EE100 – INTRODUCTORY NOTES

I. Introduction - Why EE100?

Welcome to EE100 (sometimes referred to as EECS 100) for Spring 2005. I am really excited to teach this class and I am glad the class has around 200 students! I am Bharath (aka Bart Simpson) and I am the instructor for this class.

The title of the course is "Electronic Techniques for Engineering". But, I would rather title it as "Practical Electronic Concepts". This is also a far cry from the catalog description. Why the change in title? Answer: People taking this class are not EE majors. I don't think you have any interest in studying microprocessor control (like the course catalog says), because you will probably never "talk" directly to a microprocessor.

Instead of talking about useless stuff, I will aim to give you a broad introduction to electrical engineering. Using the concepts from this class, you can actually take any upper division class in electrical engineering (like microprocessor interfacing) and learn something! Moreover, the course will answer practical questions you may have like: "what comes out of a wall outlet?", "what is the difference between DC and AC?", "why is the transistor count that Intel keeps bragging about so important?" etc. This approach will make the course practical – something I sorely missed from my Berkeley EECS undergraduate education. As an undergraduate at Berkeley, I noticed that most classes were impractical. EECS students use circuit simulation tools, but hardly construct real circuits. In EE100, you use circuit simulation tools and construct practical circuits.

I will also incorporate some aspects of your major into the course. For instance, you learn how to use a software called LabVIEW in this course. This should be relevant to the Mechanical Engineers in this class, since most of the ME classes use this tool. Actually, LabVIEW is suited to any application, as you will learn from the lab component of EE100. If you are a Chemical Engineering major, you will see some nonlinear analysis techniques that remind of you rates of change in chemical processes. If you are a IEOR major, you will see some concepts related to queing theory. Some of the teaching assistants for the class are from other majors as well. I forced this upon the EE department so you could relate more to your major.

The last important component of the course is mathematics. Mathematics transcends any major or discipline. Circuit theory is no exception – it is an application of a branch of mathematics called topology. Although such concepts are beyond the scope of this class, you can simply learn a lot by asking questions like: "why the passive sign convention?", "why is the current variable on the y-axis and not the x-axis in an i-v graph?" etc.

In conclusion, please do not view this class as a requirement enforced by your department. Rather, think about it as learning about what makes the electrical world "tick". Also, I WANTED to teach this class, because I love teaching.

II. EE 100 Spring 2005 Syllabus

Week: Dates	Lecture Topic(s) and Reading	Lab Topic and Homework
1: 01/17 – 01/21	01/18 - Course Introduction 01/20 - Chap 1: Circuit Variables Chap. 2: Circuit Elements	NO LAB, HOMEWORK NOTE: From week 2, homeworks are due Fridays (except last homework), 1:00 pm (SHARP!) in the EECS 100 HW box in 240 Cory hall . NO LATE HOMEWORKS WILL BE ACCEPTED, NO EXCEPTIONS!
2: 01/24 – 01/28	01/25 - Chap. 3: Simple Resistive Circuits 01/27 - Chap. 4: Tech. of Circuit Analysis Sections: 4.1, 4.2 – 4.3 (Nodal Analysis)	Lab 1: Introduction to electronic test equipment HW #1: 1.15, 1.17, 1.19, 1.26, 2.1, 2.3, 2.8, 2.11, 2.31, 2.33
3: 01/31 – 02/04	02/01 – Chap. 4: Tech. of Circuit Analysis Sections: 4.3, 4.4 (Nodal Analysis) 02/03 – Chap. 4: Tech. of Circuit Analysis Sections: 4.5 – 4.8 (Mesh Analysis)	Lab 2: Intro. to PSPICE HW #2: 3.8, 3.9, 3.17, 3.24, 3.30, 4.12, 4.17, 4.24, 4.27, 4.29
4: 02/07 – 02/11	02/08 – Chap. 4: Tech. of Circuit Analysis Section: 4.9 (Source Transformations) 02/10 – Chap. 4: Tech. of Circuit Analysis PRACTICE PROBLEMS	Lab 3: The Oscilloscope HW #3: 4.28, 4.25, 4.26, 4.15, 4.16, 4.48, 4.18, 4.19
5: 02/14 – 02/18	02/15 – Chap. 4: Finish Tech. of Circuit Analysis Sections: 4.10 – 4.12 (Thevenin/Norton etc.) 02/17 – Chap. 6: Inductance and Capacitance Sections 6.1, 6.2 (Intro. only) Chap. 7: First order Circuits Section 7.1 (RL Natural Response)	NO LAB. TAs will hold open office hours in lab to answer question(s). HW #4: 4.55, 4.57, 4.58, 4.60, 4.62, 4.65, 4.71, 4.73,
6: 02/21 – 02/25	02/22 – Chap. 7: First order Circuits Sections 7.2, 7.4 (RC Natural Response, Step Response) 02/24 – Chap. 7: First order Circuits Section 7.5 (Examples)	NO LAB. TAs will hold open office hours in lab to answer question(s) HW #5: 4.76, 4.84, 4.86, 4.87, 4.88, 6.1, 6.15, 6.12 (4.87, 4.88 – DO ANY METHOD YOU LIKE, EXCEPT PSPICE)!
7:02/28 - 03/04	03/01 – Movie!!!! **03/03 – MIDTERM 1 REVIEW SESSION**	Lab 6: RC Circuits HW #6: 7.1, 7.5, 7.13, 7.14, 7.24, 7.26, 7.28, 7.31, 7.32, 7.33
8: 03/07 – 03/11	03/08 – Q/A session (optional) **03/10 – MIDTERM 1 [COVERS WEEKS 1 – 6]** **UNDERGRAD. COURSE DROP DEADLINE: 03/11/04**	NO LAB, NO HOMEWORK MIDTERM WEEK

