GENERAL COURSE INFORMATION

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1. General Course Introduction

Note: The current online version of these course notes has the final say on any course policy: http://inst.eecs.berkeley.edu/~ee100/handouts Email corrections in this document to mbharat@eecs.berkeley.edu

Welcome to EE100 (or EECS 100 or EECS 42/43) for Summer 2007! I am Bharath (aka Bart Simpson) and I am the instructor for this class. I am really excited to teach this class and I am so glad the class has so many students ready to learn some cool stuff.

Ever since Summer 05 we are offering both EE100 and EE42/43 as one class. This is because of an overlap in the conceptual material (refer to the Online Course Catalog[1] for a detailed description of EE100, EE42 and EE43). Please note that EE100 has both the lab and theory in one course. EE42 is the course, EE43 is the lab. I will refer to the course as ``EE100" from now on.

The prerequisites for this course are Math 1B and Physics 7B. However, I won't be enforcing any prerequisites since I will make this course self-contained. If you didn't take either of the prerequisites, you will not be at a huge disadvantage. You may have to spend a little more time on certain parts of the course, but you shouldn't consider dropping the class just because you didn't take Math 1B and/or Physics 7B.

DO NOT TAKE Math 1B or Physics 7B (or any other class) concurrently. **This class is about 30 hours/week of work, including lectures, labs and discussion**. Lectures are 6 hours/week, labs are 6 hours/week and discussions are 2 hours/week. Therefore, you will spend 14 hours/week in class alone! Since this is summer and we are covering 16 weeks of material in 8 weeks, expect to spend at least 15 hours/week on the homework. In other words, this class is like a full-time job.

[1] http://sis.berkeley.edu/catalog/gcc_sso_search_sends_request?p_dept_name=ELECTRICAL+ENGINEERING&p_dept_cd=EL+ENG&p_title=&p_number=100

Why do you have to take this course? The simple answer: it is a graduation requirement. However, I was in your same situation several years ago - taking graduation requirements. So, believe me when I say I understand your situation. I will try to make the class fun and entertaining. I will also give you a lot of mathematical tools (for example, dynamic route) that you can use in your major.

From another perspective, I will give you a broad introduction to electrical engineering. After understanding the concepts in this class, you can take any upper division electrical engineering course. Moreover, the course will answer practical questions like ``what comes out of a wall outlet?", ``What is the difference between DC and AC?". You will use circuit simulation tools and construct circuits in the real world.

I will also incorporate some aspects of your major into the course. For instance, you learn how to use LABVIEW in this course. This software tool can be applied to any major as you will learn from the lab component of this class.

In conclusion, please do not view this class as a requirement enforced by your department. Rather, think about it as learning what makes the electrical world ``tick". Also, **I WANTED TO TEACH THIS CLASS, BECAUSE I LOVE TEACHING**.

2. Course Materials

- Book: James W. Nilsson and Susan A. Riedel, "Electric Circuits", 8th Ed. (buy the edition without the PSPICE supplement). **DO NOT USE ANY OTHER EDITION**[2].
- Online notes: You can find these on the EE100 homepage: http://inst.eecs.berkeley.edu/~ee100 Check the Handouts link.
- Prelabs, lab guides and lab reports: You can find these on the EE100 homepage under Labs.
- Nonlinear problem set: Available on the EE100 homepage under Homework.
- Reader: NONE.

[2] Note: If you already have an older edition of the book, use it at your own risk! Although the concepts covered may be pretty similar, the end-of-chapter problems will be different. Therefore on homework you will have to get the problems from the 8th edition. Exam materials will be based off the 8th Edition.

