

Topics in Solid State Physics

PHYS 560

Fall Semester, 2007

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Days: Monday, Wednesday, Friday

Time: 12:00 p.m. – 12:50 p.m.

Location: CURENS 336

Overview: This is a *Solid State Physics* course for physics majors at the graduate level. Tentative list of topics to be covered includes *electrical, thermal, and mechanical properties of crystalline solids, including lattice bonding, phonon dynamics, band theory, electrons in metals, semiconductors, and superconductivity.*

Objectives: The purpose of this course is to introduce the foundations of Solid State physics, as well as to outline the modern topics on the subject.

Textbook: *Introduction to Solid State Physics* by Charles Kittel.

Supplementary text: *Solid State Physics* by N. W. Ashcroft and N. D.

Mermin

Attendance policy: Attendance is expected although not mandatory. Students are responsible for all material presented in class, all homework, and for all changes to the schedule or plans which are announced in class.

My office is **Currens 305**. My office **telephone** number is **309-298-2743**. You are welcome to call me at my office at any time. There is a voice mail if I am not available. My **e-mail** address is I-Shovkovy@wiu.edu. I read my e-mail daily during weekdays.

Office hours will be on Tuesday and Thursday from 2:30 p.m. to 4:00 p.m. and on Wednesday from 3:00 p.m. to 4:00 p.m. You could make additional appointments with me, but **not** on short notice. Try to request appointments at least 2 or 3 working days in advance.

The final grade for this course will be based on weekly homework assignments, a mid-term examination, two 15-minute quizzes, and a **comprehensive** final examination. The following table will be used for determining the maximum score for each category:

Homework	40 points
Mid-term examination	20 points
Two 15 minute quizzes	10 points
Final examination	30 points
TOTAL	100 points

The **grade** will be determined as follows:

A (85-100 points), **B** (70-84 points), **C** (55-69 points), **D** (40-54 points), **E** (<39 points)

Homework will be assigned about every week or so. The solutions should be handed in the following week before the class. Late homework will not be accepted. There will be 10 to 12 homework problem sets assigned during the course. Most problems will be graded on a scale from 0 to 10, but exceptions to this rule are possible when the problems are easier or harder than average. At the end of the semester, I will rescale the total homework score so that the maximum is 40 points.

Tentative schedule

The exact schedule for lectures and examinations will depend on how long it takes to cover the material. The following is my best guess as of now (August 2007). Please note that the mid-term exam is tentatively scheduled for **October 15** (Monday). The mid-term exam will have several problems to be solved in class and several problems to be taken home. Each problem will be graded on a scale from 0 to about 10. The answers without solutions will **not** be accepted. The take-home questions of the mid-term exam will be due on **October 17** (Wednesday) before the class (i.e., 12 p.m.). The mid-term/final examination score will be rescaled so that the maximum is 20 points. There will be two 15-minute quizzes, scheduled tentatively for **November 7** (Wednesday) and **December 3** (Monday). The final comprehensive examination is scheduled for **December 10**, 1:00 p.m. – 2:50 p.m (Monday). Books and notes will **not** be permitted during quizzes. All exams are open book. No other reference materials will be permitted during exams. There will be no make-up exams.

Dates	Tentative description of topics to be covered
Aug. 20, 2007	Classes start
Oct. 15, 2007	MID-TERM EXAMINATION
Oct. 17, 2007	Take-home problems are due (part of the mid-term examination)
Oct. 19, 2007	Discussion of the mid-term examination problems
Nov. 7, 2007	1 st 15-minute quiz
Nov. 19 – 23, 2007	No classes (Thanksgiving)
Dec. 3, 2007	2 nd 15-minute quiz
Dec. 10, 2007	FINAL EXAMINATION (1 p.m. – 2:50 p.m.)

For student rights and responsibilities see the WIU web page:

<http://www.wiu.edu/provost/student/>

All handouts and homework solutions can be obtained from [WesternOnline](#).

ADA policy: “In accordance with University policy and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor’s attention, as he/she is not legally permitted to inquire about such particular needs of students. Students who may require special assistance in emergency evacuations (i.e. fire, tornado, etc.) should contact the instructor as to the most appropriate procedures to follow in such an emergency. Contact Disability Support Services at 309-298-2512 for additional services.”

Last modified August 20, 2007