

Written Material Policy

PHYS 1303: Introductory Mechanics

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“Written Material” refers to any document, electronic or hand-written, you submit to the instructor for assessment. This can include quizzes, homework, research papers, exams, and any other such material.

Most of your homework will be handed in electronically through the WileyPLUS system. However, this course will test your ability to not only get the correct answer to a problem but also to demonstrate that you can correctly solve a problem and write clear, accurate solutions with all work shown. The following policy provides the strict guidelines covering any written material which you submit to the instructor for grading (e.g. written solutions to homework, or any solutions written up for an in-class engaged exercise).

As in the humanities, communication in science relies on clear, well-defined standards that enable the free flow of information between parties. My standards are designed with that free but structured flow of information in mind. If you have concerns about any of the below requirements, please discuss them with me during open office hours or by appointment.

Format

All written material submitted for grading must contain the following or will receive an automatic ZERO GRADE.

- **Your full name**
- **The name of the current assignment** (e.g. Homework 1, Reading Quiz 5, etc.)
- **The date on which you handed in the material**
- **The title of each problem requested for submission** (e.g. Problem 21.7, Problem SS-5, etc.) above the work associated with that problem.

All written material must have the following qualities, or will receive an automatic ZERO GRADE:

- **Writing must be legible.** If the instructor/grader cannot read your work to determine your method or approach, no partial credit can be assigned. A completely illegible assignment receives an automatic zero (small print, messy handwriting, etc.). You are always free to type your assignment using Microsoft Word (Office365), Google Docs, LibreOffice Writer, or a similar program.
- **Writing must be coherent.** Any written answer must be formatted with a clear sentence structure: subject, verb, and object. Writing must adhere to the guidelines of good English

prose and Scientific Writing¹: short, declarative sentences clearly explaining answers, ideas, etc. Flowery prose will get you nowhere. Mathematical solutions must also be coherent. The equations should flow like sentences, one building into the next with a clear path from your original equations to your final solutions. Show as many steps in your work as you can – the smaller the steps, the more likely you are to spot mistakes quickly. If you provide insufficient steps to demonstrate how and why you were able to solve the problem, we cannot give you full credit. Right answers without clear, mathematical justification or written explanations will almost always receive low/no credit.

Solutions and Answers

The formatting of good solutions is described further below, and examples are available on the web (<http://www.physics.smu.edu/sekula/phys1303/GoodHomeworkExample.png>). In addition to legible and coherent solutions, the answers to solutions must have the following qualities in order to receive full credit:

- **Answers must be boxed:** the final numerical or written answer to a problem must have a clear box drawn around it. This indicates your commitment to your solution and makes it clear to the grader what you intended as your final result. Failure to box your answer, even if it is correct, will result in a loss of credit.
- **Numerical answers must have the correct units:** The importance of units cannot be over-emphasized. Satellites have crashed on Mars because somebody messed up units! Failure to put the correct units, or any units at all (where units apply), next to your numerical answer will result in a loss of credit.
- **Numerical answers must have the correct significant figures:** Numbers have limitations; no number derived from measurement can be known perfectly. Applying the rules of significant figures teaches you this limitation. Therefore, please review the rules of significant figures (<http://www.physics.smu.edu/sekula/phys1303/notes.html#Sigfigs>) and apply those rules to your answers. Failure to apply these rules correctly will result in a loss of credit.

Academic Honesty

You are encouraged to work together to solve problems. However, you must also follow the basic guidelines of academic ethics². Please see the bullets below for some basic guidance on this, as

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- 1 c.f. “The Scientist’s Guide to Writing: How to Write More Easily and Effectively throughout Your Scientific Career” by Stephen B. Heard or “A Scientific Approach to Writing for Engineers and Scientists (IEEE PCS Professional Engineering Communication Series)” by Robert E. Berger.
 - 2 Here, I made an important side comment. Heed it well. I am very much aware of the existence of solution manuals (published by the book publisher) and online, internet-based solution sites and forums (where students trade solutions to problems from established physics textbooks). I make the following statements of caution. First, copying solutions from such sources is a violation of the Academic Honor Code of this University. If caught, you are subject to the same proceedings as apply to plagiarism. Second, my experience in using these resources to check my own solutions is that a fair amount of the time (maybe as high as 10%), the solutions are dead wrong. If you do not learn physics, you will fall prey to the same trap that claims all people who forgo

well as for some positive ways you can adhere to these guidelines.

- **Written solutions to problems must be your own work, and not copied from anybody else.** While you are encouraged to collaborate to solve problems and learn from one another, copying each others' work **WILL NOT BE TOLERATED**. Any evidence of such behavior will result in proceedings in accord with the University Honor Code.
- **Numerical answers must be arrived at by your own work.** If evidence is obtained that suggests students in the class are sharing answers, steps will be taken in accord with the University Honor Code. Sharing of answers and failure to pursue your own solution, even based off collaboration on a problem, **WILL NOT BE TOLERATED**.

If you work together, please follow these simple guidelines to acknowledge your positive collaboration with your peers:

- **Write the names of your collaborators at the top of your submitted work.** Acknowledging collaboration is like citing sources in a research paper; it gives credit to those who help you and whom you help, while asserting that the work submitted is still a product of your effort.
- If you have arrived at a solution as a group, separate from one another and each work the problem independently to see that each member of the group can follow the approach and agrees that this is the correct solution. This will also result in independent write-ups of the solution to a given problem.

Advice for Writing Good Solutions

Writing solutions is like writing an essay - you have to convince the reader that you have understood the question, applied the correct assumptions, and then demonstrate your solution with sufficient detail to defend the answer. Here, I outline some recommendations for writing high-quality solutions. Applying these guidelines will help you to focus your problem solving and communicate your understanding effectively.

1. State and Justify Your Assumptions

- clearly state your assumptions and justify why you have chosen them. This will help your audience determine whether you have understood the question(s) being asked.

2. Show Sufficient Work To Convince Your Audience You Understand the Process

- show enough intermediate steps that your audience is convinced you not only understand the question, but that you understand how to answer the question. This includes showing how you apply your assumptions, highlighting any mathematical

learning and critical thinking: the scam. Sites often charge money for access, and solution manuals cost money, so *caveat emptor...* **buyer beware**. If you assume these solutions are all correct, you have made a serious error in judgment. Always... ALWAYS... check the claims of others using your own brain. Third, copying solutions from third-parties means you have likely failed to learn this material, and this will be reflected in your exam scores... which form the MAJORITY of the points earned in this course. The summary: cheating has few upsides and a thousand downsides. Don't cheat. It's better to come to me and admit you are struggling with the material – you've already paid for my help - than it is to suffer in silence and pay the price in your academic career.

or physical tricks needed to simplify steps in the solution, and finally clearly showing the answer. In science, *the process* is the most important means by which you demonstrate the correctness of the answer. Showing your work clearly is the most important way to show that you understood the material.

3. *Comment on the Answer*

- Always comment on the answer when asked. If you are not asked to comment on the answer, but you have observed something interesting about the solution, please make a comment. This helps demonstrate that you not only understand the question but deeply understand the answer.

Policy on Changes to Grading

You are free to challenge the grade you have received on a problem or on an assignment. **These challenges must be presented in writing to the course instructor** so that they can be discussed during an office hour. However, *any additional student mistakes identified during the review of the grading will result in additional lost points consistent with those mistakes*. Just as in the review of any professional work, you therefore stand to potentially gain or lose during the process of a formal review.