Title of Your Project

MENG 370 Design Project Report
Spring 2013 Semester

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Group Leader: Leader's name
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ACKNOWLEDGMENTS

I would like to express my gratitude to all those who gave me the possibility to complete this design term project.

TABLE OF CONTENTS

Summary 4

Introduction 5

The Format of the Report 6

Font and Layout 8

Drafting the Report 9

Pitfalls and Some Tips 10

Conclusions 11

Appendices

References 12

Bibliography 12

Referencing Published Materials 12

SUMMARY

The purpose of this document is to provide some guidelines for the preparation of your design term project written report. This is a very important part of the project. Many otherwise excellent design term projects are undermined by a poor report.

This document covers the format and contents of the report, some rules for the layout and presentation, some suggestions on style and tools that might be helpful and some recommendations for further reading.

A short introductory chapter should cover the background to the project, or state the problem, or possibly say what motivated you to work on this particular project.

Use the main body of the report to describe objectively what you have done in the project, to justify your design decisions, and to help the reader appreciate the problems you faced and what you achieved in solving them.

The conclusion should sum up what you have achieved in the project and, possibly, outline the scope for future work.

There are many excellent books available on the topic of report writing. This is not intended to be a substitute for them.

1. INTRODUCTION

This is design project. You are asked to do both analytical solution and design of a **mechanical mechanism** of your selection, which is your own design or idea. It is the intention of this design project assignment that very few restrictions are placed on the selection of **mechanical mechanisms**. You are required to discuss with the instructor regarding the specific mechanical mechanism design throughout the analytical solution and design process. The objectives of this design project include:

The mechanical mechanism design is not restricted to any specific topic. Consultation with the instructor is strongly encouraged. You should feel free to look up other resources for candidate of your design. You will need to use Pro/Engineer at HSH B15, please ask Lucy to access computer laboratory.

Your grade will depend upon the design creativity and analytical solution. The grading criteria are following.

All members in a group will receive the same grade, unless under very rare situation which warrants differential in grading among group members.

The instructor will have plenty of other evidence on which your final grades will be based, but the project report is the most visible and **permanent** record of the work you have done in the project. If you are hoping to get an honors degree, particularly if you intend to do further study or research in the future, it is important to demonstrate your ability to write clearly and coherently about your subject.

How much is needed?
A good report is short and to the point. Depending on the spacing, forty or fifty pages should be more than adequate to cover all you have to say. Everything else should be put in the Appendices.

Who is going to read it?
Besides your instructor, you will also have a second reader for your project. This is another lecturer who has expressed an interest in your project. Second readers have a great deal of influence with instructors in the marking of the project. As well as reading the reports they may want to see a demonstration of your project.

When writing the report it is often a help to think of the second reader as your main audience. He or she is not as familiar with the project as yourself and your instructor, but is an interested and informed objective third-party - just the sort of person the report should be directed to.

Your other readers include the external examiners and the students who come after you. The external examiners are people you will probably never meet, but they will be judging your work on the basis of the report you write. Bear in mind those students who come after you will want to read your report to find out information to help them with their own projects.

2. THE FORMAT OF THE REPORT

When it is finished, your report should consist of the following components **in this order**:

A Title Page
Acknowledgements
Table of Contents Page
Summary (1 to 5 pages)
An introduction (i.e. not the summary)
The main section (3 or 4)
A final section (conclusions, recommendations, suggestions and scope for further work)
Appendices (numbered)

The **Title Page** should contain the name of the project, your name, the year, the instructor's name. All centred. This page may be followed by a page for Acknowledgements (optional).

The **Acknowledgements** page is where you thank all the people who have helped you with the project, including your instructor, if appropriate. You will also need to acknowledge the contribution of others at different places in the body of the report.

The **Table of contents Page** lists the Chapter titles, and optionally the main sections within chapters, with page numbers. If there is only one Appendix, it should be included at the end of the list, otherwise numbered appendices should be listed under a separate heading.

The **Summary** is the most difficult part to write, but it is the part people are most likely to read. Indeed, it should be aimed at readers who do not intend to read the whole report. As the name suggests, it should summarise what is in the report. You will need to make several attempts at it. The shorter the summary is, the better. One page is ideal, but difficult to achieve. Do not exceed five pages.

The **Introduction** is different. It should lead the readers gently 'from the known to the unknown,' from what they already know to the new material that you are presenting in the report. It is best to start off with some general principles and go from the general to the specific. Alternatively, you may decide to use the introduction to state the problem which your project aims to solve, or to review the state of the art of the technology you have used in the project. Sometimes it is appropriate to finish the introduction with an outline of what is coming in the succeeding chapters.

