PHYS 103 Conceptual Physics
Fall 2008

Professor: Dr. Michelle Parry
Office: New Science Center 208D
Office Phone: 395-2579
E-mail: parryml@longwood.edu

Office Hours: Monday: 3-4 PM; Wednesday: 3-4 PM; Thursday: 11 – 11:50 AM; Friday: 1 – 2 PM; or by appointment.

Course Catalog Description

Conceptual Physics. A survey of basic physics principles taught from a conceptual basis. A broad survey of physics will be demonstrated in this course with such topic as mechanics, fluids, heat, electricity, magnetism, and light. The course will apply basic physics principles to our daily lives. 3 lectures and one 2-hour lab period. 4 credits.

Course Meeting Times and Locations: TBA

Textbook and Required Materials

- Hewitt, Paul G. (2006) Conceptual Physics (10th ed.) San Francisco: Addison Wesley
  ISBN 0-8053-9375-7
- Semester subscription to Web Assign ($14.95) – www.webassign.net
- Calculator

Course Content Outline

The main goal for this course is for students to understand some of the central concepts of physics, and it impacts our daily life. During the lab sessions, students will practice important science skills, which are also a part of the SOL and the Praxis tests.

Course Objectives

- Understand the major methods of natural science inquiry
- Recognize and explain major contributions of science to our culture heritage
- Understand how natural science has been used to address significant contemporary issues

Specific Course Objectives:

- Describe and calculate horizontal and vertical motion of falling objects.
- Explain the motion of objects in terms of applied forces.
- Relate concepts of work, power, potential energy and kinetic energy.
- Understand different forms of energy and different available resources.

- Understand the concept of heat energy as it relates to temperature changes and phases changes.
- Describe wave motion and properties of sound waves.
- Know and understand some fundamental principles of electricity and magnetism.
- Understand basic characteristics and applications of light.

Broad Course Objectives:

- Learn to use some basic laboratory techniques and instruments to record and analyze data
- Know how to write a complete lab report which includes analyzing data and drawing appropriate conclusions from the results
- See connections between various disciplines of science including the relationship between physics, chemistry, & biology
- Learn how our understanding of physics has been a leading drive in our society's development especially in terms of technology and structural design.

General Education Criteria:

1. Teach a disciplinary mode of inquiry and provide students with practice in applying inquiry, critical thinking, problem solving
2. Provide examples of how disciplinary knowledge changes through creative applications of the chosen mode of inquiry
3. Consider questions of ethical values
4. Explore past, current, and future implications of disciplinary knowledge
5. Encourage consideration of course content from diverse perspectives
6. Provide opportunities for students to increase information literacy through contemporary techniques of gathering, manipulating, and analyzing information and data
7. Require at least one substantive written paper, oral report, or course journal and also require students to articulate information or ideas in their own words on tests and exams
8. Foster awareness of the common elements among disciplines and the interconnectedness of disciplines
9. Provide a rationale as to why knowledge of this discipline is important to the development of an educated citizen

Class Schedule

See Class Schedule Below

Course Requirements

All announcements, calendars, assignments, lecture notes in PowerPoint and grades will be **posted on Blackboard**.

- **Final Exam** – There will be one cumulative final exam. The final exam will be worth **20%** of your final grade.
- **Tests** - There will be three major tests. The test will be worth **45%** of your final grade.
- **Homework** – There will be questions assigned for each chapter taken from the text. These assignments will be administered through Web Assign. This will count as **10%** of your final grade.
- **Reading Quizzes** – There will be a short quiz based on every reading assignment to be answered on Web Assign. This will be worth **10%** of your final grade.
- **Labs**– Each student is expected to attend all laboratory sessions and to participate in the lab activity. Completed lab sheets are to be handed in at the end of the lab. Labs will be selected from the lab schedule given below. Labs will be **10%** of the final grade.
- **Lab Report(s)** – Students will be expected to write one/two complete lab reports on specified lab(s). This will count **as 5 %** of your final grade.

Grading Policy

The final grade will be determined by the per cent earned by the student based on the following course requirements

1 Final Exam	= 20%
3 Tests	= 45%
Reading quizzes	= 10 %
Homework	= 10%
Labs	= 10%
Lab Report	= 5 %
	= 100%

Grades:

A: (100 – 90%) Indicates excellence in learning and scholarship and the ability to communicate information effectively and know the importance of the information.

B: (89 – 80%) Indicates substantial mastery of the objectives of the course.

C: (79 - 70%) Indicates average work.

D: (69 – 60%) Indicates substandard work of sufficient quality and quantity to be counted toward graduation if balanced by above average work in other courses.

F: (< 60%) Indicates failure to meet the objectives of the course.

