Elementary Classical Physics II (PHYS 1062)
section 008

Course Syllabus

Spring Semester 2015

Instructor Information

Name: Dr. Tsvetelin D. Tsankov
Office:   SERC 478
Office Hours: Tuesday and Thursday 2:00 PM – 5:00 PM
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E-mail: tsankov@temple.edu

Lecture time and place

SERC 108B, Monday, Wednesday and Friday, 9:20 AM – 10:30 AM
1. Course Description.

The course material consists of topics from Thermal Physics and Electromagnetism. In particular, we shall discuss thermal properties of matter, heat transfer, statistical mechanics, heat engines. We will concentrate further on electrostatics, electric current, electrical circuits, magnetism, electromagnetic induction, Maxwell’s equations and electromagnetic waves.

Lectures will be held on Monday and Wednesday. Problem-solving sessions will be held each Friday, during the allocated class time.

Requirements: This course is a 4.0 credit course. You must be registered for BOTH the lecture and the laboratory. Prerequisite: PHYS 1061, MATH 1041 Concurrent: MATH 1042.

2. Textbook.

The textbook for the course is a special selection of chapters from *Essential University Physics*, 2nd edition, by Richard Wolfson, published by *Pearson*. The textbook can be purchased from the University Bookstore, and it includes access to the online homework system *Mastering Physics*. Alternatively, students can get the two volumes of the original textbook. This course will cover Chapters 16–29 (the material is distributed over both Volume 1 and Volume 2).

Title: *Essential University Physics*, 2nd edition, Volume 1 and 2.
Author: Richard Wolfson
Publisher: Pearson/Addison-Wesley


In this case, access to the online homework system *Mastering Physics* must be purchased separately. One can purchase access to the electronic version of the textbook plus the homework system, or alternatively one can purchase only access to the online homework system and perhaps buy a used version of the original textbook.

The course ID to access the homework site for the course at [http://www.masteringphysics.com](http://www.masteringphysics.com) is:

**MPTSANKOV47897**

When you register at the MasteringPhysics site, make sure that you select the correct textbook for the course (Richard Wolfson’s *University Physics* 2nd edition). At one point you will be asked to enter your Temple student ID. Please do so. If mistakes are made during the online registration, these can be corrected easily, usually within 24 hours, by contacting via E-mail the customer support at [http://www.masteringphysics.com](http://www.masteringphysics.com).

Students may consider purchasing the Student Solutions Manual:


These manuals contain solutions to the odd-numbered problems in the textbook.
3. Course Schedule.

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topics</th>
<th>Lab Set of the Week</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 12</td>
<td>Unit 1: Temperature and Heat</td>
<td>NO LABS</td>
<td>1</td>
</tr>
<tr>
<td>January 19</td>
<td><strong>MLK Holiday</strong>; Unit 2: The Thermal Behavior of Matter</td>
<td>Heat Capacity and Specific Heat</td>
<td>2</td>
</tr>
<tr>
<td>January 26</td>
<td>Unit 3: Heat, Work and the 1st Law of Thermodynamics</td>
<td>Coefficient of Thermal Expansion</td>
<td>3</td>
</tr>
<tr>
<td>February 2</td>
<td>Unit 4: 2nd Law of Thermodynamics</td>
<td>Absolute Zero. Ideal Gas.</td>
<td>4</td>
</tr>
<tr>
<td>February 9</td>
<td>Unit 5: Electric Charge, Force and Field</td>
<td>Heat Engine</td>
<td>5</td>
</tr>
<tr>
<td>February 16</td>
<td>Unit 6: Gauss's Law&lt;br&gt;Midterm Exam 1&lt;br&gt;Friday, Units 1-4</td>
<td>Coulomb's Law</td>
<td>6</td>
</tr>
<tr>
<td>February 23</td>
<td>Unit 7: Electric Potential, Energy and Capacitors</td>
<td>Mapping the Electrostatic Potential and the Electric Field</td>
<td>7 and 8</td>
</tr>
<tr>
<td>March 2</td>
<td><strong>Spring Break</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 9</td>
<td>Unit 8: Electric Current and Power</td>
<td>Ohm's Law and Capacitors</td>
<td>9</td>
</tr>
<tr>
<td>March 16</td>
<td>Unit 9: Electric Circuits</td>
<td>Series and Parallel Circuits</td>
<td>10</td>
</tr>
<tr>
<td>March 23</td>
<td>Unit 10a: Magnetic Force&lt;br&gt;Midterm Exam 2&lt;br&gt;Friday, Units 5-8</td>
<td>Magnetic Forces on Wires</td>
<td>11</td>
</tr>
<tr>
<td>March 30</td>
<td>Unit 10b: Magnetic Field</td>
<td>Magnetic Field Due to Currents</td>
<td>11</td>
</tr>
<tr>
<td>April 6</td>
<td>Units 11: Electromagnetic Induction</td>
<td>Electromagnetic Induction</td>
<td>12</td>
</tr>
<tr>
<td>April 13</td>
<td>Unit 12: AC Circuits</td>
<td>AC Circuits</td>
<td>13</td>
</tr>
<tr>
<td>April 20</td>
<td>Unit 13: Maxwell's Equations and Electromagnetic Waves</td>
<td>Electromagnetic waves</td>
<td>14</td>
</tr>
<tr>
<td>April 27</td>
<td>Course Review</td>
<td>NO LABS (except Monday's sections)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Final Exam</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Final Exam</td>
<td>May 1st 3:30 PM-5:30 PM</td>
</tr>
</tbody>
</table>

**Last day to add or drop the course (tuition refund available): Monday, January 26**

**Last day to withdraw from the course: Tuesday, March 17.**
3. Assessment.

The following items contribute to the course grade in the specified proportions:

- 2 Midterm Exams                               20%       2 x 72 points = 144 points
- Labs                                                    20%       12 x 12 points = 144 points
- Problem Set of the Week (PSW)        10%       12 x 6 points = 72 points
- Conceptual Tests                                10%       12 x 6 points = 72 points
- Writing Assignment                           10%       1 x 72 points = 72 points
- Final Exam                                         30%       1 x 216 points = 216 points

The total number of points is 720. In fact there will be 13 labs, 13 PSWs and 13 conceptual tests, but the 13th of each will count as extra credit (for a total of +3.33 %).

