

SYLLABUS

Schedule

TuTh 9:30 – 10:50 AM, RFM 4234

Prerequisites

none

Catalog Description

Application of physics principles to solid materials. Topics include crystal structure and the reciprocal lattice, including x-ray diffraction, crystal binding and elastic properties, lattice vibrations, energy bands, semiconductors and metals.

Goal

The goal of this course is to acquaint the student with the fundamental ideas that are used when thinking about the physics of solid materials, and to give the student opportunities to explore and apply these ideas in different situations and contexts. We will cover chapters 1 through 9, and three additional chapters depending on the interest of the class (for example 14, 15 and 16).

Instructor

Dr. Ir. Wilhelmus J. Geerts
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Office Phone: 512.245.1821
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Office Hours (Subject to change)
MW 9:00-10:00, TuTh 11:00-12:00
or by appointment (e-mail is best)
Class information: <http://uweb.txstate.edu/~wg06/>

Text

Introduction to Solid State Physics, 8th Edition, by Charles Kittel, Published by Wiley,
ISBN 978-0-471-41526-8

An alternate resource is

Solid State Physics, Ashcroft/Mermin
States of Matter David L. Goodstein

Grades

Grades will be computed as follows:
5% class Participation

30% Written Homework
65% Semester Exams and Final Exam

Participation

Attend class. Be on task. Speak. Draw and write on the whiteboards. Use your hands when you speak. Get out of your seat once in a while. Be creative and use analogies and metaphors when you explain things. Listen well to your peers. Ask and answer questions. Keep your mind open and your attitude positive. If you have trouble with anything, inquire and learn. You must attend at least 70% of the class sessions to pass the course; if your average attendance for the whole semester is less than 70%, your final course grade is F. In the case of two absences in direct succession, your participation in the course is suspended (i.e., you cannot resume earning participation credit when you return to class) until you contact me (either in person or over email) to explain the situation. These policies are meant to help you achieve at a high level. Much of our time in class will be spent discussing ideas and concepts, so it will be expected that you have read the book before coming to class.

Written Homework

Homework will be assigned weekly, and will be due approximately one week after it is assigned. Homework can be turned in late if arrangements are made with the instructor. However, once homework solutions are published, homework cannot be accepted for credit. Problem solutions should be presented in a legible, coherent manner on stapled, standard size paper. Paper should be printed on one side only. Homework that does not meet these guidelines will be returned to the student for reformatting. The process of solving the problem should be explained along with any calculations that are done. Computer software such as Excel, Mathematica, and MatLab should be used at every opportunity to facilitate calculations and visualize results. Whenever possible, a graphic should be included to help explain the problem. Any drawings, graphs, or sketches must be computer generated. Failure to turn in legible homework assignments may result in a reduction in your homework score. Homework is exceedingly important for developing an understanding of the course material, not to mention building skills in complex physical and mathematical problem solving. Homework will require considerable time and personal effort this term!

I strongly encourage collaboration, an essential skill in science and engineering (and highly valued by employers!) Social interactions are critical to scientists' success - most good ideas grow out of discussions with colleagues, and essentially all physicists work as part of a group. Find partners and work on homework together. However, it is also important that you OWN the material. I strongly suggest you start homework by yourself (and that means really making an extended effort on *every* problem) *Then* work with a group, and finally, finish up on your own - write up your own work, in your own way. There will also be time for peer discussion during classes - as you work together, try to help your partners get over confusions, listen to them, ask each other questions, critique, *teach each other*. You will learn a lot this way!

Note: *While collaboration is the rule in technical work, evaluations of individuals also play an important role. Exams will be done without help from others. For all assignments, the work you turn in must in the end be your own: in your own words, reflecting your own understanding.* (If, at any time, for any reason, you feel disadvantaged or isolated, contact me and I can discretely try to help arrange study groups.)

Semester Exams

There will be three exams during the course of the semester. All exams will be given during a normal class period. After exams have been graded, students will have the opportunity to correct their exams and resubmit them. The grade a student receives for a particular exam will be the average of their original grade and the grade they receive on their corrections.

Final Exam

The final exam is comprehensive, and will be given on Tuesday, May 12, from 8:00 to 10:30 AM.

Appropriate Use of Technology

You are welcome to bring your laptop computer or other similar device to class. However, if you do bring such a device to class, you must use it only for instructional purposes. The following activities are NOT ALLOWED in the classroom: checking email or Facebook (on any device), answering or calling from your mobile phone, text messaging, listening to any audio device, surfing the web, etc. Do this for the benefit of your own and your neighbors' learning. If you engage in any of these activities in class, you may be asked to leave for the good of the learning community.

Special Needs

Students with special needs, as documented by the Office of Disability Services, should identify themselves at the beginning of the semester. Arrangements can be made to accommodate those needs as necessary.

Texas State Honor Code Policy

Texas State University-San Marcos expects students to engage in all academic pursuits in a manner that is beyond reproach. Students found in violation of the Honor Code are subject to disciplinary action. The full Texas State Honor Code can be found in the next page of this syllabus and at the following URL:

www.txstate.edu/effective/upps/upps-07-10-01-att1.html

Texas State Statement on Academic Integrity

Learning and teaching take place best in an atmosphere of intellectual fair-minded openness. All members of the academic community are responsible for supporting freedom and openness through rigorous personal standards of honesty and fairness. Plagiarism and other forms of academic dishonesty undermine the very purpose of the university and diminish the value of an education.

