented

7. Best management practices for electric motor systems.
8. Stationary internal combustion engines for agricultural and natural resource uses.
9. Efficient operation of pumping systems.
10. Agricultural refrigeration systems.
11. Building systems and certifications such as LEED.
12. Case Studies
13. Case Studies

Time does not permit **everything** to be covered in the lectures and labs therefore, reading and homework will be assigned. Exams will include outside reading material as well as that provided in the lectures.

Texts: There is no formal text for this subject. Select readings will be assigned.

Grading

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|-----------------------------|------------------|---------|
| Tests: | 2 @ 50 pts each | 100 pts |
| Homework: | 10 @ 10 pts each | 100 pts |
| Projects | 3 at 50 pts each | 150 pts |
| Attendance: | 20 @ 5 pts each | 100 pts |
| Presentation/Final Project: | | 100 pts |
| Total points | | 550 pts |

UF grading policy can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

| | | |
|-------------|---|----|
| 550-517 pts | = | A |
| 516-495 | = | A- |
| 494-481 | = | B+ |
| 480-453 | = | B |
| 452-440 | = | B- |
| 439-426 | = | C+ |
| 425-398 | = | C |
| 397-382 | = | C- |
| 381-371 | = | D+ |
| 370-343 | = | D |
| 342-327 | = | D- |
| <326 | = | E |

Homework will be due on or before the date assigned in class. Late work will not be accepted without prior approval. A penalty of 10% per class period will be assessed for late assignments without approval. **Class participation is expected.**

General Requirements

1. Many assignments, whether homework or projects, will be due on a given date. Late assignments will lose points in grade for each day late. Missed exams may be rescheduled only with proper documented excuses within **one week** of the original date given.

2. There is no cumulative final exam. The last exam is given in the last class of the semester.

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

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."*

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: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

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.

Services for Students with Disabilities

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. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

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.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/*

Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/

- *Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/*

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