

Semester and Year: Fall 2016

Stony Brook University
Department of Physics and Astronomy
College of Arts and Sciences
PHY 472, Solid State Physics
Course Instructor: Prof. Marivi Fernandez-Serra
Section: 01
Office Hours: Tuesdays 1 pm- 2pm or by appointment.
Instructor contact information [maria.fernandez-serra at stonybrook.edu](mailto:maria.fernandez-serra@stonybrook.edu), Physics B139

COURSE DESCRIPTION:

Must match the *Bulletin* exactly.

<http://www.stonybrook.edu/ugrdbulletin/current/index.shtml>

If the course is a "topics course" see below.

A study of the different types of solids, with emphasis on their thermal, electrical, and optical properties. It introduces the concepts of phonons and electronic bands, and applications to metals, semiconductors, superconductors, and magnetism.

Prerequisite: PHY 306 and 308

Credits: 3

Additional topics not mentioned in the bulletin description: Nanophysics, surface physics, numerical methods and algorithms and also theory of the liquid state.

Course Pre/co-requisites

Indicate the approved course prerequisites (as published: <http://www.stonybrook.edu/ugrdbulletin/current/index.shtml>)

Prerequisite: PHY 306 and 308

COURSE LEARNING OBJECTIVES:

Include course objectives. If this course is approved to satisfy D.E.C. and/or the SBC, the objectives **must** address how the course outcomes relate to the specified D.E.C or SBC category. See the DEC descriptions in the Bulletin. Include a brief description of the opportunities this course would provide for students to acquire the knowledge or skills necessary to achieve the course learning outcome(s)

The student learning objective is to understand the physics of condensed matter. In particular the students will learn to identify materials by their atomic structure and electronic properties. The students will learn to understand the differences between many body physics and few body physics and the differences between nanophysics, mesoscopic physics and continuum physics. There will be a strong component of statistical physics, both quantum and classical in this course.

COURSE REQUIREMENTS:

Attendance and Make Up Policy

Attendance is mandatory.

-- Policy for late work and tardiness

No late work will be accepted. Any (serious!) excuses (medical or otherwise) are to be documented and discussed with the instructor in a timely manner. Homework must be turned in by the date and time on the assignment, which will typically be scheduled during a lecture period. If you cannot make the lecture, you can bring your assignment to the instructor's office before the due date/time.

Description and schedule of Required Readings and/or Assignments.

Include bibliographical list of readings, library reserve items, etc.

Text books:

1. " Charles Kittel, *Introduction to Solid State Physics*, 8th edition, John Wiley & Sons, 2005.

Requirements for written assignments (margins, font, style manual)
None.

Include a brief description of the graded assignments that the instructor(s) will use to evaluate the students' achievement of the outcome(s)

Homework: homework problems will be posted weekly.

Exams

Number and Description of Exams (include dates in meeting schedule section below).

There will be two midterm exam during regular lecture hours.

There will be one final exam, on Dec 16 2016.

GRADING:

Describe the components of the course, and indicate how each component of the course will be factored into the final course grade; often expressed in %

Homeworks will be graded and returned. A=very good, B=good; C=satisfactory, D=unsatisfactory. The final grade will be 20% homework and attendance, 20% midterm1, 20% midterm2, and 40% final exam. If the final exam grade is a significant improvement over the midterm exam grade, a corresponding upward adjustment will be made in the midterm exam grade.

P/NC: If you decide to take the course for **PASS/NO CREDIT**, you must change before the University-imposed deadline.
All grades will be accessible via the blackboard for this course.

MEETING SCHEDULE

List each class meeting and assignments and topics for each. Include Exam Schedule and assignment due dates

The class will meet twice a week.

CLASS PROTOCOL

Cell Phone and electronic device statement

No cell phones or other "smart" devices with phone or WiFi capability will be permitted in the exams.

Class interruptions

CLASS RESOURCES (examples below)

Library resources

Blackboard

Writing Center

Career Center

Others (see link) <http://stonybrook.edu/aadvising/tut.html>

The University Senate Undergraduate and Graduate Councils have authorized that the following required statements appear in all teaching syllabi (graduate and undergraduate courses) on the Stony Brook Campus. See also <http://www.stonybrook.edu/provost/facultyinfo/Syllabus%20Statement.doc>

DISABILITY SUPPORT SERVICES (DSS) STATEMENT (must be the following language)

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

[In addition, this statement on emergency evacuation is often included, but not required:

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.stonybrook.edu/ehs/fire/disabilities>]

ACADEMIC INTEGRITY STATEMENT (must be the following language as approved by the undergrad council):

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. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. 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/>

CRITICAL INCIDENT MANAGEMENT (must be the following language as approved by the undergrad council):

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, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.