EEL 4924C: Electrical Engineering Design 2 (Senior Design)

http://mil.ufl.edu/4924/

INSTRUCTOR
Dr. Eric M. Schwartz
MAEB 321 392-2541 ems@mil.ufl.edu
Office Hours: M: 2-3pm; W 1-3pm

LAB SUPERVISOR
Michael Stapleton
NEB 261 392-2727 mstap@ece.ufl.edu
Office Hours: _________________

LAB ENGINEER
Eric Liebner
NEB 236 392-4923 ericl@ece.ufl.edu
Office Hours: M-F: 9am-5pm

LECTURES
T & Th: 2nd-3rd (9:30am-12:15pm) in LAR 239

LABORATORY
NEB 246

TEACHING
Michael Pridgen (Sr. Design) rhaegar@ufl.edu Lab Hours: _________________

ASSISTANTS
Subrat Nayak (Sr Design) sn32594@ufl.edu Lab Hours: _________________

(NEB 246)

REQUIRED TEXTBOOK
None

REQUIRED HARDWARE
The purchase of parts for your project is required. Some parts may be provided for you.

CATALOG COURSE DESCRIPTION
[Lab fee: $98.74]
Credits: 3; Prerequisites: Senior standing.
Selected design projects involving engineering applications in the various areas of electrical engineering. Must be taken prior to the semester of graduation. Laboratory.

COURSE OBJECTIVES
To provide the framework for specification of a design problem in a written design proposal, communication and discussion of design progress at weekly oral project briefings, documentation of technical approaches in a patent style notebook checked and signed weekly, and demonstration, presentation, and written documentation of the completed design project.

LECTURE NOTES:
Lectures will not be held regularly. Dates for class meetings will be announce in class, on the web, or by email. It is your responsibility to stay informed. Attendance is sometimes required.

LAB ACCESS
Students will receive the access code to the lab and will thus have 24-hour, 7-day access.

LAB RULES AND INFORMATION
- No eating or drinking in the lab.
- Students must return all equipment and clean her/his work area before leaving the lab.
- Students must wear eye protection when soldering or using power tools.
- Safe practices must be used when handling high voltages or other dangerous circuits. Think before flipping the switch. Be aware of the location of the fire extinguisher since fires do occur in this lab!
- Leave any personal supplies or equipment left in the lab at your own risk. If you intend to leave anything in the lab, it should be clearly labeled with your name or group name.
- Some equipment (e.g., oscilloscope, LSA, etc.) must be checked in and out of the locked cabinet by a TA or other faculty. This equipment may only be used while a TA or other faculty is present in the lab.
- At some point in the semester you will need to have circuit boards etched with our lab milling machine. When you are ready to have your board milled, please submit your designs by completing a Mill Request Form (at http://mil.ufl.edu/4924/mill_request.html). Make sure to put both all team members last names on the board.

EXAM SCHEDULE
No exams in this course.

GRADES
Grades are determined by the quality of work with the following items. In order to pass the class (and graduate) students must finish their design projects and show a working demonstration. Therefore the last two items on the below list will be emphasized.

- Project Abstract
- Preliminary Design Report
- Preliminary Design Presentation
- Intermediate Design Reviews
- Board Design Assignment
- Patent Style Notebook
Final Design Report

Final Design Presentation and Demonstration

The UF grading policies for assigning grade points can be found on the following undergraduate catalog web page:

PARTIAL LIST OF CLASS EVENTS

- Group and Project Selection – 2 members per group
- Project Selection Abstract Due (Preliminary Project Proposal)
- Preliminary Design Reports Due
- Preliminary Design Presentations (held during class)
- Guest Lectures – Generally given by class faculty or guests. Attendance is mandatory unless you have already seen the presentation in Junior Design.
  - Microcontrollers (e.g., Atmel’s AVR, Microchip’s PIC, TI’s MSP430)
  - Demos on: Soldering, Digital Scope, LSA, NI’s LabView, X-Bee
  - Printed circuit board design (layout and routing) software (National Instrument’s Ultiboard)
  - Intellectual Property
  - Career Resource Center
- Intermediate Design Reviews (Hardware and Software)
- Periodic In-lab Presentations
- Final Design Report Due Along with Final Project Presentation/Demo
- Demo and Poster Session

PROJECT REQUIREMENTS

- No development boards can be used in your final project without written approval from the Dr. Schwartz (unless you designed and built them yourself).
- All projects must have significant digital, analog, and software component unless written approval is given by Dr. Schwartz.
- Attendance at some classes and labs are required. Failure to attend without prior approval will result in a ½ letter grade reduction. Late arrival may also result in a course grade reduction.
- Meeting all project objectives guarantees a passing grade of C or better, but not necessarily an A.
- No breadboards (also known as protoboards) can be used in your final project.
- Rules for PCB milling using the lab machines:
  1. All boards must include your project name and the designer(s) name.
  2. Boards must be properly submitted using the on-line Mill Request Form.
  3. Boards that have excessively thin traces will not be milled.
  4. Boards that have too much wasted space will not be milled.
  5. If you need multiples of a board, only one will be milled until the first board is populated and verified.
  6. Boards will be milled as space is available. (A large board may take a week to mill and a small one may take a couple days regardless of their place in line.)

CLASS ATTENDANCE AND BEHAVIOR

In general, class attendance is not mandatory, but all classes are important. Missing a class may be hazardous to your grade.

