Project 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 project and associated Project Objectives are proposed, requiring examination and a final evaluation Conclusion. Aside from the "Objective" and "Conclusion," the rest of the project report is back-up material used to justify the conclusions and aid someone who wishes to reproduce the results. Every project report should be written with the idea of providing a complete and permanent record of the project, including analysis, research and experimental data. Spelling, sentence structure, and neatness will be an important factor in the evaluation of an author’s ability.

Writing Quality:
All written work submitted for this course must meet the Standards for English I. All reports should be printed using Times New Roman 12 point font on 8.5 X 11 inch paper only or submitted fully integrated in electronic format. 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 letter or memo submission format found in this manual appendix.

2. **Executive Summary or Abstract:**
   In brief concise summation, give the reader enough information to understand what the project was about, what was done, and what conclusions were drawn. This is not the project write up or procedure but includes a summary of what was done, and what was concluded.

3. **Table of Contents and List of Figures:**
   Include a table of contents and list of figures if applicable

4. **Problem Definition:**
   A detailed description of the problem the project addresses.

5. **Literature Review / Background Research:**
   Present theory, with appropriate reference material citations, utilized in the execution of the project. Develop governing equations based on reference material for project.

6. **Project Objective:**
   What are the objectives of the proposed project? What is the functional specification or analysis goals to measure success?

7. **Project Plan:**
   This is material developed by the students and accepted by the professor during the proposal phase. The project plan includes:
   - Team members & Qualifications
   - Support personnel requirements, Faculty, Technicians or outside resources
   - Facilities, labs or equipment are required to accomplish project plan
   - Detailed Gantt chart with at least 20 tasks identified besides reporting milestones with assigned resources (integrated and in landscape format)
   - Cost estimate / budget
   - How the project will be graded must be identified
8. **Results:**
   - **Research:** All pertinent theoretical research conducted should be identified and reference material cited.
   - **Data:** All original analysis results or 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 projects 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.
   - **Discussion of results:** Comment on the graphs, results, or any other aspect of the project 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.

9. **Conclusion:**
   State conclusions that can be justified from the analysis and experimental data developed in the execution of the project. Within the conclusions the reader should be able to determine if the project team understands the problem and has analyzed the data correctly. Make sure that thoughts are worded as conclusions, and not observations. Conclusions should tell how the results of this project can be applied to future projects. All statements need to refer directly to the current data.

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

11. **Appendix:**
    Include an appendix with material as required including team contract and self-evaluations.
Mr. Richard Roberts
Associate Professor
Department of Mechanical Engineering and Technology
Wentworth Institute of Technology
550 Huntington Avenue
Boston, MA 02115

Professor Roberts,

Enclosed is our report regarding “Analysis of the Thrust of a Rotating Wing.” The report focuses on first analyzing the components of a fixed wing and then later comparing them to a rotating airfoil. We have taken the steps in order to accurately measure the velocity profile of a fixed wing airfoil section at an infinite plane. Using these values, we related the lift of a fixed wing at a certain velocity to the same velocity caused by rotation.

A test wing section was developed using the NACA geometrical construction method and a scaled model (4:1) was built using a rapid prototyping machine. Since a scaled wing section was used, a method of Reynolds numbers scaling was utilized. By keeping the Reynolds number constant in both real-world and testing environments, a new scaled test velocity for the wind tunnel was determined which allows for direct data measurements from the model. Using the velocity profile of the airfoil, and the published lift coefficient from NACA, we were able to determine the lift of a fixed wing and relate this to a rotating force.

Our results show that the airflow velocity over the stationary wing directly relates to that of the velocity seen flowing over a rotating wing. The relating velocity was then placed in the derived equations to calculate thrust.

We look forward to your review of the report,

Sincerely,

Sign here
As a member of team number __________ I agree that coordinated teamwork is essential for successfully completing assigned projects. I understand my individual performance will affect the success of the entire project. I also understand that all members of successful teams need to exhibit the following behaviors during the execution of the project:

1. Fulfills duties of team role
   a. Attend all team meetings
   b. Actively participate in team meetings
   c. Be prepared to present work assigned from previous meeting
2. Researches and gathers pertinent information
3. Listens to other teammates
4. Shares work evenly
5. Regularly scheduled meetings will meet:
   a. Time/Day: __________ Place: ________________________________
   b. Time/Day: __________ Place: ________________________________
   c. Time/Day: __________ Place: ________________________________

Additional Requirements Identified By Team Consensus:

6. ___________________________________________________________
7. ___________________________________________________________
8. ___________________________________________________________
9. ___________________________________________________________
10. ___________________________________________________________________

<table>
<thead>
<tr>
<th>Printed Team Member Name</th>
<th>Team Member Signature</th>
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ASME Figure, Table and Equation Format:

*Figures:* All figures (graphs, line drawings, photographs, etc.) should be numbered consecutively and have a caption consisting of the figure number and a brief title or description of the figure. Figure titles should be placed under the figure, centered and read as is seen in Fig. 1. Text in the figure caption should be the same size text as the body of the document. Make sure each figure is referenced from within the text. Figures are referenced in the text as Fig. # unless it is used at the beginning of the sentence. Figure # is used in these instances.

![Figure 1. System Layout](image)

*Tables:* Tables refer to any tabular collection of data or text. Tables may be inserted as part of the text, or included on a separate page immediately following or as close as possible to its first reference — with the exception of those tables included at the end of the paper as an appendix. Table titles should be placed above the figure, centered and read as is seen in Table 1. Text in the table and table caption should be the same size text as the body of the document. Make sure each table is referenced from within the text.

![Table 1. Data](image)

*Equations:* Equations should be numbered consecutively beginning with (1) to the end of the paper, including any appendices. The number should be enclosed in parentheses (as shown above) and set flush right in the column on the same line as the equation. It is this number that should be used when referring to equations within the text. Equations should be referenced within the text as "Eq. (x)." When the reference to an equation begins a sentence, it should be spelled out, e.g., "Equation (x)."

Formulas and equations should be created to clearly distinguish capital letters from lowercase letters. Care should be taken to avoid confusion between the lowercase "i" (el) and the numeral one, or between zero and the lowercase "o." All subscripts, superscripts, Greek letters, and other symbols should be clearly indicated.

In all mathematical expressions and analyses, any symbols (and the units in which they are measured) not previously defined in nomenclature should be explained. As can be seen in Eq. (1)

\[ F = ma \quad (1) \]

Where \( F \) is force, \( m \) is lumped mass, and \( a \) is acceleration.

If the paper is highly mathematical in nature, it may be advisable to develop equations and formulas in appendices rather than in the body of the paper.
<table>
<thead>
<tr>
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<tr>
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<tr>
<td>Project Plan</td>
<td>2 - Developing</td>
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<tr>
<td>Mechanics &amp; Apparatus</td>
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**Technical Report Grading Rubric:**

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**Assessment Criteria:**

- **Introduction:**
  - Good but could still be improved. Needs format, organization, and fluency, could improve organization, structure, and flow. Good but could still be improved. Needs format, organization, and fluency, could improve organization, structure, and flow. Good but could still be improved. Needs format, organization, and fluency, could improve organization, structure, and flow. Good but could still be improved. Needs format, organization, and fluency, could improve organization, structure, and flow.

- **Mechanics & Apparatus:**
  - Improvements needed. Needs to be more detailed, organize content, and improve formatting. Needs to be more detailed, organize content, and improve formatting. Needs to be more detailed, organize content, and improve formatting.

- **Results:**
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- **Conclusions/Implications:**
  - Minimal coverage on conclusions and implications of project, author provides significant implications of work when appropriate.

- **References:**
  - Procedure source not referenced. All sources (including information and graphics) are accurately documented, but many are not in ASME format. Contains two or more non-scholarly sources.

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