3. Syllabus and Lab Schedule

Week	Date(s)	Lecture	Lab(s)
1	06/25 – 06/29	Book chapters 1 and 2 (Intro to EE, simple circuits)	NO LAB
2	07/02-07/06	Book chapters 3 and 4 (Circuit Analysis)	1: Sources & Resistive Circuits 2: Function Generator & Scope
3	07/09-07/13	Book chapters 6 and 7 (RC circuits, skipping op-amps for now to keep in sync with labs)	3: Capacitors, inductors Section 11, 13 – 1st lab Section 15, 16 – 1st & 2nd lab **MIDTERM**
4	07/16-07/20	Book chapter 5, oscillators (Op-Amps)	4: Opamps - Linear
5	07/23-07/27	Book chapter 9 (Frequency Domain)	5: Opamps - Nonlinear 6: Frequency Domain
6	07/30-08/03	Diodes and Transistors Digital Logic and Digital Systems (Microcontrollers)	7: Project Sensor: Strain Gauge **[SECOND LAB SESSION]**
7	08/06-08/10	Wrap up Digital Systems & Project Lecture(s)	8. Project Platform: PIC intro 9. Project I/O & Wrap up project
8	08/13-08/17	Winthrop's "Gee whiz" stuff: Demo cool EE projects (EE128, CS150, EE192) and relate to course concepts	NONE **FINAL**

- Chapters refer to your book, nonlinear notes can be found on the EE100 homepage. Check the Course Materials section for more information.
- Listed below are sections that you can skip from chapters:
  - Chapter 3: Sections 3.6 and 3.7
  - Chapter 6: Sections 6.4 and 6.5
  - Chapter 7: Section 7.7 (revisit after learning about op-amps)
  - Chapter 9: Sections 9.10 and 9.11
- Homeworks refer to end of the chapter problems. For the nonlinear problem set(s), check the homework link under the EE100 homepage. **Homework should be READABLE by the reader(s). If they are not, we WILL NOT grade them**.
- There is no lab the first week of classes. **EXCEPT FOR THE FIRST DISCUSSION SECTION** (Monday, 9:00 AM - 11:00 AM), there **IS** discussion the first week of classes. For lab guides, prelabs and lab reports check Course Materials section.

- **HOMEWORKS ARE DUE ON MONDAYS @ 2:00 PM IN THE HOMEWORK BOXES IN THE CORY LOUNGE (240 CORY). NO LATE HOMEWORK WILL BE ACCEPTED, NO EXCEPTIONS!**
- For information on exams refer to the Exams and Grades section.

4. Resources

- Your fellow students are the most important resource. Get to know people from your class, they will be invaluable for study groups etc. Me and the TAs are available for any kind of questions you may have
- On a side note, we don't discriminate based on grade. That is, don't think the EE100 staff won't talk to you because you are getting bad grades on homeworks or you didn't do well on the exams. We are always happy and willing to talk to anyone, if you are polite. It is quite normal to feel uncomfortable telling others that you don't understand something. But overcome this feeling and ask questions, believe me it will make you feel a whole lot better.
- The class website is packed with information: http://inst.eecs.berkeley.edu/~ee100 You should make it a point to check the website at least once a day.
- There is an electronic bulletin board system that you can use to communicate with other EE100 students and staff: http://groups.google.com/group/ucberkeleyclassee100Su07 Register on the newsgroup ASAP by the end of the first lecture. Just follow the registration instructions on Google groups. Please post questions to the newsgroup instead of sending emails to the staff. This will benefit not only you but also your fellow students.
- There may be tutoring available via HKN, the EE honors society. However this is summer so please check their schedule before going for tutoring: http://hkn.eecs.berkeley.edu
- There is a website for the course textbook. http://cwx.prenhall.com/bookbind/pubbooks/nilsson2/ However you don't have to go through this site inside-out. It just serves as extra reference material.

5. Enrollment – Class, Laboratory and Discussion Sections

Summer session is only 8 weeks long which means the course moves at a very frantic pace so you should try not to miss anything.

