

Physics 105/105G

(Edition 2004)

Class Web Site: Blackboard

Lecture Instructor: Nathan L. "Nate" Harshman
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Class Meetings: Tu/Fr 11:20 am – 12:35 pm, McKinley 108

We encourage you all to make every effort to attend class and have particularly little sympathy for the problems of students who skip class. If you are late to class or have to leave early, try not to disturb your classmates.

Our class Blackboard site will contain class policy, lecture notes, homework assignments, solution sets grades, on-line reading quizzes, and links to web sites with materials relevant to the subjects discussed in class. Your usage of and comments on the web site will impact future development of this web site.

Course description and goals:

College Physics (UP) I is the first part of a two-semester introduction to many topic in classical physics. The most important goal of this class then will be to survey some of the topics of classical mechanics. In terms of the jargon of classical physics, we will learn about the kinematics and dynamics of rigid objects, conservation principles, Newton's law of universal gravitation, the kinematics and dynamics of non-turbulent fluid flow, oscillations and thermodynamics. This overview will focus both on the conceptual interplay between different physical aspects and on the mathematical language that can be used to describe these relationships.

A secondary goal of the class is to encourage critical scientific thinking. To that end, the course will provide many experiences where understanding and progress can only be made by combining theoretical insights with real-world experiments or practical knowledge. The wonder and utility of science is that it fulfills three roles: it predicts, describes and explains. Physics relationship to other sciences and its social and historical context will not be ignored.

A final goal of the course is to provide ample experience in problem-solving, one of the most important tools, not just for science, but also for life. Qualitative and quantitative methods of problem solving will be explored and practiced in the context of physics.

The course presupposes a solid mathematical background through pre-calculus, with the prerequisite of MATH-170 or the equivalent.

General Education Information: CP I is one of eight foundation courses in Curricular Area 5 (The Natural Sciences) in the University's General Education Program. This course is the first of a two-course sequence. Students who take CP I frequently take CP II to fulfill both the General Education requirements as well as a major requirement. The second level courses which may be taken following CP I to complete the Area 5 sequence (if you have the necessary prerequisites) are:

BIO-240G Oceanography, CHEM-205G The Human Genome, CHEM-210G General Chemistry II, CHEM-220G Environmental Resources and Energy, CHEM-230G Earth Sciences, PHYS-200G Physics for a New Millennium, PHYS-205G College Physics II, PHYS-210G University Physics II, PHYS-220G Astronomy

Course Materials:

Text: *Physics*, James S. Walker, Pearson—Prentice Hall

Required Supplemental Resources: (these come free with text at the bookstore) *Ranking Task Exercises in Physics*, O’Kuma, Maloney, Hieggelke and *Physlet® Physics*, Christian and Belloni (which include software disk)

Laboratory manual: On sale at campus bookstore, handouts will also be distributed

Calculator: Scientific calculator that can do trigonometric, exponential, and logarithmic functions; graphing capacity not required; graphing capabilities cannot be used during on-line quizzes or in-class tests.

You are responsible for all the material assigned in the chapters of the text, whether or not the material is specifically covered in lecture. Please come to class prepared to discuss the assigned material from the textbook.

Grading:

Class Participation	15%
Homework	25%
Mid Term 1	12.5%
Mid Term 2	12.5%
Mid Term 3	12.5%
Part I of the Final Exam	7.5%
Part II of the Final Exam	15%

The total of all the lecture grades will make up 85% of your grade. Laboratory will make up the other 15%.

The distribution of accumulated scores will assist us in assigning grades at the end of the course. We will, however, try to avoid using a curve. You can check where you stand by checking the Grading page on the class web site. The following represents the toughest possible grade assignment system we will use, and the cutoffs for plusses and minuses will be determined at the very end:

A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	Below 60

If your final average is 90% or better, regardless of the distribution of scores, you will get at least an A-. The grade boundaries may, however, shift downward. **Note:** Grading of problem sets and exams will be based on what actually appears on your paper. Turning in **ONLY** the answers (correct or otherwise) will yield little or no credit. You must show your work with sufficient detail that the grader(s) can determine your approach, methodology, and logic!

Class Participation: out of 200 points

Class periods will consist of a mixture of lecture, demonstrations, and interactive exercises. You will receive credit toward your class participation grade for completing each of these activities. Reading quizzes on the material in our textbook will also provide an opportunity for you to earn additional class participation credit. Finally, there will be surveys taken at the beginning, in the middle, and at the end of the term. Completing these surveys earns you class participation credit, too. Class participation is worth 15% of your before-lab grade.

- **Attendance:** 5 pts per lecture class, 25 classes, 75 pts possible

Sometimes attendance will be collected using the CPS system, sometimes worksheets will be distributed.