Attendance Policy

Attendance is mandatory. Class attendance will be taken daily with a sign in sheet or with PRS. It is your responsibility to make sure that your name appears on the attendance sheet. You must sign in at the beginning of class. Late attendance will count as an absence. Signing in for a classmate is considered a violation of the Honor Code set forth by Longwood College. Appropriate

measures will be taken if a violation occurs. Assignments must be turned in on time and tests must be taken during the scheduled time periods unless prior arrangements have been made. If you fail to attend 25% of the scheduled class meetings (lectures and labs combined) you will receive a final grade of an F for the course. (excused or unexcused absences) A grade of 0 or F will be given on assignments missed due to an unexcused absence. Exceptions may be made in the case of an emergency. However, remember that what you consider an emergency may not constitute an emergency in my judgment.

Conduct Policy

All students are expected to behave appropriately in class at all times. No disruptions to classroom instruction will be tolerated. Cell phones and all other electronic devices not related to the course should be turned off during class periods. A student may be ejected from class and given a "0" for attendance if necessary.

Honor Code Policy

I strongly support the Longwood Honor Code. Students should pledge all tests, quizzes, exams, and out-of-class assignments. The Honor Code states: "I have neither given nor received help on this work, nor am I aware of any infractions of the Honor Code."

Special Accommodations

Any student who feels s/he may need an accommodation based on the impact of a physical, psychological, medical, or learning disability should contact Dr. Sally Scott. If you have not already done so, please contact the Office for Disability Services (103 Graham Building, 395-2391) to register for services.

Class Schedule: (This schedule is tentative)

Week	Date	Topic	Pages Covered	Assignments
1	Mon	Introduction		• Read Chapter 1 • Lab 1 Analysis due Thursday • Read Chapter 2, View Videos • Chapter 2 Reading Quiz due by 8 AM Friday
	Wed	CHP 1: About Science	2-17	
	Thurs	Lab 1: Scientific Inquiry		
	Fri	CHP 2: Aristotle, Galileo, Copernicus, Galileo's Inclined Planes, Newton's 1st Law of Motion	22-27	
2	Mon	CHP 2: Net Force, Equilibrium, Types of Forces	28-36	• Read Chapter 3, View Videos • Chapter 3 Reading Quiz due by 8 AM, Wednesday • Lab 2 Analysis due Thursday • Homework Set 1 (Chp 2) due by 11 PM Thursday • Read Chapter 4, View Videos • Chapter 4 Reading Quiz due by 8 AM, Friday
	Wed	CHP 3: Motion, speed velocity, acceleration,	41-47	
	Thurs	Lab 2: Density		
	Fri	CHP 3: Free Fall CHP 4: Newton's 2nd Law, Friction, Mass vs. Weight	47-51 58-66	
3	Mon	CHP 5: Newton's 3rd Law of Motion, Vectors	74-85	• Read Chapter5, View Videos • Chapter 5 Reading Quiz due by 8 AM Monday • Lab 3 Analysis due Thursday • Homework Set 2 (Chp 3, 4 & 5) due by 11 PM Thursday • Read Chapter 6, View Videos • Chapter 6 Reading Quiz due by 8 AM, Wednesday
	Wed	CHP 6: Momentum, Impulse-Momentum Relationship	91-96	
	Thurs	Lab 3: Friction		
	Fri	CHP 6: Conservation of Momentum, Collisions	98-103	

4	Mon	CHP 7: Work, Power, Mechanical Energy,	110 - 117	• Read Chapter 7, View Videos • Chapter 7 Reading Quiz due by 8 AM, Monday • Lab 4 Analysis due Thursday • Homework Set 3 (Chps 6 & 7) due by 11 PM, Thursday • Read Chapter 8, View Videos • Chapter 8 Reading Quiz due by 8 AM Friday
	Wed	CHP 7: Conservation of Energy, Simple Machines, Efficiency, Sources of Energy	118 - 123	
	Thurs	Lab 4: Simple Machines		
	Fri	CHP 8: Rotational Motion, Torque, Rotational Inertia, Center of Mass & Gravity	131 - 139	
5	Mon	CHP 8: Centripetal Force, Centrifugal Force, Angular Momentum, Conservation of Angular Momentum	140 - 153	• Read Chapter 9, View videos • Exam 1 (Chapters 1-7) Thursday • Read Chapter 10 • Chapter 10 Reading Quiz due by 8 AM, Friday
	Wed	CHP 9: Universal Law of Gravity, Weightlessness	161 - 168	
	Thurs	Exam 1: Chapters 1 - 7		
	Fri	CHP 10: Projectile Motion	184-191	
6	Mon	CHP 10: Satellite Motion & Kepler's Laws of Planetary Motion	192 - 203	• Read Chapters 11 • Lab 5 Analysis due Thursday • Homework Set 4 (Chps 8,9, &10) due by 11 PM, Thursday • Read Chapter 12, View Videos • Chapter 12 Reading quiz due by 8 AM, Friday
	Wed	CHP 11: The Atomic Nature of Matter	210 - 225	
	Thurs	Lab 5: Centripetal Acceleration		
	Fri	CHP 12: Solids & Hooke's Law	229 - 243	

