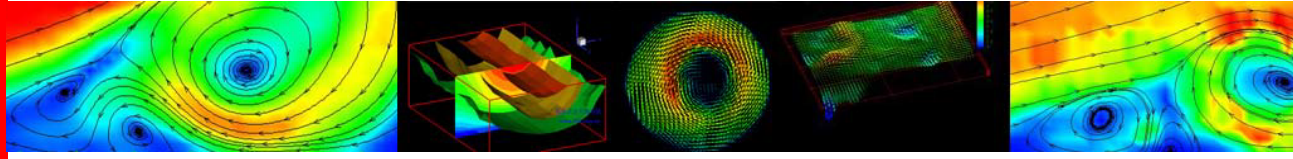
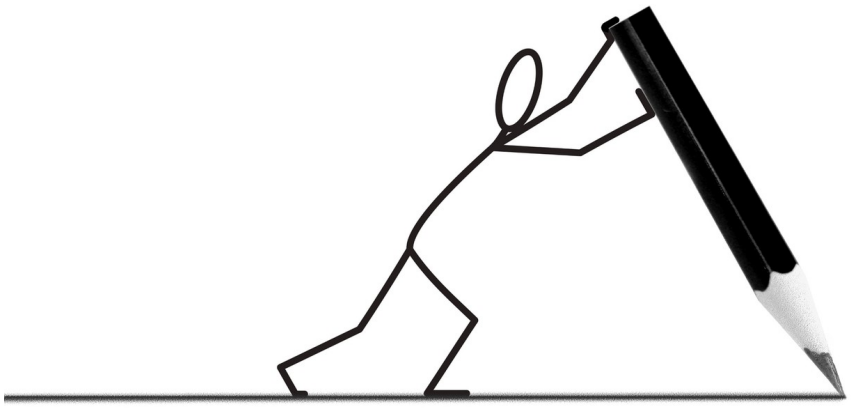


A Short Guide to Writing Your Final Year Project Reports



First draft - Telling yourself the story

UNIVERSITY OF PERADENIYA SRI LANKA

Contents

1 Introduction

THIS guide is meant to help you produce a good final year project report, and good practices presented in this could be useful for any other scientific report. Professionalism in scientific endeavour is not only confined to getting the job done but it also accounts for how you present your scientific work both in writing as wells as in oral presentations. A good report should; (a) contain adequate materials relevant to the work that you have undertaken, (b) be organised into a logical framework, and (c) be supported by written material that follows well-established academic conventions in a consistent fashion.

The project proposal that your supervisor may provide, would underline what is expected in your chosen topic to deliver. In your project reports, you are expected to justify all decisions made at every stage of your work including any chosen methodological approach.

It should be noted that this guide is not comprehensive, and mainly intended to introduce a common standard and professionalism for report writing.

2 Gathering Material

This section highlights material and content that you would need to collect before setting off writing a project report. The required writing material can be your own ideas and experiences gained while carrying out the project, your approach to solve the engineering problem that you have decided to address. Also, during your literature review or background study at the very beginning of your work, you will also use references and various scientific sources that may include journal articles, books, policy documents, handbooks, Internet resources, related software, etc. Thus, you may find it helpful to keep a notebook/diary and record all relevant information throughout the period of your project.

The typically information that you would need to note in your diary:

- References such as articles, books, websites with full bibliography details;
- Lessons learned throughout your project;
- Notes from meetings with your supervisor;
- Potential end-users and other stakeholders;
- Technical experts, and so on.

Towards the end or at any stage of your project, a diary filled with these information will show the progress made during a particular time of your project and how you have spent your project time. Also, it is highly recommended that you keep a running log of your activities and their outcomes when any validation, testing, and debugging are performed. Such a record will provide you unforeseen difficulties that you encountered, and hopefully, how you have resolved them. Extracts from these information will stand in good stead in writing your project report.

3 Arranging Material and Structuring the Project Report

Considering the fact that whether the major tasks of your project would encompass product development, research, experimentation, or simulation, the essential sections of front matter may slightly differ. In order to take into account this distinction, four distinctive report structures have been introduced of which required sections within the main body are slightly different (Figure 1).

3.1 Front matter

The front matter comprises of first pages of your project report, and front matter pages should usually be numbered in lower Roman numerals. Essential sections of the front matter that need to be included in your report are presented below.

3.1.1 Title page

The title page should be the first page of your report and should include: the project title; the name(s) of the author(s) and group number; the qualification for which the project report is a part of; the name of the university/department; the date of completion of the project report. A sample title page is provided in Figure 2.

Your project title must be carefully chosen. It should be short, yet should aim to describe the contents of the project report as accurately and closely as possible. On the other hand, the title should not be too short that it makes the scope of your report very broad.