- Lecture attendance is optional. If you are waitlisted for the lecture, please wait till the end of the first week of class to see you if get in. We admit students based on a first-come, first-served basis. So, if you are number one on the waiting list then chances are pretty good you will get in. If you don't get in by the end of the first week, sorry, we cannot make any guarantee that you will get in. You can wait it out to see if students drop, but you are taking a risk.
- **YOU MUST ATTEND YOUR LAB SECTION. You cannot switch out of lab sections because it creates a logistical nightmare for us.** Make sure you are in groups of two. If there are an odd number of students, the TA may form group(s)

of three. Please refrain from asking HW questions in lab, this is what the discussion sections and office hours are for.

- Discussion sections are optional, but I highly encourage attending them since the course moves very quickly and you may need all the help you can get.

6. Policy on Cheating[3]

The vast majority of people reading this will not be cheating. I apologize for dragging you through this becuase of the very few who do.

We encourage collaboration. It is the best way to learn and keep up with the wealth of material you are expected to cover. At the same time cheating is not permitted. Sometimes the line between collaboration and cheating doesn't seem so easy to articulate, so we've tried to come up with very clear and enforceable rules so you know what is expected and what isn't.

- Unlike the degree of collaboration allowed and expected on homework, tests is in this course must be your own, individual work. Of course I hope you will work cooperatively with your friends **BEFORE** the test to help each other prepare by learning the ideas and skills in this course. But during the test you're on your own.
- For the labs, you will do it in groups of two. Of course you can talk to your neighbors. But don't copy what they are going.
- For homework it usually not clear what is allowed and what isn't. But as grown-ups, you *know* if you are cheating or not. For instance if you tell your HW partner that you do the odd numbered problems and they do the even, are you cheating? Well ask this question: are you learning *all* of the material? Not really since you are skipping problems. Of course we may never catch this but you will get penalized on the exams and later on in the course because you didn't learn the material. The idea behind collaboration is this: you and your study group sit down to *discuss* problems.

In my experience, most students cheat because they fall behind gradually and then panic at the last minute. Some students get into this situation because they are afraid of an unpleasant conversation with an instructor if they admit to not understanding something. However, like I keep saying: we don't discriminate like this. We would rather deal with your misunderstanding *early* than deal with its consequence later. Even if the problem is you spent the entire week stoned out instead of doing the homework, overcome the feeling of guilt and ask for help as soon as you can.

If someone wants to copy your work etc, be very blunt: ``Are you nuts? No way". Anyone who asks you to cheat is threatening your ethics: don't give in!!

Inspite of all this advice, some students till cheat. Some faculty are willing to work with a student who has cheated, to try to find an accommodation etc. **I AM NOT ONE OF**

[3]CS61A Course Handout and Kris Pister's Course Policy for CS150 etc.

THOSE FACULTY. Here is my policy on cheating: If I catch you cheating in any form, I WILL give you an F in the course. I will also do my best to throw you out of the university.

7. Exams and Grades

- The class is **NOT** curved. This means your grade is not affected by how your peers do so this will minimize competitiveness. Although I want the class average to be a B if all of you get an A that is ok. When I taught EE100 last summer, the class average was a B+. When I taught EE100 in Summer 2005, the class average was an A-. When I taught EE100 in Spring 2005 the class average was a B+.
- Here is the letter grade breakdown:
  - [99,100]:A+
  - [90,99): A
  - [87,90): A-
  - [83,87): B+
  - **[80,83): B (I want the class average to be a B)**
  - [77,80): B-
  - [73,77): C+
  - [70,73): C
  - [67,70): C-
  - [63,67): D+
  - [60,63): D
  - [57,60): D-
  - < 57: F
- Since the grade scale is fixed, an 89.99 is an A-. Although I want the class average to be a B I will NOT curve down. If all of you get an A that is awesome! 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 **(ref: CS61A Handout)**.
- Here is percentage break down according to midterm, final, labs, project and homework:
  - Percentage break down of points (EE100):
    - Midterm (07/13, in class): 30%
    - Final (08/17, location: TBA) : 35%
    - Labs: 20%
    - Project: 10%
    - Homeworks: 5%
  - Percentage break down of points (EE42):
    - Midterm (07/13, in class): 40%
    - Final (08/17, location: TBA) : 45%
    - Homeworks: 15%
  - Percentage break down of points (EE43):
    - Pass/Not pass: Need to score more than 57% to pass

