Course Syllabus

ECE 189A Senior Computer Systems Project (Elective) 4 units

Catalog Description:
Student groups design a significant computer-based project. Groups work independently but may, if desired, cooperate to address subprojects within a larger overall project context, interacting as appropriate via interface specifications and informal meetings.

Prerequisites:
Consent of instructor; senior standing in computer engineering, computer science, or EE.

Text, References, and Software:

Topics Covered and Course Goals:
This course provides an over-arching design experience wherein the students actually go through an entire design cycle. In addition to the material covered in lecture format (which is organized around a set of milestones comprising a typical project development cycle) students learn how to work in teams, keep project notebooks, and report on their individual and collective progress. A rough timeline showing the milestones follows:
1. Project selection (concepts and rough breakdown) .... 1 week
2. Refined project (annotated block diagram with prose behavioral specifications) .... 1 week
3. System-level design (subsystem requirements and interface specs, component selection, software structural overview) .... 2 weeks
4. Detailed design (schematic drawings, Verilog source (if programmable logic used), final software structure plan) ... 4 weeks
5. Implementation of the hardware design (artwork for PCB fab, final schematics, engineering drawing, assembly drawing, parts kit, bill of materials) .... 2 weeks

The goals of the capstone project course are:
1. Provide each student with a team design experience
2. Learn the myriad of details that must be considered when creating a product, including all of the phases from concept to full demonstration and presentation.
3. Acquire presentation and progress estimating and reporting skills in a team environment.
4. Learn to keep a project notebook
5. Learn to select components, study their datasheets to extract interfacing details, and ultimately use commercial components in a real design.
6. Learn to plan, create, simulate, and develop low-level software that runs at the hardware/software interface.
7. Learn to draw schematics, create netlists, and plan and route a printed circuit board.

**Class/Laboratory Hours:**
Though some projects may do some early breadboarding or component evaluations in support of their component selection, there is no formal laboratory section for this course.

**Contribution to Criterion 5**
ECE189-A and its follow-on ECE189-B will prepare students for engineering practice by providing each student with direct participation in a group design project using commercial chips, modules, and surface-mount printed circuit board technology with implementation according to up-to-date engineering standards and conventions.

**Contribution to Program Outcomes:**

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<th>Course Goals</th>
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Prepared by: Steven Butner          Date: October 9, 2007