Course Syllabus

Course No. & Title: EEL 4935-015 Mechatronics for Innovation

Term & Meeting Info: Spring Term, 2016 – Day: MW Time: 11:00 AM – 12:15 PM Room: TBA
Instructor Info: Dr. Alexandro Castellanos acastel2@usf.edu Fax: (813) 974-5250
Office: ENB 251; Phone: (813) 974-4788 (Office) or 974-2369 (Secretary)
Office hours: TBA or by appointment (Send Email requesting appointment with Email Subject: “Mechatronics for Innovation Appointment”)

Catalog Description: To present mechatronics as the integration of mechanical & electrical systems, electronics, computer software and control systems via multidisciplinary applications while fostering a dialog among artists, STEM educators and engineers to promote innovation.

Semesters Offered: Spring

Prerequisites: Any math course that meet FKL@USF mathematics requirement.
Corequisites: None

Courses that require this course as a direct prerequisite: None

Level: UG/GR Credit: 3 Class Duration: Two – An hour and fifteen minutes lecture per week

Text Info: TBA


Course Outcomes:

Students will demonstrate the ability to:
1. Define mechatronics as a discipline
2. Recognize real life examples of mechatronics systems
3. Identify the components of a typical mechatronics system.
4. Develop a basic understanding of electronic circuits, signal processing, software and mechanics as components of a mechatronics system
5. Recognize the importance of feedback control in physical systems via examples.
6. Identify and describe the different types of sensors and actuators used in mechatronics systems.
7. Implement innovative solutions for the design and fabrication of mechatronics systems
Test & Grading Info:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Test I</td>
<td>20%</td>
</tr>
<tr>
<td>Test II</td>
<td>25%</td>
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<tr>
<td>Homework projects, Quizzes &amp; Class Participation</td>
<td>25%</td>
</tr>
<tr>
<td>(In-class and CANVAS group discussion)</td>
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<tr>
<td>Final Project</td>
<td>30%</td>
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1 “In-Class contribution is part of the grade, and an important part of our shared pedagogical experience. Your active participation helps the instructor to evaluate your overall performance as a student (as well as making the class more interactive and engaging for all of us). The quality of your participation is more important than the quantity. Given our limited amount of time together, talking (CANVAS/writing) without positively contributing to the discussion will negatively impact your in-class contributions. However, I want to stress that positive contributions are not necessarily “right” answers. I encourage you to experiment and take risks. “Wrong” answers can also be instructive and debate is often a good way to learn. Positive contributions are those that advance the discussion by presenting new ideas or insights, or building on others’ comments, or presenting a counterpoint to others’ comments in a respectful way. Contributions that are not positive are those that simply repeat points already made or deride others’ contributions in a discourteous way”. (Gina Dokko’s Managing Organizations Syllabus on the sample syllabi site for Spring 2005)

2 TBA right after test I

Grading Scale:

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<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90 - 100</td>
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<tr>
<td>B</td>
<td>80 - 89</td>
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<tr>
<td>C</td>
<td>70 - 79</td>
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<td>D</td>
<td>60 - 69</td>
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<tr>
<td>F</td>
<td>00 - 59</td>
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Note 1: PLUS AND MINUS GRADES WILL NOT BE USED.
Note 2: Test dates will be announced at least a week in advanced. All exams will be comprehensive in nature, with emphasis placed on material recently covered. All exams will be closed notes, closed book.

Missed Exam: All exams are mandatory. Request for makeup exams will be considered on a case by case basis. Written documentation (i.e., attending physician’s statement and signature on physician’s letterhead, copy of police/fire report, etc.) must be provided before a makeup exam. Makeup exams will be given during the final exam week. If written documentation is not provided, a grade of zero will be awarded. In the event of building evacuation, the exam will be given as scheduled in an alternate location. Students to be absent from class due to the observation of a major religious observance must provide notice of the date(s) to the instructor, in writing, by the second class.
Homework: Special in class quizzes and/or take-home assignments may be used as a basis for extemporaneous testing or extra credit opportunities. There will be no make-up for in class or for take home quizzes. Exam questions will be based on lecture problems, quizzes, examples within the book. During this course, the students will be encourage to use an Embedded System hardware and software platform to implement most of the theory covered with a semester-long sequence of projects, and a Final project developed by a group made of a maximum number of 3 students.