Week: Dates	Lecture Topic(s) and Reading	Homework and Lab Topic
9: 03/14 – 03/18	03/15 – Chap. 5: Operational Amplifiers Intro Sections 5.1 – 5.3 03/17 – Chap. 5: Operational Amplifiers Sections 5.4 – 5.7	Lab 7: Amplifiers HW #7: NONE No prelab for lab 7, your prelab points will be determined by your wiring in lab.
	SPRING BREAK: NO CLASS	NO LAB, NO HOMEWORK
10: 03/28 – 04/01	03/29 – Reader: Introduction to nonlinear circuit analysis 03/31 – Reader: Introduction to nonlinear circuit analysis (contd.)	Lab 8: Building square wave generators (Relaxation Oscillators) HW #8: 5.1, 5.3, 5.5, 5.6, 5.9, 5.11, 5.15, 5.19, 5.25, 5.33
11: 04/04 – 04/08	04/05 - Reader: Introduction to diodes **04/07 – MIDTERM II REVIEW SESSION**	Lab 9: Diodes HW #9: From Reader
12:04/11 – 04/15	04/12 – Q/A session (optional) **04/14 – MIDTERM II [COVERS WEEKS 7 – 10]**	NO LAB, NO HOMEWORK MIDTERM WEEK
13:04/18 – 04/22	04/19 – Project lecture 04/21 – Reader: Diode Circuits	Lab 10: PROJECT LAB I HW #10: From Reader
14:04/25 – 04/29	04/26 – Reader: Diode Circuits (contd.) 04/28 – Conclusion: Transistors and beyond. Applications – Robotics.	Lab 11: PROJECT LAB II HW #11: From Reader (due Thurs., 1:00 pm in 240 Cory)
15: 05/02 – 05/06	**05/03 –REVIEW SESSION FOR THE FINAL** **05/05 – Q/A SESSION FOR THE FINAL**	NO LAB, HOMEWORK 1. **PROJECT REPORT DUE!** MAKEUP ALL MISSED LABS! 2. MAKE SURE ALL ONLINE GRADES ARE CORRECT BY 5:00 PM, FRIDAY, 05/06/05. **NO GRADE CORRECTIONS WILL BE ACCEPTED AFTER THIS, NO EXCEPTIONS!!!!!**
	FINAL EXAM (CUMULATIVE): **FRIDAY, MAY 13th 2005, 12:30 – 3:30 pm**	

Note:

1. Homeworks are due by Friday, 1:00 pm in the homework box in 240 Cory. Exception is the last homework, because Friday 04/29 is a holiday (Good Friday). So it will be due a day earlier, on Thursday at 1:00 pm. No late homeworks will be accepted! No exceptions!
2. No homework scores will be dropped! No exceptions!

