6.823 Computer System Architecture
Course Information   Spring 2002

General
This course is a study of the evolution of computer architecture and the factors influencing the design of hardware and software elements of computer systems. Topics may include: instruction set design; processor micro-architecture and pipelining; cache and virtual memory organizations; protection and sharing; I/O and interrupts; in-order and out-of-order superscalar architectures; VLIW machines; vector supercomputers; multithreaded architectures; symmetric multiprocessors; and parallel computers.

Prerequisites: 6.001 and 6.004 or equivalent.

Lectures: Lectures: 2 sessions / week
                              1.5 hours / session

Tutorials: 2 sessions / week
                     1.5 hours / session (optional)

Textbooks
Computer Architecture: A Quantitative Approach: 2nd Edition by J. L. Hennessy and D. A. Patterson is the main textbook used in this course. Supplemental readings from selected papers may also be assigned; in which case, there may be a nominal photocopying charge (payable to MIT).

You may also want to refer to *Computer Organization & Design: The Hardware/Software Interface* by D. A. Patterson and J. L. Hennessy to review the basic material.

Exams: There will be a midterm exam covering the material from the lectures, assigned readings, and class notes. A final exam will cover the entire course but will emphasize the latter half. Review sessions will be scheduled for both the midterm and the final exam.

Problem Sets: There will be 6-7 problem sets. Problem sets are due at the beginning of class on the due date. Students are strongly encouraged to work in groups of two or three. Each student is expected to work on all problems. However, only one write-up should be turned in per group. Groups need not remain the same throughout the course. We only need to know the people who worked on a particular problem set submission together. To facilitate grading, each problem must be stapled separately.
Solutions will be provided for each problem set. It is the students' responsibility to review the solutions and contact the TAs if they have additional questions.
If an extension is needed, please contact the TAs well in advance. No problem sets will be accepted once solutions are handed out.

Collaboration Policy
The course policy on collaboration and the use of past course materials is as follows:

1. For problem sets (**with the exception of problem set #0, which must be done individually**), students may work in groups of up to 3 students. Although only one write-up should be turned in per group, each student must work on all problems. Students in different groups **are not allowed to collaborate** on a problem set.

2. Collaboration amongst students to understand the course material and the statement of problem sets is always encouraged.

3. Referring to course bibles (e.g. old problem sets and solutions) is **strictly forbidden**. Normal ethics dictate that, if you have been exposed to an old solution inadvertently, you should explicitly state this fact on the first page of an affected problem set submission.

If you have any questions about the above policy, please consult one of the TAs.

Grades
Grades will be based 30% on problem sets, 30% on the midterm exam and 40% on the final exam. In addition, we have instituted the requirement that every student must help grade at least one problem set over the course of the semester. Failure to assist in grading will result in up to half a grade deduction (e.g. B to B-).

Problem Set Grading
In past years, as the size of the class has gotten very large, we have had trouble returning the graded problem sets in a timely manner. To alleviate this problem, we ask students to assist in grading problem sets. From our previous experience, this peer-grading requirement is very enjoyable and helpful in re-enforcing understanding of the course material. Each student will be expected to help out in grading one problem set. Unless explicitly excused by the instructor, **every** student will be required to grade once. Failure to assist in grading will result in up to half a grade deduction (e.g. B to B-).

Grading will be done in scheduled group sessions supervised by a TA. Sign-up sheets for the grading session for a particular problem set will be handed out during lecture the day the problem set is due. If not enough students sign up for a given grading session, the TAs may pick additional students from the set that have not yet graded.

Food and drinks will be provided during each grading session. We hope these sessions will be fun and interesting, and provide an opportunity for additional interaction among students and the TAs.

Computer Communication
The TAs can be reached for questions. All announcements, clarifications to assignments, and answers to common questions, etc., will be sent to the course mailing list. The course web site also contains all handouts (including the latest corrections) and course announcements.