



College of Engineering

GE106: Introduction to Engineering Design

Technical Communication and Tips for Writing Group's Final Report

By

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- **Technical Communication**
 - Definition and Objectives of Technical Communication
 - Why is Communication Important to You?
 - Effective Technical Communication
 - Essentials of Effective Technical Communication
 - Your Responsibility in the Communication Train

- **Focus on Group's Final Technical Report**
 - Layout of Your Group Final Project Report
 - Discussion of Contents of the Group Final Project Report
 - Specific Formatting Specifications
 - Important Notes and Considerations
 - Project Report Checklist before Submission

- **Closing Statements**

Definition and Objectives of Communication

- Communication is not writing or speaking. Writing and speaking are **modes** of communication but not communication.
- Communication is the transfer of data and ideas about things and people from a **source of information** to a **person who has a need** for the information.
- Communication has two main objectives
 - **Persuade** (Persuasive and Subjective Statement)
 - **Inform** (Neutral and Objective Statement)

Importance of Communication to You

- It demonstrates your competence.
- Shows mental clarity and conciseness.
- Reveals who you are to your audience.
- Reveals a personal understanding of the concept you are trying to communicate.
- Helps you to plan, develop and revise your engineering solutions.
- In this course, it demonstrates your group's ability to fulfill these components and especially your ability to work together as a team to achieve specific objectives.

- Effective communication is:
 - **Understandable** (clarity)
 - **Useable** (credibility/reliability)
 - **Shows clearly what actions are required or suggested**

Essentials of Effective Communication

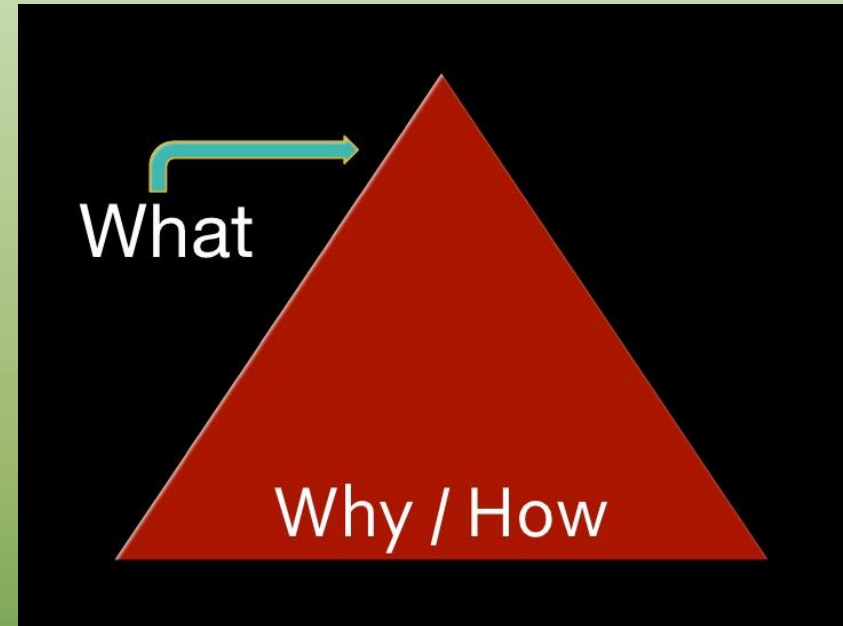
- **Have a well defined objective**; a purpose, a goal (what am I trying to communicate through this medium and why?).
- **Know your material** (adequate research and painstaking execution of engineering design process).
- **Know your audience** (write for the audience/reader not for yourself).

Your Group's Responsibilities in the Communication Train

- Collect data, do a thorough research.
- Design a solution.
- Perform experiments, when needed.
- Generate results.
- Design specifications, etc.
- **Help the audience make sense of your project by showing how you interpreted, organized and synthesized gathered information into solving the formulated design problem.**

What is a Good Technical Report?

- Meets the audience's needs
- Well organised
- Readable
- Answers the questions:
 - What is the purpose of the document?
 - What was achieved?
 - What should be done next?



Suggested Final Report Layout for Group's Design Project

Front Matter

Title Page

Abstract

Table of Contents

List of Figures

List of Tables

Body

- Introduction
- Need Analysis: Problem statement, Objectives, Criteria, and Constraints
- Morphological Analysis
- Design Concept Generation
- Design Evaluation/Selection
- Detailed Design of Selected Concept

Ending

- Conclusions/Recommendations
- References
- Appendices

Project Title



- The title is more important than most people think

- Choose a title using as few words as possible (less than 10) to clearly describe the content
- It is also a good idea to read through your title and think about how it might be interpreted by your audience.
- The title page should contain the following: course name, project title, the authors' full names and ID numbers, the name of the instructor, the date of submission

Abstract (Problem Definition)

- The abstract is the second level at which a potential reader can filter out reports that he or she is not interested in reading.
- The abstract is generally limited to 150 words (or so). It must be a self-contained description of the report.
- It includes a short summary of the design problem and the most important results and conclusions of the project.



Conclusions, Summary and Recommendations

- Summarize what has been done.
- Highlight the features of the design.
- Are there any limitations in your design?
- What are the implications of your findings?
- Recommend a follow-up study for any remaining problems.

SO WHAT DOES
IT ALL MEAN



Referencing

- Always cite sources within the report
- Use a consistent & specific system of referencing (citation) e.g. APA,
- Be careful of web sources
- Plagiarism** = cheating
= penalty
- DO NOT copy-and-paste, summarize in your own words.
- Give the list of references used according to a standard style.



