Fall Semester 2014 **San Francisco State University**

PHYSICS 450

INTRODUCTION TO SOLID STATE PHYSICS

INSTRUCTOR: Barbara Neuhauser
415-338-1468
barbjn@sfsu.edu
Thornton 540 (academic office)
Thornton 106 (research office)

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 450: your name"

OFFICE HOURS: MWF 2:30 pm – 3:30 pm in TH 540 (tentative)
Tuesday Noon – 2:00 pm in TH 106 (tentative)
and by appointment

PREREQUISITES: PHYSICS 320: Modern Physics I (required)
PHYSICS 360: Advanced Electricity and Magnetism (recommended)
PHYSICS 370: Thermodynamics and Stat. Mechanics (recommended)

REQUIRED TEXT: **Elementary Solid State Physics** by M. Ali Omar, any edition (Addison-Wesley)

OBJECTIVES: Students are expected to master basic concepts in the following areas and to be able to apply them to solve qualitative and quantitative problems.

- Crystal structure
- X-ray diffraction
- Lattice vibrations
- Elementary models of electrical conductivity
- Electron energy bands in solids
- Electrons and holes in semiconductors

LECTURES: **Students are expected to attend ALL lectures and to ARRIVE ON TIME.**
Please TURN OFF your cell phone during lectures.

A tentative lecture schedule accompanies this syllabus. Lectures will discuss appropriate portions of the textbooks and provide extensive supplemental materials. 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.

HOMEWORK: Problem sets will be assigned each Wednesday and will be due immediately after lecture on the following Wednesday. 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 must work out the detailed solutions by him/herself.**

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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: Approximately eight times during the semester a "take-home quiz" will be handed out during a lecture and will be due at the beginning of the following lecture. **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: (tentative) Wednesday, 15 October 2014
(tentative) Wednesday, 19 November 2014

- Each midterm exam will be taken in-class, closed-book, closed-notes.
- It will be graded and returned for you to correct as an open-Physics 450 text book, open-Physics 450 notes, **do-it-yourself** take-home exam.
- The reworked exam will then be graded, and the initial and final scores will be averaged.

FINAL EXAM: Wednesday, 17 December 2014, 10:45 am – 1:15 pm

- **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 documented 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-minus or better.**

HOMEWORK:	35 %	**All** homework sets will be included
QUIZZES:	15 %	**All** quizzes will be included
MIDTERM EXAMS:	15 % each	(Total 30 %)
FINAL EXAM:	20 %	

CHEATING ON 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).**

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STUDENT SURVEY FORM

Please fill out this form and hand it in at the beginning of the second lecture.

Name: _____
(family) (given)

Major: _____

Address: _____

_____

Telephone: _____ **E-mail:** _____

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

Course	**Date Completed**	**Grade (optional)**

Comments or questions: