

Elementary Classical Physics II (PHYS 1062) section 008

Course Syllabus

Spring Semester 2015



Instructor Information

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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

ISBN-10: 0321706692 ISBN-13: 9780321706690 Volume 1

ISBN-10: 0321701275 ISBN-13: 9780321701275 Volume 2.

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> 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>.

Students may consider purchasing the Student Solutions Manual:

ISBN-10: 032171203X ISBN-13: 9780321712035 Volume 1

ISBN-10: 0321712056 ISBN-13: 9780321712059 Volume 2.

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

3. Course Schedule.

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

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:

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%

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.