APPENDIX D:

Summary and Evaluation Guidelines: The Conclusion

One of the most difficult parts to completing the lab report, and hence one of the most difficult to grade, is the conclusion or evaluation of the experiment. Many times students do not know what to write or what the instructor hopes the student has learned. Listed below are several suggestions that should be followed in order to improve this portion of the lab report.

Each conclusion should contain at least two of the following three parts:

1. Compare the experimental result with the known or accepted value of the given quantity.
   This value is usually found in the textbook or reference material. In this comparison, the student should discuss how close they came to achieving the accepted value and calculate a percent error.

2. Discuss whether or not a particular concept or principle being studied has been demonstrated. The actual numerical values in the result are secondary to the principles being examined. Use experimental data, graphical analysis, and logic to support your conclusions about the experiment. Be specific and detailed. It is also useful to calculate a percent difference between various quantities you have determined. Remember, the actual quantity is not as important as is the justification of the principle or concept being studied.

3. Identify and discuss those aspects or effects that may have influenced the experimental results. These effects are uncertainties (not numerical as considered in the error analysis worksheet) and may cause results to be brought into question. It is not as important at this time to determine if these effects significantly affected the result. It is important to identify them and consider the possibility. (Example: Did the decrease in amplitude of the swinging pendulum due to air resistance have a significant effect on the period of the pendulum?)

Other items that should be considered in writing the conclusion:

A. Any questions that result in a Yes/No answer must be accompanied with a complete explanation. Refer to experimental results to justify.

B. Any activity which requires a choice between several formulas or procedures needs an explanation. Refer to experimental results to justify.

C. Discuss any measurements that would lead to uncertainties in the results. These measurements may not have been dealt with by the rigorous error analysis. (Example: a wire will become thinner as it is stretched)

D. Discuss how the results may have been affected by the interpolation or extrapolation of graphical data. These numbers were not acquired through formulas or computer calculations, but by interpretation of a graph.

E. If your experiment was not successful, discuss where the mistakes or discrepancies occurred. Analyze the experiment to determine what you would do differently the next time.

F. The answers to ALL questions must be complete sentences that are understandable. ONE WORD ANSWERS ARE NOT ACCEPTABLE.