Advanced Microprocessor System Design

CMPE-123/123L  
Fall 2002  
MWF 12:30pm –1:40pm  
Laboratory: BE150  Class: BE 372

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Requirements: CE 170 or equivalent experience, some digital design class like CE 121 highly recommended.

This course is a challenging and fitting opportunity for students to use the skills and knowledge obtained in previous courses in a practical, systems level engineering project using microprocessors and other digital technologies. Students can work in teams or alone though it is recommended that students work in a team. Experience will be gained from the entire cycle of engineering design from the concept, the specification, experimental prototyping and verification, up to the final design and implementation. Each team will give a collective oral presentation/demonstration of their work at the end of the course and present a written formal report discussing the entire project. Information such as schedule delays and changes to failures and challenges should be covered. A daily journal in a lab book is also required; it should contain what you worked on and any insights you have learned.

The class and lab will eventually be combined into an open forum for discussion, problem resolution, and one-on-ones. I will expect every member of a team to have a general understanding of the entire project and to have thorough knowledge of their portion of the design. You may be asked to present findings or briefly lecture on topics for which you have become an expert or especially informed. Generally, laboratory sessions will immediately follow these meetings. Since the lecture and laboratory components are strongly interrelated and dependent on one another, enrollment in both is mandatory and so is attendance.

FGPA/CPLD’s are an option to this course and students are encouraged to integrate these programmable devices in their projects if logic design is a future career interest. There will be several lectures and some homework assignments on Verilog, an HDL (hardware description language). Assignments can be implemented using either the Xilinx or Altera tools provided in the lab.

Other lecture topics will include the I2C serial bus interface, the USB interface, and possible some discussion of IR, Bluetooth, and firewire. Lecturers will be held for the first half of the quarter after which all time will be spent solely in the lab (BE150).

Your performance in this class will be based on the following general areas:

1. Degree of success in realizing your engineering design and professional growth.
2. Quality of your engineering notes.
3. Experimental (laboratory) skills.
4. Final formal group presentation and written report.
5. Attendance.
Project Ideas

MP3 Players
Remote controlled cars/robots (IR, RC, Web)
Network appliance
CCD camera device
Game playing robot/mouse
Game player (handheld or TV device)
Data acquisition device (talk to other departments)
Called ID phone system

Useful Links

www.allelectronics.com
www.halted.com
www.robotstore.com
www.rabbitsemiconductor.com
www.altera.com
www.xilinx.com
www.digikey.com
www.jameco.com