Important Dates

Schedule Changes	January 17 – January 28	
Refund Drop Deadline	February 4	12 th Class Day. Students may drop by 11:59 PM and receive a 100% refund.
Class Drop Deadline	March 26	Students may drop the class and receive an automatic “W” on their transcript. Deadline is 5:00 PM.
Withdrawal Deadline	April 23	Must withdraw (drop hours to zero) by 5:00 PM.

Withdrawing from the University

Notification to the instructor does not constitute a withdrawal. Students wishing to withdraw (drop ALL classes) are encouraged to come to the Registrar's Office during regular business hours, J.C. Kellam Lobby, for specific instructions. If it is not possible for a student to come by the Registrar's Office the student may send a letter to the Registrar's Office, 601 University Dr, San Marcos, TX 78666-4606 or fax to (512) 245-8126, with his/her signature. Post mark date or fax date will be used as the withdrawal date. The withdrawal process is different than dropping a course. If you withdraw before the 4th/12th class day there will not be a record of classes; however, your transcript will state: "(semester withdrawn), Withdrew and (date of withdrawal)." A \$15.00 matriculation fee will be assessed for withdrawals prior to the first class day. **See the Calendar for deadline dates and the chart for withdrawal refunds.** Should you need to leave the University after that date, report to the Registrar's Office. **Note: Students cannot WITHDRAW via the CATS system.**

Texas State University Honor Code

As members of a community dedicated to learning, inquiry, and creation, the students, faculty, and administration of our University live by the principles in this Honor Code. These principles require all members of this community to be conscientious, respectful, and honest.

WE ARE CONSCIENTIOUS. We complete our work on time and make every effort to do it right. We come to class and meetings prepared and are willing to demonstrate it. We hold ourselves to doing what is required, embrace rigor, and shun mediocrity, special requests, and excuses.

WE ARE RESPECTFUL. We act civilly toward one another, and we cooperate with each other. We will strive to create an environment in which people respect and listen to one another, speaking when appropriate, and permitting other people to participate and express their views.

WE ARE HONEST. We do our own work and are honest with one another in all matters. We understand how various acts of dishonesty, like plagiarizing, falsifying data, and giving or receiving assistance to which one is not entitled, conflict as much with academic achievement as with the values of honesty and integrity.

THE PLEDGE FOR STUDENTS

Students at our University recognize that, to insure honest conduct, more is needed than an expectation of academic honesty, and we therefore adopt the practice of affixing the following pledge of honesty to the work we submit for evaluation: I pledge to uphold the principles of honesty and responsibility at our University.

THE PLEDGE FOR FACULTY AND ADMINISTRATION

Faculty at our University recognize that the students have rights when accused of academic dishonesty and will inform the accused of their rights of appeal laid out in the student handbook and inform them of the process that will take place. I recognize students' rights and pledge to uphold the principles of honesty and responsibility at our University.

ADDRESSING ACTS OF DISHONESTY

Students accused of dishonest conduct may have their cases heard by the faculty member. The student may also appeal the faculty member's decision to the Honor Code Council. Students and faculty will have the option of having an advocate

Preliminary Schedule PHYS 5320: Electromagnetic Field Theory 2.

Tuesday 1-20-2015	Ch1 Kittel
Thursday 1-22-2015	Ch1 Kittel
Tuesday 1-27-2015	Ch2 Kittel
Thursday 1-29-2015	Ch2 Kittel
Tuesday 2-3-2015	Ch3 Kittel
Thursday 2-5-2015	Ch3 Kittel
Tuesday 2-10-2015	Semester Exam 1
Thursday 2-12-2015	Ch4 Kittel
Tuesday 2-17-2015	Ch4 Kittel
Thursday 2-19-2015	Ch5 Kittel
Tuesday 2-24-2015	Ch5 Kittel
Thursday 2-26-2015	Ch6 Kittel
Tuesday 3-3-2015	Ch6 Kittel
Thursday 3-5-2015	Semester Exam 2
Tuesday 3-10-2015	Ch. 7 Kittel
Thursday 3-12-2015	Ch. 7 Kittel
<i>Tuesday 3-17-2015</i>	<i>Spring Break</i>
<i>Thursday 3-19-2015</i>	<i>Spring Break</i>
Tuesday 3-24-2015	Ch. 8 Kittel
Thursday 3-26-2015	Ch. 8 Kittel
Tuesday 3-31-2015	Ch. 9 Kittel
Thursday 4-2-2015	Ch. 9 Kittel
Tuesday 4-7-2015	Semester Exam 3
Thursday 4-9-2015	Ch. 14 Kittel
Tuesday 4-14-2015	Ch. 14 Kittel
Thursday 4-16-2015	Ch. 15 Kittel
Tuesday 4-21-2015	Ch. 15 Kittel
Thursday 4-23-2015	Ch. 16 Kittel
Tuesday 4-28-2015	Ch. 16 Kittel
Thursday 4-20-2015	Semester Exam 4
Monday 5-4-2015	Last day of class
Tuesday 5-12-2015	Final Comprehensive Exam 8:00-10:30