*What goes into the **Main Chapters** is up to you. Some students find it helpful to think of the project in terms of **Why** they did it, **What** they did, **How** they did it and **Why** they did it the way they did it and then to write about those things. Naturally these are not the titles of the chapters, but the general idea of what they contain.*

One of the main reasons why people read a project report is to find out whether the project itself is any good. So an important component of any report is **evaluation**. There are two levels on which evaluation can be done. One level is the formal process in which the system is presented to third parties, such as user representatives, or experts in the field, to collect feedback which

may then be used in the further development of the project. Some projects naturally lend themselves to this kind of evaluation, for example, Computer Aided Learning systems of different kinds, and systems where the usability is paramount. In these cases the evaluation experiment and results can be part of the report. Other projects require you to do the evaluation yourself. You might consider how much you have achieved and how well you have done compared to what might have been expected. Your ability to evaluate and criticize your own work is considered an important educational objective, and is usually well-rewarded. Even though you may feel it is risky to point out the inadequacies of your work, it is worse to appear unaware of them.

In writing the report you have a great opportunity to make use of the work you did which may not be evident in the final system. In trying to get a satisfactory design or implementation, you may have entered more than a few 'blind alleys.' Like Edison who discovered one thousand different ways not to make a light-bulb, you may have discovered that several different approaches were unsatisfactory in one way or another, and more importantly, why. The report is one way to highlight all the work you have done in these areas. Think of the people who come after you.

In the **Conclusions** it is acceptable to sum up what you have said already, but better still try to sum up what you have achieved. Be careful to distinguish what you have done from what was there already. Just because you use other people's ideas does not take away from your achievement. Part of the scholarly tradition is to know and use what is already known in a particular area, and to give due acknowledgement to your sources.

It is also a good idea to point out how much more is waiting to be done in relation to a specific problem, or give suggestions for improvement or extensions to what you have done. **Show** that you had more ideas than time to implement them.

Appendices
As well as the references and bibliography, these include any documentation you may wish to include with the report.

References and bibliography
These are not the same. References are works directly referred to or quoted from in the text of the report. There are a number of standard schemes for 'pointing' to the reference list, such as the numbering scheme used which is used in many Computer Science journals or the name and date scheme which is used in this document. Please use **one** of them.

Most of you will simply need a bibliography, which is a list of works consulted or used in the course of your project. Do not skimp on this.

There are also a number of standard formats for listing the references. For postgraduate theses, the University of Limerick recommends a format known as the Harvard System. The postgraduate regulations (UL 1994) contain useful examples of the layout and format of author, title and publication details. For a fuller treatment see (Turabian 1987) which is available in the library under classification 808.02.

Other Appendices

This is the best place for screen dumps. In other words, do not clutter the main chapters with illustrations. In the main body these tend to break the reader's concentration and cause numerous problems with printing and page breaks. Remember you are not writing a textbook, so don't worry about causing the reader to refer back and forth.

Depending on the project, it may be a good idea to produce a **user manual** and put it in an appendix. It looks good if you get this printed/copied on colored paper.

Database projects generally have a chapter in the main body of the report discussing the database design, including descriptions of tables, etc. If this is not appropriate, then the tables should be documented in an appendix. An entity-relationship diagram may be used as the basis of a discussion of the requirements for a system, in which case it is best placed in the relevant chapter. In general, the more detailed items and repetitive items like file formats should be relegated to the appendices, but the more abstract models should be up-front in the main chapters.

3. FONT AND LAYOUT

Naturally you will type the report yourself. Choosing a font is a matter of personal preference. This document uses Bookman Old Style, which is a True Type (TT) font. Times Roman, Palatino, or Schoolbook are also good. It is best to choose **one font** and try to stick to it for the entire document. If using MS Word, be careful to select a serif TrueType font and not a terminal or system font. Do not use **Arial** or any other sans-serif font. Serifs are the tiny tails at the beginnings and ends of letters (missing in the word Aerial above). MS Word is often set up with styles for headings based on a sans-serif font. These are acceptable, but documents are supposed to be harder to read if they are printed mainly using sans-serif fonts.
Use a **font size** of 12 for the main body of the text, larger for headings and chapter titles. These should be in **bold type**.

The word-processor will take care of left **justification**. Beware of right justification or alignment. It looks tidier but it sometimes interferes with the readability of the text, by inserting extra spaces, especially if you have a tendency to use long words. Newspapers and books use left and right-justification but they generally use a smaller font size (8) and better quality printers than you will be using. In MS Word, left- and right-justified is called justified.

The **margins** should be 1.18" on the top, 1" on the bottom, 1" on the right and 1" on the left. The wider left margin is important because it helps when reading the bound report. (File, Page Setup in Word.)

Make sure the page size is set correctly. Letter paper is 8.5"x11" size.

Pages should be **numbered**, starting at the Summary. The page number should be printed at the foot of the page and centred. Use the **Insert Section Break** option in MS Word, followed by **Insert Page Numbers**. Do this with the cursor positioned at the top of the Summary page.

Appendices should have page numbers, in sequence with the main body of the report.

In the past it was common to double-space academic reports and theses. This is no longer necessary, due to advances in typography and printing technology. You may double-space your report, but **one-and-a-half line spacing** is preferred. The exceptions are the references and bibliography, which should be **single-spaced**.

