

## PHYS 251 LABORATORY APPROACH & PHILOSOPHY

In the laboratory portion of this course you will be exploring some important phenomena, concepts and principles to help you make sense of the issues and ideas you are studying. You will complete a pre-laboratory task that will start you thinking about ideas relevant to the laboratory investigation. Pre-labs will be due to your lab instructor prior to the lab period. For many laboratories your first task will be to come to a group consensus about the pre-lab. The whole laboratory class will then have a brief discussion about the pre-lab. Next is the actual investigation. Instructions on what and how to do the investigation will become less specific and comprehensive as the semester progresses. Consequently, for the later investigations you will be given a problem and your group will have to figure out all aspects of what you need to do and how you are going to do it. This approach is being employed because one of the goals of the laboratory component of the course is to teach you to become effective investigators and problem solvers.

For many of the laboratory investigations there will be a relatively brief task at the end. This task may take one of several forms. The task might be to demonstrate that you have understood the concepts, principles and/or relations you investigated by applying them to a new context or by answering some questions. Or the final task may test to see if you understood what you were investigating by having you analyze the data in a different way.

The grading procedure for the laboratory will have three components. Each laboratory will be worth a maximum of 20 points. Honest effort and completion of the pre-lab task will be worth 5 points. For the most part, you will not be graded on whether your answers are right or wrong, but on whether you completed all parts of the task and explained your ideas and reasoning fully. **ALL PRE-LAB TASKS REQUIRE FULL EXPLANATIONS!** Active participation in the laboratory investigation will earn another 5 points. You must be actively engaged with the physics during the investigation; discussions of last Friday's party or a non-existent social life do not count. Finally, the challenge task at the end of lab will be worth a maximum of 10 points. This task will be evaluated for correctness.

As mentioned above these laboratories will progress through the semester in giving you more responsibility for what is done and how it is done. One of the facets of such an approach is that you will need the concepts and skills learned in earlier lab investigations to handle later ones. This means you cannot simply forget each lab when it is finished. We strongly encourage you to keep all of your work from each laboratory. We also very strongly encourage you to work with the concepts, principles, relations, equipment, and skills until they make sense to you and you can apply them effectively. It is a good idea to record places where you went wrong, why you went wrong, and how you corrected the situation. Following this procedure will make these experiences productive learning events and not simply sources of frustration. Additionally, when working on the laboratories you must also keep in mind and follow the "process of science" as has already been discussed in class. This will enable you to learn more from your observations – than simply the observations. Finally, you need to be careful when making measurements to understand and determine your uncertainty in those measurements.