# UNIVERSITY OF MARYLAND

# Department of Physics
### Summer Session I 2008
# Physics 121, Fundamentals of Physics

Mark A. Laurenzi III, Ph.D.

Office: (CUA): Room # 433 Hannan Hall
Office: (UMD): Room # 3102
Office number (CUA): 202-319-5649
Email: Laurenzi@umd.edu

```
0181
     Meets 06/02/08-07/12/08
     MTuWThF... 5:30pm- 6:50pm (PHY 1201)
     TuTh...... 7:00pm- 9:00pm (PHY 3306) Lab
     MW........ 7:00pm- 8:00pm (PHY 1201) Dis

0182
     Meets 06/02/08-07/12/08
     MTuWThF... 5:30pm- 6:50pm (PHY 1201)
     MW........ 7:00pm- 9:00pm (PHY 3306) Lab
     TuTh...... 7:00pm- 8:00pm (PHY 1201) Dis
```

T.A. contact information:

| | | | |
|---|---|---|---|
| T.A. name: | Steve Cohen | T.A. name: | Kostas Koutrolikos |
| Email: | scohen@umd.edu | Email: | koutrol@umd.edu |
| Office: | 4223 | Office: | 4219 |
| Office phone: | 301-405-6192 | Office phone: | 301-405-6073 |

Prerequisites

MATH112 or MATH115 is a Pre-requisite for this course. Therefore, a reasonable mastery of algebra and trigonometry is required. I will fill in the blanks in your mathematical history wherever appropriate. I may also introduce new concepts.  If you find that you are algebraically challenged please do not wait!  Seek help early in the semester.

Text

I.      Required Book: College Physics, 7th edition, volume 1, Serway and Faughn (Thomson, 2005) ISBN# 0534997236.
II.     Required Lab Book: Physics 121 Laboratory Manual.

Attendance:

I will expect everybody to be here each day. I am aware that life gets in the way of coming to class sometimes and when it does know that you are responsible for getting the notes from the lecture that you missed. It is extremely important for you to attend the lectures because I do not follow the text book's outline verbatim. I will often do problems that are similar or not found in your book as examples in class. You will also find that the exams that I write are based on the lectures. If you come to class and take good, clear notes. You should have no problem doing very well on the exams. Often, I will announce, during lecture, important problems to study and important dates of up coming events.

The Lecture:

During lecture, we may deviate from the outline in order to make a point or to make a physical principle clear. In general, my lectures will not follow the book. My lectures are designed to give you another angle from which to approach the interpretation of physical principles that are in the text. I recommend that you read the appropriate chapter in the text before coming to class. And after the lecture read the chapter a second time. This technique will help solidify the import physical principles which will be tied together by reason in physics problem solving. I will make use of the university's stockpile of demonstrations whenever I feel that such a visual aid will enhance the lecture. If you have a question during the lecture you are permitted to interrupt me politely. Since there is a large group of students please limit your questions to those that are about the material at hand. It is in your best interest to keep questions to a minimum during the lecture because the exam will come when it is scheduled. For questions that do not pertain to the subject of the lecture please see me during office hours or send me an email. I will reply to emails as promptly as I can.

Discussion:

Your job, during discussion, will be to ask your T.A. about homework and lab questions. The T.A.'s job during this time is to discuss and help you solve HW and Lab problems only.

Homework:

**Make a copy of everything that you will turn in to me or your TA.**

The assigned homework problems will be due as indicated on the homework schedule. The rate at which we cover material in the course will slow down and speed up during the summer session. However, homework due dates are fixed. There have been instances where I extend homework due dates and things of this nature however, extensions will not be granted for any situations other than those considered extraordinary circumstances.

Exams:

There will be at least two in class exams and a final exam that will be cumulative. Please rearrange your schedule so that you can take the exams on the dates given in the course schedule. There will be no make-up exams unless absences are caused by illness, death, religious observances or participation in University activities at the request of University authorities. Any excuses must be formally documented.  If a valid excuse for missing an exam is presented to me, a make-up exam will be scheduled that is completely different from the exam given in class that you missed in most cases slightly more difficult. If class is canceled because of snow or any other reason, the exam will be given the next day of class. The spirit of the exam will reflect the physical principles that we discuss in class. The exams will not be cookie cutter, homework problems. Problems that are covered in lecture are more likely to become exam problems. During the exam I will not answer any questions that have anything to do with the calculation of the problem.  All exams will be copied by the physics department for your convenience in the event that an exam is lost.  I will keep the original and the copy will be returned to you.  All instances of suspected or direct cheating will be reported to the honor council. Cheating is an extremely serious matter and will not be taken lightly.

How to study for exams:

Study the problems that I use as examples in class. When you study the problems that I present during lecture I suggest that you begin by rewriting the problem and solution neatly, then re-solve the problem two more times with the additional twist of substituting different constant values into the equations. And more importantly reason through your result. For instance: Newtonian mechanics will allow for infinite energies and velocities. Einstein was able to bound velocities by the speed of light. If you were to obtain a velocity for an object that was greater than the speed of light using Newtonian mechanics. Immediately you should stop and check your calculation. This is an example of reasoning through your result. You may also extend your solutions criticism by asking the questions: Is the answer in the correct units? Does this make sense physically? Is the answer a vector or a scalar quantity? The chapter examples in the book are good for practice and grasping the mechanics of solving problems. Same goes for homework problems.  However, they are not the driving force or particularly inspiring to me when I write exams. I will sometimes say "this is a good problem to study". Listen to me in class I will give you all kinds of hints as to what I am considering to put on the exam. Reference other physics text books and look up specific subjects online.

