**PHYSICS 472          Fall 2021**

**Syllabus**

**Physics 472** is an introductory course on Solid State Physics. The emphasis is on the basic properties of metals, semiconductors and insulators.  Lattice vibrations and electronic band structure will be discussed in detail. We will also cover selected topics like p-n junctions, semiconductor devices, magnetism and superconductivity. The course is intended for students who have taken Modern Physics (PHY 251 or equivalent) and have a knowledge of Quantum Mechanics and Thermal / Statistical Physics.  Calculus will be used extensively.

**1. Course Organization**

This course is offered only in in-person fromat, with two lectures each week. The lectures are mainly devoted to the presentation of the material covered in the syllabus of the course, but the homework exercises and problems will also be discussed. There will be two exams, one in the middle of the semester and another one during the last lecture-time.

* Instructor: Prof. László Mihály (office: B-146; phone: 2-8178; email: laszlo.mihaly@stonybrook.edu).
* Textbook: [Solid State Physics](https://www.amazon.com/Introduction-Solid-Physics-Charles-Kittel/dp/047141526X/ref%3Dsr_1_3?dchild=1&keywords=kittel+solid&qid=1623336636&sr=8-3)by Charles Kittel. There are several editions of this book; The 7th edition is recommended because it is less expensive, but the 8th edition is also fine, and earlier editions are also acceptable.
* Recommended: Laszlo Mihaly and Michael C. Martin: [Solid State Physics, Problems and Solutions, 2nd edition, Wiley VCH](https://www.amazon.com/Solid-State-Physics-Problems-Solutions/dp/352740855X). In addition to having lots of solved problems, this book has a short summary of the main concepts at the beginning of each topic.
* Download and install the The Solid State Simulation (SSS) Project software from this [site http://pages.physics.cornell.edu/sss/](http://pages.physics.cornell.edu/sss/).

**2. Homework**

Students are supposed to read ahead of time the material covered in the lectures.  There will be homework assignments in about every 2 weeks. Each assignment will typically consist of a few problems from the textbook. The homework is due at the beginning of the lecture one week after it has been distributed in class. Late homeworks will be penalized by a 50% reduction of the grade points. The latest time to submit a homework is 2 weeks after it was assigned. After that time the homework will not be accepted. No electronic submissions, please.

**3. Policy on student collaborations and plagiarism** Students are encouraged to discuss homeworks. However, when the written solution is prepared, students should work alone. The ideas underlying the solution should be expressed by the student's own words, and the calculation must be done by the student. Consulting the internet for help in the solution of the homeworks is also encouraged, but use caution, there are lots of mistakes on the internet. Cutting and pasting blocks of text, or otherwise directly copying from WEB pages or books are strictly prohibited. Use your own words to describe the solution, perform your own calculations.

**3. Exams**

There will be two exams during regular lecture time. The first one, at the middle of the semester, will cover approximately half of the material discussed in the course. The second one, at the end of the semester will cover the other half. All exams are "closed book", but an 8 ½ x 5 ½ formula sheet (two sided), handwritten by the student, will be allowed.

**5. Grades**

The final grade will be determined from the various portions of the course with this relative weight:

Homework: 20 %

First Exam: 40%

Second Exam: 40%

The letter grade will be assigned on an absolute scale. Students demonstrating sufficient knowledge of the course material will get an A.

If a student misses an exam, he/she will receive a zero in that test unless absence is due to medical reasons, which must be justified by a written note from the medical doctor attending the student.  In this case,  a make-up test will be offered.

**Required statements**

Americans with Disabilities Act: 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, room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

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. Faculty are required to report any suspected instances 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/

Critical Incident Management: 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.