



### Prelab Preparation and Recitation

**Plan to spend at least 1–2 hours preparing for recitation.** The actual amount of time necessary will depend on the experiment and on your background. 20% of your weekly lab grade is based on your demonstrated preparation at recitation to successfully conduct the experiment. You must successfully complete recitation in order to be permitted to attempt the experiment.

Recitation is a 20–30 minute individual meeting with your section TA. Don't be late for your recitation, or you will lose some of the prelab preparation credit. You must thoroughly review the experiment notes (*including the in-lab procedure and analysis sections!*) and write out answers to the experiment's prelab problems before attending recitation. You should expect that many experiments will involve physics which you have not yet covered thoroughly in lecture; you may find that you are somewhat uncomfortable with the details of the phenomenon and the theory behind it. This is quite representative of the situation you will find yourself in during your early career as a graduate student!

You must be prepared to thoroughly answer the following questions regarding the experiment. If you are unsure about certain aspects of the theory or the procedure, then recitation is the time to ask! Your TA will question you regarding a few of the following topics:

1. What is the experiment all about? Provide an overview of the primary theory which the experiment examines and the data that you will gather.
2. What is a specific mathematical statement of the aspect of the theory which you will evaluate? What is the significance of this expression to the overall validity of the theory? Are there any free parameters representing fundamental constants of nature which you can measure using your experiment's data?
3. Provide a thorough description of the physical nature of the data you will gather. What parameters do you control? What are the units of the data you will record? Within what numerical range do you expect the data from the experiment to fall?
4. How does this data relate to the mathematical statement of the theory you are examining? How will you analyze the data to evaluate the accuracy of the theory's predictions?
5. Provide a general description of the experiment's apparatus. What are the major components used to establish and control test conditions and collect the numerical data? How do you take a data point?
6. What do you expect to be the major sources of systematic error in the apparatus? How will you mitigate the impacts of these errors? How will you incorporate estimates of their magnitudes into the uncertainties in your results?
7. What is the target value or range for the first data point you will attempt? How will you know if you've successfully obtained useful data? How much data do you need to evaluate the accuracy of the theory? Which data points should be the most difficult to accurately measure?