- Grade corrections: YOU HAVE ONE WEEK FROM THE TIME YOU GET ASSIGNMENTS BACK IN LAB TO HAVE YOUR GRADE CORRECTIED. If it is a lab grade, talk to your lab TA. For homeworks and tests, please bring it to my office hours. **By university policy, final exams may not be regraded. Unless we did a complete blunder like missing a question altogether or got the wrong total.**
- Checking your grade: You can check your grades online at the EE100 website. They are indexed by using a mathematical function of your SID and are password protected. I will give you the necessary information in the first lecture. I will update grades every Sunday evening around 9:00 pm

The midterms are not difficult and students usually do very well. For instance, the two midterm averages from Spring 2005 were 84% and 91%. The labs and project are pretty much gimme points. You put in effort and understand basic concepts, you should get them all. The homeworks are not worth that much, so if you miss a couple of homeworks, it should be ok. But try to turn in all homeworks, they are probably the best way to understand the course. The final exam is difficult, because it is cumulative. Just don't slack off when you study for the final and you should be ok.

8. FAQs

a. How strictly will you enforce the prerequisites (Math 1B and Physics 7B)?

I won't enforce any prerequisites. You really don't need to know anything from Physics 7B and Math 1B to understand the material. Knowledge of basic differentiation and integration is sufficient for the class. You may have to put in more effort depending on your skill level, but you don't have to think about dropping the class just because you don't meet the prerequisites.

b. How much work is this class?

This question is really difficult to answer because it depends on your skill level. If you are an average student, expect to put about 30 hours/week on this class. Yes, this is a LOT. But, this is the summer. I will try to make the learning fun. However we are covering 16 weeks worth of material in 8 weeks.

c. Is this course really necessary for my major?

Another very difficult question to answer. To be honest, you probably will not use ``an Enhancement type NMOS FET'' directly in your major. However, the mathematical concepts you learn (like nonlinear analysis) will be very applicable to your major since the subject underlying any field of study is mathematics.

d. What is your advice on how to aim for an A- or above in this course?

Three things: **DO NOT CHEAT**, **do not leave the homework until the day before the due date** and **ask for help as soon as you don't understand something**.

e. I am disabled and need special facilities or arrangements to do the course work. What should I do about it?

The Disabled Students Program (DSP, ext. 2-0518) certifies students as having special needs. DSP students are entitled to the necessary accommodations in course arrangements. The DSP office will give you a letter to bring to us. Please take the initiative about letting us know what you need (example: if you are qualified to take tests separately or need more time on the test) **1 WEEK** in advance. If English is not your native language and you have trouble understanding the course materials or lectures, please talk to us about it as well.

f. Why don't you curve the class?

Because some students will then try to backstab others. If there are no curves, the grade you get in the class depends only on you. Trust me, your lab partner's work won't affect your grade.

g. Its 1 second past the regrade deadline, can I still submit a regrade request?

NO.

h. Its 1 second past the homework submission deadline, can I still submit the HW?

NO.

i. Why are homeworks worth so little, yet they are so much work?

To discourage giving high grades to students who cheat on the homework. Unfortunately, it is very easy to cheat in this class since the material is so basic (and because of the magic of Internet and Google). If you honestly try the homework and understand the material you should do very well on the tests. The midterm exam should be very straightforward, only the final will be difficult because it is cumulative. So, if you understand the material you should get a very high grade in the class, even if you falter on the homework grade because you didn't turn in a couple of homeworks. Also, if homeworks get lost then you won't suffer.

j. Can we do/turn in homeworks in groups?

