

# PHYS 121 Fundamentals of Physics I

**Spring 2015 Sections 0301-0305**

**Monday, Wednesday, Friday 3:00pm – 3:50pm**  
**Room: PHY 1412**

**Instructor: Dr. Sergio Picozzi**



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## Overview

The purpose of this class is to give you a deep understanding of the fundamental principles that govern physical systems, how they may be used to accurately predict the behavior of objects when they interact with their environment, and how these simple principles lead to more complex phenomena. Topics will include acceleration, force, Newton's laws of motion, drag, friction, gravity, momentum, energy, torque, elasticity, fluids, gases, and thermodynamics. Besides the physics concepts themselves, this course is also designed to develop your general ability to think analytically and converse about physical systems.

Students are **required** to attend lectures, where the course material will be presented and exams will be administered. In other words, *attendance is mandatory*.

**Years of experience have convinced me that the most effective way to teach introductory physics is by working out in full detail problems from the textbook (or from other sources, when available) in front of the class. In physics, concepts and principles are but empty shells unless they are applied to the solution of quantitative or qualitative problems. In my approach, concepts and principles will emerge and will be elucidated along the way while problem solutions are worked out. In a nutshell, my technique consists in “teaching by doing”.**

You will also have a **discussion session** and a **lab session** each week, except at the beginning of the semester. The discussion session is designed to help you explore and solidify the physics principles and their consequences, collaborating with your classmates and TA. The lab sessions present you with rather open-ended investigations that you must plan, carry out, evaluate and explain in teams. You must attend the specific discussion and lab sessions for the course section you registered for. If you miss your normal day for a valid reason (such as illness), contact your TA right away. At the end of the semester there will be an opportunity to make up *one* lab session if you missed one for a valid reason during the semester.

## **Required and Optional Course Materials**

The **textbook** for this course is “College Physics: A Strategic Approach” by Knight, Jones and Field, published by Addison-Wesley / Pearson. It is available either as a single hardcover volume or as two paperback volumes. Either version works. PHYS 121 will cover material corresponding to the first 13 chapters, which is all in volume 1 of the paperback edition. The current edition of the book is the *second edition*, and it can be purchased either new or used. Note that there are actually two versions of the second edition: the original, and a “technology update”, which mainly has added QR codes to view online video demonstrations. I’m not requiring that, so either version will be fine. You may be tempted to consider buying an electronic version of the book *instead of* a printed copy, through *coursesmart.com*. However, I recommend buying a printed book instead of just an eBook subscription! First of all, the higher-quality type in a printed book is easier to read than pixels on a screen, and a physical book is easier to flip through. Second, the eBook subscriptions expire after 18 or 24 months, and then you have nothing to show for the money you spent. A printed book can, at least, be sold if you don’t want to keep it.

*To summarize: the required material for PHYS 121 is the textbook.*

## **Graded work**

**Homework** will be assigned nearly every week. Assignments will consist of a handful of multi-part problems to be answered on paper and turned in. Assignments and their due dates will be sent to every student via email, using the class mailing list. Your homework must be submitted *in class*, no later than the due date.

*No late assignments will be accepted, under any circumstances. The two lowest scores of your homework assignments will be dropped. If you are unable to turn in one or two assignments on time, for any reason, those are the scores that will be dropped.*

**Lab work** will be graded partly on your team’s lab reports and partly on your individual efforts.

You will also earn points for **participation** in class and discussion.

Three **midterm exams** will be given in class, plus a **final exam** at the end of the semester.

On exam day, bring a pocket calculator (graphing calculators are discouraged, although not prohibited) and writing tools (pens or pencils). Paper will be provided.

**All exams are closed-book and closed-notes. However, you should prepare and bring a formula sheet containing equations and values of fundamental constants, but emphatically no problem solutions.**

*The lowest of three scores in the midterm exams will be dropped. No make-ups will be given under any circumstances. If you happen to miss one midterm, due to illness or any other reason, that is the score that will be dropped. If you miss the final exam, you will be receiving a grade of Incomplete (I) for the class, provided, of course, that you have a passing grade up to that point.*

**Course grade break-down:**

7%	Participation (class participation, discussion attendance)
23%	Homework
20%	Labs
30%	Midterm exams (15% each of two)
20%	Final exam

**How written homework will be graded:**

A typical homework assignment will include about 4-to-6 problems to be solved on paper and turned in. We will collect all your papers in class, then divide them up by questions so that each problem (from all students) will be graded by a single TA.

*In order for us to handle and grade your papers efficiently, and to minimize the likelihood of mishandling, please start each question on a new sheet of paper, write your name and section number on every sheet, and do not use any staples or paper clips when turning them in.*

You may answer all parts of a given question on the same sheet, and you may write on both sides of the sheet (and/or use multiple sheets, if needed) as long as it is all part of the same question. Blank office paper is preferred and is available in the Course Center, but notebook paper is OK as long as

you can tear or cut it to have a clean left edge – no ragged edge from tearing out of a spiral notebook, please! Clarity of presentation and neatness do count; points will be deducted for sloppy writing or ragged paper edges.

