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Phy335

Electronics and Instrumentation Lab
<http://mini.physics.sunysb.edu/~xudu/teaching.html>
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Spring 2017

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Organization

Class Meetings: Mon/Wed & Tue/Thurs, 1-3:50pm, Room A-127

Professor: [Xu Du](#), B-103, Office Hours: Tues. 10:50-12:50 in **B-103** or by appointment
 Send [mail](#) or phone at 2-8019

Teaching Assistant: [Xinzhong Chen](#) and [Lui Li](#)

Description

All material is divided into Units, with each Unit covering internally related topics (see [below](#)). Each Unit may occupy from 2 to 5 lab periods. Lab assignments *with instructions* for each Unit are shown below. You must read the material covering the upcoming lab in the textbooks, design needed circuits, do calculations beforehand to be prepared for the lab work, where time is limited. Extensions of lab time may be arranged with the TA by prior mutual agreement, but should be done only under exceptional circumstances. No substitution of regularly scheduled lab periods is possible.

There will be a short (about 30-45 min) mini-lecture at the beginning of most labs; please come on time. The mini-lecture may cover the main points of the upcoming lab, or may concern some other, related subject in electronics and physics.

You must have **two lab books with lined and graph paper** (See *Texts*). These books will contain your notes and data taken in the lab. After finishing a Unit you will submit your lab book to TA for grading, and use the second book for the next Unit.

You will be doing the lab work either individually or in groups of 2 per setup. All students should make the best effort to participate equally in the experimental part. You will write separate lab reports ([example report](#), [guidelines](#)) after completion of each unit and submit them for grading along with your lab book. Although you may work in the lab with a partner, you will write your reports individually. Except for the raw data, the reports are expected to be different and reflect individual work. Copying of any part of the report is unacceptable and will automatically lead to zero grade, as a first warning.

There will be *Midterm practical exam* during the semester, and a *final exam*. Exams include doing experimental tasks in the Lab, explaining the relevant theory (for example, derivation of essential formulas), and data analysis. Take notes at mini-lectures to prepare for this. Each exam will resemble the lab period and the writing of the report, all combined in the interval of 1/2 a lab period. The exams are given in two shifts, so that each student will have to work on the exam problems on his or her own. Active and equal participation in experimental work and study of the material covered in mini-lectures during the course will prepare you for the exams. Sign-up sheets for each shift of the midterm (12:30-2:30 pm and 3:00-5:00 pm) will be posted in the lab 2-3 weeks in advance.

Grading

At least six units, the midterm and the final must be completed to pass this course. The grading is weighted as
60% Units + 20% midterm + 20% final

ACADEMIC INTEGRITY: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculties are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Syllabus and Unit Assignments

Unit	Subject	Lab Dates	Reports Due	Text Sections
	Introductory Lecture	Jan. 23, 24		
Unit 1a, 1b	Lab instruments, signals, resistors	Jan. 25, 26, 30, 31, Feb. 1, 2	Feb. 8, 9	1.2.1-1.2.5, 1.3- 1.8
Unit 2	Capacitors, inductors, RC filters	Feb. 6, 7, 8, 9, 13, 14	Feb. 20, 21	1.2.6-1.2.8, 2, 3; handout Pass Filter demo applet
Unit 3	Diodes and DC Power	Feb. 15, 16, 20, 21	Feb. 27, 28	4.5-4.7
Unit 4	Transistors and Transistor circuits	Feb. 22, 23, 27, 28, Mar. 1, 2, 6, 7, 8, 9	Mar. 22, 23	5
Midterm	(Units 1-4)	Mar. 20, 21		
Unit 5	Operational amplifiers	Mar. 22, 23, 27, 28, 29, 30, Apr. 3, 4	Apr. 10, 11	6.3-6.6 Handout
Unit 6	Elements of Digital Electronics	Apr. 5, 6, 10, 11, 12, 13, 17, 18	Apr. 24, 25	7.1-7.10 Boolean Algebra
Unit 7	Analog->Digital Interfacing	Apr. 19, 20, 24, 25, 26, 27	May. 3, 4	7.11 Extra documentation Fitting Handout Minimalist Fitting Code
Final	(Units 4-7)	TBA		

Texts

Required Text(s):

- Curtis A. Meyer, Basic Electronics: An Introduction to Electronics for Science Students
- Two laboratory notebooks, ala *Science Notebook* from the book store

There will not be specific reading assignments from the textbook. However, you should look in the section with a topic similar to each lab, read it and understand it before coming to do the lab. These are primarily references

Optional Text(s), on reserve in the physics library:

- Horowitz and Hill, The Art of Electronics, 2-nd edition, (Cambridge University Press, 1989)
- Hayes and Horowitz, Student manual for the Art of Electronics (Cambridge University Press, 1989)
- Rizzoni, *Principles and Application of Electrical Engineering*
- Alexander and Sadiku, *Fundamentals of Electric Circuits*
- J. R. Cogdell, *Foundations of Electrical Engineering*

DISABILITY SUPPORT SERVICES (DSS) STATEMENT If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.sunysb.edu/ehs/fire/disabilities.shtml>

Critical Incidents Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students' ability to learn.