3.1.2 Executive summary

The summary of your project report must be less than 300 words long. It should give enough information to allow a potential reader to decide whether or not the report will be of interest to them. This is more like a USP (unique selling point) of your project as far as the readership is concerned. It should briefly describe the main ideas of the report, including the aims and conclusions. The summary should not include anything that is not mentioned in the main body of your report. For this reason, it is recommended that a summary is usually written at last.

3.1.3 Acknowledgments

This section should be used to describe indebtedness for the use of facilities or help from particular sources or individuals. An acknowledgment is a personal statement, however, it should not sound stereotype. Furthermore, if any institutions or organisations have helped your project in monetary terms or by providing facilities/resources for carrying out the project, they should also be mentioned in here.

3.1.4 Disclaimer

From academic research reports to commercial white papers, a range of different liabilities may arise out of the production, publication and distribution of such reports. The purpose of disclaimer is to help manage or reduce the liabilities. You should include an appropriate disclaimer in your report.

Figure 1: Suggested report structures for various types of projects

Project title
(Font size: 18, type: Times New Roman, Bold)

ME406: Mechanical Engineering Group Project I Report
(Font size: 14, type: Times New Roman, Bold)

Submitted by
(Font size: 14, type: Times New Roman, Bold)
Names, Reg. Nos., Group No.
(Font size: 14, type: Times New Roman)

in
(Font size: 14, type: Times New Roman, Bold)
partial fullfilment of the requirements for the degree
Bachelor of the Science of Engineering
(Font size: 14, type: Times New Roman)

University Logo

Department of Mechanical Engineering
Faculty of Engineering, University of Peradeniya
(Font size: 14, type: Times New Roman, Bold)

Date
(Font size: 14, type: Times New Roman)

Figure 2: Suggested title page for ME420 project reports

3.1.5 List of Figures

All Figures that are included in your report are listed here with Figure numbers and captions.

3.1.6 List of Tables

All Tables that are included in your report are listed here with Table numbers and captions.

3.1.7 Abbreviations

If you use any abbreviations, obscure terms or acronyms in the project report, their meaning should be explained where they first occur. If you go on to use any of them extensively then it is helpful to

list them all in a table so that readers can quickly remind themselves of their meaning.

3.2 Body matter

This is the core of your project report. As mentioned in Section 3, the major sections included in the body matter can slightly differ depending on the nature of tasks involving with your project. The body matter corresponding to product development oriented projects (Figure 1) are described in the following sections.

3.2.1 The "Introduction"

A good introduction should tell the reader what the project is about without assuming special knowledge and without introducing any specific material that might obscure the overview. It should anticipate and combine main points described in more detail in the rest of the project report. Also, importantly, it should intrigue the reader about the work so much that they would end up reading the entire report. Normally, it should include:

- The aim(s) or goal(s) of the project;
- The intended audience or "beneficiaries" of the work done;
- The scope of the project;
- The approach used in carrying out the project;
- Assumptions on which the work is based, and
- A broad summary of expected outcomes.

3.2.2 The "Background"

The purpose of the Background section is to provide the typical reader with information that they cannot be expected to know, but which they will need to know in order to fully understand and appreciate the rest of the report. It should explain why the project is addressing the problem described in the report, indicate an awareness of other work relevant to this problem and show clearly that the problem has not been adequately solved. This section may describe such things as:

- The wider context of the project;
- The problem that has been identified;
- Likely stakeholders within the problem area;
- Any theory associated with the problem area;
- Any constraints on the approach to be adopted;
- Existing solutions relevant to the problem area, and why these are unsuitable or insufficient in this particular case;
- Methods and tools that your solution may be based on or use to solve the problem.

Your background section should end with a clear statement of the engineering problem/research question that the project attempts to answer. These will reflect the aim of your project, but will be different in that they explain the problem you are attempting to solve. An example is given below.

Aim:

```
The aim of this project is to develop software for the improved
planning of the routing of delivery vehicles to customer
locations, that reflects the forecast availability of each
customer to receive goods.
```

How it can be written in the background section:

```
In order to demonstrate the achievement of the stated aim, this
project will identify route planning software currently in use
and the underpinning algorithms, define appropriate performance
metrics, determine how to express constraints on an alternative
algorithm, develop an improved algorithm and demonstrate on
what basis it is judged an improvement, and implement the
improved algorithm in a usable and robust software package.
```

3.2.3 The "Specification & Design"

The purpose of the Specification and Design sections is to give the reader a clear picture of the system you plan to create. Specifications should tell the reader what your final product is required to do. Then, the content on the design should provide the top-level details of how the system you designed meets the requirements which specified earlier. You should also state constraints or limitations of your system that you have identified in the development process.

Some of the aspects that need to be included in this particular section may be;

- User requirements and an overview of your final product/system;
- The user interface;
- The dynamic behaviour of the system;
- How data flows through the system;
- What algorithms are implemented in the system;

As well as describing the system, it is important that you justify the particular design by discussing the implications of constraints on your solution and different design choices, and then giving reasons for making the choices you did.

