

# Elementary Classical Physics II (PHYS 1062)

## Course Syllabus

Spring Semester 2015



### Instructor Information

Name: Dr. Zbigniew Dziembowski

Office: SERC 412

Office Hours: Monday, Wednesday and Friday 3:00 PM – 5:00 PM

Phone: 215-204-7639

E-mail: [dziembow@temple.edu](mailto:dziembow@temple.edu)

### Lecture/recitation time and place

Sec 002: Monday, Wednesday and Friday, 9:20 AM – 10:30 AM room SERC 108A,

Sec 007: Monday, Wednesday and Friday, 1:20 PM – 2:30 PM room SERC 108A.

## 1. Course Description

Calculus-based introduction to thermodynamics and electromagnetism, including such topics as electric charge and electric fields, Gauss's law, electric potential, capacitance, current, resistance, and circuits, magnetic fields, and fields due to currents, induction and inductance, Maxwell's equations, and electromagnetic waves.

For a detailed listing of lecture topics and a schedule of major course events, please refer to the course schedule.

**Requirements:** This course is a 4.0 credit course. You must be registered for **both** the lecture/recitation bundle and a zero-credit laboratory. Prerequisite: PHYS 1061, MATH 1041 Concurrent: MATH 1042.

## 2. Course Materials

The text for this course is a selection of chapters from *Essential University Physics* by Wolfson, 2<sup>nd</sup> edition. This course will cover chapters 16–29.

Textbooks may be purchased in either two-volume version published by *Pearson* or as a soft-cover Temple University custom text. The TU custom book at the bookstore also contains access to the MasteringPhysics homework system we will be using in the course.

Some homework assignments will be administered through MasteringPhysics, a web-based homework program. Access to MasteringPhysics is obtained by either purchasing the TU custom book in the bookstore (the access code is included) or making a payment online (<http://www.masteringphysics.com/>). The course ID is

**MPDZIEMBOWSKI34362**

You are also required to purchase a TurningPoint clicker. These are available from the bookstore and elsewhere. Using your TurningPoint (TP) clicker in class is part of your grade. You can find out about obtaining and registering the device at <http://computerservices.temple.edu/clickers-students>. If you do not register your clicker, you will not earn lecture/recitation participation grade (5% of the total course grade).

Finally you will need to bring a scientific calculator to each class.

**3. Course Elements** The course consists of 13 content units, all but one in one week segments.

### 3.1 Reading

All learning in this class begins with reading of the text. You are given reading assignments for each course unit (see the attached course schedule), and will be given homework questions covering this reading **before** you have discussed it in class. You are expected to come to classes, not necessarily with a full understanding of the material you read but, at a minimum, prepared to discuss the contents of the reading and to identify difficult concepts and quantitative patterns.

### 3.2 Lectures

Lectures meet twice each week, on Mondays and Wednesdays. Classes are designed to highlight pivotal concepts and critical skills and to give you opportunities to engage with these concepts and quantitative patterns in an active and meaningful way. You will be *actively engaged* during these sessions, so it is very important to come to class having read the assigned content, ready to think, work and learn.

We will use TP clickers in class for two different types of questions: qualitative concept questions and simple, usually one-step, calculations (exercises), both graded for effort. “Clicker questions” are generally multiple choice questions, designed to help identify common misconceptions and provide feedback during the class. They are designed to help you know when you understand the topic at hand, and your instructor to know when more discussion is needed and when to move on to the next topic.

Each lecture you will earn points for active participation with the clicker. If you forget your clicker, you will not be able to earn participation points for the session. Some questions may be designated as extra credit and these will require correct answer to earn points. For this reason, there will be no adjustments for forgetting to bring your clicker to lecture or recitation, and no extra-credit or make-up work for absences.

Appropriate use of clickers by their owner during their class is an expectation of the course. Asking someone to use your clicker for you is asking them to help you cheat. If someone asks you to use their clicker, they are asking you to help them cheat. If you agree, you have helped them cheat. If you observe someone is cheating - e.g., you see someone using two clickers - you are obligated to report it. If you do not, you are helping them to cheat. Please refer to the Academic Dishonesty Policy below.

