

PHY 2014 Physics for Scientists and Engineers I and Lab // CRN = 32691

Summer 2006

Department of Physics and Engineering

University of Central Oklahoma

Location	Howell Hall 101
Time	MTWR 8:00 – 9:15 a.m.
Instructor	Evan Lemley, Ph.D.; Assoc. Prof. of Physics and Engineering
Office	Howell Hall 221L
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Phone	(405)974-5473 // (405)204-5616
Office Hours	MWR 9:30 - 10:30 a.m. or by appointment.
Final	M July 31, 2006 from 8 – 10 a.m. in HOH 101

Course Description

This course is the first in a two-semester calculus-based introduction to physics, and covers the fundamentals of mechanics, waves, heat, and thermodynamics. Laboratory experience is a principal component of this course.

Corequisites

MATH 2305 Accelerated Calculus 1/2 **OR** MATH 2323 Calculus 2

PHY 2014L Physics for Scientists and Engineers I Lab

Textbook (Required)

Fundamentals of Physics, 7th Edition, David Halliday, Robert Resnick, and Jearl Walker, J. Wiley, 2005, ISBN: 0-471-21643-7.

Laboratory

You must be enrolled in the accompanying laboratory section for this course: PHY 2014L Physics for Scientists and Engineers I Laboratory (Sect. Number 33390), which meets T and R from 1:00 – 3:00 p.m. in HOH 163. Mr. Abdellah Ait Moussa is the instructor for the lab. Students that have not enrolled in the lab section will be dropped from the course. If you are having difficulties enrolling in a laboratory section, then see the Physics and Engineering Department Chair (Dr. Miller) immediately. Laboratories will begin the first week of class with an introductory lab for the first session and an experiment for the second session. All students must bring a lab manual to the first lab. Lab manuals are available from Advanced Printing (on the corner of Rankin and 2nd across from the main entrance of the university).

Objectives

To develop skills needed to work basic problems requiring calculus in their solution in the areas of mechanics, waves, heat, and thermodynamics.

Instruction Techniques

Lecture will be used approximately 90% of the time and recitation (in-class problem solving, including work in groups and on-the-board student solutions) will be employed around 10%.

Topical Outline

1. Units, Dimensions, and Standards
2. Motion in One Dimension
3. Vector Operations
4. Motion in Two and Three Dimensions
5. Newton's Laws
6. Friction, Centripetal Force
7. Energy, Work, and Power
8. Potential Energy
9. Particle Collisions in One and Two Dimensions
10. Rotational Motion and Torque
11. Angular Momentum
12. Rigid Body Equilibrium
13. Waves
14. Thermodynamics
15. Fluid Mechanics

Calculator

You must own a scientific calculator – *see the list of allowed calculators for exams in the Department of Physics and Engineering*. **Please bring your calculator to class for each meeting.**

Internet & E-mail

Access to the Internet and ability to send and receive E-mail. If you do not have a computer at home you can use machines on the UCO campus: Look at <http://technology.ucok.edu/support/microcomplab.htm> for a full list of available general use computers on campus.

Portable Electronic Devices (including cell phones)

Please turn off any portable electronic devices (esp. cell phones) during class. You may not access any portable electronic device during exams except calculators that are on the approved list for Physics and Engineering courses.

Class Polices

Attendance is not required, but you will be responsible for any announcements or notes from class (and quizzes).

Attendance is mandatory for all exams or other graded activities (e.g. project competitions or presentations).

Cheating or academic dishonesty of any kind will not be tolerated.

Homework (*engineering paper not required for this course*)

Working HW problems in a timely manner is the best way to do well on exams and in the class as a whole. Homework is due at the beginning of the class period on the due-date or due-day. Homework should be neatly written on only one side of your paper, folded length-wise with your name written on the outside of the folded pages before turning it in. Each problem should fit all of the following criteria: clearly labeled, **one problem per sheet of paper**, legible and organized. HW papers that do not fit these criteria will be penalized accordingly. See the following web-page: http://evan.lemley.org/courses/hwk_format.php for details on the presentation of HW problems.

Each HW problem you turn in is worth ten points. Some problems will be graded on detailed solutions and others will be graded on effort. I will **not** tell you ahead of time which or how many problems will be graded relative to a detailed solution, but on the returned and graded HW paper a check mark next to the problem number will indicate full effort (or ten points) and a numerical score (e.g. 8/10) next to the problem number will be used on those problems under more scrutiny.

Grading Policies

The following table shows the breakdown of credit for the course.