You can do homeworks in groups of two or three (NOT MORE). But you have to turn in individual copies and identify your homework partners in your copy.

k. When and where do we turn in the homeworks?

Homeworks should be turned in by 2:00 PM on Monday (starting the second week of classes) in the homework box labeled ``EECS 100 homeworks'' on the 2nd floor of Cory hall in room 240 (aka Cory lounge). You **CANNOT** turn in homework anywhere else (lecture or lab). You **CANNOT** turn in late homeworks, no exceptions!

l. How do we get homeworks back?

You get them back in your lab section. **Therefore, please put your name, parnter(s) names, your student ID and your lab section number on your homework. If you don't do this or enter incorrect information, you will loose 10 points on the homework**.

m. Can our homework partner be in a different lab section?

Yes.

n. I turned in my homework, but I can't find my grade online. I can't find my homework in lab. What should I do?

Well, there is nothing you or we can do. **WE ARE NOT RESPONIBLE FOR LOST HOMEWORKS**.

o. I have issues with grading, what do I do about them?

If its a lab grade, contact your lab TA. If its homework or exam related, **you must bring it to my office hours (check the location and time on the EE100 homepage**. You have one week from the date your receive the assignment in lab to do this. **YOU CANNOT SUBMIT GRADE CORRECTIONS AFTER THIS, NO EXCEPTIONS!**

p. I know some student(s) who cheated in the class, what should I do about it?

You should report them to me ASAP. I will of course keep your involvement confidential. I will also verify if the student(s) actually cheated before taking action. If you feel guilty about reporting your fellow class mates, think about this: if the student(s) cheat on something insignificant as one letter grade, what happens when they become engineers and are responsible for designing systems that affect human lives? Suppose they are not able to finish the project on time, what guarantee is it they won't cheat?

q. I don't like (or have a conflict with) my discussion section/lab section. Can I switch?

You **CANNOT** switch lab sections, because it creates a logistical nightmare for us. You may however switch discussion sections (these sections are optional anyway), depending on space. First, ask the TA of the discussion section to see if they have any room, then

go ahead with the switch. You don't have to make the discussion section switch on Telebears.

r. Can I have a lab partner from another section?

NO.

s. Is there a separate course reader that I have to buy?

NO, we will post all lab guides and other notes online.

t. My lab/homework partner never does any work, what should I do about it?

First, talk to your partner. Maybe they have some personal difficulty that is hampering them. Try to sort it out within your group. If that does not work, approach your TA and explain the problem. The TA will go about resolving the matter. If no solution is reached in a week, remind the TA and/or talk to me.

u. What should we call you?

Bharath or Bart or B. **DO NOT CALL ME** ``Professor'' or ``Professor Bharath'' or anything that starts with ``Professor''.

v. What are some ways to p* you off?**

Note: students don't ask this question outright. But, I am sure most of you are wondering about this. Hence, some of the ways are: calling me ``Professor'', crying about grade, sending me anonymous email and telling me how to do my job (like: ``Bart, could you please post HW solutions online? I got this question in an email from a student last semester. What annoyed me: the individual sent me this email a minute after the HW was turned in)

w. I am having trouble understanding course material, what should I do about it?

This is pretty normal. You are all probably excellent students in your major. This is outside your major so you will have initial difficulties thinking ``like an electrical engineer''. But, if you wait a week before asking questions then you will fall behind. **Please ask for help as soon as possible**. **THERE IS NOTHING SHAMEFUL IN ASKING FOR HELP**.

9. References

a. Prof. pister's policy on cheating. http://www-bsac.eecs.berkeley.edu/~pister/etc/Cheating.htm. Last accessed: June 11th 2005.

b. Brian Harvey. Cs61a course handout. http://inst.eecs.berkeley.edu/~cs61a/sp05/handout0.pdf. Last accessed: June 11th 2005.