Turn off all cell phones, beepers, laptop sound effects, and other noise making devices before entering our classroom. If a noise-making device goes off during class, I reserve the right to lower your course grade. If a noise-making device goes off during an exam, your will lose a significant number of points on this exam.

STUDENTS WITH DISABILITIES

Students requesting classroom, laboratory or exam accommodations 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.

UF COUNSELING SERVICES

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.
UF CAREER RESOURCE CENTER (CRC)
The CRC offers many unique services, such as career workshops, on-campus interviewing, Cooperative Education & Internship programs, and others - separate handouts detailing these are available. Shown here are a few of the materials and services that students and employers will find at the Career Resource Center, located in a state-of-the-art facility on the west side of the first floor of the J. Wayne Reitz Union. Most of these services are available during all regular business hours.

From the CRC: “Behavioral interviews are the standard now in HR world and we do focus on strategies to answer those types of questions in our workshops and mock interviews. … Students are encouraged to participate in our Mock Interview program (www.crc.ufl.edu/mockinterview). We also offer a Virtual Mock Interview program on our website for students who wish to practice from home using a webcam.”

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.

ACADEMIC HONESTY
All students admitted to the University of Florida have signed a statement of academic honesty committing them 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 student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.

CHEATING
CHEATING WILL NOT BE TOLERATED. We will actively search for cheaters. If you are caught, there will be no negotiations. You will fail the course and get reported to the honor court. There are no excuses and no exceptions. If you know someone is cheating, it is your responsibility to report it. We have and will continue to prosecute cheaters by turning them over to the office of Student Judicial Affairs. For more information about cheating, see the URLs: http://www.dso.ufl.edu/judicial/.

WORKING TOGETHER
You are encouraged to work with other students in this course and to consult with other students and faculty. Although you may consult with other students, TAs, or Professors, the work of your team must be your team’s work. Consulting means “seeking opinions or advice” not getting working programs or designs, understanding them, and then modifying them to make them your own. The latter constitutes cheating (see above section).

DOCUMENTATION
A printed version of all documents must be turned in during the appropriate class. An electronic version should also be submitted (via email) in either MS-Word or pdf format to Dr. Schwartz at ems@mil.ufl.edu, the TAs, and Michael Stapleton.

CONFIDENTIALITY
Please treat all information that you hear about projects of other students in this class as confidential. Patents might be filed in the future, and by agreeing to this confidentiality, you preserve their rights to patent their projects. See http://mil.ufl.edu/4924/docs/Confid-Disc-Agree.pdf for the complete confidentiality disclosure agreement.

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Signature (By signing, you agree to the online confidentiality disclosure statement):

Last Name: _________________________________ First Name: _____________________________

Have you taken Junior Design (circle one) YES NO

Desired E-mail (not necessarily UF): __________________________________________ (please print clearly)

Desired First/Nick Name (i.e., what name you want me to use when talking to you) __________________________________________

10-digit Password: _______________________________ (used to retrieve grade information; please print clearly)

Your password must be 10 alphanumeric digits or less. Please save this password somewhere.
## Semester Schedule

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<tr>
<th>Week/Day</th>
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<th>Class</th>
<th>R</th>
<th>Notes</th>
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<tr>
<td>M</td>
<td>11-May</td>
<td>1 C</td>
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<td>Intro &amp; Project Ideas PIC</td>
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<tr>
<td>Tu</td>
<td>12-May</td>
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<td>Form Teams; Discuss Projects; Atmel</td>
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<td>Notebooks; Prelim Project Proposals</td>
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<td>In-lab Presentation uP Demo Due (in lab)</td>
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<td>Demos: Soldering; Digital Scope, LSA; MSP-430 Project Abstract Due (email)</td>
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<td>Advanced uP topics (timers, USARTs, interrupts)</td>
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### Notes
- R = Room
- C = In Class
- L = In Lab
- H = Harris Rotunda (NEB)
- Class in LAR 239 / Lab in NEB 246

### Additional Notes
- M-F 22-Jun – 26-Jun No Class Summer Break
- 7 M 29-Jun In-lab Presentation
- 7 T 30-Jun 13 L PCB Design and Layout Assignment Due (in lab)
- 7 W 1-Jul Hardware Demo (content verification), Detailed System Block Diagram Due (in lab)
- 7 Th 2-Jul 14 L Independence Day
- 8 M 6-Jul
- 8 Tu 7-Jul 15 L Software Descriptions/Flowcharts due
- 8 W 8-Jul In-lab Presentation
- 8 Th 9-Jul 16 L
- 8 F 8-Jul Independence Day
- 9 M 13-Jul
- 9 Tu 14-Jul 17 L In-lab Presentation
- 9 W 15-Jul
- 9 Th 16-Jul 18 L In-lab Presentation
- 9 F 17-Jul
- 10 M 20-Jul
- 10 Tu 21-Jul 19 L In-lab Presentation
- 10 W 22-Jul
- 10 Th 23-Jul 20 L In-lab Presentation
- 10 F 24-Jul
- 11 M 27-Jul
- 11 Tu 28-Jul 21 L In-lab Presentation
- 11 W 29-Jul
- 11 Th 30-Jul 22 L Demonstrations
- 11 F 31-Jul
- 12 M 3-Aug Final Reports Due
- 12 Tu 4-Aug 23 C Final Presentations
- 12 W 5-Aug Final Demos in Harris Rotunda Setup: 8:30-9:30am Event: 9:30am-12:30pm
- 12 Th 6-Aug 24