Integrity:

We are all adults here and I expect the same from you as from myself. We will do our best to keep our language and comments to that of a cordial nature. Please try to turn off your cell phones and I will do the same. If your cell phone does go off during the lecture try to hit the mute button as soon as you can without dropping your books and making a big scene. As far as cheating goes, you are only stealing

from your own orchard. I will be more than happy to do what I can to help you do the best that you can in the class. I only ask that before you come to me please seek out the help of your T.A. If for any reason you have a problem with your T.A. feel free to let me know in private. All disciplinary actions will be taken in accordance with the universities policies regarding that specific matter.

Directions to CUA from UMD:

From UMD Campus:
1. Go south on Rt.1
2. Make a right on East-West Highway
3. Make your first left onto Queens Chapel Rd.
4. Queens Chapel Rd. turns into Michigan Ave.
5. After passing over a bridge Catholic University is located on the right side of the road. Turn in and go to: The Physics Department, Hannan Hall Room 433.  (its best to just ask a student walking around where to go)

Grading:   Average sum of HW grades =15%, average of the sum of the regular exams =45%, average sum of Lab grades=20%, final exam=20%.

Exam and Homework schedule: Physics 121, Fundamentals of Physics 2008

      Chapter 1               1,2,3,5,6,15,16,21,23,24,28,33,34,36,37,51,55

      Chapter 2               1,2,3,6,8,10,15,16,19,22,25,37,41,42,43,51

Ch. 1 & 2 due: 6-9

      Chapter 3               6,7,8,13,21,24,29,33,34,38,49

Ch. 3 due: 6-12

      <u>EXAM I Chapters: 1 - 3</u>          <u>June 13, 2008 (F)</u>

      Chapter 4               26, 27, 28, 30, 33, 50, 58

      Chapter 5               28, 30, 33, 40, 44, 63, 76

Ch. 4 & 5 due: 6-23

      Chapter 6               22, 30, 34, 50, 57, 59, 60

Ch. 6 due: 6-26

      <u>EXAM II Chapters: 4-6</u>          <u>June 27, 2008 (F)</u>

      Chapter 7               25, 28, 29, 48, 51

      Chapter 8               38, 46, 48, 51, 74

Ch. 7 & 8 due: 6-30

      Chapter 9               41, 43, 44

Ch. 9 due: 7-3

      <u>EXAM III Chapters: 7, 8 & 9</u>      <u>July 3, 2008 (F)</u>

4<sup>th</sup> of July NO CLASS!!!

      Chapter 10              35, 37, 52

      Chapter 11              8, 31, 33

Ch. 10 & 11 due: 7-9

      Chapter 12              13, 15, 20

Ch. 12 due: 7-10

      <u>Final Exam (Comprehensive)</u>      <u>July 11, 2008 (F)</u>

*There are 9 total experiments that must be completed in order for you to pass the course.  If you should not complete one lab experiment you will fail the course!!!*

~Lab experiment schedule for Physics 121, Fundamentals of Physics 2008
~Lab work will take place in room 3306.

Section 0181

| | | | |
|---|---|---|---|
| T | 6-3 | 2) | The pendulum |
| Th | 6-5 | 3) | Motion with constant acceleration |
| T | 6-10 | 4) | Equilibrium of forces |
| Th | 6-12 | 5) | Conservation of energy |
| **T** | **6-17** | | **Make-up for labs 2-5** |
| Th | 6-19 | 6) | Conservation of linear momentum |
| T | 6-24 | 7) | Centripetal force and acceleration |
| Th | 6-26 | 8) | equilibrium of rigid bodies |
| T | 7-1 | 9) | Mechanical equivalent of heat |
| Th | 7-3 | 10) | Simple harmonic motion and Hooke's law |
| **T** | **7-8** | | **Make-up for all Labs by request** |
| Th | 7-10 | | No Lab |

Section 0182

| | | | |
|---|---|---|---|
| M | 6-2 | 2) | The pendulum |
| W | 6-4 | 3) | Motion with constant acceleration |
| M | 6-9 | 4) | Equilibrium of forces |
| W | 6-11 | 5) | Conservation of energy |
| **M** | **6-16** | | **Make-Up Day for labs 2-5** |
| W | 6-18 | 6) | Conservation of linear momentum |
| M | 6-23 | 7) | Centripetal force and acceleration |
| W | 6-25 | 8) | Equilibrium of rigid bodies |
| M | 6-30 | 9) | Mechanical equivalent of heat |
| W | 7-2 | 10) | Simple harmonic motion and Hooke's law |
| **M** | **7-7** | | **Make-up labs 6-10** |
| W | 7-9 | | No lab |

**\*The material contained within this syllabus is subject to change and/or modification at any time during the course.**