### **Grade recording:**

Scores on all of your assignments will be recorded on CANVAS soon after grading is complete. When different people are grading different parts of a homework assignment or an exam, it can take a little longer to collect all the parts and add them together. Please check your scores periodically and let me know if you think there is an error; I will do all that is necessary to investigate and correct mistakes. However, *do allow for a few days to insure that all the grading for an assignment is completed before you conclude that a grade is missing; it may simply be that some TAs are still working on that assignment. No haste is necessary and no panic is warranted: grades are official records and we take them very seriously. Before the course is over all of your grades will be properly recorded.*

### **Course Policies**

#### **Attendance:**

*Lecture attendance is both strongly recommended and required.* Students are responsible for all material covered in lectures. It is the students' responsibility to record accurately and to be aware of the specific lectures' contents. This is one of the reasons why attendance is necessary. No lecture-related material will be made available online.

**Reviewing with care the problems worked out in class is by far the best way to prepare for the exams.**

As regards attendance of laboratory sessions, in case of illness or other overwhelming circumstances, we will follow the university policy posted at: <http://www.president.umd.edu/policies/v100g.html>. Please let me (not just your TA) know your situation as soon as possible, and I will tell you if I need documentation for the reason for your absence. In any case, whatever the reason for your absence, it is important that you contact me as soon as you reasonably can, and I will do my best to make accommodations.

**Policy on collaborating:**

Working together with other students is part of the course; in fact, the tutorials and labs are specifically designed around teamwork. Working together to figure out the homework is also encouraged, but you must turn in your own work. This simple rule applies: Never look at someone else's written solution. Talking about how to work the problem is fine if it helps you to understand it better, but copying a solution is strictly forbidden.

**Honor Code:**

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. I will ask you to sign the Honor Pledge on exams; I will not ask you to sign it on each homework assignment, but it should be understood that the Honor Code still applies. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. Violations will be taken very seriously and may result in an XF grade for the course and possible suspension. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/SHC/Default.aspx> .

**Religious observances:**

If you need to miss class, a deadline, or an exam due to a religious observance, please notify me in advance, preferably at the beginning of the semester.

**Students with disabilities:**

Accommodations will be provided to enable students with documented disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester so that appropriate arrangements can be made. *Students who are registered with DSS, and who are planning to take examinations at DSS facilities, are required to let me have the pertinent authorization forms in editable electronic format at least one week prior to each exam date.*

**Weather and emergency closures:**

If the University is closed due to weather or some emergency situation on a day when homework is due, then that homework must be turned in at the

beginning of the next class when the University is open. If the University is closed on the scheduled date of an exam, then the exam will be given during the next class period when the University is open. If the University is closed on any non-exam day, including just before an exam, then the exam will still be given according to the original schedule. In these or other exceptional circumstances, I will attempt to send out information by email.

**Course announcements by email and email usage:**

I will be sending important announcements to the class, specifically to each student's umd.edu email address. If you use some other email system, please make sure that mail sent to your umd.edu address is successfully forwarded to the address you use most regularly. *I will be communicating with students outside of class exclusively via email. I will not be using CANVAS, as that system is rather unwieldy, and I am asking you to please do the same.*

**I will be happy to respond to your inquiries, communications, and requests via email, in as timely a fashion as is practicable. Using that tool, I will be happy to clarify doubts and misgivings you may harbor, or to make arrangements to discuss any issues that you would like to address with me in person. So I do welcome your communications. However, I am also asking you to be judicious in your use of electronic mail. Spread over five different courses, I will have nearly six hundred students this semester. Therefore, in order to help me serve you better and more promptly, it is important to keep the number of emails I need to answer down to a manageable size. For example, any question that can be asked in person, either in class or at office hours, or even out of class by appointment, would preferably be asked in person. Any information that you could equally well receive from a classmate, particularly in reference to things that have been said in class, or locate on one of the UMD websites, would preferably be derived from those sources. Most importantly, any information that is provided within this document should be derived from it. So please read this syllabus with great care.**

**Copyright Protection of Course Materials**

Unless indicated otherwise, any lecture handouts, exams, homework and exam solutions, and the lectures themselves (including audio and video recordings) are copyrighted by me and may not be distributed or reproduced for anything other than your personal use without my written permission.

# Physics 121 Sections 0301-0305

## Course Schedule

Spring 2015 --- Prof. Sergio Picozzi

<i>Week Beginning:</i>	<i>In Class Activities:</i>
Jan 26	Chapters 1-2
Feb 2	Chapters 2-3
Feb 9	Chapters 3-4
Feb 16	Chapters 4-5
Feb 23	Chapter 5
Mar 2	Chapter 6
	<b>Mar 2</b> <b>Midterm 1</b>
Mar 9	Chapters 6-7
Mar 16	SPRING BREAK
Mar 23	Chapters 7-8
Mar 30	Chapters 8-9
	<b>Apr 1</b> <b>Midterm 2</b>
Apr 6	Chapter 9
Apr 13	Chapter 10
Apr 20	Chapter 11-12
Apr 27	Chapter 12
	<b>May 1</b> <b>Midterm 3</b>
May 4	Chapter 13
May 11	Chapter 13

## Examination Schedule

**Midterm 1: Monday 2 March, Chapters 1 through 5**

**Midterm 2: Wednesday 1 April, Chapters 6 through 8**

**Midterm 3: Friday 1 May, Chapters 9 through 12**

**Final Exam: Saturday 16 May, 1:30-3:30 pm, Cumulative**



