SYLLABUS

Solid State Physics I
Phys 5500 / 6530
Spring 2010

Instructor:  D. Mark Riffe
Office:  SER 222B
Phone:  797-3896
Email:  riffe@cc.usu.edu
Office Hours:  by appointment (use email or stop by my office)
Texts:  Introduction to Solid State Physics (8th edition), Charles Kittel
Credits:  3 semester credit hours
Lecture:  M W F, ENGR 206, 12:30 – 1:20 pm

Goals of the Course

1.  Learn some Solid State Physics.
2.  Learn to learn on your own, as you will need to do when doing research.

Class Time:  Several different activities will take place during the scheduled class periods.

1.  Lectures
    About 1/3 of the class periods I will introduce a new topic via a lecture.

2.  Discussion Session
    About 1/3 of the class periods we will discuss assigned reading material that will follow up on the introductory lecture.

3.  Assigned Problems
    About 1/3 of the class periods we will discuss assigned problems.

4.  Review Sessions
    There will be a review session before each exam.  Come prepared with questions!

5.  Exams
    Two class periods will be used for midterm exams.  Exams will cover concepts and be multiple-choice format.
Student Responsibilities

1. Cass Notebook
   Your first assignment is to go to the campus bookstore and buy this specific notebook: 70972 32098. It is a 100 page 11×9 inch notebook with a pocket in the front inside cover (good for holding this syllabus!) You can find it on the right-hand-side of the upper shelf where the spiral-bound notebooks are in the bookstore.

   You shall use this notebook for the following purposes.
   (a) You will keep your reading notes in this notebook.
   (b) You will keep any notes you take in lecture in this notebook.
   (c) You will work out assigned problems in this notebook.

   In short, everything you write down for this class shall be written down in this notebook.

   Furthermore, in the notebook you shall clearly identify
   (a) the date that material on each page was entered into the notebook with a notation on the top of that page.
   (b) the nature of the material being entered – reading notes, lecture notes, or assigned problems – with a heading identifying the material.

   The last two requirements have two purposes
   (a) to make you a better scientist by encouraging the organization of your activities
   (b) to make my assessment of your notebook proceed in a smooth fashion.

   Your entries shall be in chronological order

   If you fill up one notebook, you will need to purchase another identical one.

2. Reading
   You are responsible for reading ahead of time material related to (a) my lectures, and (b) the follow-up discussion. Page numbers are indicated on the schedule below.

3. Problems
   You are responsible for working out the assigned problems ahead of the time that they will be discussed in class.

Grading Breakdown

Class Attendance and Participation 30%
Class Notebook 30%
Exams 20%
Final Exam 20%

I plan on using standard percentages for determining letter grades.

Disability: If you have a disability which requires accommodation in order for you to take this class, please contact me. The disability must be documented by the Disability Resources Center.

Possible Errors: The instructor reserves the right to correct any possible errors to this syllabus.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>Jan 18</td>
<td>MLK Holiday</td>
<td>Problem Set Ch 1: 1,2,3</td>
<td>Lecture: Reciprocal L. pp. 24 – 32</td>
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<td>Jan 25</td>
<td>Discussion: Reciprocal L. pp. 24 – 42</td>
<td>Problem Set Ch 2: 1,2,5,7</td>
<td>Discussion: Binding Energy pp. 48 – 59</td>
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<td>Feb 1</td>
<td>Discussion: Binding En… pp. 48 – 73</td>
<td>Problem Set Ch 3: 2,4,6</td>
<td>Lecture: Vibrations pp. 90 - 99</td>
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<td>Feb 8</td>
<td>Discussion: Vibrations pp. 90 - 102</td>
<td>Problem Set Ch 4: 2,3,5 Turn in Notebook</td>
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<td>pick up notebook</td>
<td>Review 1</td>
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<tr>
<td>Feb 15</td>
<td>President’s Day Exam 1 Ch. 1 – 4</td>
<td>Lecture: Thermal pp. 106 - 117</td>
<td>Discussion: Thermal pp. 106 - 121</td>
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<td>Feb 22</td>
<td>Problem Set Ch. 5: 1,3,4</td>
<td>Lecture: Electron Gas pp. 132 - 147</td>
<td>Discussion; Electron Gas pp. 132 - 157</td>
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<td>March 1</td>
<td>Problem Set Ch. 6: 1,3,6,9</td>
<td>Lecture: Energy Bands pp. 162 - 174</td>
<td>Discussion: Energy Bands pp. 162 – 182</td>
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<td>March 8</td>
<td>Problem Set Ch 7: 1,3,6</td>
<td>Lecture: Semiconductors pp. 186 - 205</td>
<td>Lecture: Semiconductors pp. 206 - 218</td>
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<td>March 15</td>
<td>Spring Break</td>
<td>Spring Break</td>
<td>Spring Break</td>
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<td>March 22</td>
<td>Discussion: Semiconduct… pp. 186 - 218</td>
<td>Problem Set Ch. 8: 1,2,3,4 Turn in Notebook</td>
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<td>pick up notebook</td>
<td>Review 2</td>
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<td>March 29</td>
<td>Exam 2 Ch. 5 - 8</td>
<td>Lecture: Metals pp. 222 - 232</td>
<td>Discussion; Metals pp. 222 - 242</td>
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<td>April 5</td>
<td>Problem Set Ch 9: 1,2,11</td>
<td>Lecture: Superconductors pp. 258 - 270</td>
<td>Discussion: Supercond… pp. 258 - 279</td>
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<td>April 12</td>
<td>Problem Set Ch 10: 1,3,5</td>
<td>Lecture: Plasmons, etc pp. 394 - 403</td>
<td>Lecture: Plasmons, etc pp. 404 - 410</td>
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<td>April 19</td>
<td>Discussion: Plasmons, etc pp. 394 - 417</td>
<td>Problem Set Ch 14: 1,5,7,10</td>
<td>Lecture: Surface Physics pp. 488 - 498</td>
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<td>April 26</td>
<td>Discussion: Surf. Phys… pp. 488 - 513</td>
<td>Problem Set Ch. 17: 2,3 Turn in Notebook</td>
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<td>pick up notebook</td>
<td>Review 3</td>
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**FINAL EXAM**
(comprehensive)
Wednesday, May 5, 2010
11:30 a.m. – 1:20 p.m.