

## Technical Writing Guidelines

### Preparation of Formal Technical Reports

#### Components of a Formal Technical Report

This is a summary of what goes into a formal technical report. All students should refer to the Aerospace Engineering Report Writing Manual for specific guidance on report writing. Some of the important points will be summarized here. The formal technical reports you turn in shall consist of the following elements: A cover page, front matter, the body of the report, references, and appendices.

#### Cover Page

Use the cover sheet formatted in the Microsoft Word template for a technical report.

#### Front Matter

Following the cover page, there is an assortment of “front matter.” This material includes the abstract, table of contents, and several lists of information.

##### Abstract

The abstract should not exceed 200 words, even for a relatively long paper. It should be written last, but it must appear first in the report as a single paragraph. It should be an overall summary (not an introduction!) and complete in itself. Readers should not have to read the paper to understand the abstract. Avoid using too many acronyms or symbols. Keep it mostly text. The abstract should contain the following points, and can be written in four sentences at a minimum:

- A statement of the engineering problem (what the whole work is all about)
- An explanation of the approach used to solve the problem (analytical, experimental, design technique, device improvement, testing scheme, etc.)
- The principal results (summarize the newly observed facts)
- What the principal results mean (brief conclusions of the experiment or argument discussed in the paper)

##### Table of Contents

Make sure “Table of Contents” doesn’t show up in your table of contents.

##### List of Figures

This list shows all the figures in the report and their respective page numbers.

##### List of Tables

This list shows all the tables in the report and their respective page numbers.

## List of Symbols

This list tabulates all symbols (English and Greek), abbreviations, and acronyms that appear in the report.

## Body

This is the text of the actual report. It should include four major components. These would be chapters in a large, formal report or section headings in a small, informal report. For formal laboratory reports, use the former construct. These sections are summarized:

### Introduction

Consider this to be independent of the abstract and write it as if the latter never existed. Include the following points:

- The background of the report (e.g., What is the motivation and/or the applicability of the study? This is the “Why” for the study, and should tie it in with relevant aircraft, observed phenomena, or published work).
- The purpose and objectives (i.e., the specific “What” and “How” for the study. What types of tests are being done?).
- Background theory used in the report. Give only the equations used in data reduction and to explain certain phenomena or trends that occurred in the experiment. The assumptions involved must be well stated. Number your equations so you can refer to them later in the text.

### Experimental Setup and Procedure

Describe the setup and outline the procedure undertaken during the experiment. Include pictures or sketches when they would help your description. This should include the model, the wind tunnel (or other facility), supporting relevant equipment, and instrumentation.

### Results

This section shall represent the major element of the report, and should be about half of the total number of pages. A good presentation and discussion of the results will yield a good grade. A bad one will drop the grade considerably. So, be alert! The results should be discussed in a logical sequence by referring to each individual figure or table. The graphs and tables should be numbered and captioned accordingly. Reference every figure and table in the report. Any figure or table included in the report and not referenced in the Results section will be a liability to the writer, and that figure or table will be ignored. This may reduce the grade substantially. The discussion of the results must represent a critical assessment of the project. Any deviations of the experimental method from theoretical predictions must be explained and justified. The errors resulting from these comparisons should be assessed and quantified which should give you reasons for rejecting or accepting the experimental results. You must present your experimental error as a deviation from the listed data. The uncertainty of your measurements is as important as the measurements themselves. **TRUE ENGINEERS ARE VERY CRITICAL OF THEIR WORK.**

### Conclusions

Summarize what you have accomplished by emphasizing the important results obtained, and whether you have accomplished all the objectives set out for the project mentioned in the Introduction. You shouldn't have anything new to say in the Conclusions. Critique your own work if there are deficiencies. Include recommendations to accept or reject the results and to improve the methodology of the project. BE CREATIVE. Do not be afraid to express original ideas as long as they make good engineering sense.

## References

Any external source that was used in the preparation of the work should be cited. This could include background theory or other published experimental data. Include any web sites that were accessed.

## Appendices

Appendices may contain sketches, tables, figures, sample calculations, and data if it is not convenient to place within the text. Examples of this would be raw data, or the sampling of data plots that is not directly addressed in the Results section. Also include any MATLAB scripts that were used to reduce your data. Each appendix is assigned a letter.

