ECE418: Algorithms of Circuit Design Fall 2006

Lecture: MWF, 4:10-5:00, 1234 Engineering Bldg
Instructor: Dr. Shantanu Chakrabartty, shantanu@msu.edu
Office Hours: Tue: 2-4 PM in EB 3530 or EB 1320
Or by appointment in my office EB 3530.

Cadence TA: Yang Liu
Cadence TA Hours: Tuesday 2-4PM (Tentative)
Computer Lab Reservation: Tuesday 2-4PM (EB1320)
Course Website: http://www.ece.msu.edu/classes/ece418/shantanu/

Prerequisite: ECE 302

Topics Covered:
The following is a tentative schedule of topics that will be covered during the course. The relevant sections from the text-book are listed along with the topic.
1. Introduction to Analog circuits
2. Basic MOS device physics and modeling (Section 1.1 and 1.2)
3. Processing and Layout (Section 2.1 and 2.3)
4. Basic current mirrors and single stage amplifiers (Section 3.1-3.8)
5. Simulation and Cadence tools
6. Frequency response of single stage amplifiers (Section 3.11)
7. Basic opamp design and compensation (Section 5.1 and 5.2)
8. Advanced current mirrors and opamps (Section 6.1-6.6)
9. Comparators (Section 7.1-7.4)
10. Sample and Hold (Section 8.1-8.3)

Attendance and Conduct in Class:
Students are expected to attend classes and be attentive and responsive to all class discussions. It is the student’s responsibility to get notes and handouts for any missed class.

Grading:
The grades will be assigned according to the following credit table.

<table>
<thead>
<tr>
<th>Option</th>
<th>Credit Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>Homework (40% )</td>
</tr>
<tr>
<td>2</td>
<td>Mid-Term (20% )</td>
</tr>
<tr>
<td>3</td>
<td>Finals (30% )</td>
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<tr>
<td>4</td>
<td>Class participation (10%)</td>
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Tentative dates for two exams will be posted on the class website. Participation in class (attendance, asking/answering questions) will also be a factor in your grade (10%)
Design/Simulation Homeworks: 
Some of the homework will be a design/simulation quiz, which will require the use of Cadence design tools. A tutorial will be provided to help you get started and a TA will be available to help with the use of Cadence. Students are urged to make themselves familiar with the simulation tools as soon as possible. Detailed information on accessing and using Cadence on a UNIX platform will be provided.

Other Policies: 
- Cheating in any form will not be tolerated! This includes copying homework, copying circuit design files, cheating on exams, or any other form of unethical behavior.
- Homework can be worked on in groups but must be turned in individually. Direct copying of homework will result in a zero-point score for all people involved.
- Homework and projects must be turned in at the beginning of class on the date it is due (generally Fridays).
- Makeup exams will only be allowed for excused absences and only when the instructor is informed before the exam.

ECE Department Program Objectives 
Graduates of the computer/electrical engineering program will:
1. have acquired an understanding of the discipline (breadth)
2. have established expertise within the discipline (depth)
3. be engaged in lifelong learning (foundation for learning after graduation)
4. have an appreciation for the global and societal impact of the discipline (ethics, etc.)
5. have successfully utilized essential professional skills (teamwork, communication)