# Advanced Robotic Systems Design
ABE 6933   Section 27823
Class Periods:   Tuesdays, Periods 7-8, 1:55pm - 3:50pm
Location:   Frazier Rogers Hall 106
Academic Term:   Spring 2026

***Instructor:***
Henry Medeiros
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352-294-6706
Office Hours:   Mondays, 3:00pm – 4:00pm  (or by appointment), Frazier Rogers Hall 275

Teaching Assistant/Peer Mentor/Supervised Teaching Student: N/A

## Course Description
This course provides graduate students foundational skills for the design, implementation, and performance assessment of agricultural robotic systems.  Students will learn how to design and implement modules for robotic navigation, perception, and manipulation using the Robot Operating System. They will also be introduced to best design practices and project management techniques for integrated hardware/software development teams. Students who successfully complete this course will be encouraged to participate in the Robotics Competition held at the Annual International Meeting of the American Society of Agricultural and Biological Engineering (2 credits).

## Course Pre-Requisites / Co-Requisites
ABE 4171C or equivalent for undergraduate students or ABE 6005 or equivalent for graduate students. Both pre-requisite courses can be taken concurrently with this course.

## Course Objectives
Students should leave the course with knowledge of how to conceive and manage an integrated hardware/software development project, as well as hands-on experience on the design, implementation, and evaluation of the main components of a fully functional specialized robotic system.

## Materials and Supply Fees
N/A
## Required Textbooks and Software
- Readings assigned on Canvas.

## Recommended Materials
- N/A

## Course Schedule
Weeks 1-2:       Robot Operating System (ROS) Architecture
Weeks 3-4:       ROS Robot Specification
Weeks 5-6:       Navigation, Perception, and Manipulation Nodes
Weeks 7-8:       Project Specification, Scheduling, and Management
Week 9:Project Documentation and Versioning
Weeks 10-11:     Module Design
Week 12:          Module Design Presentations
Week 13:          Software Testing and Assessment
Week 14:          Hardware Testing and Assessment
Week 15:          Prototype Proof of Concept Implementation and Performance Evaluation Presentation

*Evaluation of Grades*

| Assignment | Percentage of Final Grade |
|---|---|
| Attendance and Participation | 15% |
| Mini-projects and homework | 20% |
| Module Design Presentation | 20% |
| Prototype Proof of Concept Presentation | 20% |
| Prototype Testing and Performance Assessment Presentation | 25% |
| | 100% |

*Grading Policy*

| Percent | Grade | Grade Points |
|---|---|---|
| 93.4 - 100 | A | 4.00 |
| 90.0 - 93.3 | A- | 3.67 |
| 86.7 - 89.9 | B+ | 3.33 |
| 83.4 - 86.6 | B | 3.00 |
| 80.0 - 83.3 | B- | 2.67 |
| 76.7 - 79.9 | C+ | 2.33 |
| 73.4 - 76.6 | C | 2.00 |
| 70.0 - 73.3 | C- | 1.67 |
| 66.7 - 69.9 | D+ | 1.33 |
| 63.4 - 66.6 | D | 1.00 |
| 60.0 - 63.3 | D- | 0.67 |
| 0 - 59.9 | E | 0.00 |

More information on UF academic policies may be found at: https://go.ufl.edu/syllabuspolicies

*Commitment to a Positive Learning Environment*
The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:
• Your academic advisor or Undergraduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu