Laboratory Report Format

The goal of report writing in the Mechanical Engineering and Technology Department is to have students assemble reports that will be acceptable in an industrial setting. A problem is assigned (Objective), requiring examination and a final evaluation (Conclusion). Assuming the reader is not technically proficient in the area, the conclusion must be clear and to the point. Aside from the "Objective" and "Conclusion," the rest of the report is back-up material used to justify the conclusions and aid someone who wishes to reproduce the results. Every lab report should be written with the idea of providing a complete and permanent record of the experiment, including observed data. In many situations, the only way an author will become known to others in a company is through the dissemination of their reports. Spelling, sentence structure, and neatness will be an important factor in the evaluation of both an author’s ability and promotion potential.

Writing Quality:

All written work submitted for this course must meet the Standards for English I. Poorly written papers will be returned to you, without a grade, for revision. The first paper returned will be without penalty, however, all subsequent papers not meeting the standards and requiring revision will receive lower grades. Students are encouraged to utilize the Writing Center Facility for help polishing their papers. Some reports will be required to be seen by and initialed by the staff of the Writing Center. All reports should be printed using Times New Roman 12 point font on 8.5 X 11 inch paper only, without perforated edges and stapled in the upper left corner. Reference material must be used and identified using the attached ASME reference format attached in the appendix of this document. Grading will be in accordance with the technical writing rubric included in the appendix.

Report Form:

1. **Cover sheet:**
   Use a standard Mechanical / Manufacturing Wentworth Institute of Technology cover sheet found in this manual appendix.

2. **Abstract:**
   In one brief concise paragraph not to exceed 150 words, give the reader enough information to understand what the experiment was about, what was done, and what conclusions were drawn. This is not the experimental write up or procedure from item #4, or the complete conclusion from item #8, but includes a summary of what was done, and what was concluded.

3. **Introduction:**
   Include a brief introduction to the experiment which includes presentation of theory and appropriate reference material citations regarding the experiment.

4. **Experimental procedure:**
   This is taken from the laboratory manual or from material given to the students by the professor. The procedure includes identification and description of equipment used along with the operational procedures to conduct the experiment.

5. **Results:**
   - **Data:** All original measurements must be recorded no matter how trivial. Organize the data taken and put it in tabular form.
   - **Table:** Repetitive and iterative calculations can be done using a spreadsheet and displayed in tabular form.
• **Illustration of set up:** Include a drawing of the arrangement of the equipment and measuring devices showing the location of gages, gage markings, etc. Use simple diagrams of essentials only.

• **Sketches of observations:** In some experiments the results are shown by making a sketch of what happens. Include those here.

• **Graphs:** Graphs must be integrated in the report by using a section break and using the entire page in landscape format using Excel for each graph.

• **Sample calculations:** Examples of each different calculation must be done using Microsoft equation editor and integrated as part of the report.

• **Discussion of results:** Comment on the graphs, results, or any other aspect of the experiment that is pertinent to the conclusion. A set of questions is generally given to provide a starting point for the discussion. Do not confine the discussion to merely answering the questions. A discussion of errors and their possible causes are always pertinent.

6. **Conclusion:**

   This is the most important part of the report. State conclusions that can be justified with the data. From the conclusions the boss will be able to determine what steps to take next. He/She will also learn if the experimenter understands the problem and has analyzed the data correctly. Make sure that thoughts are worded as conclusions, and not observations. Make simple declarative statements, and do not ramble into a discussion. Conclusions should tell how the results of this experiment can be applied to other experiments. All statements need to refer directly to the current data.

7. **References:** Cite all references in accordance with ASME standards attached in the appendix of this document.

8. **Appendix:**

   Include an appendix with material as required.
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>1 - Beginning / Incomplete</th>
<th>2 - Developing</th>
<th>3 - Accomplished</th>
<th>4 - Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction / Theory</td>
<td>No introduction or theory</td>
<td>Intro provided but imperfect; some omissions or misspellings.</td>
<td>Intro provided that is clear, well-written.</td>
<td>Intro well-written, complete, and well-organized.</td>
</tr>
<tr>
<td>Procedure</td>
<td>Narrative missing several important experimental details or not written in narrative form.</td>
<td>Narrative missing some experimental details or observations or includes insignificant procedural details.</td>
<td>Narrative including important experimental details, some minor details or observations missing.</td>
<td>Narrative of experimental procedures/results. Omits information that can be assumed by peers. Includes all important procedural details.</td>
</tr>
<tr>
<td>Results: data, figures, calculations, etc.</td>
<td>Figures, graphs, tables contain errors or are poorly constructed, have missing titles, captions or numbers, units missing or incorrect, etc.</td>
<td>Most figures, graphs, tables OK, some still missing some important or required features or organization is poor.</td>
<td>All figures, graphs, tables are correctly drawn, are numbered and contain titles/captions. Section is organized and easy to read. Only unusual or difficult calculations are shown.</td>
<td>All experimental details are included. All calculations are correct and appropriate. All sources (information and graphics) are accurately documented, but one or two sources are not in ASME format.</td>
</tr>
<tr>
<td>Conclusions / Implications / Future Directions</td>
<td>Implications are erroneous or section is narrow, minimal coverage on conclusions and implications of experiment.</td>
<td>Implications are not explicitly stated.</td>
<td>Author provides significant implications of work when appropriate.</td>
<td>All conclusions are clear, well-supported, and well-written.</td>
</tr>
<tr>
<td>References</td>
<td>Procedure source not referenced.</td>
<td>All sources accurately documented, but a few are not in ASME format.</td>
<td>All sources are accurately documented in ASME format. All sources are scholarly and peer-reviewed. Some sources are not accurately documented.</td>
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</tr>
<tr>
<td>Mechanics / Appearance &amp; Formatting</td>
<td>Frequent grammar and/or spelling errors, writing style is rough and immature.</td>
<td>Sections out of order, too much handwritten copy, sloppy formatting. No title page.</td>
<td>Less than 3 grammar/spelling errors, mature, readable style.</td>
<td>All grammar/spelling correct and very well-written. All sections in order, well-written. All sections in order, well-written. All sections in order, well-written. All sections in order, well-written.</td>
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**Technical Report Grading Rubric:**

- **Orientation / Theory:** 4 - Exemplary
- **Introduction:** 3 - Accomplished
- **Procedure:** 2 - Developing
- **Results:** 1 - Beginning / Incomplete