Welcome to BEE331! The first stop in your journey to learn the art of electronics!

We will be covering a large volume of material during this quarter. Hopefully, this course will be both informative and fun.

There are four main topics covered in the course:

1. Physics of conduction in semiconductors
2. Solid-state diodes and their use in non-linear circuits
3. Physics and applications of Field Effect Transistors (FET)
4. Logic circuit design

We will begin with a study of the phenomenon of conduction in semiconductors. This provides the basis for understanding the principles of operation for two very important classes of electronic components: diodes and FETs. After a comprehensive study of these components, we will use them to design and build logic gates and more complicated circuits. By the end of this quarter you will be able to:

1. Calculate conduction properties of materials and simple device structures
2. Explain the operating principles of semiconductor diodes and FETs
3. Determine the in-circuit operating state of diodes and FETs
4. Perform large signal analysis of circuits containing semiconductor diodes and FETs
5. Use a modern schematic capture and computer-aided circuit analysis program (SPICE)
6. Calculate the performance parameters for different MOS logic families

Class Information:

Instructor: Tai-Chang Chen  tcchen[at]uw.edu
Webpage: http://faculty.washington.edu/tcchen/BEE331/

Make sure to check the class web frequently for class announcements, and reading assignments. Exam dates, holidays, ... . The solution to the problem sets will be posted after collecting HWs as well.


Lab Handbook: Print from the class webpage

Grading: Segment Weighting
Homeworks 16% (the lowest will be dropped)
Laboratory Reports  12% (4 total, 3% each)  
Design Project  12%  
Midterm #1  25%  
Midterm #2  25%  
Final Quiz  10%  
Total: 100%

Homeworks:  There will be weekly homework assignments. Be prepared since some of the assignments may require a significant time commitment. Homeworks will be handed out each Thursday and collected at the beginning of the class the following Wednesday. No late homework will be accepted. You are encouraged to discuss the problems with other students but the final work that you hand in should be your own work. You will have the option of dropping the one with the lowest grade; so only seven of the homework assignments will be counted towards your final grade.

Exams:  There will be two in-class midterms and a final quiz. No make-up exam will be given. Failure to attend an exam or to make prior arrangements will result in a zero. Incompletes are not given out as course grades. The exams are normally closed book, closed-note, and closed homework. Make sure to bring a calculator to all exams.

Laboratory:  Making real, working systems is the ultimate goal of engineering. In this course we will have weekly lab sessions. The lab sessions in the first part of the course will provide you with an opportunity to see the material covered during the class in action: what happens when we bias a diode, how can we hook up a few gates to make a ring oscillator, ...

Laboratory results should be your group original work. Copying measurements made by another group without indicating in your report is cheating. So is letting someone copy your measurements.

In the second part of the class, we will spend about three weeks on a design project. Here, you will be presented with a current engineering problem. You are expected to come up with an innovative solution to this problem and demonstrate it in the lab. The scores you receive for the lab reports and the design project will determine your final lab grade.

Computers:  We will be using a simulation program (Multisim) for many of the assignments.

Disability Accommodations

If you believe that you have a disability and would like academic accommodations, please contact Disability Support Services at 425.352.5307, 425.352.5303 TDD, 425.352.3581 FAX, or at dss@uw.edu. They will be happy to provide assistance. You will need to provide documentation of your disability as part of the review process.
If you have a letter from Disabled Students Services, please be sure to present the letter to me in the first week of the quarter so we may make the necessary arrangements.

**Academic Integrity**

See the *UWB General Catalog*, the documents you signed upon admission to S & T, and the policy statements at [http://www.uwb.edu/academic/policies/academic-conduct](http://www.uwb.edu/academic/policies/academic-conduct) for crucial information regarding academic integrity. The library also has an extremely useful website with resources at [www.uwb.edu/library/guides/research/plagiarism.html](http://www.uwb.edu/library/guides/research/plagiarism.html). You are responsible for knowing what constitutes a violation of the University of Washington Student Code, and you will be held responsible for any such violations whether they were intentional or not.