

## Writing a Scientific Report

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**Abstract:** Unlike an essay, a scientific report has a formalized structure. This paper presents a short description of writing a scientific report. Scientific reports written by undergraduates share the same format as scientific reports written by academics for publications.

### 1. INTRODUCTION

The sections of a scientific report are:

- Title
- Abstract
- Introduction
- Method
- Results
- Discussion
- Acknowledgements
- References (or Bibliography for S3 students)
- Appendices

### 2. METHOD

Let us now look at the details of a scientific report.

#### a. TITLE

Title of your project.

(Times Roman, font size 14 – first letter capitalized – bold)

#### b. ABSTRACT

(Font size 10 – bold)

From Abstract onwards the report should be in double column with font size 11.

An abstract summarizes, in one paragraph (usually), the major aspects of the entire report in the following prescribed sequence.

- What you investigated (or purpose), (from introduction)
  - State the purpose very clearly in the first or second sentence
- The experimental design and methods used, (from Methods)

- Clearly express the basic design of the study.
- Name or briefly describe the basic methodology used without going into excessive detail – be sure to indicate the key techniques used.

- The major finding including any key quantitative results or trends (from Results)
  - Report those results which answer the questions you were asking
  - Identify trends, relative change or differences, etc.
- A brief summary of your interpretations and conclusions. (from Discussion)
  - Clearly state the implications of your results

Abstract therefore is the last section you should be writing.

**Style:** The Abstract is ONLY text. Use active voice when possible, but much of it may require passive constructions. Write your Abstract using concise, but complete sentences and get to the point quickly. Maximum length should be 100-150 words, usually in a single paragraph.

#### c. INTRODUCTION

Introduction should contain the purpose, the scientific literature relevant to the topic and the objective. Organize your report so that your reader will understand the logical flow of the experimental work. Subheadings work well for this purpose. Avoid use of the first person.

#### d. METHOD

Describe your experimental design clearly. In this section you must explain clearly how you carried out your study in the following general structure and organization. Organize your write up so that the reader will understand the logical flow of the experiment(s); subheadings work well for this purpose.

### e. RESULTS

The function of the Results section is to objectively present your key results without interpretation in an orderly and logical sequence.

### f. DISCUSSION

The function of the Discussion is to interpret your results with respect to the objective of the project, and to explain your new understanding of the problem after taking your results into consideration.

### g. ACKNOWLEDGEMENTS

If you received any significant help in thinking up, designing or carrying out the work, or received materials from someone who did you a favour by supplying them, to carry out your project, you must acknowledge their assistance and the service or materials provided.

### h. REFERENCES/BIBLIOGRAPHY

Use IEEE standards of giving references or a bibliography. In your case, as S3 students, you can give a Bibliography instead of a list of References. More information on <http://www.ieee.org/documents/ieeecitationref.pdf>

Examples are given on page 2, at the bottom.

### i. APPENDICES

Appendix contain information that is non-essential to the understanding of the report but may present information that further clarifies a point without burdening the body of the write up. Each Appendix should be identified by a Roman numeral in sequence. E.g., Appendix I, Appendix II, etc. Each appendix should contain difference material.

Figures must be numbered and must include a caption at the bottom of the figure. Eg:



Figure 1: BNC Connectors

Figures must be referred to in the main body of the report.

Tables must be numbered and must include a caption on top of the table. Eg:

Table 1: Population of Eastern Province, 2009

| District   | Population | Land Area |
|------------|------------|-----------|
| Ampara     | 705,002    | 4431      |
| Batticaloa | 596,317    | 2633      |

Tables also must be referred to in the main body of the report.

Equations must be right justified and properly numbered using a parenthesis. An example of the equation layout and referencing in the text is shown below:

... A double sideband suppressed carrier signal can be represented by:

$$u(t) = Am(t)\cos(2\pi ft) \quad (2.1)$$

The detection of such a signal requires coherent demodulation as is evident from (2.1). Note that all variables used throughout the text must be italic, but not the numbers and parentheses.

Examples of giving the bibliography.

### BIBLIOGRAPHY

L. Stein, "Random patterns," in *Computers and You*, J. S. Brake, Ed. New York: Wiley, 1994, pp. 55-70

*Transmission Systems for Communications*, 3rd ed., Western Electric Co., Winston-Salem, NC, 1985, pp. 44-60

J. H. Davis and J. R. Cogdell, "Calibration program for the 16-foot antenna," *Elect. Eng. Res. Lab., Univ. Texas, Austin, Tech. Memo. NGL-006-69-3*, Nov. 15, 1987

**In Summary**

| <b>Project Process</b>       | <b>Section of Paper</b>     |
|------------------------------|-----------------------------|
| What did I do in a nutshell? | Abstract                    |
| What is the problem          | Introduction                |
| How did I solve the problem? | Method used                 |
| What did I find out?         | Results                     |
| What does it mean?           | Discussion                  |
| Who helped me out?           | Acknowledgements (optional) |
| Whose work did I refer to?   | References/Bibliography     |
| Extra information            | Appendices (optional)       |