University of North Texas
Department of Physics

Syllabus, Spring 2018
PHYS 4500.001: Introduction to Solid-State Physics

Instructor: Dr. Yuankun Lin Office: Physics Building 323
Tel: 940-565-4548 Email: Yuankun.lin@unt.edu
Class time: TuTh 12:30PM-1:50PM
Office hours: TuTh 10:00 am-11:00 am or by an appointment
Lecture class room: Physics Building 115
Recitation: Tu 11:00AM-11:50AM Phys 116

Textbooks: Introduction to Solid State Physics, **8th ed.**
by C. Kittel, (Publisher: John Wiley & Son)

Course description:

An introduction to the major areas of solid state physics, including crystal structure and symmetry, lattice vibrations and phonons, thermal properties, energy bands, semiconductors, superconductivity, and magnetic properties.

Course objective:

By the end of the course, you be able to (a) understand basic properties of solids; (b) model solids to calculate these properties; (c) apply key concepts and theories to solve the real problem; (d) understand current cut-edge researches and technologies through class presentation.

Attendance:

Attendance is mandatory. Lectures will contain vital information needed to do well on the exams. There are short quizzes occasionally in the class. You could answer these quizzes either individually or in groups

Exams:

There will be two exams. The exams will consist of multiple-choice questions and problems. These will be related to the lecture materials, and homework.
Makeup exams are not given, except under exceptional and verified circumstances (i.e., athletic conflict, verified sickness, and *etc*.)

Homework:

There is a homework after each chapter. It is acceptable to collaborate on solving homework problems but not acceptable to simply copy the work of others.
Late homework will not be accepted, except under exceptional and verified circumstances (i.e., athletic conflict, verified sickness, and *etc*.)

Presentation:

Each student in the course will give a 20 minute oral presentation on a topic of cut-edge research and technology, which are related to the course topic. The topic can be selected from a provided list or student can pick up one topic with an approval from the instructor.

Disability:

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda. You may also contact them by phone at 940.565.4323.

UNT link information:

UNT's policy on Academic Dishonesty can be found at:
http://policy.unt.edu/sites/default/files/06.003_StudentStandardsOfAcademicIntegrity_8_2017.pdf
Drop information is available in the schedule of classes at:
http://registrar.unt.edu/registration/schedule-of-classes

Grading:

Class attendance and quiz:	10%
Mid-exam:	20%
Homework:	40%
Oral presentation:	10%
final-exam:	20%

Guidelines for Grading Homework

Please work out each problem step by step. You won't get full points if you only turn in the final correct result.

- Write name in a blank paper 1/10
- Draw diagram and use right equations 4/10
- If answer is right, but several steps are skipped 6/10
- Work on question step by step but with a wrong final answer 9/10
- Everything is right 10/10

Covered Course Materials & Tentative Schedule

Class: T & Th	TOPIC	BOOK CHAPTER
1	Introduction	
2	Crystal structure	1
3	Crystal structure	1
4	Crystal structure	1
5	Reciprocal Lattice	2
6	Reciprocal Lattice	2
7	Reciprocal Lattice	2
8	Crystal binding and elastic constant	3
9	Crystal binding and elastic constant	3
10	Phonons I. Crystal vibrations	4
11	Phonons I. Crystal vibrations	4
12	Phonons II. Thermal Properties	5
13	Phonons II. Thermal Properties	5
14	Phonons II. Thermal Properties	5
15	Review for mid-exam	
16	Mid-exam	
17	Spring break	
18	Free Electron Fermi Gas	6
19	Free Electron Fermi Gas	6
20	Free Electron Fermi Gas	6
21	Energy bands	7
22	Energy bands	7
23	Semiconductor crystals	8
24	Semiconductor crystals	8
25	Semiconductor crystals	8
26	Semiconductor crystals	8
27	Superconductor	12
28	presentation	
29	Presentation, review	
30	Final-exam	

Addendum to Course Syllabus

The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you on-line at the end of the semester and will provide you with an opportunity to provide feedback to your course instructor. SPOT is considered to be an important part of your participation in this class. In addition to SPOT, there will be a brief in-class course survey during the last two weeks of the semester.

For the Spring 2018 semester you will receive an email on April 2nd (12:01 a.m.) from "UNT SPOT Course Evaluations via *IASystem* Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox. Simply click on the link and complete your survey.

After logging in to the my.unt.edu portal, students can access the SPOT survey site by clicking on the SPOT icon. A list of their currently enrolled courses will appear. Students complete each course evaluation independently. During the long terms, the SPOT is open for students to complete two weeks prior to final exams. During the Spring term, the SPOT is open for students to complete six days preceding their final exam. See SPOT Calendar for specific dates and deadlines.