7	Mon	CHP 13: Pressure in a Liquid, Archimedes's Principle, Floatation	248 - 257	• Read Chapter 13, View Videos • Chapter 13 Reading Quiz due by 8 AM, Monday • Lab 6 Analysis due Thursday • Homework Set 5 (Chps 11,12 & 13) due by 11 PM Thursday • Read Chapter 14, View Videos • Chapter 14 Reading Quiz due by 8 AM, Friday
	Wed	CHP 13: Pascal's Principle, Surface Tension	258 - 263	
	Thurs	Lab 6: Hooke's Law		
	Fri	CHP 14: Atmospheric Pressure, Boyle's Law, Buoyancy of Air	268 - 276	
8	Mon	CHP 14: Bernoulli's Principle	277-283	• Read Chapter 15, View Videos • Chapter 15 Reading Quiz due by 8 AM, Wednesday • Lab 7 Analysis due Thursday • Read Chapter 17, View Videos • Chapter 17 Reading Quiz due by 8 AM, Friday
	Wed	CHP 15: Temperature, Heat, Specific Heat capacity	290- 296	
	Thurs	Lab 7: Specific Heat Capacity		
	Fri	CHP 15:Thermal expansion CHP 17: Evaporation, Condensation, Boiling, Melting & Freezing	297-301 325-333	
9	Mon	CHP 17: Energy & Phase Change	334 - 337	• Homework Set 6 (Chps 14, 15, 17) due by 11 PM Tuesday • Exam 2 (Chapters 8-15, 17) Thursday • Read Chapter 16, View Videos • Chapter 16 Reading Quiz due by 8 AM, Friday
	Wed	Catch up Day – Exam Review		
	Thurs	Exam 2: Chapters 8 -15, 17		
	Fri	CHP 16: Conduction, Convection, & Radiation	306-319	

10	Mon	CHP 19: Vibrations, Pendulums, Types of Waves	362-369	• Read Chapter 19, View Videos • Chapter 19 Reading Quiz due by 8 AM, Monday • Lab 8 Analysis due Thursday • Read Chapter 20, View Videos • Chapter 20 Reading Quiz due by 8 AM, Friday
	Wed	CHP 19: Standing Waves, Doppler Effect	370-375	
	Thurs	Lab 8: Pendulum, Standing waves in a Column of Air		
	Fri	CHP 20: Sound & Resonance	380-393	
11	Mon	CHP 22: Electric Forces, Electric Charges, Conductors & Insulators	410 - 416	• Read Chapter 22, View Videos • Chapter 22 Reading Quiz due by 8 AM, Monday • Lab 9 Analysis due Thursday • Homework Set 7 (Chps 19,20) due by 11 PM, Thursday • Read Chapter 23, View Videos • Chapter 23 Reading Quiz due by 8 AM, Friday
	Wed	CHP 22: Charging by rubbing, Polarization, Electric Fields, & Electric Potential	417 - 429	
	Thurs	Lab 9: Series & Parallel Circuits		
	Fri	CHP 23: Electric Current, Voltage Sources, Resistance, Ohm's Law	436-442	
12	Mon	CHP 23: AC/DC current, Series & Parallel Circuits	443-451	• Read Chapter 24, View Videos • Lab 10 Analysis due Thursday • Homework Set 8 (Chps 22 & 23) due by 11 PM Thursday • Read Chapter 25, View Videos • Combined Chapters 24 & 25 Reading Quiz due by 8 AM, Friday
	Wed	CHP 24: Magnetism, Magnetic Fields, Magnetic Poles, Electric Current & Magnetic Fields, Electric Motors	458-473	
	Thurs	Lab 10: Magnetism		
	Fri	CHP 25: Electromagnetic Induction, Electric Generators, Power Production, Transformers	477-448	

13	Mon	CHP 26: Electromagnetic Waves, Electromagnetic Spectrum, Seeing Light	496-507	• Read Chapter 26, View Videos • Exam 3 (Chapters 19 – 26) Thursday • Read Chapter 27, View Videos • Combined Chapters 26 & 27 Reading Quiz due by 8 AM, Friday
	Wed	Catch up Day – Exam Review		
	Thurs	Exam 3: Chapters 19-26		
	Fri	CHP 27: Colors, Reflection, Color mixing,	515-526	
14	Mon	CHP 28: Law of Reflection, Law of Refraction,	530-542	• Read Chapter 28, View Videos • Chapter 28 Reading Quiz due by 8 AM, Monday • Lab 11 Analysis due Thursday • Homework Set 9 (Chps 25-28) due by 11 PM, Thursday
	Wed	CHP 28: Total internal Reflection, Lenses, Formation of Images,	543-551	
	Thurs	Lab 11: Mirrors & Lenses		
	Fri	Catch up Day – Final Exam Review		
15		Final Exam		

- **All Reading Quizzes will be administered through WebAssign**
- **All Homework Assignment will be administered through WebAssign**
- **All videos are available on Blackboard**
- **Review Questions for each chapter are available on Blackboard – good source of review for reading quizzes and exams**