TA’s & Help Sessions: TBA

Course Topics:

Intro to Mechatronics systems
Sensors and signal conditioning
Analog & Digital Systems
Actuator Systems
Mechanisms
Data Display
System models
Control Systems strategies

Specialization: This course is part of the new certificate in Electrical Engineering, Digital Design and the Arts and also an elective for Electrical Engineering students

Professional Component: Engineering Science – 60% Engineering Design – 40%

Additional Course Features: NA

Relation of Course to EE Dept. Program Outcomes: Outcomes:

(b) An ability to design and conduct experiments, as well as to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainabilit
(d) An ability to function on multidisciplinary teams.
(g) An ability to communicate effectively
(k) An ability to use the techniques, skills, and modern engineering tools necessary for real life engineering applications.

Assessments Tools & Weighted Distribution: Exams (2 - 45%), Homework Projects & Quizzes (25%), Final Project (30%).
Additional Course Info:

- Questions concerning grading of exams must be addressed within 10 days from when the student received the graded material.
- Calculator restriction: According to departmental policy, calculators that have been approved for taking the EIT exam, namely HP 33s and HP 9s; TI 30X IIS or IIB, TI 36X Solar; Casio FX 115 MS Plus; or equivalent, as approved by instructor prior to quiz date, can be used during an exam.
- Cheating: Cheating in this course is defined as the use of unauthorized material during the taking of an exam. Unauthorized material is defined as any material other than the exam sheets and a calculator. Students identified as cheating will receive a grade of zero on the subject exam and/or a failing grade in the course. See Policy below.
- Important Notice: Students are not permitted to sell notes or tapes of class lecturers.
- In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: CANVAS, Elluminate, Skype, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor CANVAS site for each class for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.
- Students in need of academic accommodations for a disability may consult with the office of Students with Disabilities Services to arrange appropriate accommodations. Students are required to give reasonable notice prior to requesting an accommodation.

Academic Dishonesty Policy

The field of Electrical Engineering is based upon the integrity of those people working in it. It is assumed that students in the Department of Electrical Engineering will live up to the highest levels of academic honesty. All papers, research, and examinations will be monitored carefully and students found cheating will be punished to the fullest extent allowed by the University and the Department. The faculty of the Electrical Engineering Department is committed to maintaining a learning environment which promotes academic integrity and the professional obligations recognized in the IEEE Code of Ethics (http://www.ieee.org/about/corporate/governance/p7-8.html). Accordingly, the department adheres to a common Academic Integrity Policy in all of its courses. This policy is to be applied uniformly in a fair and unbiased manner.
University rules regarding academic integrity will be strictly enforced. It is not acceptable to copy, plagiarize or otherwise make use of the work of others in completing homework, project, laboratory report, exam or other course assignments. Likewise, it is not acceptable to knowingly facilitate the copying or plagiarizing of one’s own work by others in completing homework, project, laboratory report, exam or other course assignments. It is only acceptable to give or receive assistance from others when expressly permitted by the instructor. Unless specified otherwise, as in the case of all take-home exams, scholarly exchange regarding out-of-class assignments is encouraged. A more complete explanation of behaviors that violate academic integrity is provided at: http://www.ugs.usf.edu/policy/AcademicIntegrityOfStudents.pdf

The minimum penalty for violation of the academic integrity policy stated in the preceding paragraph is the greater of an automatic zero on the assignment or a letter grade reduction in the overall course grade. Student(s) found in violation of the policy on an exam will receive a minimum penalty of an F in the course. All instances of policy violations will be recorded in a letter from the instructor that is kept in the student files held by the department; a copy of the letter will be forwarded to the appropriate (undergraduate or graduate) Dean's office. A second violation of the policy, irrespective of whether it was related to an exam or any other course assignment, will result in a course grade of “FF” and expulsion from the Electrical Engineering Department.

At the instructor’s discretion the penalties associated with the EE Department’s Academic Integrity Policy may be stricter, in which case further explanation is provided in the following link: http://ee.eng.usf.edu/docs/grad%20handbook%2012-13.pdf (It applies also to Undergraduate Students)

Syllabus Prepared by: A. Castellanos

Date of Approval of Syllabus by Area Subcommittee: TBA