PHY386 Project Paper Expectations:

Your paper must tell a story that revolves around answering the question that you posed. The story in your paper should hit on the following points: What is your question and why should anyone be interested? What did you calculate/measure and how? How specifically does this result help you to answer your question? What did you find out and how confident are you about this result? I encourage you to think of this as being composed of the following pieces:

- Question and context
- Images and captions
- Answer to question
- Backing up your answer (Error analysis, χ^2)
- Allowing others to reproduce your results (not relive your experience)

The paper's sections:

You should not expect everyone who picks up your paper to actually read the entire thing. Using standard sections allows your reader to jump to the parts that truly interested them. These sections in this order are fairly standard, but you can combine sections if that makes the paper flow more naturally.

- Abstract (required w/ label)
  - Very brief (four sentences or less) with question, prediction, and observed values including their uncertainty.
- Introduction (required w/label)
  - Pose your question and give it context here. The context might be historical, theoretical, practical, etc.
- Theory
  - Give the framework a physics major would need to understand the theoretical underpinnings of the experiment. If you had to look up the theory cite the work.
- Procedure
  - Explain here the method you are using to perform your calculation. If an experiment accompanies your calculation show your experimental apparatus here (picture/sketch of the experiment is indispensable) and explain the principle behind your measurements.
- Results (where the most effective approach is typically, but not always, to show a graph)
- Analysis/Discussion
  - This should include a discussion of how you found your uncertainties, the predicted value, the observed value, whether they are in agreement or not.
- Conclusions (required w/ label)
  - Tie it all together with a brief summary of your question, the facts needed to answer it and clearly answer your question.
- References (required w/ label)
  - If you quote from the text cite it. Cite at least one external source, this might be a textbook for theory, the CRC handbook of Physics and Chemistry for a constant, a website for a predicted value or historical context, etc.

Grading

I'll be looking for these things in your papers with roughly the following weight:

Abstract (w/ key values and their uncertainties)	5%
Intro motivates experiment	5%
Self-contained • Necessary theory in place, • all variables defined, • procedure explained	10%
Relevant data presented • Ideally raw data in graphs and fits made and incorporated (with caption present and graph discussed in text) • When a graph is inappropriate in tabular form.	10%
Error Analysis performed (if relevant) • Method used stated • 1st non-zero digit of uncertainty sets observation precision	10%
Valid and meaningful comparison made between data and prediction • Clearly state basis of prediction and value (theoretical prediction, accepted value, mean result of several methods measuring the same quantity) • χ^2, ν, and p value calculated (if relevant) • Accuracy of prediction interpreted	10%
At least one reference beyond textbook referenced, its use clearly cited in the text.	5%
Performed Calculation	35%
Code included as an appendix	10%

Final consideration

Use the active voice (I did X) rather than the passive voice (X was done), it is more readable and your project will be no less objective. I am looking for the paper to be no longer than it needs to be (recognizing that part of what sets this is the page count required for a WI course). Your words are yours to choose, however I recommend simple language that uses words correctly over arcane terms and excessive jargon used incorrectly.