"Microelectronic Circuits"

ECE 3040
Spring Semester 2008

School of Electrical and Computer Engineering
Georgia Institute of Technology

Dr. John D. Cressler

When and Where:

Lecture Place: C341 Van Leer
Lecture Time: M-W-F 10:35-11:55 am

My Contact Information:

email: cressler@ece.gatech.edu
office: Room 538 in TSRB (in Technology Square)
phone: (404) 894-5161
(404) 351-0198 (emergencies only)

My Office Hours:

Right after class is generally best for quick questions
… or M-W-F 4:30-5:30 in 538 TSRB
… or by appointment
… or if my door is open, stop in and say hi!

If you need me and cannot find me ... email me!

Course Policies and Procedures

Course Prerequisites

ECE 2030
ECE 2040
CHEM 1211
MATH 2403

Required Textbooks

R. Pierret, *Semiconductor Device Fundamentals*, Addison-Wesley, 1996.
R.C. Jaeger and T.N. Blalock, *Microelectronic Circuit Design*, 3rd Edition, McGraw-Hill, 2006.

There are numerous other books on the subject which may be useful for consultation, extra problems, etc. See, for instance,

R. Spencer and M. Ghausi, *Electronic Circuit Design*, Prentice-Hall, 2001.

In addition, you may find a SPICE reference helpful if you don't already have one.

PSPICE exists on CD in the back of Jaeger's book, or it can be downloaded for free:

http://www.orcad.com/downloads/demo/default.asp

I will be using overhead material during **every** lecture.
You need to put it in a binder and bring it to every lecture!

Web Site

The official course web site is located on my home page:

http://users.ece.gatech.edu/~cressler/

Go to the "Courses" button on the left, and then click on our course. Overhead material used in lecture will be posted there, along with homeworks, HW answers, supplemental material, etc. Other ECE 3040 professors also have lots of useful information on their web sites (old exams, lots of practice problems, visualization tools, etc.). Students are encouraged to use all available resources. See, for instance:

http://users.ece.gatech.edu/~alan/
(Dr. Doolittle)
http://users.ece.gatech.edu/~gmay/ece3040/
(Dr. May)

Lectures

Lectures will consist of a mixture of on-the-board notes, overheads, discussion about the technical material, problem solving, and digressions on life. Lecture will be considered by most to be fast-paced. The course itself is definitely fast-paced! Keeping up will prove essential to your success. Solving all homework problems and reading your assigned readings are key to good grades. **Based on past experience, class attendance should be viewed as mandatory for those desiring high grades**. All students are responsible for all material covered in class (written or orally transmitted), and which can appear on exams.

Homework

For full-credit, homework must be turned-in on the assigned date! **(in my hands by 5:00 pm).** Joint work is allowed on homeworks, but each student **MUST** hand-in their own individual solution. HW will consist of qualitative, quantitative, and theoretical problems of varying difficulty and length. Computer solutions will at times be necessary. Good grammar and diction most definitely count.

Exams

Exams will be open book, open notes. Any and all calculators are allowed. Partial credit will be given, but only if you provide a clear, legible, and easy-to-follow exposition of your solution. Box off your final answers. Good grammar and diction count. Exams will consist of three main parts: *qualitative* (tell me about something), *quantitative* (calculate something for me), and *theoretical* (project your knowledge of the material into uncharted territory for me). An optional outside-of-class study session will be provided before each exam. The final exam is cumulative.

Teaching Assistant

Your Teaching Assistant for the semester will be announced as soon as assigned. The TA will only be responsible for homework grading. I will grade the exams. Please see me for help with course material.

Grading Policy

Course grades will be calculated according to the following formula, based on a 100-point scale:

Homework - 20% (the lowest HW grade will be dropped)
Exam 1 - 10%
Exam 2 - 15%
Exam 3 - 20%
Final Exam - 35%

Academic Honesty

Students are expected to abide by Georgia Tech's established Academic Honor Code (refer to the General Catalog). Academic misconduct is not acceptable in my class, and incidents will be reported to the Administration. While students are encouraged to work together on homework, individual solutions must be submitted for grading. No collaboration in any form is permitted on exams.

Course Objectives

ECE 3040 introduces the basic concepts in semiconductor materials, devices, and circuits. Given that microelectronics is absolutely fundamental to all sub-disciplines of Electrical and Computer Engineering, this is an important class, and mastery of the material will serve you well in your future career.

Important Dates

Georgia Tech Calendar

Event	Day	Date
• First Class	Monday	1/7
• Holiday	Monday	1/21
• Drop Day	Friday	2/29
• Spring Break	Monday-Friday	3/17-21
• Last Class	Friday	4/25

Tentative 3040 *Calendar*

Event	Day	Date
• Exam 1	Friday	2/8
• Exam 2	Monday	3/10
• Exam 3	Monday	4/14
• Final Exam	Wednesday	4/30 (2:50-5:40)

Please mark all these dates on your calendar!

Tentative Travel Dates

- Monday: 3/3
- Wednesday: 3/12
- Friday: 3/28

Please understand that travel is a fact of life for a professor. My travel schedule is reasonably well known at present, but in some cases it can be dynamic during the semester as meeting schedules, reviews, etc. change. However, the show must go on! A guest lecturer will fill in for me during my required absences, as needed.

My Expectations of You

Class participation matters a great deal to me. In fact, it will be used to determine borderline grading cases. Meaningful participation during lecture requires preparation for lecture on your part. Read the course material. Come 5 minutes before lecture and review your previous notes. I expect all students to be respectful of their fellow students (and me). I expect you to be alive and kicking during lecture (bring coffee or soda if necessary!), and responsive to my questions. Please be on time for lecture. We will start promptly at 10:35 pm. Please turn your cell phones off. Please turn off wireless internet-connections! Smile, and relax … you are amongst friends!

My Teaching Philosophy

Simply stated, I am here for you. Period. I am concerned about *any* impediment to your learning and happiness, whatever that may be, and I will do whatever I can within my power to assist you. My goal in this class is to help facilitate your mastery of this material, but also to convince you of the beauty and majesty of the subject matter. And hopefully add some insight into life as well. It is my job to make the material clear to you. If I'm not succeeding in that, I am depending on you to make me aware of it. I conduct my classes informally. If you have a question, or comment, or need me to repeat something, or can't read my writing, or you don't follow what I'm saying - interrupt me (politely). There is no such thing as a dumb question. All questions are the potential source of deeper enlightenment for both you and me and the rest of the class. Ask! I would be happy to discuss any aspect of life with you; from career path, to graduate school, to the meaning of life. As you will see, I am fond of quotations, and offer them to you for your deeper reflection. They are also intended to remind you that there is much more to life than ECE!