Laboratory General Information

Each student is expected to complete six laboratories during the course of the quarter. Laboratory is scheduled for Friday from 13:30 to 17:20. Each student is expected to arrive promptly at 13:30 (1:30 p.m.) in order to be present for any discussion that takes place at the beginning of the laboratory. Subsequently, you and your lab partners will begin the experiment. All data collected during the lab period is to be recorded in your laboratory notebook. Please refer to general course information for recommended lab books. In any case, each of you is expected to come to each lab with a lab book. Those of you who have a lab top and wish to bring it and record data directly into your lap top are encouraged to do so. Each lab report should consist of the following sections:

1) **Purpose** A clear statement of goal/objective of the laboratory – that is what you are measuring – in short, a statement of purpose.

2) **Theory** A theoretical description or a physics discussion of the measurements you are about to make. For example, in the case of the simple pendulum, you are measuring the acceleration of gravity by using a simple pendulum. At this point you develop the relevant equations, your theoretical framework and describe how your measurements will be used to extract your data. In other words, at this point you move from a description of apparatus into the next step, experimental procedure. In experimental procedure you describe how measurements are estimated or how the precision of the measuring instrument or how you will determine the precision associated with each measurement.

3) **Apparatus and Procedure** A description and sketch of the apparatus and discussion of the measurement procedures that clearly describe the relevant variables and how they are to be measured. In this section you need also to discuss the sources of errors and how you estimate errors on measured variables. If you intend to make several measurements and average to get your best estimate you should discuss that in this section.

4) **Data** In this section you present the data that is collected and make any comments that are relevant; for example if some change occurs in your apparatus that causes you to reset a zero or reposition some component you need to explain clearly what you did and how you verify that all was well afterwards.

5) **Data analysis** In this section you describe your analysis, show any graphs or fits to data and describe how they are made and describe in detail your error calculation and present your final results and the error.

6) **Comparison with previous measurements** In this final section of your report you need to discuss your results and compare with previous measurements or the best known value of the parameter you are measuring. In this section it is important to explain why your result agrees or does not agree with known values. This is where your experimental error becomes relevant - in making comparison with other measurements.
Attention:

1) The significant figures given in the final result need to be consistent with the precision of your measured values; the least significant number will establish the final number of significant figures to present.

2) You need to clearly explain, justify if necessary, the uncertainties you assign to each measured quantity.