Syllabus for
PHY 102-62—General Physics II Laboratory
1 Credit Hour
Spring 2008

I. COURSE DESCRIPTION

Lab exercises to supplement PHY 102 Lecture.
Co requisite: PHY 102 Lecture
Lab fee: $35.

General Physics II laboratory provides practical hands-on experiments in beginning physics. The topics included are mechanics, heat, and sound. The experiments that are done in this laboratory course complement the topics under discussion in the co requisite lecture course PHY 101.

II. COURSE GOALS

This course is designed to enable the student to do the following:

A. Gain practical experience for the concepts discussed in the General Physics II Lecture course.

B. Obtain an understanding of experimental techniques generally applicable to research in physical sciences.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Terminal Objectives

As a result of successfully completing this course, the student will be able to do the following:

1. Set up and correctly use the apparatus encountered during the course.
2. Identify apparatus and measurements with the physical concepts with which they deal.
3. Correctly execute appropriate systematic and mathematical analysis of problems similar to those encountered during the course.
4. Discuss the sources and magnitude of errors inherent in the measurements utilized during the course.

B. Unit Objectives

As a result of successfully completing the following units, the student will be able to do the following:

1. Fields & Equipotentials
   a. Discuss the Coulomb's Law.
   b. Draw some electric and magnetic field configurations.

2. Resistances in Series & Parallel
   a. Draw the circuit characteristics of resistors in series and parallel.
   b. Measure the current, voltage, and resistance in both circuits.
3. The Measurement of Resistance: Wheatstone bridge
   a. Operate a slide-wire Wheatstone bridge.
   b. Measure an unknown resistance using a Wheatstone bridge.
4. The Potentiometer
   a. Operate the potentiometer.
   b. Measure resistance's accurately using the potentiometer
5. Joule's Law
   a. Measure the joule equivalent of the calorie of heat energy.
   b. Measure electric heating.
6. The RC Circuit
   a. Construct an RC circuit.
   b. Measure the time constant of an RC circuit.
7. Electromagnetic Induction
   a. Measure the amount, direction, and duration of an induced current.
   b. Construct a transformer.
8. Reflection and Refraction
   a. Discuss the laws of reflection.
   b. Discuss the laws of refraction.
9. Spherical Mirrors and Lenses
   a. Measure the focal length of several lenses and mirrors.
   b. Explain the parameters that govern the use of spherical mirrors and lenses.
10. Optic of the Eye
   a. Explain the eye is an optical instrument.
   b. Explain how lenses are used to correct visual defects.
11. The Transmission Diffraction Grating: Spectrometer Method
   a. Use a spectrometer.
   b. Discuss the optical spectra.
12. Detection of Nuclear Radiation
   a. Explain the characteristics of the Geiger tube.
   b. Explain the inverse-square relationship for nuclear radiation.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Materials

Textbook

Wilson, Jerry D. Physics Laboratory Experiments, 6th ed. Boston: Houghton Mifflin Company, 2005.

Other

Scientific Calculator

B. Optional Materials

None

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.

2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software. By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding ePortfolio requirements. Students should consult the ePortfolio handbooks for requirements regarding general education and the students' majors.
   a. The penalty for not submitting electronically or for incorrectly submitting an ePortfolio artifact is a zero for that assignment.
   b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies and Procedures
1. Evaluation Procedures
   a. The laboratory manual for this course contains procedural instructions, theoretical explanations, and relevant questions for each experiment. Results from the procedures and answers to the questions will be written in the designated areas within the manual. Then a discussion or conclusion of the experiment should be written on a separate sheet of paper and attached to the report. The conclusion should be concise and to the point, not over half a page.
   b. Students will have three hours in the laboratory to complete each day's experiment, and must hand in their written report at the end of the period, whenever possible.
   c. Each student is expected to read the experiment before the lab period and complete the Advance Study Assignment that precedes each experiment which will be collected at the beginning of the laboratory period.

12 lab write-ups (25 pts. Each)	=	300 pts
Lab final (written and/or practical)	=	225 pts.
3 quizzes (50 pts. Each)	=	150 pts.
100%		
Total	=	675pts.

   d. The letter grade is assigned in accordance with the following percentage ranges:
   A = 100 - 90
   B = 89 - 80
   C = 79 – 70
   D = 69 - 60
   F = 59- 0

2. ePortfolio Requirements
   a. In conjunction with laboratory# 6, RC time constant, a special assessment of the results of the exercise is required to be submitted as a part of ePortfolio assignment.
   b. Instructions for completing this assignment will be handed out in lab. They are also available on the eli website under the category "ePortfolio" as part of the General Education Handbook.
3. Other Policies and/or Procedures
   a. Students are responsible for the University materials that they use during the laboratory period and will be assessed an appropriate fee for any items that are lost, damaged, or broken.
   b. Students should leave their table and apparatus in good order; i.e., weights put away, instruments returned, scrap paper picked up, etc.
   c. Make-up assignments (for full credit) are given only in extremely unavoidable situations upon **prior arrangement with instructor** or with valid medical excuse.
      Show all work for the full credit.
      Messy papers (non-trimmed, non-stapled, non-readable) will result in a lower grade.
   d. Courtesy
      Please, turn off your cell phones.
      No food in the classroom.

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Laboratory GC 1A18

VI. COURSE CALENDAR

Lab. No. Lab

1. Fields and Equipotentials (Handout)
2. Resistance's in Series & Parallel. Experiment 21
3. The Measurement of Resistance (Wheatstone).Experiment 19
4. The Potentiometer. Experiment 41 (Handout)
5. Joule's Law. Experiment 22

Quiz 1 over Labs 1-4

6. The RC Time Constant. (Handout)
7. Electromagnetic Induction. Experiment 48 (Handout)
8. Reflection and Refraction. Experiment 25

Quiz 2 over Labs 5-8

9. Spherical Mirrors and Lenses. Experiment 26
10. Optic of the Eye. (Handout)

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11. The Transmission Diffraction Grating Spectrometer Method. Experiment 30
12. Detection of Nuclear Radiation. Experiment 31
13. **Make-up, Review.**
14. **Quiz 3 – Labs 9-12**
15. **Final**

Course Inventory for ORU's Student Learning Outcomes

PHY 102-62—General Physics II Lab
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This course contributes to the ORU student learning outcomes as indicated below:
Significant Contribution – Addresses the outcome directly and includes targeted assessment.
Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.
Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.
No Contribution – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

	OUTCOMES & Proficiencies/Capacities	Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	**Outcome #1 – Spiritually Alive** Proficiencies/Capacities				
1A	Biblical knowledge			√	
1B	Sensitivity to the Holy Spirit			√	
1C	Evangelistic capability				√
1D	Ethical behavior			√	
2	**Outcome #2 – Intellectually Alert** Proficiencies/Capacities				
2A	Critical thinking	√			
2B	Information literacy			√	
2C	Global & historical perspectives			√	
2D	Aesthetic appreciation			√	
2E	Intellectual creativity			√	
3	**Outcome #3 – Physically Disciplined** Proficiencies/Capacities				
3A	Healthy lifestyle			√	
3B	Physically disciplined lifestyle			√	
4	**Outcome #4 – Socially Adept** Proficiencies/Capacities				
4A	Communication skills			√	
4B	Interpersonal skills			√	
4C	Appreciation of cultural & linguistic differences				√
4D	Responsible citizenship			√	
4E	Leadership capacity			√	