The grading ranges are as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90%...100%</td>
</tr>
<tr>
<td>A-</td>
<td>86%...89%</td>
</tr>
<tr>
<td>B+</td>
<td>80%...85%</td>
</tr>
<tr>
<td>B</td>
<td>75%...79%</td>
</tr>
<tr>
<td>B-</td>
<td>70%...74%</td>
</tr>
<tr>
<td>C+</td>
<td>67%...69%</td>
</tr>
<tr>
<td>C</td>
<td>60%...66%</td>
</tr>
<tr>
<td>C-</td>
<td>55%...59%</td>
</tr>
<tr>
<td>D</td>
<td>46%...54%</td>
</tr>
<tr>
<td>F</td>
<td>0%...45%</td>
</tr>
</tbody>
</table>

3.1 Midterm Exams.

Two midterm exams will be held during the lecture periods on

**February 20, Friday**, based on the material from Units 1-4 (Thermodynamics), and **March 27, Friday**, based on the material from Units 5-8 (Electrostatics and Electric Current).

The midterm exams will consist of 4 problems similar in style and difficulty to the problems discussed in class and done for homework (PSW). Students will be provided with an equation sheet at the time of the exam.
3.2 Labs.
Lab sessions will be conducted in SERC 221. Lab manuals and the lab grading rubric will be accessible through Blackboard.
Upon completion of a lab exercise you need to write individually a formal lab report, describing your work. The lab report should contain the following:
- Title, including date and names of group participants, your name must be underlined
- Statement of the topics that were investigated
- Brief description of the actions taken in the process of investigation, listing any special precautions
- List of all devices used in the experiment
- Picture or drawing of the experimental setup (if possible)
- Tables with measured data (including the appropriate physical units)
- Graphs, sketches, and figures (if applicable)
- Calculations
- Answers to the numbered questions in the lab manual
- Conclusions.

Labs start in the 2nd week of the semester. The lab sections that meet on Monday, January 19 (MLK day) will complete their first lab on Monday, April 27. For planned or unplanned absences please contact the Laboratory Coordinator Dr. John Noel, office: SERC 229, E-mail: john.noel@temple.edu, as early as possible and he will let you know whether accommodations can be made.

3.3 Problem Set of the Week.
Homework will be assigned on a weekly basis, typically on the week after the material has been introduced in class. New assignments will become available on Friday 5:00 PM. The due date for each assignment is on Sunday 10:00 PM of the following week. Each problem set of the week consists of 6 problems. Students are allowed 6 attempts per question. The assignments will be posted at http://www.masteringphysics.com. No extensions of homework deadlines will be given. PSW will be assigned starting with Week #1 of the semester. For the very first assignment an extension of one week will be given.

3.4 Conceptual Tests.
Conceptual tests consist of 6 multiple-choice questions designed to test the conceptual understanding of the material. They will be assigned on Friday 5:00 PM and students will have to complete them by the following Monday 10:00 PM. Students are allowed 2 attempts per question. Conceptual Tests will be assigned starting with Week #1 of the semester. For the very first test an extension of one week will be given. The conceptual tests will be posted on http://www.masteringphysics.com.
3.5 Writing Assignment.

You must complete a formal writing assignment and submit it in person (no E-mails!) no later than the end of Week 13 of the semester (Friday, April 10).

Instructions:
Select a name from the following list, by matching the last digit of your Temple student ID number:

0. James Watt
1. Alessandro Volta
2. Nicolas Leonard Sadi Carnot
3. Michael Faraday
4. James Prescott Joule
5. William Thomson
5. James Clerk Maxwell
7. Nikolaus August Otto
8. Thomas Alva Edison
9. Nikola Tesla

Write a short essay (about 5-6 pages) about the life and the achievements of the selected scientist/engineer/inventor. Include bibliographical references. The essay must contain a brief biographical sketch (do not just copy and paste wikipedia pages but follow up on reference links, go to the library, do your own research). The main objective is to discuss the scientific achievements of the particular person, putting a special emphasis on those discoveries or inventions that are directly related to the material discussed in the course. Comment on the impact that the work of the particular scientist/inventor made on science and technology in particular, and on society in general.

3.7 Final Exam.

The Final Exam consists of 6 problems similar to those discussed in class and assigned for homework. The problems will be of varying degree of difficulty. Students will be provided with an equation sheet at the time of the exam. The exam is scheduled for

May 1st, 3:30 PM – 5:30 PM.

Incomplete Policy: The grade of "incomplete" used on final grade reports indicates that the work is satisfactory as of the end of the semester, but has not been completed. The grade of "incomplete" may be given only when the completed portion of a student's work in the course is of passing quality-see Student Handbook for details. Only extreme hardship cases will be considered.

Elementary Classical Physics II-on Blackboard. The course has an important on-line component. All course related materials, announcement, including current grades, are available on Blackboard Course Management System. Click on Blackboard tab and then choose the Elementary Classical Phys II link to access the course materials.