Department of Electrical Engineering and Computer Sciences
College of Engineering
University of California , Berkeley

EECS 42 Introduction to Electronics for Computer Scientists

Spring 2001 William Oldham T, Th 11-12 Room 2040 VLSB

Brief Overview This 3-unit, lower-division EECS core course covers essential hardware topics at the device and circuit level. Topics include: (1) Essential quantities for circuit analysis, (2) Circuit laws and DC circuit analysis, (3) Transients and step response of RC circuits, (4) Digital logic and gates, (5) Essential analog elements for digital circuits, (6) CMOS integrated circuits and static logic gates (7) Switch models and performance of CMOS logic gates, (8) Speed, power and scaling of CMOS

Textbook "Electrical Engineering, An Introduction", Schwarz and Oldham, published by Oxford. It should be available in the bookstore, but a better way to obtain it is to buy it used from survivors of EECS. Post a notice or try to get it used at Neds or ASUC.
Alternate references available in the Library on one-day reserve:
Rissoni, *Principals and Applications of Electrical Engineering*
Cogdell*, Foundations of Electric Circuits*
Irwin and Kerns, *Introduction to Electrical Engineering*
Horowitz & Hill, *The Art of Electronics*
The first three cover circuit theory and some basic electronics. Horowitz and Hill is a marvelous reference text for electronic gadgeteering and is the only book of all of the above worth buying and keeping. (Be sure to sell your text immediately after the course in case someone changes the course text in the future).

WEB Information All of this information and more can be found on our WEB page at www-inst.eecs.berkeley.edu/~ee42. Look there for complete list of Faculty/TA office hours, emails, access to our NEWSGROUP, etc. All handouts and problem sets as well as sample midterms and finals are posted.

Homework Homework will generally be handed out on Tue and is due promptly at 11 PM the following Tuesday. It will not be accepted late. The homework is deposited into the boxes labeled EECS 42 Homework near room 275 Cory (in the hallway). You are free to work with fellow students on home problems, but the work submitted must be your own, NOT copies of someone else's work (see policy on cheating, below).

Examinations There will be two midterms (Feb 22 and April 5) and a Final (May 16). *Do not register for this course unless you can meet these examination times because there will be no exceptions to taking the exam at the scheduled time*. The examinations are based on the lecture material; so regular lecture attendance is advised. Previous exams are available on the Web. All exams are closed book, but we supply a list of formulas in the exam, some of which may possibly be relevant.

Examination Questions: We discourage the asking of questions during exams. The exams are pre-tested and should be free from errors and bugs. If you think there is an error on an exam question, please do point it out. If you feel that something is ambiguous or unclear, just interpret it as best you can and make clear on the exam paper how you are interpreting it. Remember this is an engineering course and we make many approximations. The same approximations we make in the home problems will be inherent in the exam. To ask a question like “should I assume that the wires have zero resistance” will NOT get you anything but a frown.

Examination Regrades: We do sometimes make errors grading exams, and you have the right to have a problem or the entire exam regraded. The procedure for requesting a regrade is to carefully and neatly write a polite note explaining our stupidity, attach it to the exam, and pass the exam back in (you can do this in class). You also will have the opportunity to examine the Final, and again point out grading errors. In the case of the final, we regrade all problems of any exam resubmitted; so be careful; the score can go down if we have overlooked some errors elsewhere on the exam. In our experience about half the requests are for “more points” on some problem on which the student got the wrong answer. These requests are of course denied if the grading was consistent with the uniform grading scheme used on that problem. Note that some problems are graded with no partial credit for incorrect answers.

Laboratory: Although no laboratory is required, we encourage students to take EECS 43, a P/NP lab which reinforces most of the basic concepts taught in this course. If you have never worked with meters and oscilloscopes you will be at a significant disadvantage in EECS 42 unless you take the lab simultaneously. (For your information EECS 43 is a fun 2-hour per week lab where students are encouraged to explore circuits and devices. There are no lab reports or quizzes. Its OK to burn up transistors, though we want you to be kind to the expensive equipment. The last 5 weeks of the lab is spent building a simple lego-based robot. Hey, where else can you get credit and learn something building legos?)

Grading The course grade is made up as follows:
Homework: 5% ; Midterm I: 23% ; Midterm 2: 23% ; Final Exam: 49% .
The grading is not "curved" or normalized but is based on overall performance. Tentatively we anticipate the ranges to be A: >85 ; B: 70 to 85 ; C: 55 to 70. There will be + and - grades (e.g. approximately in the range of 80-85 and 65-70). We reserve the right to adjust grades higher in the event we create a "killer" exam with very low averages, but we guarantee that these scores will be the minimum (if you get an overall score of 85 out of a possible 100 you cannot receive less than an A).

EECS DEPARTMENT POLICY ON ACADEMIC DISHONESTY

Copying all or part of another person's work, or using reference material not specifically allowed, are forms of cheating and will not be tolerated. A student involved in an incident of cheating will be notified by the instructor and the following policy will apply:

1. The instructor may take actions such as:
   (a) require repetition of the subject work,
   (b) assign an F grade or a 'zero' grade to the subject work,
   (c) for serious offenses, assign an F grade for the course.

2. The recommended action for cheating on examinations or term papers is 1(c).
3. The instructor must inform the student and the Department Chair in writing of the incident, the action taken, if any, and the student's right to appeal to the Chair of the Department Grievance Committee or to the Director of the Office of Student Conduct.
4. The instructor must retain copies of any written evidence or observation notes.
5. The Department Chair must inform the Director of the Office of Student Conduct of the incident, the student's name, and the action taken by the instructor.
6. The Office of Student Conduct may choose to conduct a formal hearing on the incident and to assess a penalty for misconduct.
7. The Department will recommend that students involved in a second incident of cheating be dismissed from the University.

CLASS POLICY ON COLLABORATION AND CHEATING

(ref. Yelick and Shewchuk at http://www.cs.berkeley.edu/~jrs/61bf98/lectures/general)

Cheating directly affects the reputation of the Department and University and lowers the morale of other students. As is consistent with departmental policy, incidents of cheating on homework assignments or lab reports will result in a grade of zero on that assignment, while cheating on exams will result in a failing grade in the course. All incidents of cheating will be reported to the Office of Student Conduct where records of academic misconduct are maintained.

You are encouraged to help each other learn the course material by discussing the work before you do the homework assignments. Students are expected to be capable of distinguishing between helping other students and cheating. For example, explaining the meaning of a question is an example of interaction that is encouraged. On the other hand, there is no reason that you should ever have another student's solution in your possession. If you are not sure whether a particular interaction is appropriate, talk to Prof. Oldham or a TA before you turn in the assignment.

Presenting another person's work as your own constitutes cheating, whether that person is a friend or an unknown student in this class or a previous semester's class. Everything you turn in must be your own doing, and it is your responsibility to make it clear to the grader that it really is your own work. The following activities are specifically forbidden on all graded course work:

- Possession of another student's solution or partial solution in any form (electronic, handwritten, or printed).
- Giving a solution or partial solution to another student, even with the understanding that it will not be copied.
- Working together to develop a single solution and then turning in copies (or modified versions) of that solution under multiple names.

Be forewarned: Professor Oldham believes in applying the legally most severe penalty for cheating. All parties will be penalized. Do not copy or plagiarize and do not let your work be copied or plagiarized.