- **Physlets:** 10 pts per assignment, 10 Physlets assignments, 100 pts possible

Almost every week you will have a Physlets assignment due at the beginning of class on Friday, but not during test weeks or Thanksgiving. Physlets are interactive computer modules that allow you to develop a better feel for the physics concepts and equations that we'll be studying in class. Consider them to be your virtual laboratory, allowing you to play around with different variables without the complication of setting up equipment or demos. Each week, you'll be given a list of recommended and required Physlets. You'll be expected to turn in the two required Physlets at the beginning of class on the Thursdays indicated on the syllabus. You should work through the recommended list of Physlets as we go along as well. Don't wait until the week before the test—you'll have far too much else to do that week. Pace yourself. Spend a little time on physics each day. You'll learn the material much better that way, too.

- **On-line Reading Quiz:** 5 pts per quiz, 11 quizzes, 55 pts possible

Almost everyweek you will have an on-line reading quiz due before class on Tuesday. These 5-question multiple-choice quizzes will be simple and straightforward, designed to help you keep up with the reading assignments. The quizzes will be posted on the Blackboard site. **Make sure your account works as soon as possible so that we can correct problems early in the semester.** Quiz responses are due at 11:00 am on the Tuesdays listed in the syllabus. The quizzes will be posted about one week before they are due, so you'll have several days to plow through the text and find all the answers. Once you begin taking the quiz, however, you have 30 minutes to complete it. You MAY use your book, but you may not consult other students when answering the quizzes.

- **Surveys:** 5 pts per survey, 4 surveys, 20 pts possible

Two surveys will be available at the beginning of the semester, one on our Blackboard site and one at a site called Interactive Learning Toolkit, described in the on-line resource reference sheet. I'll talk about these in class on the first day. There will also be a mid-semester and end-of-semester survey.

Class Participation Grade:

I will compute your grade based on the percentage of points you accumulate out of 200 points, with a maximum grade of 100%. If you completed all the class participation activities, you could earn 250 points! So you can miss some stuff and still get 100% on Class Participation. As a result, none of these points can be made up for any reason ever.

Homework: out of 250 points

Working problems is important in the process of learning physics. We have therefore made your homework average an important part of your grade: 25% before the lab is taken into account. You are encouraged to consult your fellow students for assistance in solving the homework problems. HOWEVER, simply copying the answers of your fellow students is a violation of the university honor code. Not to mention the fact that failing to work through the problems on your own will lead to disappointing performance on the exams. The solutions you turn in for credit must be your own work. Late homework will not be accepted, so make sure to get the assignments done on time.

- **On-line problem sets:** 20 pts per set, 9 sets, 180 pts possible

Nine times during the semester you will complete on-line problem sets generally consisting of 3-5 problems. With the exception of the first Monday (Labor Day), these will be due by 4 PM on Monday. The on-line portion of your homework assignment can be found at www.masteringphysics.com. Click on the “Young/Geller” book cover (on the far right) and then click on the “Register” button. Use the following access code to register: USMPC-STOUP-BOULE-AYERS-MYTHS-ACHES. You will then be able to set up your own unique ID and password codes to allow you access to the site all semester. You will also need to enter our course ID when you register. Our course ID is MPHARSHMAN0001. You will find documentation on how to use this software in more detail on our Blackboard site. This portion of your weekly homework assignment is automatically scored as you complete it. We have been given the opportunity to “test” this web-based instructional tool free of charge this year. Your feedback is important in helping us to decide whether or not to continue using this software next year, so please, speak up and be heard! Note: the first homework won't be graded, but you will get 20 points for completing it.

- **Essay question sets:** 30 pts per set, 4 sets, 120 pts possible

Four times during the semester, roughly before each test and the final, you will complete three essay questions and turn them in on Monday by 4 PM. The problems in these assignments are designed to be more conceptually-based than those on Mastering Physics. As a result, there may not (and almost certainly will not) be one correct answer for these problems. Instead, these assignments are designed to get you to think about the physics associated with a variety of situations. We hope you'll find them informative and refreshing. These assignments and solutions will be posted on Blackboard.

- **One Recommended Problem Set each week, NOT GRADED**

The list will consist both of problems from the end-of-the chapter in Walker as well as from the MasteringPhysics.com web site. You will find it helpful to work through the recommended problems before attacking the required homework problems. The recommended problems, especially those on MasteringPhysics.com, are often instructional in nature and very similar to the ones assigned for credit. Again, try to keep up with the recommended problems. One of them ALWAYS shows up on the mid-term exams. If you've done all the recommended problems, you'll have worked one of the exam problems already before you even take the exam! I'm happy to discuss the solution to any of the assigned problems during office hours. Again, you are encouraged to work together. Solution guides for the end-of-chapter problems will be posted on Blackboard and for the electronic problems will be available on MasteringPhysics.com.