If you test a hypothesis instead of designing a product or system, specification and design sections may not be required in quite the same form. The specifications may then become a description of the problem and what is required of a solution. The design becomes a description of your approach to solving the problem and your suggested solution(s).

3.2.4 The "Results"

In this section you should describe to what extent you achieved your goals. You may include comprehensive summaries of the results of all critical tests/calculations that you carried out. Even if you have not been able to carry out your tests rigorously, you should try to indicate how confident you are about whatever you have produced. In this regard, you will have to provide some statistical backing-up of your results rather than indicating isolated numbers.

You should keep in mind that any tabulated results of your project must be described in words.

3.2.5 The "Discussion"

It is very important to indicate how your results are compared with existing studies. For instance, you can describe how you compare the performance of the algorithms used in your design to other algorithms, and you can illustrate why your approach is more efficient or superior.

You must also critically assess your results in the light of existing ones by describing its strengths and weaknesses. No project is totally perfect. If your project has failed to deliver what was intended to achieve, you would still have gained a lot by learning from the mistakes and difficulties.

Finally, this section provides you an opportunity to present a critical appraisal of the project as a whole. For instance, you can make an overall assessment whether the methodology you chose or the programming language used were appropriate.

3.2.6 The "Conclusions"

The Conclusions section should be a summary of the aims of project and a restatement of its main results, i.e. what has been learned and what it has achieved. An effective set of conclusions should not introduce new material. Instead it should briefly draw out, summarize, combine and reiterate the main points that have been made in the body of the project report and present opinions based on them.

3.2.7 The "Future Work"

It is quite likely that by the end of your project you will not have achieved all that you planned at the start, and in any case, your ideas will have grown during the course of the project beyond what you could hope to do within the available time. The Future Work section is for expressing your unrealized ideas. A good Future Work section should provide a starting point for someone else to continue the work which you have begun. The Future Work section marks the end of the body matter of the project report.

3.3 Back matter

3.3.1 The "References"

All references that you would have used in the main body of your report should appear as a list of references in the back matter. The references could be an article, book, book chapter, thesis, or a webpage, they should all follow a standard referencing format. It is recommended to use author-year citation in the main body. Furthermore, you are advised to get accustomed with any bibliographical manager (e.g. endnote if you use MS Word or jabref if you use LaTeX) so that this can automatically

be done. A sample of two articles cited in the main body and how they appear in the list of references are given below.

How the articles are cited in the main body:

```
"Arctic sea ice has declined precipitously in both extent
and thickness over the past four decades (Maksym, 2019), and
consequently boreal fish have already started to move polewards
(Kortsch et al., 2015)".
```

How the two citations should appear in the list of references:

References

Kortsch, S., Primicerio, R., Fossheim, M., Dolgov, A. V., and Aschan, M. (2015). Climate change alters the structure of arctic marine food webs due to poleward shifts of boreal generalists. *Proceedings of the Royal Society B: Biological Sciences*, 282(1814):20151546.

Maksym, T. (2019). Arctic and antarctic sea ice change: contrasts, commonalities, and causes. *Annual review of marine science*, 11:187--213.

3.3.2 The "Appendices"

Appendices are where you present material which you want to include in the report, but which would seriously obstruct the flow of ideas if put anywhere in the main body. This could be extensive technical details or mathematical proofs, derivations of formulae, etc. required to support a point you may want to make in the report. If you have several Appendices, they should be headed by letters in alphabetical order, i.e. Appendix A, Appendix B, etc.

4 Writing the project report

4.1 Potential Readership

Always keep your potential readers in mind and repeatedly review what you have written, putting yourself in their place. Look at the draft, and ask yourself: Will this make sense to the readers given their existing knowledge and what I have told them up to now? You can consider the potential readership as your academic supervisor; an internal/external examiner, and quite possibly future students and others interested in the topic.

4.2 Stylistic Conventions

There are various stylistic conventions relating to technical writing that you should follow. For example:

- Do not use shortened forms such as don't for do not;
- Avoid using a colloquial language and slang words;
- Use British/American English and write in complete sentences instead of fragmented phrases;
- Divide your writing up into paragraphs;

Generally, you should write in the "third person". The "first person" can be used, to avoid the report becoming stilted, though it is recommended that its use be limited. Writing where the language style or typography (e.g. font or character size) change arbitrarily can be very distracting for the reader, typography should be used to support the content. Other places where consistency should be maintained include: bullet points; use of hyphens; use of capitalization; technical terms; abbreviations; use of symbols. To some extent you can use your own judgment about what conventions to follow. Whatever you do though, they must be consistent.

4.3 Cross-references

Cross-references are references to other parts of the same document. Section numbers will change if sections are added or deleted. Good typesetting or word processing software provides suitable mechanisms to automatically number sections and create such references such that they will always refer to the intended section. Make sure you know how your chosen software does this. If you do not use automated cross-referencing, it is a good idea to wait until the report is almost complete before putting in any cross-references.