As a fundamental science, physics is at the heart of modern science and technology. Understanding basic physical principles and concepts is the starting point towards comprehending – or at least being able to talk about – state-of-the-art physical topics and beyond - think, for example, environmental issues.

This course will at most rely on elementary algebraic calculations. We will not use a more mathematical treatment like calculus. You do not need to be a medical doctor to speak about trendy medical topics, or to enjoy a program on the radio about a new surgical technology, or a new medication. In the same way, you do not need to be a high energy physicist to read about the recently discovered Higg’s particle.

My wish is that whatever your future profession will be, if in a couple of years somebody will ask you something like “Why do objects drop to the ground?” , you’ll be able to speak about gravity, and maybe mention gravitons and quantum field theory. Isn’t it fascinating to be aware of the extension of human knowledge, maybe even in a fairly sketchy way? We do it all the time, let’s do it with physics!

From your textbook...

“I hope that Physics: Concepts and Connections will help you discover many links between you and the universe. In writing this book, my constant criterion has been “Is this material relevant to readers who wants to participate fully in our science-based culture but who won’t necessarily use science in their professional lives?” I’ve tried to use language that’s meaningful to literate nonscientists. There are no extraneous technical terms and no extraneous mathematics - in particular no algebra. [But we’ll use some algebra during the course!] The text does however, make wide use of numbers, proportionalities, graphs, and numerical estimates because quantitative tools are essential to meaningful communication today. Literate people must also be numeric.” [Hobson pp.2-3]

“The problems and the solutions of our times are bound up with science and its close relative, technology. That’s why we call this the scientific age. To solve these problems, the world needs your help. We dare not simply entrust these critical issues entirely to experts or government.” [Hobson p.3]

Instructor
Dr. Paola M. Cereghetti
e-mail: pmc5@lehigh.edu
Office: LL 406
Office hours: After class, or by appointment. Please e-mail me, thanks!

Class Meetings
Monday, Wednesday, and Friday: 11:10am to 12:00pm in room LL316
Thursday’s Labs: 1:10pm to 4:00pm in room LL221

Textbook
Physics: Concepts and Connections, 5th Edition, by Art Hobson (Pearson, 2010). We will be covering almost the all book.

Reading Assignments
The Friday of each week you will be given a reading assignment. Each reading assignment is to be completed before the class meeting listed.
Class notes
Class notes will be handed out in class. These notes are just for your convenience and do not replace the textbook. Carrying out the reading assignments before each class will facilitate considerably your understanding of the material.

Homework
Homework will be assigned every week. HW is meant to reinforce and deepen the material learned in class. The HW due date will be written on the HW sheet; HW is usually due each Monday at the beginning of class. The HW grade will be calculated from the points you earn in the homework assignments.

Homework solutions
Homework solutions will be provided in class. Please make sure that you understand each problem that you have not been able to complete correctly.

Laboratory
There is a laboratory section of this course that meets once a week. There will be approximately 11 different labs in the semester. The first lab is this week and meets in LL 221 on Thursday, from 1:10 to 4 pm.

YOU MUST BUY A LAB BOOK TO WRITE EACH LAB REPORT IN. PLEASE BUY THIS AT THE BOOKSTORE BEFORE COMING TO LAB THURSDAY.

Attendance
You are expected to attend all classes and labs.

Tests
There will be 2 hour tests, and a final exam. Hour test 1 is tentatively scheduled for February 15, 2013; hour test 2 is tentatively scheduled for March 29, 2013. The final exam date will be set by the registrar. Hour tests and the final exam are closed book.

Grading:
Your numerical grade in the course will be determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>125</td>
</tr>
<tr>
<td>Lab</td>
<td>125</td>
</tr>
<tr>
<td>Attendance</td>
<td>50</td>
</tr>
<tr>
<td>Hour test 1</td>
<td>100</td>
</tr>
<tr>
<td>Hour test 2</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>700</strong></td>
</tr>
</tbody>
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Accommodations for Students with Disabilities
If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.
Tentative List of Topics

Week 1
Jan 14 Chapter 1
Jan 16 Chapter 1
Jan 18 Chapter 3: 1st Newton’s Law

Week 2
Jan 21 Chapter 3: Measuring motion
Jan 23 Chapter 4: 2nd Newton’s Law
Jan 25 Chapter 4: 3rd Newton’s Law

Week 3
Jan 28 Chapter 5: Newton’s Theory of Gravity
Jan 30 Chapter 6: Conservation of Energy
Feb 1 Chapter 6: Conservation of Energy

Week 4
Feb 4 Rotational Motion
Feb 6 Gravitational force
Feb 8 Birth and death of stars Chap 6

Week 5
Feb 11 Heat
Feb 13 Review for Hour Test 1 Second law of thermodynamics
Feb 15 Hour Test 1

Week 6
Feb 18 Chap 7
Feb 20 Electrostatics and Electric Currents
Feb 22 Magnetism

Week 7
Feb 25 Electromagnetic Induction
Feb 27 Waves
Mar 1 No Class-III Chap 8,9

Week 8
Mar 4 Waves and Properties of Light I
Mar 6 Properties of Light II
Mar 8 Properties of light III, Sound
SPRING BREAK!!! (March 11 to March 15)

Week 9
Mar 18  Chap 10
Mar 20  Review for Exam 2  Chap 11
Mar 22  Special Relativity 1

Week 10
Mar 25  Special Relativity 2
Mar 27  Review for Hour Test 2
Mar 29  Hour Test 2 General Relativity

Week 11
Apr  1  Modern cosmology  Chap 11
Apr  3  Quantum theory light spectra
Apr  5  Light waves and photons_duality  Chap 12

Week 12
Apr  8  Quantum theory...uncertain principle
Apr 10  Quantum theory of atoms  Chap 13
Apr 12  Applications of quantum theory

Week 13
Apr 15  Nuclear physics I
Apr 17  Nuclear physics II  Ch 14,15
Apr 19  Nuclear Physics III

Week 14
Apr 22  Fusion and Fission
Apr 24  The Energy ChallengeCh 16
Apr 26  Quantum fields I  Ch 17