Homework Grade:

I will compute your grade based on the percentage of points you accumulate out of 250 points with a maximum grade of 100%. Since there are 300 points available, you can miss one written assignment and one MasteringPhysics.com assignment over the course of the semester and still earn a 100% homework grade. But remember, no late homework assignments will be accepted.

Exams:

- **Three mid-term exams**

Three lecture periods will be used for examinations as noted on the syllabus. During each of these periods, you will be given one multiple-choice section that everyone must work, one essay problem (very similar to the written homework) that everyone must work, and 3 problem sections from which you must choose two to work. Each of these midterm exams will be 75 minutes long and each is worth 12.5% of your final grade. **If you are unable to make it to a scheduled exam, please contact Dr. Harshman, before the exam so alternate arrangements can be made.**

You will be permitted to bring **ONE 3" X 5" index card** (on which you may put any formulas, notes, etc. that you wish), a **calculator**, and a **pencil or pen** to each exam. You may place anything that you feel relevant on your note card (formulae, solutions to problems, prayers). The note cards must be hand-written: **no photocopied, reduced, or computer generated note cards will be permitted.** Note cards must be stapled to and turned in with your exam. They will be returned after the exam has been graded. You are not allowed to use your textbook or any other notes during the exams. Furthermore, you are not allowed to consult your classmates for assistance with exam problems. The exams will not be designed to test your ability to memorize, but rather your ability to think. All relevant constants (including units) will be provided to you on a single sheet at the back of each exam.

- **Three optional exam reworks (one for each midterm exam).**

After each exam, you will have the opportunity to turn in revised solutions to the exam, working in the comfort of your own college room or library cubicle. You're not limited to 2 or 3 hours for the rework, but will have all the time up until it's due to work on it. You're free to use whatever resources you deem necessary to solve the problems. By completing the rework, you will get back 1/3 of the difference between your actual exam grade and your score on the rework assignment as credit toward your exam grade.

- **Final exam**

The Final Exam Period will be scheduled by the registrar. For the Final Exam, you will be permitted to use a full sheet of 8.5" X 11" notebook paper with any notes or formulae that you care to place on it. Again, this note sheet **must be hand-written**. If you feel that the space requirements are unfairly confining due to personal penmanship difficulties, please contact Dr. Morris before the exam.

The Final Exam will consist of two parts. The first part of the final will contain three problem sections on material from the last 3 weeks of the course. You choose to work two of the three sections. Your score on these two problems will be worth 7.5% of your final before-lab grade.

The second part of the Final Exam will contain one multiple-choice section (required), one essay question section (required), and 4 problem sections. You choose to work three of the 4 problem sections in this part of the Final Exam.

Laboratories:

Ten times during the semester you will meet during the laboratory time in McKinley 14 to perform experiments. You are expected to have read the section in the laboratory manual about that week's experiment before you arrive. Each week that the lab meets you will complete a laboratory report for that experiment to be turned in the following week to the lab instructor. If you miss a lab for an unexcused reason (see below), it is at the discretion of the laboratory instructor to allow you to make it up on a later date. Occasionally the material covered in the experiment for the week will lead the lecture; this is normal. The lab instructor will provide you with more information about this component of the class.

Succeeding in this class and getting help:

To succeed in this class, it is imperative that you interact with the material every day. Physics is like a foreign language, you cannot learn it just from attending class. Make sure you do the readings before class and lab, do all the quizzes and homework, solve the sample test questions, attend tutorial session, come to office hours.

Tutorial sessions: Once a week there will be optional sessions with a tutorial leader for you to discuss the homework. The times of these sessions will be announced. The role of the tutorial leader is not to give you answers, but to facilitate peer-groups in working together to select the correct ideas and methodologies and to find the answers.

Office hours: You are super-welcome to come to office hours. We have a good time there. If you can't make any of the times listed above, then call or email me, and we can work something out.

Students with disabilities: You should be registered with the University, who will send me a letter describing your special needs. We can accommodate your needs, but occasionally patience will be required. Anything discussed will be kept confidential.

Academic Integrity Code: Read it and follow it. It is your responsibility to know it and abide by it. Follow all instruction given here or given on a specific assignment or the full due process of the AIC will come down on you.

Excused absences and extensions: Severe illness, religious observance, University business, and family emergency are acceptable reasons for missing class or needing an extension on an assignment. I have the right to request reasonable documentation, in accordance with University policy. Do not notify me of an absence, such as missing an exam or needing an extension, at the last minute. Use email and notify as far in advance as possible. I will be strict about this. You will get you money's worth out of this class if I have anything to do with it.

Appeals:

You have ONE week from the day on which assignments/exams are returned to appeal your grade. After 5pm on the 7th day, your grade for that assignment/exam becomes final.

Rule 9.01(c) (Adopted from Major League Baseball):

The instructors have the authority to rule on any point not specifically covered in the above document.