

Physics 161 - Spring 2010

“General Physics: Mechanics and Particle Dynamics”

SYLLABUS as of 1.02.2010

Instructor: Dr. Brad Conrad

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Office Hours: I'll usually be available the ½ hour before and after class. If these times do not work for you, other times can be arranged.

Official Course Description: Grade Method: REG/P-F/AUD. CORE Physical Science (PS) Course. *Pre- or corequisite: MATH141. Credit will not be granted for PHYS171 and PHYS161 or PHYS141 or former PHYS191.* First semester of a three-semester calculus-based general physics course. Laws of motion, force, and energy; principles of mechanics, collisions, linear momentum, rotation, and gravitation. Physics Clinic, PHY 1214, MTWHF 11, 1, 2. If purchasing used books additional software WILL BE required.

Lecture:

Date/Time: M/1900-2050 & W/1900- 1950

Room: 1410 Physics Building

Discussion:

| Section | Date/Time | Room | TA |
|---------|-------------|------|-----|
| 0401 | W/2000-2050 | 1219 | TBA |
| 0402 | W/1800-1650 | 1219 | TBA |
| 0403 | M/1800-1650 | 1219 | TBA |

Pre/Co-Requisites: Math141 (Calculus 2). You will *need* to be comfortable with calculus before taking this class. Calculus will be used extensively.

Textbook: The *required* textbook is:

Physics for Scientists and Engineers, A Strategic Approach, with Mastering Physics, Volume 1, **Second Edition**, by Randall D. Knight (Addison Wesley).

When you buy your textbook you should get a copy that is packaged with an access number for Mastering Physics. The access number is needed to get on-line access to Mastering Physics, which is the web-based homework collection system. If you buy a used copy, you will need to also purchase an access number which you can get on-line at: www.masteringphysics.com or at the bookstore.

Clickers: Do not get one!

Recommended Texts: Knight's book is a good physics text, but there are many other books that you may find helpful. No two people learn the same way and you might prefer the arguments made in other books: Feynman's Lectures on Physics (Volume 1) by Feynman

and Leighton and Physics for Engineers and Scientists (Volume 1) by Ohanian and Markert are suggested.

Grading:

As a rule, I try to make grading as transparent and straightforward as possible.

The total grade in the class is calculated according to the following:

| | | |
|------------|------------------|----------|
| Homework | Drop one | 25% |
| Dis./Lect. | | 15% |
| Midterms: | First exam | 9% |
| | Second and Third | 13% (x2) |
| Final | | 25% |

A histogram of total scores for the entire class will be plotted. Assuming that the distribution is reasonably bell-shaped, letter grades will be assigned so that students with scores in the top 20% will receive an A, the next lower 40% will receive a B, the next lower 25% will receive a C, and the remaining 15% will be split between D and F. I reserve the right to change this policy as the class progresses.

Homework will have two weighted components. Mastering Physics is an electronic problem set website and will be due Fridays at 1800 EST. This will be worth 70% of the homework grade. An additional 1-2 problems will be assigned on elms and due **at the beginning of class** on Mondays. Graded in detail, turned in homework will be 30% of your homework grade. *No late work will be accepted.* I will drop the lowest weekly homework score (one and only one) for each student.

Homework guidelines:

- 1) Use 8.5x11 inch paper. No spiral ring paper will be accepted. Pencil or black/blue ink.
- 2) Name and page number on EACH page.
- 3) Write on only ONE side of the paper.
- 4) Clearly label your problem(s).
- 5) Final answers must be boxed.
- 6) All pages MUST be stapled before you walk in the classroom. I will not have a stapler.
- 7) The “answer” is not the final number/equation/statement/graph. It is ALL the work and logic leading up to it. I will be grading the whole process. Feel free to use sentences.
- 8) **If I cannot read it, it is wrong.** Therefore, please write it neatly.
- 9) Not doing the above will result in loss of points.

Discussion/Lecture: Discussion sections are required for this course. They will be a mix of individual and group based work sheets/quizzes and question/answer sessions. The TA is there to help and clarify, not do your work for you. Quizzes will be graded. This work cannot be turned in late or made up at a later time.

In addition, individual or small group quizzes will be given from time to time *in class*. These quizzes cannot be made up at a later time. Your Lecture/Discussion grade will be based on both sets of quizzes and group activities.

Exams: There are three midterm exams and one final exam. All exams are closed book. I do not allow crib sheets (electronic or paper). Calculators are allowed during exams, but you are not allowed to use any device with phone, photo, web, messaging or text display capabilities during an exam. Graphing calculators are ok but I reserve the right to search them if I believe they are being used in an improper way. No computers. You **must** take all the exams and **no** exam score will be dropped. If you cannot attend an exam at the scheduled time, speak with Dr. Conrad at least one week before the exam! If you miss an exam with a valid excuse, a makeup exam will be given and it is your responsibility to arrange this in a timely fashion with Dr. Conrad. If you miss an exam without a valid excuse, your exam grade will be penalized 25%. Students are responsible for all material including the assigned reading, lectures, discussions, and homework. Material from any part of the course can appear on a test, quiz or homework, whether or not it was covered in the lectures. It is VERY important to master all assigned material. Your grade will depend upon the completeness of your solution, not simply determining the "right number." **SHOW YOUR WORK!**

THE FINAL EXAM is on TUESDAY, May 14 from 6:30pm-8:30pm - the University still needs to figure out where the exam will be given! You can check the schedule at: <http://www.testudo.umd.edu/soc/exam201001.html>
It is a common exam, meaning that all students currently taking phys161 will have the same exam.

