

Authors Note: This document was prepared by David Jackson for distribution to students at Santa Clara University enrolled in an Explorations in Physics Course. This will have to be modified to conform to your own course management philosophy and local conditions. You are welcome to use/modify it as you wish.

Explorations in Physics: Course Overview

OVERVIEW OF SCIENCE

Today, science is an integral part of our technological society, and people are often inundated with information on issues such as global warming, nuclear waste disposal, ozone depletion in the atmosphere, combating deadly diseases, finding new sources of energy, or the prediction of earthquakes and violent weather systems. A basic understanding of scientific principles and concepts is essential if today's citizens are going to be knowledgeable enough to comprehend and make informed decisions about these and many other difficult issues. In order to arrive at such an understanding, it is helpful to have some idea as to what science is all about.

There are about as many different definitions of science as there are scientists in the world. Perhaps the simplest way of defining science is as *an investigation into the workings of nature to try and understand how the world works*. Typically, this involves

greater extent than you would in an ordinary science class. In fact, in this course your powers of observation, reasoning ability, and the depth of comprehension of scientific concepts and methods are considered to be *far* more important than any memorized facts, theories, or laboratory procedures. The critical question in this course is not “*what* do

as well as gathering or creating the necessary experiments, taking the appropriate data, drawing conclusions, and presenting the results to your classmates. As you work on your projects, you will have ample opportunity to discuss problems you encounter with your classmates as well as with the instructor.

WHAT'S EXPECTED: CLASS WORK

The Activity Guide this is used in this course has been developed to support the *Workshop Physics*® approach to learning. Your in-class work will consist of undertaking various experimental activities, participating in discussions, solving problems, and documenting your work in the Activity Guide. It is important that you fill in the activity guide as you go. It will be assumed that you have completed all of the previous sections each time we begin a new section. Your instructor will make periodic checks to see that you are answering the questions in your Activity Guide. It is in your best interest to think carefully about the questions in your activity guide before answering them.

There will be homework problems assigned on a regular basis. Some of the problems may be small activities for you to complete with your partner to help prepare you for the projects you will be undertaking at the end of each unit. Some of the problems will involve calculations and some will be more conceptual. We feel it is important for you to have experience with many different types of problems. These homework problems will be graded and must be handed in on time.

You will work with a partner and also in small groups, depending on what type of activity you are doing. When working in a group, make sure that everyone gets a chance to take part in the activities, including working with the computer. Don't have the same person do the computer work for every single activity. This is a great opportunity to get comfortable with computers and computer-based measurement devices, but you must be willing to "get your fingers dirty." Some of the exam questions may involve the computer, so it is important that everyone be comfortable with it.

There will also be class discussions from time to time and you may be called on to answer questions or give your opinion. It is important that you participate in class discussions, which means being quiet and listening to what others say as well as contributing your own thoughts and ideas. Your willingness to discuss ideas with classmates, devise clever ways to measure or observe things, and make brief presentations using

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attempting something too easy or too difficult. If needed, you will be asked to submit a revised proposal. One of the main purposes of the project proposal is to get you to think through the project critically so that you don't run into too many unforeseen problems. (There are *always* unforeseen problems when you undertake an investigation.) The project proposals should be about one page in length and should address what you want to investigate, why you want to investigate it, what measurements you intend to make, and a breakdown of your plan of action, including a preliminary time schedule. Because it is important to write a good proposal, 10% of your project score will be for your proposal.

Your projects will be done in groups of three that will be assigned randomly, so don't ask if you can work with your friends. You

of the detrimental effect of disruptions on the rest of the class, no one will be allowed to enter after this time. That means that the door will be locked at the time the class starts, so make certain you arrive on time.

Classroom Hours—You may want to come in and work at times other than the normal class times. This is particularly true while working on your projects. The classroom will be open an hour before class each day so that you can come in if you feel like you need some extra time working on things. This is also an excellent opportunity to try and make up work if you happened to miss a class.

Respect for Equipment—We expect you to be careful with the lab equipment. At the end of every class session, your table should be left with the equipment arranged neatly, computer equipment off, and any scrap materials thrown away. If you need equipment outside of class for your project, you must have your instructor sign it out to you. **Make sure that you bring it back and have it signed in, or else you might be held responsible for replacing it!**

Late Work—In general, late work will not be accepted. You *must* consult with your instructor *before the work is due* if you believe you deserve an exception to this rule. Be aware, however, that very few (if any) exceptions will be given.

Academic Honesty—You are encouraged to discuss and debate the ideas in any of your assignments and projects with your instructor, TA's, lab partners, and other classmates. If you work on assignments cooperatively, rather than independently, you may share ownership of spreadsheets, graphs, and diagram files based on data you have taken with your partners. However, any other spreadsheet or written assignments must be expressed in your own words and reflect your own format details. This includes your project summaries! Thus, you may not copy (even with some modifications) problem, solutions, or spreadsheet assignments, activity guide entries, project summaries, or material on examinations. If there is reasonable evidence of copying, it will be construed as an act of plagiarism. *Anyone found cheating will immediately receive a penalty grade of "F" for the entire course!*

GRADING

You will be graded on a professional judgment of your work using the following weighting scheme as a guide:

Component	Percentage
Activity Guide	10%
Homework	15%
Quizzes	20%
Exam	20%
Project	30%
Effort/Participation	5%
Total	100%