### 3.3 Laboratories

Laboratory sections meet once a week in room SERC 221. Your meeting time is determined by your Physics 1062 lab section number. You **must** attend the laboratory section in which you are scheduled — **no switching is permitted**.

The laboratories are designed to provide you with hands-on experience with the material covered in class. Students work collaboratively in small groups to carry out the experiments. The relevant lab scripts are posted on the course website on *Blackboard* at *Physics 1062 Laboratory Spring 2015*. You will need to bring an individual copy of the pertinent lab script to class.

After the lab session, you will prepare a formal lab report, which should contain the following: 1) Title, date and names of group members. Please underline your name; 2) Statement of the topics that you investigated; 3) Brief description of the actions taken in the process of investigation; 4) List of all devices used in the experiment; 5) Picture or drawing of the experimental setup (if applicable); 6) Tables with measured data in the appropriate units; 7) Graphs, sketches, and figures (if applicable); 8) Relevant calculations; 9) Answers to the numbered questions in the lab manual; and 10) Conclusions.

Lab reports will be graded according to a rubric with a set of check points related to the above 10 items. A copy of the rubric is posted on *Blackboard*.

**Missing lab policy:** See Dr. John Noel, Lab Coordinator, Barton, SERC 235A, john.noel@temple.edu

### 3.4 Recitations

Recitation sessions meet once a week on Fridays in room SERC 108A. In these sessions you will work collaboratively in three-member groups to complete problem-solving exercises. These problem solving activities are an invaluable component of learning physics, and will provide you with much more opportunity to develop problem solving skills than you will have in lecture sessions.

The recitation materials are available via the course website on *Blackboard*. Please bring your individual copy of the pertinent recitation resources to class.

### 3.5 Homework

Weekly homework assignments will have three components: reading quiz (RQ), conceptual test (CT) and problem set of the week (PSW). All new assignments will be available **Fridays 5:00 PM**. The assignment due dates obey the following pattern:

1. Sunday night **10:00 PM**, before given content unit is discussed in class, a short RQ assignment is due based on the reading. Doing the reading and checking your understanding with these questions will ensure you are prepared for lecture the next morning.
2. Monday night **10:00 PM**, after given content unit is discussed in recitation, a CT assignment with 6 multiple-choice questions, designed to test the conceptual understanding of the material, is due. Students will be allowed 2 attempts per question.
3. A PSW assignment will be due the following Sunday evening **10:00 PM**. PWSs consist of 6 more challenging and often multistep problems, similar to the problem discussed in recitations. Although the PSW questions are provided online, it is crucial that you work through each problem with pencil and paper, as if you were going to hand in this work. This develops robust problem solving skills. Students are encouraged to work together and collaborate on PSW assignments. However, work submitted for individual assessment must be the work of the individual student. To be precise: discuss, don't copy. Please refer to the Academic Dishonesty Policy below.

The RQs and CTs are to be completed on *Blackboard* whereas the PWSs on the online homework system, *MasteringPhysics*. Answers to the homework questions and problems are available immediately after the due date. The online system allows you to submit your homework at any time of the day and night. Your grade on each assignment will be available immediately and, in most cases, you will have multiple tries to arrive at the correct answer. Because answers are available immediately after the due date, no late assignments can be accepted.

The due date and time for each assignment appears on *Blackboard* and *MasteringPhysics*.

### 3.6 Exams

There will be two midterm exams and a cumulative final exam. Exams will be closed book. Relevant physical constants and formulae will be provided. Cellular phones, smart phones, any other communication devices, and additional scrap paper are not allowed. The exams will be based on the assigned reading, the material covered in lecture, the recitations, and the homework assignments.

#### 4. Grades

Your grade in the course will be based on your performance in the labs, lectures and recitations, on the homework assignments, and on the exams with the following weights:

2 Midterm Exams	20%	144 points
Final Exam	30%	216 points
12 Labs	20%	144 points
12 Problem Set of the Week (PSW)	10%	72 points
12 Reading Quizzes (RQ)	5%	36 points
12 Conceptual Tests (CT)	10%	72 points
12 Unit Participations	5%	36 points
<b>TOTAL</b>	<b>100%</b>	<b>720 points</b>

There will be 13 labs, 13 CTs, and 13 PSWs, but the 13<sup>th</sup> of each will count as extra credit.

