PHYSICS 457
PRINCIPLES OF ELECTRONICS

INSTRUCTOR: Barbara Neuhauser
Thornton 315 (academic office)
415-338-1468
Thornton 106 (research office)
barbjn@coolchips.sfsu.edu

E-MAIL CONTACT: You may e-mail me about administrative matters. Please do NOT e-mail questions about homework; I have to draw diagrams and wave my hands when I answer physics questions. Please use this subject in your e-mail messages: "PHYSICS 457: your name"

OFFICE HOURS: MWF 11:10 am - 11:45 am in TH 106 (tentative)
Tuesday 1:00 pm – 2:00 pm in TH 106 (tentative)
and by appointment

PREREQUISITES: PHYSICS 230 (General Physics with Calculus II)
PHYSICS 232 (Laboratory for Physics 230)

REQUIRED TEXTS: The Art of Electronics (2nd ed.) by P. Horowitz and W. Hill (Cambridge)
Student Manual for The Art of Electronics by T.C. Hayes and P. Horowitz (Cambridge)

CONTENT: This course covers the design and analysis of analog electronic circuits using discrete bipolar and field effect transistors and also integrated circuit operational amplifiers. Students are expected to master basic concepts in the following areas and to be able to apply the concepts in the laboratory:

- Passive linear and nonlinear circuit components
- Network analysis techniques
- Phasors (on "stun", not "kill")
- Diodes (ideal, pn junction, Zener)
- Bipolar junction transistors (BJTs)
- Field effect transistors (FETs)
- Operational amplifiers
- Oscillators

LECTURES: Students are expected to attend ALL lectures and to ARRIVE ON TIME for the lectures. Please TURN OFF your cell phone during the lecture !!! A tentative lecture and laboratory schedule will be provided during the first week of classes. Lectures will discuss appropriate portions of the textbooks and provide extensive supplemental material. Usually, but not always, lecture notes will be handed out so that students can focus on the presentation. Relevant questions that can be answered briefly are welcomed during the lectures. Longer discussions of topics must be deferred to scheduled office hours.

LABORATORY: Students are expected to attend ALL laboratory sessions. Students must ARRIVE ON TIME for the labs and stay for the ENTIRE lab period unless they finish taking data early, which has rarely happened in this course. Preparation is essential if the lab work is to be completed during the scheduled periods!!

CHRONIC LATE ARRIVAL AT LAB SESSIONS AND/OR A SINGLE UNEXCUSED ABSENCE FROM A LAB SESSION WILL RESULT IN THE STUDENT BEING DROPPED FROM THE COURSE. Do NOT schedule travel plans that conflict with laboratory sessions.
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Usually laboratory data will be taken during SCHEDULED SUPERVISED SESSIONS or during
SUPERVISED make-up sessions. On rare occasions the instructor and student may make
explicit written plans for unsupervised lab work by the student.

Lab reports are due at the beginning of the laboratory period one week after the lab work
has been completed. Sloppy lab reports may not be graded. FAILURE TO HAND IN THE
FIRST LAB REPORT ON TIME MAY RESULT IN THE STUDENT BEING DROPPED FROM THE
COURSE. Failure to hand in the remaining lab reports on time may result in a 25% penalty.
Failure to complete the assigned labs will result in a grade of Incomplete for the course.

HOMEWORK:
Problem sets will be assigned each Friday (tentatively) and will be due at the beginning of the
lecture on the following Friday (tentatively). Students are expected to state briefly but clearly the
justification for each major step in the solution to a problem. Sloppy homework sets may not be
graded. Students may discuss with each other general approaches to the problems, but
each student should work out the detailed solutions by him/herself without using solutions
obtained from any source.

Failure to hand in the first problem set on time may result in the student being dropped from the course. Failure to hand in the remaining problem sets on time may result in a 25% penalty.

EXAMINATIONS:

QUIZZES:
A “take-home quiz” will be handed out on most Mondays and will be due at the beginning of the
lab session on the following Wednesday. Topics include lab preparation calculations and/or simple
exercises related to recent lecture topics. Each student should work out the detailed solutions
by him/herself without discussing the quiz with anyone or using solutions obtained from
any source.

MIDTERMS:
Friday, 5 March 2010 (tentative); Lectures 1-15
Friday, 23 April 2010 (tentative); Lectures 16-30

Each midterm exam will be taken in-class, closed book and closed notes. If the instructor’s
workload has sufficient flexibility, each exam will be graded and returned for you to correct as an
open-P457-text-book, open-P457-lecture-notes, do-it-yourself take-home exam. Your score will
be the average of the two scores.

FINAL EXAM:
Wednesday, 19 May 2010, 8:00 am – 10:30 am (Lectures 1 – 41)

The final exam will be taken in-class, closed book and closed notes.

The final exam MUST be taken at the scheduled time to avoid assignment of a grade of zero.
Do not make travel plans that conflict with this schedule. No make-up final exam will be
given except in the case of illness or personal crisis.
GRADE: A student must earn at least 50% of the total possible points in order to receive a grade of C- or better

HOMEWORK: 20 % All homework sets will be included.
QUZZES: 10 % All quizzes will be included.
MIDTERM EXAMS: 15 % each
LAB: 25 % All lab work must be done or else a grade of Incomplete will be given
FINAL EXAM: 15 %

CHEATING ON LAB REPORTS, HOMEWORK, QUIZZES, OR EXAMS WILL RESULT IN FORMAL DISCIPLINARY ACTION BEING TAKEN AGAINST THE STUDENT.

STUDENTS WITH DISABILITIES:

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu).
STUDENT SURVEY FORM

Please fill out this form and hand it in at the end of the class period. Your completed form will serve as proof of your attendance.

Name: ____________________________________________________________________________
   (family)   (given)

Major: __________________________________________________________________________

Address: __________________________________________________________________________
   __________________________________________________________________________

Telephone: ___________________________ e-mail: ________________________________

Summary of undergraduate and graduate Physics and Engineering courses already taken:

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<tr>
<th>Course</th>
<th>Date Completed</th>
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Comments or questions: __________________________________________________________
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