EE550A **Spring 2006**

MICROPROCESSOR-BASED SYSTEMS

The course will explore features of microprocessors and microprocessor-based systems. We will cover micro-architectural features of advanced processors, high-performance memory design, interfacing techniques and related standards. Examples and case studies will cover a variety of processors. Some of the lab assignments will be based on the MC68000 family of processors.
The course will be a mix of lectures and discussions on assigned readings. Students will be responsible for leading and participating in these discussions.

Instructor: Dr. Anura Jayasumana
Engineering C201D, Phone: 49l-7855
Anura.Jayasumana@colostate.edu
Office Hours – 10:30-11:30, Tu, Th

Time/Place: Tu, Th 2:10-3:25PM B2 Engineering
Some of the lectures will be scheduled at different times to accommodate instructor's research related travel.

URL: http://www.engr.colostate.edu/EE550/Sp06/
Prerequisites: EE45l and EE25l

Text: Required reading material (selected papers, chapters, manuals etc.) will be made available via the course webpage or as handouts.

Topics:

1. Introduction to microprocessors and microprocessor based systems
2. Architecture and assembly language of Motorola 68000 family of processors
   - bus structure, addressing modes, instruction set, hardware model
   - modes of operation, exceptions
3. Structured assembly language programming
4. Memory system operation and design
   - cache memory, secondary memories, memory management and protection
5. Microprocessor interface design
   - I/O, Co-processor interface
   - local and expansion buses (ISA, EISA, VL, PCI, PCI-X etc.)
6. Architectural features
   - RISC, CISC, VLIW, EPIC
   - Pipeline design, branch predication, speculation, register renaming, etc.
7. Case Studies

Grading:

Homework and lab assignments	40%
Presentation & Discussion Leading	40%
Discussion participation	10%
Minute papers	10%

The lab will be run on an open-hour basis. Once a lab is completed, you are required to provide a well commented printout of the program and demonstrate the lab to the TA. Each lab should be completed by the due date. The lab assignments are an important part of this course. You must pass each lab assignment with a score of 60% or better to pass the course. Discussions with colleagues are encouraged on different approaches to solving the assignments and to overcome difficulties. However, the program must be your own work, and no collaborative efforts are acceptable in developing the program, except in case of group assignments, for which any collaboration has to be limited to the group. *Under no circumstances should you copy a program or a segment of a program from another source. Providing code for use by someone else or using someone else's code in any form is academic fraud, and will be dealt with harshly. It is your responsibility to ensure that the code you write for the assignments is not accessible to others.*

A minute paper is a short write-up (>250 words) addressing the following questions: What is the most significant things you learned in the lecture? Why is it significant? What question is uppermost in your mind at the end of the lecture? Be creative!! Since each minute paper is based on a lecture, you must not submit one for a lecture that you did not attend. The minute paper for a given lecture must be submitted prior to the next lecture. Follow the link from course web page to submit minute papers.

Each student is required to make a presentation and lead a discussion on one or more topics. More information on duration and scheduling will be provided in the coming weeks. A list of papers dealing with microprocessors and microprocessor based systems will be made available on which the presentations may be based.

Active participation in class, such as contributing to discussions, will be rewarded.