

Syllabus for
PHY 112—Physics II Lecture
3 Credit Hours
Fall 2009

I. COURSE DESCRIPTION

Calculus-based studies of wave motion, sound, electricity, magnetism and light includes an introduction to modern physics.

Prerequisite: PHY 111 Lecture.

Corequisite: PHY 112 Lab.

II. COURSE GOALS

The course will enable the student to do the following:

- A. Develop the background to deal intelligently with third millennium technological problems in wave motion, electricity and magnetism, light and optics, and modern physics.
- B. Develop a basis for specializing in many fields of modern science dealing with the physical world.
- C. Realize and appreciate the contributions of physics and physicists to the present day society.
- D. Analyze and apply mathematical functions in physics.
- E. Approach the learning of a subject in a consistent and discipline manner.
- F. Develop critical thinking skills.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

It is anticipated that as a result of the successful completion of this course the student will be able to do the following:

- A. Identify and associate the technical names of significant terms in physics.
 - 1. Define or identify given name or term.
 - 2. Match a given statement with the appropriate name or term.
- B. Explain the basic concepts of physics.
 - 1. Discuss in writing a given concept.
 - 2. Select, from several choices, the proper description of a given topic.
- C. Discuss the basic laws of physics.
 - 1. Describe in writing a given physical law.
 - 2. Write the mathematical formulation of a given law.
 - 3. Identify a particular law when expressed by a given mathematical formula.
- D. Apply the terms, concepts, and basic laws of physics.
 - 1. Solve problems similar to those in the textbook.
 - 2. Solve an unfamiliar problem using the familiar laws and concepts.

- E. Interpret an equation and predict how the variation of one or more parameters affects the physical quantity defined by the equation.
- F. Approach the learning of the subject in a consistent and disciplined manner.
 - 1. Attend class sessions regularly and punctually.
 - 2. Turn in homework assignments regularly and on time.
 - 3. Participate in regular class recitation.
- G. Demonstrate the ability for critical thinking analysis.
 - 1. Organize presentations of papers or answers to questions.
 - 2. Derive results from given information.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

Required Materials

Textbooks

Serway, Raymond A and, John W. Jewett, Jr., Physics for Scientists and Engineers. 7th Edition, Philadelphia: Thompson/Brooks/Cole, 2004.

Gordon, John R., and Serway, Raymond A. Study Guide With Computer Exercises to Accompany Physics for Scientists and Engineers. 6th Edition, Thompson/Brooks/Cole, Orlando, 2008-p.

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 Whole Person Assessment requirements. Students should consult the WPA 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
 - a. Four tests will be given in class. The tests will account for 60% of the final course grade. In lieu of one test, a group project may be substituted. The project will count the same amount as one exam (15% of total grade).

- b. Homework will be collected at the beginning of the class on the due date and graded. The semester's homework and occasional quizzes based on the homework will account for 15% of the final course grade. No makeup will be allowed for quizzes. The final average of the semester will be reduced by one point for each unexcused absence above the first three.
- 2. The performance expected following each module listed under VII (Calendar Topic Listing and Sequence) is the performance described in II Terminal objectives, as applied to the topics covered in that part of the module.
- 3. Whole Person Assessment Requirements
 - a. The Group Project final report must be submitted both electronically to the student's Engineering ePortfolio file, and also as a hard copy to the Instructor.
 - b. A research paper on the history and development of some aspect of electricity, magnetism, and/or light and optics must be submitted both electronically to the student's General Education ePortfolio file and also as a hard copy to the Instructor.

VI. COURSE CALENDAR

(TOPIC LISTING AND SEQUENCE)

Week	Topic	Chapter(s)	Homework
1	Oscillatory Motion	15	3,5,7,9,18,21,23,31
2	Wave Motion Sound Waves	16 17	2,7,10,17,22,35,39,48 1,3,9,13,15,20,22,26,31,39,43,52
3	Superposition of Waves	18	1,4,7,9,16,17,27,35,37,52
4	Wave Demos/ Exam 1 (Chr. 15,16,17,18) Electric field	23	3,5,7,9,12,16,19,23,26,34,39,43,44,54
5	Gauss's Law	24	3,10,15,21,27,30,43,50,58,59
6	The Electric Potential Capacitance and Dielectrics	25 26	6,9,13,18,23,29,31,35,47,53,61 5,13,17,27,29,31,38,45,57,58,68
7	Current Resistance DC Circuits	27 28	4,14,21,27,33,43,46,53,59 1,14,20,21,29,33,43,46,63,65,75
8	Exam 2 (Chapters. 23,24,25,26,27,28)		
9	The Magnetic Field Sources of Magnetic Field	29 30	9,14,20,23,31,41,43,57 5,13,16,29,38
10	Faraday's Law Inductance	31 32	8,9,18,20,27,45,49 7,15,21,71
11	Alternating Current Circuits Electromagnetic Waves	33 34	3,4,11,17,29,30,31,43,51,52,57 6,12,19,25,31,34,37
12	Exam 3 (Chapters 29,30,31,32,33,34) Door Projects/Nature of Light	35	8,15,20,33
13	Geometric Optics/Image Formation	36	3,13,19,26,33,38,54,69
14	Interference of Light Waves Diffraction and Polarization Final Exam	37 38	1,5,6,15,29,34,47 3,17,27,33,60

Course Inventory for ORU's Student Learning Outcomes

PHY 112 – Physics II Lecture Fall 2009

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				x
1B	Sensitivity to the Holy Spirit			x	
1C	Evangelistic capability				x
1D	Ethical behavior				x
2	Outcome #2 – Intellectually Alert Proficiencies/Capacities				
2A	Critical thinking	x			
2B	Information literacy		x		
2C	Global & historical perspectives		x		
2D	Aesthetic appreciation			x	
2E	Intellectual creativity		x		
3	Outcome #3 – Physically Disciplined Proficiencies/Capacities				
3A	Healthy lifestyle				x
3B	Physically disciplined lifestyle				x
4	Outcome #4 – Socially Adept Proficiencies/Capacities				
4A	Communication skills			x	
4B	Interpersonal skills			x	
4C	Appreciation of cultural & linguistic differences				x
4D	Responsible citizenship				x
4E	Leadership capacity				x