Final letter grades for the course will be based on an absolute scale. The course score will be calculated to the nearest integer. The break points for the various grade levels are as follows: A: 90-100, A-: 86-89, B+: 80-85, B: 75-79, B-: 70-74, C+: 67-69, C: 60-66, C-: 55-59, D: 46-54, F: 0-45.

**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 the Blackboard Course Management System. Click on *Blackboard* tab in *TUPortal* and then choose the **Elementary Classical Phys II** link to access the course materials and your current course grade.

**Academic Dishonesty Policy:** Students are expected to work together but submit **their own work** on all assignments in this course. Dishonesty on an exam, CT, PSW, RQ or lab report will result in a grade of zero for that assignment. Severe cases will result in a failing grade for the course.

**The Disability Disclosure Statement:** Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services (DRS) at 215- 204-1280 (or [drs@temple.edu](mailto:drs@temple.edu)) in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.

**Physics Help:** For help on physics outside of class, you should visit my office hours and the Physics Department Tutoring Center. It is located in the breakout area outside of room 484 in SERC. Tutoring hours are Monday-Friday, from 9:00AM to 6:00PM. For more information <https://phys.cst.temple.edu/physics-help.html>.

## 5. Course Schedule

Wks	Topics	Lab Set of the Week	Wolfson 2 <sup>nd</sup> ed /TU Custom text
<b>Jan 12</b>	Unit 1 Temperature & Heat	<b>No labs</b>	Chap 16 / Chap 1
<b>Jan 19</b>	MLK Jr Day; Unit 2 – The Thermal Behavior of Matter	Heat Capacity and Specific Heat	Chap 17 / Chap 2
<b>Jan 26</b>	Unit 3 – Heat, Work and the 1 <sup>st</sup> Law of Thermodynamics	Coefficient of Thermal Expansion	Chap 18 / Chap 3
<b>Feb 2</b>	Unit 4 – The 2 <sup>nd</sup> Law of Thermodynamics	Absolute Zero. Ideal Gas	Chap 19 / Chap 4
<b>Feb 9</b>	Unit 5 – Electric Charge, Force and Fields	Heat Engine	Chap. 20 / Chap 5
<b>Feb 16</b>	Unit 6 – Gauss' Law <b>Mid-term exam #1 (F) Unit 1-4</b>	Coulomb's Law	Chap. 21 / Chap 6
<b>Feb 23</b>	Unit 7 – Electric Potential; Electrostatic Energy and Capacitors	Mapping the Electrostatic Potential and the Electric Field	Chap. 22 & 23/ Chap 7 & 8
Spring recess			
<b>Mar9</b>	Unit 8 – Electric Current	Ohm's Law and Capacitors	Chap. 24 / Chap 9
<b>Mar 16</b>	Unit 9 – Electric Circuits	Series and Parallel Circuits	Chap. 25 / Chap 10
<b>Mar 23</b>	Unit 10 – Magnetic Field <b>Mid-term exam #2 (F) Unit 5- 8</b>	Magnetic Forces on Wires	Chap. 26 / Chap 11
<b>Mar 30</b>	Unit 10 – Magnetic Field	Magnetic Field Due to Currents	Chap. 26 / Chap 11
<b>Apr 6</b>	Unit 11 – EM Induction	Electromagnetic Induction	Chap. 27 / Chap 12
<b>Apr 13</b>	Unit 12 AC Circuits	AC Circuits	Chap. 28 / Chap 13
<b>Apr 20</b>	Unit 13 – Maxwell's Equations and EM Waves	EM Waves	Chap. 29 / Chap 14
<b>Apr 27</b>	Course review	<b>Labs for Monday sections only</b>	
<b>Final exam: May 1<sup>st</sup> 3:30 PM-5:30 PM</b>			

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

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