ECE 110/120 Honors Lab Section Home

Course Information:

- Meeting Time: Thursday 6:00-8:00 P.M and Friday 4:00-6:00 P.M.
- Location: ECEB 1001

Course Description:

The main purpose of this lab is to expose freshman students to the engineering design process. To do so, it is organized similar to the Senior Design Class (ECE 445) students will take later on in their academic career. As a result, students of this section are asked to use creative thinking to solve a real world problem with an electronic device. This problem is intentionally left open ended so that students will be able to pursue something that they are passionate about. Projects, however, if the student is in ECE 110 should involve collecting some sort of useful data which is often done using sensors or other devices such as cameras, microphones, etc. If the student is in ECE 120 it must contain logic gates instead of sensors. At the end of the semester each individual or group will be expected to present a functioning project to their peers. To receive honors credit you must spend a minimum of 16 lab hours on your project.

Announcements & Reminders:

- Please read the comments on your page every few days
- Please read the syllabus (see side bar) for a summary of what is expected in this course throughout the semester

Parts Request:

- Honors Lab Order Form: https://docs.google.com/a/illinois.edu/forms/d/16YfABCSZyjnvpbCsfkMosAS5RcMaVfGTSrmwl6w4dASQ/viewform
- Independent Study Order Form: https://docs.google.com/forms/d/e/1FAIpQLSfBqt-24zctw-dFdtG4ud_3pZGcEbjSwJIL-6Qs-iG86_iZcA/viewform
- ECE Electronics Parts Shop: http://eshop.ece.illinois.edu/parts/Parts_List.txt
- ECE Store: https://my.ece.illinois.edu/storeroom/catalog.asp

Weekly Journal:

Each group should create a page for their project on the Wiki Cite which will be used by students to report their progress. At the end of each lab each group should write a brief summary of the work they accomplished and what they intend to work on the following week.

Lab Notebook:

Students will be required to keep a lab notebook that includes all brainstorming, meeting notes, calculations, designs, tests, and results (i.e. anything pertaining to your lab project). This will prepare students for future lab courses as well as industry lab testing. Please note that this notebook should be bound and have numbered pages.

Engineering Design Algorithm:

When an engineer takes on the task of designing a new device, he or she will inherently follow a number of procedures that highlight their skills as effective problem solvers. These skills have been tabulated and are often referred to as the steps of engineering design or, more formally, the Engineering Design Algorithm. We will adapt the version given by Orsak, et. al., in the textbook, *Engineering Our Digital Future: The Infinity Project*.

The Algorithm:

1. Evaluate the challenge by defining goals and constraints
2. Research the problem to design possible solutions
3. Choose the best solution from the options and build a prototype
4. Test and evaluate the prototype and return to earlier steps as needed

A design report is often as important as the design itself. As you step through the design process, you will make a series of decisions and support these choices within your report.

Watch Out for Plagiarism:

Often times, students might plagiarize materials due to ignorance rather than intent. Please read up on the topic of plagiarism so that you do not make the same mistakes!

http://www.library.illinois.edu/learn/research/academicintegrity.html

Helpful Links:

To help with the research portion of the honors project here are a few sites. Please spend some time familiarizing yourself with the beekeeping industry and the state-of-the-art in bee monitoring techniques.

Beekeeping Links:

- Basic training in beekeeping (learn to think like a beekeeper!) with excellent videos. I know this couple and they lives about 30 minutes away near Danville, IL:
  http://www.honeybeesonline.com/lessons.html
- Honeybee Project with U of I professor, Gene Robinson:
  http://news.illinois.edu/news/14/0722RFID_GeneRobinson.html
- Some monitoring techniques already in use:
  http://colonymonitoring.com/cmwp/whats-available/
- Some open-source hardware and software solutions to the problem, including the Apidictor for acoustic monitoring:
  http://hivetool.org/
- Bee tracking (in flight) using video:
  http://sonic.net/~goddard/home/bees/bees.html

Other Helpful Links:

- Instructables.com contains different projects that have been made in the past, which will greatly help in broadening your ideas and skill set in order to execute your honors project.
  http://www.instructables.com/
- Here is a link to the parts list of the ECE Electronic Service Shop. Please check this link for any component you might require before going ahead with ordering components from the ECE store.
  http://www.ece.illinois.edu/eshop/parts/Parts_List_7-31-2009.txt

Arduino and Raspberry Pi Resources:

- Arduino Tutorials:
  http://tronixstuff.com/tutorials/
- Raspberry Pi Tutorials:
  http://www.raspberrypi tutorials.yolasite.com
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- Interface (LC3) update Oct 01, 2017

- Born, Austin J
- Sylla bus update Oct 01, 2017

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