III. Grading

I hate this, but it has to be here. **By university policy, final exams may not be regraded, unless there is a totalling error or we missed a problem!** [Ref: http://www.berkeley.edu/catalog/policies/grades.html]

Therefore, my grading scheme is:

MT I: 15% MT II: 15% Final: 20% Labs: 25% Homework: 25%

Since the final exam is worth only 20% of your grade, you shouldn't worry about the final having a huge impact on your final grade in EE100. The letter grade breakdown is:

100 – 99: A+
98 – 90: A
89 – 87: A-
86 – 83: B+
82 – 80: B [I want the class average to be a B]
79 – 77: B-
76 – 73: C+
72 – 70: C
69 – 67: C-
66 – 63: D+
62 – 60: D
59 – 57: D-
<= 56: F

THE GRADE SCALE IS FIXED – NO CURVES! For example, an 89.99 in the distribution above is an A-. However, if the class average ends up being a C because of an exam, then I will decide the exam is at fault and adjust your grades accordingly. But if the class average is an A+, I won't bring it down to a B. When I taught EE100 in summer 2004, the class average was an A-.

The bottomline is: your grade in the class is determined by YOU. If you really care about a good grade, then my suggestion is to work hard and see what happens. Do the homeworks, they are very important in understanding the class material. They are not hard, just long. The labs should be fun and not exceedingly difficult or long. The final project is not hard as well. You can actually finish it in one lab sitting, but I give you two weeks. I DO NOT believe in giving hard tests, so you should be able to get an 80% on the test if you understand the basic material.

Here is the EE100 policy on cheating:
[Ref: http://www-bsac.eecs.berkeley.edu/~pister/etc/Cheating.htm]

> If I catch you cheating on HW, I will give you an F in the assignment.
> If it is a midterm or the final, I will give you an F in the class. Also, **I WILL DO MY BEST TO THROW YOU OUT OF THE UNIVERSITY.**
>
> For examples on student excuses for cheating, visit the website above.

DON'T KILL YOURSELF OVER A BAD GRADE – IT IS NOT THE END OF YOUR CAREER! TRUST ME ON THIS! I almost got kicked out of high school because of bad grades. I had Cs in some of my EE classes as an undergraduate. But, on the bright side I have worked on building supercomputers at Los Alamos National Labs and I am an EE graduate student in Berkeley working on two-legged walking robots. How? Because I am always learning, I NEVER study. Whatever I do, I give it my best. If its a class and I get a good grade, great. If not, I just move on.

IV. Miscellaneous

1. Course website (check FREQUENTLY): http://inst.eecs.berkeley.edu/~ee100.
2. Homework solutions will be available online at the website right after the HW is due. The HW solutions are password protected due to copyright issues. I will give you the login and password in the first lecture.
3. Textbook for this class is Electric Circuits, by James W. Nilsson and Susan A. Riedel, 7th Edition (includes PSPICE supplement). ISBN# 0-13-132972-3 . **PLEASE BUY THIS EDITION FROM THE CAL STUDENT BOOK STORE, DO NOT USE OLDER EDITIONS!**
4. There is a course reader which has important material. Please buy this reader from Copy Central on Hearst and Euclid (2483 Hearst Avenue, Berkeley, CA 94704). Ask for EE100 Spring 2005 Reader **(WILL BE AVAILABLE AFTER JAN. 10th 2005).**
5. There is a class newsgroup that I created on Google Groups, ucberkeley.class.ee100. The web link is http://groups-beta.google.com/group/ucberkeleyclassee100 Get on the newsgroup ASAP, it will be invaluable for last minute HW questions etc. To get on the newsgroup, email me (mbharat at cory dot eecs dot berkeley dot edu) your full name and SID so I can add you.

V. Conclusion

Have fun learning and before the end of the first week of classes:
1. Stop calling me "professor etc". Call me Bharath or Bart Simpson (preferable)
2. Buy the book and start reading!
3. Buy the reader from Copy Central.
4. Get on the newsgroup.