

# LAB REPORT FORMAT

- **Cover Page**
- **Background & Theory**
  - Introduce the theory for the lab you are conducting
  - Used to provide the reader with a reason to read the report
- **Objective**
  - Should be a single, concise paragraph stating the purpose of the experiment
  - Describe what you are trying to find and why
  - Reason you are conducting the present experiment
- **Experimental Setup & Procedures**
  - Hardware & software used to conduct the experiment
  - Depiction of experimental setup
    - Must appropriately show how to set up to record data
  - A short description of the experimental procedure
    - What steps did you take to successfully perform the lab?
    - Anyone should be able to recreate the lab from the instructions you provide in this section.
- **Results & Discussion**
  - Put the pertinent data obtained from your experiment in a clear, concise chart.
  - Briefly describe the theoretical analysis and data analysis procedures and present and discuss your results
    - Include any and all equations used to perform the analysis.
      - Equations do not go in the Appendix!
    - The analysis may be in chart and/or graph form.
    - If equations were used to calculate specific values, then a chart **and** graph are necessary.
    - Be sure to have captions for all graphs, figures, and tables.
  - Discuss trends and individual analysis results in paragraph format after each graph or chart.
- **Conclusions**
  - What were the results from the analysis that was performed on your data?
    - Use the graphs and charts to make conclusions about the stated objective.
  - How do your results compare to theory learned in class?
  - Tie your conclusions to topics you have learned in class and to everyday situations.
  - Be sure to have answers to any attached questions in your discussion.
  - Do not express feelings in the conclusion. Be technical with your conclusions. Use your knowledge to make connections and decipher data.
- **References**
- **Appendix**
  - Raw data not included in lab report

## Points of Concern

- Your lab report should be written from an objective point of view (3<sup>rd</sup> person).
  - Do not use I, we, us, etc.
  - Objective means to leave your feelings out of it.
- Present data and analysis professionally and correctly.
  - Include all equations used for your analysis.
  - A graph or table without labels and units is worthless.
    - Self-explanatory graph title
    - Axis titles with units
    - Select appropriate axis range
    - Do not randomly connect data using straight lines.
    - Use different symbols for different data sets.
      - Provide a legend in this case.
    - Use error bars when uncertainty is calculated.
  - Units are essential for any engineer. **MAKE SURE THEY ARE THERE!**
  - Watch out for the default graph settings in Excel or other spreadsheet programs. They are the wrong type for most engineering problems.
    - Scatter plots
      - Show the relationship among the numeric values in several data series
      - Allow plotting two groups of numbers as one series of XY coordinates
      - Typically used for displaying and comparing numeric values, such as scientific, statistical, and engineering data
      - Used when independent variable data does not have the same scale
    - Bar or column charts
      - Illustrate comparisons among individual items
      - Data ranges in values
    - Line graphs
      - Ideal for showing trends in data at equal intervals, i.e. time, distance, etc.
      - Used when independent variable data has the same scale
  - When you are asked to plot “A vs. B” this means that B is the independent variable (x-axis or horizontal) and A is the dependent variable (y-axis or vertical).
  - If you do not know how to use Excel or another spreadsheet program, YouTube or Microsoft Help are fantastic sources to teach yourself how to use it.
- Please watch your grammar and vocabulary.
  - There is a spell checker in every word processing program on campus. **USE IT!**
    - One of the fastest ways to raise questions about your competence is to create documents with misspelled words.
  - Visit the University Writing Center located on the third floor of the Student Academic Center (STAC 3.119)
  - Read your report out loud; if you cannot understand it, then I won't be able to either. If I cannot understand it, then you do not get any credit.
    - Read your report/memo to someone.

- Do your own work.
  - Labs are completed as a group; however, lab reports/memos are done individually. There is no hesitation from faculty to turn you in to the Dean of Students if you are caught copying, cheating, pawning someone else's work off as your own, collusion, etc.
  - Make your own charts, graphs, conclusions, etc.
    - Using someone else's work (charts, graphs, conclusions, etc.) is cheating. Their work is their intellectual property, and yours is yours. Stealing their intellectual property is dishonest, intolerable, and can get you expelled from the University.
  - If your work (homework, lab reports, projects, etc.) is stolen, do not hesitate to let your professor know when or just after you turn in your assignment.
  - Evidence of copying might include things such as:
    - Use of data other than that taken by the student (without proper explanation)
    - Use of plots and tables other than those individually developed by the student
    - Out-of-context answers obviously taken from someone else's laboratory write-up