

Chapter 4: How to Write an Engineering Report

1. What is an engineering report?

An engineering report is a practical working document written by engineers for clients, managers, and other engineers.

- ✓ presents a problem
- ✓ analyzes this problem
- ✓ offers solutions
- ✓ involves collecting and compiling data and ideas,
- ✓ conducting testing,
- ✓ Organizing the information.

2. Guidelines for Writing a Successful Report, Research, and other Scientific Papers

- All researches should have a **unique style** of writing a successful report and research papers to represent an individual personality.
- A crystal-clear **understanding of** what is to going to be the abstract, references, introduction, **context**, and conclusion is essential.
- The writing **should be simple** without many complexities to enable even a layperson to read and understand easily.
- **In-Depth knowledge of the subject** will prevent unnecessary diversions, which are out of the scope of the research paper.
- **Innovative ideas and ways to justify the research work** will be much appreciated.
- **Different scientific terminologies and a track of bibliography** will help in raising the standards of the research paper.
- **To strictly follow all the specifications of the approving and publishing authority** while writing the research paper.
- **Thorough proofreading from top to bottom of the research paper** is critical to avoid any errors in the research paper.

3. Basic report structure

Report generally includes these sections in this order:

3.1. Title

- ✓ clearly expressed in a few words
- ✓ convey the most information
- ✓ with the goal of attaining maximum "findability"

3.2. Abstract

- ✓ a short-written statement containing only the most important ideas in a report, speech, article etc.
- ✓ Is brief (one paragraph-one page)
- ✓ Past tense
- ✓ States research problem
- ✓ main objective
- ✓ Indicate the methodology used
- ✓ Presents the main findings and conclusions

3.3. Introduction

- ✓ Explains the research problem and its context
- ✓ Explains importance of the problem (why does it matter?)
- ✓ Applications of the experiment or theory
- ✓ Explains reason and goals for study
- ✓ Motivation
- ✓ Outline the purpose and announce the present research, clearly indicating what is novel and why it is significant.
- ✓ Avoid repeating the abstract; providing unnecessary background information; exaggerating the importance of the work; claiming novelty without a proper literature search.

3.4. Background

- ✓ Includes the theory for the experiments
- ✓ Any equations required for the calculations
- ✓ Each equation should be numbered
- ✓ Included references

3.5.Methodology/Procedure

- ✓ Is in past tense and passive voice (3rd person)
- ✓ Do not use “We”, “I”, or “You”
- ✓ Describes the experimental procedure and data collection
- ✓ Included a schematic/diagram of the apparatus
- ✓ Write in complete sentence
- ✓ “The tank was filled with 5 L of water”
- ✓ NOT “Fill tank with 5L of water”
- ✓ Incomplete sentence and present tense

3.6.Results

- ✓ State the results in the text before presenting any graphs, figures or tables.
- ✓ Text points out the most significant portions of research findings
- ✓ Indicates key trends or relationships
- ✓ Highlights expected and/or unexpected findings
- ✓ Visual representation of results:
- ✓ Graphs, tables or figures
- ✓ Included error analysis
- ✓ Past tense (these are results you measured, calculated or observed)

3.7.Discussion

- ✓ Why did you observed what you observed?
- ✓ Explanation for Results:
- ✓ Comments on unexpected results, offering hypothesis for them
- ✓ Comparison to literature
- ✓ Does your research confirm previous studies? Deviate from them?

3.8.Conclusions

- ✓ What was learned through research?
- ✓ Strengths and weakness of study
- ✓ Possible applications of study (how it can be used)
- ✓ Recommendations

3.9.Recommendations

- ✓ What would you do differently?
- ✓ Any changes would you recommend for the experiment

3.10. References

3.11. Acknowledgement

3.12. Annexes

4. Visual Design

- ✓ Should be used to illustrate specific points
- ✓ Should be incorporated in a way that is natural to report's content/context
- ✓ Should be explained fully in text using references such as "Fig. 1 shows...."
- ✓ Should be cited if taken from a source
- ✓ Textual information should come before graphics

5. Source Documentation

- Cite sources whenever you are quoting, paraphrasing, or summarizing work that is not your own
 - ✓ Quote directly is discouraged
 - ✓ DO NOT COPY
- Sources include:
 - ✓ Books
 - ✓ Journal, magazine, or newspaper articles
 - ✓ Interviews
 - ✓ Conference Proceedings
 - ✓ Lectures
- Citing
 - ✓ Shows your credibility as a researcher
 - ✓ Gives proper credit to authors and researchers
 - ✓ Protects you from accusations of plagiarism