

PHY 1114

General Physics I and Laboratory

Fall 2005

Department of Physics and Engineering

University of Central Oklahoma

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|---------------------|---|
| Location | Howell Hall 100 |
| Time | MWF 10:00 - 10:50 a.m. |
| Instructor | Evan Lemley, Ph.D.; Assoc. Prof. of Physics and Engineering |
| Office | Howell Hall 221L |
| Web | http://engrphys.lemley.org |
| email | elemley@ucok.edu |
| Phone | (405)974-5473 |
| Office Hours | TR 9:00 a.m. - 10:00 a.m. & F 8:40 a.m – 9:40 a.m. or by appointment. |
| Final | F December 16, 2005 from 9:00 a.m. - 10:50 a.m. |

Course Description

This course is the first semester of a two-semester sequence in algebra-based fundamentals of physics. This semester covers the areas of mechanics, waves, heat, and thermodynamics. A laboratory experience is integral to this course.

Prerequisites and Concurrent Enrollment

MATH 1593 Plane Trigonometry (which assumes you have had algebra) - *prerequisite*

PHY 1114L - *concurrent enrollment*

Textbook

Physics, 6/E, John D. Cutnell and Kenneth W. Johnson, Wiley, 2003. ISBN: 0-471-15183-1.

Objectives

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

Instruction Techniques

Lecture will be used predominantly although sometimes recitation periods will be employed.

Topics

1. Units, Dimensions, and Standards
2. Motion in One Dimension
3. Vectors and Two-Dimensional Motion

4. Newton's Laws and Friction
5. Energy, Work, and Power
6. Momentum and Particle Collisions
7. Circular Motion and Gravitation
8. Rotational Motion, Torque, and Angular Momentum
9. Heat
10. Thermodynamics

Class Policies

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

Exam attendance is mandatory for all exams.

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

Homework

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 will **NOT** be accepted after this time.

Format is important on your HW. 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 (just as the problem is labeled in the text), one problem per sheet of paper, legible and organized. HW papers that do not fit these criteria will be penalized accordingly.

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 in detail (they will be picked at random), 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.

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.

Grading Policies (Updated 10OCT05)

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

| | | |
|--------------|-------------|---|
| HW and Misc. | 10% | <i>First six assignments then switched to recommended homework.</i> |
| Exams (x4) | 10% | |
| Lab | 20% | |
| Final Exam | 30% | |
| Total | 100% | |

Grading Note added on 19-September-2005

The lowest of the four (4) regular exam scores will be replaced by your Final Exam Score if your Final Exam Score is greater.

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://engrphys.lemley.org/courses/fall_2005_syllabus_attachment.pdf

Revised Schedule for GP1 // 24AUG05

| Tentative PHY 1114 General Physics 1 Schedule | | | | | |
|---|-----|-----------|--|------------------------------------|---------|
| Week # | Day | Date | Topics and Activities | Text Sections | Covered |
| 1 | M | 22Aug2005 | Introduction | Chapter 1: 1.1-1.3, Appendices A-C | |
| | W | 24Aug2005 | Vectors & Vector Addition | Chapter 1: 1.4-1.7, Appendix E | |
| | F | 26Aug2005 | Vector Components | Chapter 1: 1.8 | |
| 2 | M | 29Aug2005 | Position, velocity and acceleration | Chapter 2: 2.1-2.3 | |
| | W | 31Aug2005 | Motion graphs | 2.7 and Chapter 1: 1.9 | |
| | F | 02Sep2005 | 1-D const acceleration; free fall | 2.4-2.6 | |
| 3 | M | 05Sep2005 | LABOR DAY – NO CLASS | | |
| | W | 07Sep2005 | Position, velocity and acceleration in 2-D and 3-D; Projectile Motion | Chapter 3: 3.1-3.3 | |
| | F | 09Sep2005 | More projectile motion | 3.5 | |
| 4 | M | 12Sep2005 | Newton's Laws | Chapter 4: 4.1-4.5 | |
| | W | 14Sep2005 | Exam 1 | | |
| | F | 16Sep2005 | Free body diagrams | 4.6-4.13 | |
| 5 | M | 19Sep2005 | Inclined planes | | |
| | W | 21Sep2005 | Problems with 2 objects | | |
| | F | 23Sep2005 | Friction | 4.7 | |
| 6 | M | 26Sep2005 | Circular motion problems; period and frequency | Chapter 5: 5.1-5.3 | |
| | W | 28Sep2005 | More circular motion problems | 5.4-5.8 | |
| | F | 30Sep2005 | Work; work from equation and graph | Chapter 6: 6.1, 6.9 | |
| 7 | M | 03Oct2005 | Work-energy theorem | 6.2 | |
| | W | 05Oct2005 | Conservation of energy; potential energy of gravity and spring | 6.3-6.5 | |
| | F | 07Oct2005 | More conservation of energy | | |
| 8 | M | 10Oct2005 | Nonconservative problems and power | 6.6-6.8, 6.10 | |
| | W | 12Oct2005 | Momentum and impulse | Chapter 7: 7.1-7.2 | |
| | F | 14Oct2005 | Exam 2 | | |
| 9 | M | 17Oct2005 | Collisions in 1D | 7.3 | |
| | W | 19Oct2005 | Bullet and block problems | | |
| | F | 21Oct2005 | FALL BREAK – NO CLASS | | |
| 10 | M | 24Oct2005 | Collisions in 2D; center of mass | 7.4-7.6 | |
| | W | 26Oct2005 | Angular position, velocity, and acceleration; equations of motion for const angular acceleration | Chapter 8: 8.1-8.3 | |
| | F | 28Oct2005 | Relating angular and linear quantities; tangent and radial directions | 8.4-8.5 | |
| 11 | M | 31Oct2005 | Rigid bodies; torque; rotational equilibrium | Chapter 9: 9.1-9.3 | |
| | W | 02Nov2005 | More rotational equilibrium | 9.4 | |
| | F | 04Nov2005 | Rotational 2nd Law and rotational inertia | | |
| 12 | M | 07Nov2005 | Rotational work and energy | 9.5 | |
| | W | 09Nov2005 | Angular momentum | 9.6-9.7 | |
| | F | 11Nov2005 | Thermal equilibrium; temperature; thermal expansion | Chapter12: 12.1-12.5 | |
| 13 | M | 14Nov2005 | Exam 3 | | |
| | W | 16Nov2005 | Specific heat; calorimetry problems | 12.6-12.7 | |
| | F | 18Nov2005 | Latent heat; more calorimetry problems | 12.8, 12.11 | |
| 14 | M | 21Nov2005 | Ideal gas law | Chapter14: 14.1-14.2 | |
| | W | 23Nov2005 | THANKSGIVING BREAK – NO CLASS | | |
| | F | 25Nov2005 | THANKSGIVING BREAK – NO CLASS | | |
| 15 | M | 28Nov2005 | Kinetic theory of gases | 14.3, 14.5 | |
| | W | 30Nov2005 | Heat, internal energy, work | Chapter15: 15.1-15.3 | |
| | F | 02Dec2005 | Exam 4 | | |
| 16 | M | 05Dec2005 | Thermal processes | 15.4-15.5 | |
| | W | 07Dec2005 | Heat engines and Second Law | 15.6-15.7 | |
| | F | 09Dec2005 | Heat engines and Second Law | | |
| 17 | F | 17Dec2004 | FINAL EXAM – F December 16, 2005 from 9:00 a.m. - 10:50 a.m. | | |