Examples of References Citation

Books

[1] B. Klaus and P. Horn, **Robot Vision**. Cambridge, MA: MIT Press, 1986.

Handbooks

[7] **Motorola Semiconductor Data Manual**, Motorola Semiconductor Products Inc., Phoenix, AZ, 1989.

Reports

[4] P. Diament and W. L. Lupatkin, “V-line surface-wave radiation and scanning,” Dept. Elect. Eng., New York, Sci. Rep. 85, Aug. 1991.

Journals

[3] W. Rafferty, “Ground antennas in NASA’s deep space telecommunications,” Proc. IEEE vol. 82, pp. 636-640, May 1994.

Standards

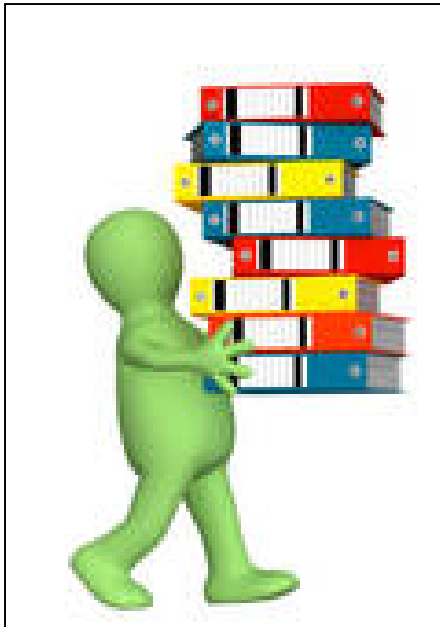
[2] **Letter Symbols for Quantities**, ANSI Standard Y10.5-1968.

Patents

[1] J. P. Wilkinson, “Nonlinear resonant circuit devices,” U.S. Patent 3 624 125, July 16, 1990.

Appendices

- Things that are related to the project, but not contained in the main body (components) of the report, e.g. raw survey reports, raw data, initial designs, technical standards, engineering code, etc.
- Examples are:



- Computer codes
- Lengthy specifications
- Supporting tables or other materials
- Raw survey reports
- Raw data
- Initial designs
- Engineering code

Figures and Tables Labels (Captions)

- All necessary figures/tables must be included within the main body of the Report.
- ALWAYS include a figure/table labels. (descriptions/captions) and number.
- If the figure (or table) is not yours, put the reference number at the end of the caption
- Give the source of data (e.g., data from [5]).
- The caption of the figure is centered **below** the figure.
- The caption of the table is centered **above** the table.



Document Formatting; **This is Critical!**

- Leave **one-inch margins** all around
- Use **1.5 spacing** between lines
- Title of Report in **Initial Capital Letters**: (**16 points, Boldface**)



- Sections titles are **14 points**, flush left, and boldfaced. Use initial capitals
- The text should all be with **font size 12pt** (Times New Roman is recommended or Calibri)

Important Notes

- Use a predefined style when writing a report to allow for easy modification without the need of renumbering or reformatting.



- No title should be directly followed by “bullets” or independent sentences”; a paragraph must be used first to introduce the content of the section.
- The writer should include all the information required for the reader to understand the details without the need to ask basic questions.

Important Notes (cont'd)

- A paragraph must contain at least three sentences.
- Every reference listed at the end of your report needs to be cited in your text.
- Every figure and table must be mentioned and discussed in the text. You should *not* have a figure that just appears out of nowhere, doing nothing.
- Numbers less than ten should be written in letters (use "three" not "3").



Important Notes (cont'd)

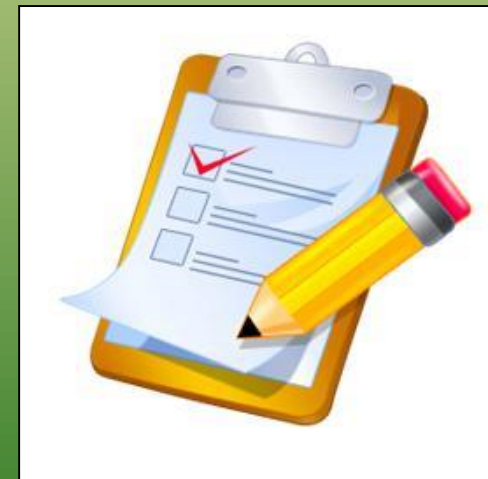
- Always use complete sentences, except for a figure or table caption.
- Do not use contractions; use **it is** (not **it's**) and **cannot** (not **can't**) ; similarly, do not use haven't, doesn't, wouldn't, etc.
- The semicolon is used to separate two sentences that are closely related. If you use a semicolon, look at the expressions on each side.



Checklist (Before Submission)

Check the following points before submitting your report:

- ✓ The cover page has all the required information.
- ✓ The report has all the necessary components.
- ✓ The entire document is proofread*
- ✓ The document is checked for spelling errors
- ✓ The document is checked for grammar and there are no sentence fragments or run-on sentences in the text.



*Try the **two-day approach**: print the report, keep hidden in a drawer somewhere, then read it again. You will be surprised by what you wrote!

Checklist (cont'd)

- ✓ There are no contractions (do a global search for the apostrophe and make sure it occurs only in possessives).*
- ✓ You used paragraphs with more than three sentences.
- ✓ All of the references that are given at the end of the report are explicitly cited within the report.
- ✓ All of the figures and tables are mentioned within the text.



Closing Statements



- Effective communication demands some considerable efforts and commitment from you.
- Ensure you follow and implement all given guidelines in this presentation when writing your technical reports, because your report will be evaluated based on them.
- Your group's final technical report is a critical component of this course, so make it your very best!



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