Quizzes/HW/Misc.	15%	<i>Record your scores here</i>
Exam 1	20%	
Exam 2	20%	
Final Exam	25%	
Lab Average	20%	
Total	100%	

Tentative Grading Scale

90-100% -- A, 80-90% -- B, 70-80% -- C, 60-70% -- D, <60% -- F

STUDENT INFORMATION SHEET / SYLLABUS ATTACHMENT

See separate handout or go to:

<http://www.busn.ucok.edu/academicaffairs/FORMS/Student%20Information%20SheetSPR06rev.pdf>

Tentative Schedule for PSE-1 Summer 2006						
Week	Day	Date	Topic	Reading	Other	
1	Monday	06/05/06	Intro & Motion/Position/Displacement 1-D	1-1 – 1-7 & 2-1 – 2-3		
	Tuesday	06/06/06	Velocity/Speed/Acceleration/Const. Accel. 1-D	2-4 – 2-8	PSE-1 Lab	
	Wednesday	06/07/06	Vectors Addition, Unit Vectors, and Vector Products	3-1 – 3-8	Quiz	
	Thursday	06/08/06	Motion/Position/Displacement Velocity/Speed/Acceleration/Const. Accel. 2-D	4-1 – 4-4	PSE-1 Lab	
2	Monday	06/12/06	Projectile Motion/Uniform Circular Motion/Relative Motion 2-D	4-5 – 4-9	Quiz	
	Tuesday	06/13/06	Force Vectors/Free Body Diagrams/Newton's First and Second Laws	5-1 – 5-6	PSE-1 Lab	
	Wednesday	06/14/06	Common Forces/Newton's Third Law/simple applications	5-7 – 5-9	Quiz	
	Thursday	06/15/06	Friction/Drag/Forces in Circular Motion	6-1 – 6-5	PSE-1 Lab	
3	Monday	06/19/06	Newton's Law Applications/Work & Kinetic Energy/Work-Energy Theorem	Ch. 6 & 7-1 – 7-5	Quiz	
	Tuesday	06/20/06	Work of a Varying Force (including springs) and Power	7-6 – 7-9	PSE-1 Lab	
	Wednesday	06/21/06	Exam 1			
	Thursday	06/22/06	Gravitational and Elastic Potential/Conservative Forces/ Non-Conservative Forces/Total Mechanical Energy	8-1 – 8-4	PSE-1 Lab	
4	Monday	06/26/06	Conservation of Mech. Energy/Potential Energy Diagrams/Overall Conservation of Energy	8-5 – 8-8 & 13-2/13-6	Quiz	
	Tuesday	06/27/06	Linear Momentum/Impulse/Conservation of Momentum	9-1 – 9-7	PSE-1 Lab	
	Wednesday	06/28/06	Inelastic and Elastic Collisions in 1-D/COM	9-9 – 9-10	Quiz	
	Thursday	06/29/06	Inelastic and Elastic Collisions in 2-D/COM	9-11	PSE-1 Lab	
5	Monday	07/03/06	INDEPENDENCE DAY BREAK – NO CLASS OR LAB			
	Tuesday	07/04/06	INDEPENDENCE DAY BREAK – NO CLASS OR LAB			
	Wednesday	07/05/06	Angular Velocity and Acceleration, Constant Angular Acceleration	10-1 – 10-4	Quiz	
	Thursday	07/06/06	Relating Angular and Linear Kinematics and Rotational Energy	10-5 – 10-7	PSE-1 Lab	
6	Monday	07/10/06	Torque and Angular Acceleration/Angular Form of Newton's Second Law	10-8 – 10-10	Quiz	
	Tuesday	07/11/06	Rotational Work/Power & Rolling	10-10 & 11-1 – 11-4	PSE-1 Lab	
	Wednesday	07/12/06	Exam 2			
7	Thursday	07/13/06	Angular Momentum/Angular Form of Newton's Second Law Revisited/Conservation of Angular Momentum	11-6 – 11-12	PSE-1 Lab	
	Monday	07/17/06	Static Equilibrium	12-1 – 12-3	Quiz	
	Tuesday	07/18/06	Fluid Statics and Dynamics	14-1 – 14-7	PSE-1 Lab	
	Wednesday	07/19/06	Fluid Dynamics	14-8 – 14-10	Quiz	
8	Thursday	07/20/06	Temperature and Zeroth Law of Thermo	18-1 – 18-5	PSE-1 Lab	
	Monday	07/24/06	Heat and Work and First Law of Thermo	18-7 – 18-10	Quiz	
	Tuesday	07/25/06	Ideal Gases and Specific Heats	19-1 – 19-8	PSE-1 Lab	
	Wednesday	07/26/06	Entropy and Second Law	20-1 – 20-4	Quiz	
9	Thursday	07/27/06	Mechanical Waves	16-1 – 16-6	PSE-1 Lab	
	Monday	07/31/06	FINAL EXAM 8-10 a.m.			