

## How Can I Do Better in Physics?

1. There are too many equations!
  - How many bones, muscles, etc are in the human body?
  - How many parts are there to a shark?
  - How many important dates are there in a history class?
  - How many vocabulary words do you need to know in other classes?
  - How many equations are there? (Hint – look at the handout!)
  - Each equation embodies the physics concepts and/or definitions. If you understand these things, then you will get most of the equations.
2. There are not enough examples, or the examples are not like the homework.
  - There are differing levels of examples and development of concepts.
  - I spend time developing the concepts, which are the core of the physics. Without the right concepts, one cannot get started on the problems.
  - Class examples highlight the concepts introduced.
  - Too many examples encourage the misconception that physics is only about manipulating equations.
  - More complicated exercises are left to the homework as there is little time to harder questions on the exams.
  - Homework should be started early, after properly reading the chapters, going to the lectures and digesting the material.
  - Do not spend more than about 20 minutes on any one problem. This is an indication that you should seek other ideas from peers or the instructor.
  - Watching the instructor doing problems is not the same as the training needed to think things through yourself and understanding where your thought process needs to be modified.
3. How do I study for the tests?
  - The process of learning does not take place over night. You need to follow the patterns first outlined at the beginning of the class.
    - a. Read the text before the lecture.
    - b. Determine the important concepts/definitions, but do not immediately aim to understand everything the first time through.
    - c. Listen to the lecture and seek to understand the concepts.
    - d. Reread the chapter after the lecture. Understand how the equations used connect to the concepts.
    - e. After some understanding of the concepts, tackle the problems. Picture what is going on before worrying about equations and numbers. This is not a matter of scanning equations and plugging in the numbers. Physics is based upon what is happening in the real world.
  - Each chapter involves a few simple concepts and equations. These equations are on the handout that you received the first day. You should know each of these without looking them up. It would help to try this while doing the homework to see which ones you can write down before looking them up.
  - The sample quizzes/exams can test you on many of these, though not necessarily all of them.
  - Other samples questions can be found by looking at unstarred problems in the text, or looking at the samples at the text website.
  - Again, you must constantly be working on physics. This is a different type of thinking and some may need to work on it more than others.
4. I get A's in most of my classes, so I should get an A in physics. If I cannot do physics, then I must be stupid!
  - Doing physics is in many ways a lot different than anything else you have done to date. It is a different way of thinking and a different way to view what is going on around you. Most everything we do in this class can be related to some experience you have had. When some students immerse themselves into this class, they report strange connections with the outside world, like thinking about physics in ordinary situations.
  - Many of you have not thought this way, or developed these skills. Perhaps this is why physics is a requirement in many seemingly unrelated disciplines.
  - No, you are not stupid! You just need to learn to adjust. It takes time and sometimes we do not have this time with all of our other commitments.
  - So, just because you get A's in other classes with sometimes little studying, it does not always work here. It is just different. It is not something to be hated .. it is a challenge ... a puzzle ... something to be conquered in time.
5. What are your study habits?
  - How many hours do you spend doing physics .. alone? Some need more than others!
  - How many have explored the resources I have put on the web?
  - How many make an effort to communicate with the professor to clear up problems?
  - Do you read to understand, or just try to get the work turned in?
  - Are you overcommitted? A full time student (15 hrs) needs to spend at least 30-45 hours outside of class on reading, homework, etc. Working more than 10 or more hours limits the time need for studies. Sometimes this is necessary and you have to make your own choices. (In the summer this course should occupy at least 8.33 hours in lecture+6 hours in lab + 16.67 hours work outside of class = 31 hours. )