Excuses: If you have a valid excuse for missing an exam, quiz, or homework, see me to arrange what to do about it, beforehand if at all possible. *Ex post facto* (after the fact) excuses will require validation and may not be acceptable. You *must* speak to me. Your TA does not have the authority to excuse you from any requirement. Turning in late homework or missing an exam is not allowed without a valid documented excuse as defined by the University (medical problem, religious holiday, or serious family crisis). In all cases, a makeup assignment or makeup exam must be completed in a reasonable amount of time or you will receive a score of zero for the assignment or exam. The makeup test or assignment, and the due date, must be arranged by consulting with the instructor as soon as possible after it becomes apparent that an exam or assignment due date will be missed. If you are going to miss an assignment because of a religious holiday, it is *your responsibility* to inform the instructor in advance so that suitable arrangements can be made.

Academic Honesty: I expect you to get together in small groups and discuss the material and the homework problems. However, do not use these discussions as an excuse to copy someone else's solution to the homework or let someone else copy your solution. That is cheating. The right way to proceed is first to work through the problems on your own and arrive at a definite answer. With this preparation you can then discuss with others and see if you have missed something. All work you submit must be your own and should reflect

your own understanding. Academic dishonesty, such as copying homework, cheating on an exam, or having someone else use your clicker, is a very serious offense which may result in suspension or expulsion from the University. Don't do it. Details on the policy can be found at www.testudo.umd.edu/soc/dishonesty.html.

Help Available: It is very important not to fall behind in this class, since each chapter builds on all previous chapters! If you have any difficulty at all understanding the material, please clear it up as soon as possible. If a difficulty is not cleared up right away, it will lead to more trouble later on. So, let me repeat again, clear up your difficulties as soon as they arise without any delay. THIS IS VERY IMPORTANT

You can also use a free tutoring service in the Physics Department: the Slawsky Clinic. It is run by a group of retired physicists. It is located in Room 1214 in the Physics building. You can usually get help at any time they are open, from 10 AM until 3 PM. See <http://www.physics.umd.edu/academics/ugrad/slawsky.html>.

If you find that you are having more general academic problems, or are having trouble figuring out what you want to do, I'd recommend that you stop by Room 1120 Physics and talk to Tom Gleason, the Physics Coordinator of Student Services. Tom graduated from Maryland and also used to be an advisor in Letters and Science (undeclared majors). He knows all the University rules and is a great person to talk to because of his perspective on Physics and other programs at the University.

Escape Clause: I reserve the right to modify any aspect of this syllabus at any time if I believe that such a change will allow the students in this class to better meet the course goals. If the syllabus does change, such changes will be explained to the class immediately.

Very rough schedule of material:

| Lecture | Day | Material to be covered (Ch): |
|---------------|-----------------------|------------------------------|
| 1,2 | 01.25 | 0 & 1 - Motion |
| 3 | 01.27 | 1 - Motion |
| 4,5 | 02.01 | 2 - Kinematics in 1D |
| 6 | 02.03 | 3 - Vectors |
| 7,8 | 02.08 | 3 & 4 - Kinematics in 2D |
| 9 | 02.10 | 4 - Kinematics in 2D |
| 10,11 | 02.15 | 4 & 5 - Force and Motion |
| 12 | 02.17 | 5 - Force and Motion |
| 13,14 | 02.22 | 6 - Dynamics 1 |
| Exam 1 | 02.24 | Exam (1-5) |
| 15,16 | 03.01 | 6 - Dynamics 1 |
| 17 | 03.03 | 7 - Newton's Third Law |
| 18,19 | 03.08 | 7 - Newton's Third Law |
| 20 | 03.10 | 8 - Dynamics II |
| 21,22 | 03.15 | Spring Break |
| 23 | 03.17 | Spring Break |
| 24, 25 | 03.22 | 8 - Dynamics II |
| Exam 2 | 03.24 | 8 - Dynamics II |
| 26,27 | 03.29 | 9 - Impulse and Momentum |
| 28 | 03.31 | Exam (6-8) |
| 29,30 | 04.05 | 9 - Impulse and Momentum |
| 31 | 04.07 | 9 - Impulse and Momentum |
| 32, 33 | 04.12 | 10 - Energy |
| 34 | 04.14 | 10 - Energy |
| 35, 36 | 04.19 | 11 - Work |
| 37 | 04.21 | 11 - Work |
| 38, 39 | 04.26 | 12 - Rotation |
| Exam 3 | 04.28 | 12 - Rotation |
| 40,41 | 05.03 | 13 - Gravity |
| 42 | 05.05 | Exam (9-13) |
| 43,44 | 05.10 | Wrap up |
| | 05.14 (FRIDAY) | Common Final Exam (1-13) |
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