EE/CpE-423/424 – Senior Design

Catalog Description:

EE/CpE-423 (0-8-3)
Senior design course. The development of design skills and engineering judgment, based upon previous and current course and laboratory experience, is accomplished by participation in a design project. Projects are selected in areas of current interest such as communication and control systems, signal processing, and hardware and software design for computer-based systems. To be taken during the student's last fall semester as an undergraduate student. It includes the two-credit core module on Entrepreneurial Analysis of Engineering Design (E 421) during the first semester.

EE/CpE-424 (0-8-3)
A continuation of EE/CpE 423 in which the design is implemented and demonstrated. This includes the completion of a prototype (hardware and/or software), testing and demonstrating performance, and evaluating the results. To be taken during the student's last spring semester as an undergraduate student. Prerequisite: EE/CpE 423.

Text Book:

none

Instructor:

Bruce McNair, Distinguished Service Professor of ECE.

Goals:

The goal of this two semester course is to expose students to a microcosm of the real-world development environment in an educational setting. The project will be developed from concept to specification to prototype to demonstration. Students will learn the tools needed to design and implement a practical system in a team-based setting. They will also present their work, through written reports and presentations, to a diverse audience.

Prerequesites:

- Senior standing in EE or CpE program

Grading Policy:

Since this course requires the student team to work closely with an advisor from either the ECE department, the CS department or the Physics department, the overall grade is determined by the advisor and the course coordinator as follows
Advisor: 75%
Coordinator 25%

The advisor grade criteria will be established by the advisor, but is generally based on engineering judgment, responsiveness to advisor feedback, level of effort, and the ability to establish and follow a project schedule.

The coordinator grade is based on:

('423 – Fall)

Midterm report:	20%
Final report:	20%
Weekly project and effectiveness reports:	20%
Project presentation	10%
Web site:	10%
Time expended on project:	20%

('424 – Spring):

Midterm report:	20%
Final report:	20%
Weekly project and effectiveness reports:	20%
Web site:	20%
Time expended on project:	20%

Specific requirements for written reports and presentations are provided in the course notes and on the course web site (see below). All assignments provide opportunities for extra credit work. Work that goes significantly beyond what is asked will be graded accordingly.

There are two ungraded, but mandatory, additional deliverables for the Fall semester.

- Prior to Week 2 of EE/CpE-423, each student will write a one paragraph description of a problem they would like to see solved. The focus of this assignment is to take the customer/user perspective to identify real-world needs, rather than a purely technology-drive view of products. The list of problems identified by students will be shared with the class to, perhaps, motivate students to tailor their project to meet common needs.
- At the end of the Fall semester, each project group will write a provisional patent application. This application ideally would be on some novel aspect of their design approach, but does not necessarily have to be.

Stevens has a long-standing Honor System. As Senior Design is to create a microcosm of the real-world design environment, ethical behavior is a related core principle of engineering. As an example, this is reflected in the IEEE Code of Conduct and similar codes for other engineering disciplines (see http://www.ieee.org/about/corporate/governance/p7-8.html). It is expected that every student in Senior Design will follow the highest standards of ethical behavior and will comply with the Stevens Honor System. Specifically, **all** submissions in this class **must** be pledged. Unpledged assignments will not be graded. For more information on this topic, see http://www.ece.stevens-tech.edu/~bmcnair/syllabi/syllabi.html and http://www.ece.stevens-tech.edu/~bmcnair/FAQ.htm

Course Components:

- Engineering - 100%

Course Web Site:

- Specific class materials for the current year can be found here: http://koala.stevens-tech.edu/~bmcnair/ senior_design-xx-yy where xx-yy is the current academic year, e.g., 06-07
- An archive of current plus prior course materials and project can be found here: http://www.ece.stevens-tech.edu/sd/

Course Topics

Senior design is a team-advisor oriented course. As a result, most of the course work will be done in the student team setting, including advisor meetings, individual research, and

group experimentation with prototypes. Topics in the lecture component of the course will include:

- Approaching a design problem
- Selecting an appropriate project
- User-oriented design choices
- Typical project “waterfall” design schedule
- Protection of intellectual property
- Effective presentations

Last revised: April 17, 2008