EEL 4665  Intelligent Machines Design Laboratory

1. Catalog Description – (3 credits) Design simulation, fabrication, assembly, and testing of intelligent robotic machines.

2. Pre-requisites - Senior standing and EEL 4744-Microprocessor Applications, or consent of instructor

3. Course Objectives - To design a robotic mobile platform from scratch and have it perform elementary behaviors in one semester; design combinational and sequential sensor interface circuits; use a printed circuit board design and simulation package, use a software IDE for a microprocessor (Atmel AVRStudio or equivalent), to study the fundamentals of microprocessor architecture, including assembly language and C programming and the design of basic components of a microprocessor.

4. Contribution of course to meeting the professional component (ABET only – undergraduate courses) - 4 hours of Engineering Design

5. Relationship of course to program outcomes: Skills student will develop in this course (ABET only undergraduate courses) - EE2, a, b, c, e, f, g, k

6. Instructor – Dr. Antonio Arroyo
   a. Office location: 338 MAE-B
   b. Telephone: 392-2639
   c. E-mail address: arroyo@mil.ufl.edu
   d. Class Web site: http://www.mil.ufl.edu/imdl/
   e. Office hours:

   Instructor – Dr. Eric Schwartz
   a. Office location: 321 MAE-B
   b. Telephone: 392-2541
   c. E-mail address:
   d. Class Web site: http://www.mil.ufl.edu/imdl/
   e. Office hours:

7. Teaching Assistant – Tim Martin
   a. Office location:
   b. Telephone: 321-591-7530
   c. E-mail address: sonictj@ufl.edu
   d. Office hours:

   Teaching Assistant – Ryan Stevens
   a. Office location:
   b. Telephone: 321-514-6468
   c. E-mail address: stevert@ufl.edu
   d. Office hours:
Teaching Assistant – Josh Weaver
   e. Office location:
   f. Telephone: 352-443-2110
   g. E-mail address: josh.n.weaver@ufl.edu
   h. Office hours:

8. Meeting Times – T R 2\textsuperscript{nd}-3\textsuperscript{rd}

9. Class/laboratory schedule - 4 class periods consisting of 50 minutes each

10. Meeting Location – 328 Benton

11. Material and Supply Fees - $45.00

12. Textbooks and Software Required -
   a. Title: Embedded Robotics
   b. Author: Thomas Braunl
   c. Publication date and edition: 2\textsuperscript{nd} edition, 2006, Springer
   d. ISBN number: 3-540-34318-0

13. Recommended Reading -
   a. Title: The 6.270 Robot Builder’s Guide
   b. Author: Fred Martin
   c. Publication date and edition: 1992, MIT, Cambridge, MA
   d. ISBN number:

14. Course Outline (provide topics covered by week or by class period) –

<table>
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<th>Week</th>
<th>Project Phase</th>
<th>Weekly Project Goals</th>
<th>Reading 6.270 Notes</th>
<th>Reading Braunl</th>
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<td>1.3</td>
<td>Boards Functional</td>
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<td>Ch 3</td>
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<td>Informal Written Proposal</td>
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<td>4</td>
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<td>Oral Report 1</td>
<td>Ch 7</td>
<td>Ch 5</td>
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<td>Written Report 1</td>
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<td>Boards function w/ sensor</td>
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<td></td>
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<td>and/or actuator w/ software control</td>
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<td>5</td>
<td>2.1</td>
<td>Platform Component Cutout Group 1</td>
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<td>7</td>
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<td>Platform Fully Assembled with Electronics functioning &amp; mounted in the platform &amp;</td>
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<td>all Sensors in hand</td>
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<td>8</td>
<td>2.4</td>
<td>Collision Avoidance (Sense/React) on the completed platform</td>
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<td>Spring Break</td>
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<td>10</td>
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<td>Oral Report 2 Written Report 2</td>
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<tr>
<td>11</td>
<td>3.2</td>
<td>Preliminary Special Sensor/System working under software control</td>
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<tr>
<td>12</td>
<td>3.4</td>
<td>Tweak &amp; Finalize Design &amp; Final Special Sensor Demo</td>
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<td>4.1, 4.2</td>
<td>Software Demo</td>
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<td>Pre-Demo Day</td>
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<td>Final Demo Final Presentation</td>
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<td>16</td>
<td>Media Day</td>
<td>Final Written Report Media Day</td>
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15. Attendance and Expectations - 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/ugrad/current/regulations/info/attendance.aspx](https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx)

16. Grading –
   - Written and Oral assignments: 20%
   - Demonstrations in Lab: 10%
   - Demo Day: 70%

17. Grading Scale (e.g., 90-100 A, 85-89 B+, 80-84 B, etc.) If grades are to be curved, so state. Values should not overlap and the full grade to percentage/points map must be included. –
   - A: 93-100
   - A-: 90-92
   - B+: 87-89
   - B: 83-86
   - B-: 80-82
   - C+: 77-79
   - C: 73-76
   - C-: 70-72
   - D+: 67-69
   - D: 63-66
   - D-: 60-62
   - E: 0-59
This statement must be included in every grade scale for undergraduate level 1000-4000 syllabi:
“A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

This statement must be included in every grade scale for 5000 level graduate syllabi:

“Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

This statement must be included in every grade scale for 6000 level graduate syllabi:

“In order to graduate, graduate students must have an overall GPA and an upper-division GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:
http://gradschool.ufl.edu/catalog/current-catalog/catalog-general-regulations.html#grades

18. If you have a University-approved excuse and arrange for it in advance, or in case of documented emergency, a make-up exam will be allowed and arrangements can be made for making up missed work. University attendance policies can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Otherwise, make-up exams will be considered only in extraordinary cases, and must be taken before the scheduled exam. The student must submit a written petition to the instructor two weeks prior to the scheduled exam and the instructor must approve the petition.

19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will
provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
   - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
   - Career Resource Center, Reitz Union, 392-1601, career and job search services.

22. Software Use – All faculty, staff and student 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. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.