The report should be printed on one side of the paper only. Any documents included in the Appendices should be likewise on A4 paper. Photocopy them if this is necessary. Source code is **not normally** included in the Appendices. If your instructor wants it printed then bind it separately in any suitable folder.

The bound report
This should be paper-bound, in any color. Please do not get it hard-bound. It looks pretentious, takes up too much shelf-space in the department and it will not impress your instructor. If you want to get a hard-bound copy for yourself or your parents, then go ahead.

Hand in two copies of the report to your instructor. Only one copy of your program listings is required, if at all, and your report, MS-Word file and graphics file should email to jongblee@nyit.edu right after hard copy submission.

4. DRAFTING THE REPORT

Draft report
Good writing is nearly always the result of re-writing. The reason for the draft report is to give your instructor a chance to read it and make suggestions for its **improvement** before you have to hand it in officially. While the print-out should be as readable as possible, it is not necessary to laser print or bind the draft. The instructor will be looking at the **contents** at this stage.

The writing
The unit of writing is not the sentence but the paragraph. Break up your text into paragraphs and sub-paragraphs. Try to have one idea per paragraph. Group your paragraphs into sections and think of meaningful headings for each section.

Like all well-meaning instructors, the Word grammar-checker is against using the passive voice and wants you to use the active voice all the time. This means you should say what the subject did, not what happened to the subject. For example: “The cat is sitting on the mat” is the active voice. “The mat was set upon by the cat” is the passive voice.

Your instructor will not mind if you use the passive voice from time to time: it is not bad grammar. On the other hand, too much of the passive voice makes your writing hard to understand. The active voice is always simpler and clearer.

Very often when you are trying to be objective, as you should when writing a report, it is easier to achieve this by writing in the passive voice. You can always revise what you have written, to make it clearer.

Use short sentences. This is another piece of advice favored by the grammar-checker and many teachers of writing. Certainly, shorter sentences are easier to understand, but rest assured that your instructor and second reader can understand the occasional long sentence, including ones that contain sub-ordinate clauses.

After reading the draft, your instructor will probably make some suggestions, possibly changes to the structure, or requesting you to expand some sections or chapters. **Always** do as he or she suggests.

5. PITFALLS AND SOME TIPS

It often happens that an otherwise excellent project is ruined by a poor write-up. The most common problems which could be avoided include:

writing in a tone which is too personal (e.g. "I stayed up all night looking for that bug"). This is hard to avoid when you are describing something which is all your own work. Try to remember that strangers will be reading your report. We used to advise that the word ‘I’ should never appear in a project report, but we have decided to drop this constraint. Nevertheless, it is very important to adopt an impartial stance and write in an objective tone. Some people go to the other extreme which is:

writing in a tone that is stilted and indirect, (e.g. "The learner is given total control over the rate at which he or she progresses through the system and also over the amount of detail with which he or she is presented at any time"). Be yourself. Let the reader ‘hear’ your ‘voice.’

writing in the past tense This is a common trap, trying to write a report that is one long story from beginning to end, only it does not work because you keep jumping from one idea to another. Write in the present tense. You are writing about something that exists.

failure to acknowledge sources There are three main types of sources of material which you will need to acknowledge:

1. the software which you used, including the development environment, compilers, libraries, etc.
2. the algorithms, models, hypotheses and paradigms that you use. These may or not require detailed description depending on how important they are to the project. Also, the further back you go the more ideas become public domain. However, as a rule of thumb it is always better if you can demonstrate that you know the origin of a technique, idea or concept.
3. Written, printed, or published material (see appendix 3)

re-writing the manual. You can assume that your reader is knowledgeable about certain things, so there is no need to write a potted history of Java or whatever. On the other hand it is important

to mention everything you used in the project and to fully explain anything that might be unusual or novel to the interested reader. The topics needing this treatment vary from one year to another. For example, five years ago it was important to introduce the reader to Java, but now it is ‘old hat.’

bad spelling. You may think, "So what if it's wrong as long as the meaning is clear." But poor spelling gives a bad impression (of carelessness and worse) and sometimes causes confusion. Some people are born bad spellers, others are poor typists. But there is no excuse for anybody who has access to a spelling checker. Use it.

Other Tips
Find out and use the proper spelling and capitalisation of the programming languages, tools and other proprietary software that you used. For example, is it Unix or UNIX?
Do not leave a space before a full stop or other punctuation mark. If you do, the automatic justification will treat it as a separate word and may leave it 'dangling' at the beginning of a line. Likewise, do not leave a space after an opening bracket or before a closing bracket. Do it (like this).
Use round brackets only for parentheses. Keep square brackets for references.
Believe it or not, typesetting convention requires that commas and full stops go **inside** quotation marks. Even at the end of sentences like "this."
It is a good practice to leave **two** spaces after a full stop.
Always spell out numbers <10 in text, i.e. write “two” not “2” except where you are numbering bullet points.

6. CONCLUSIONS

In this short document I have tried to cover most of the areas of concern in writing a project report. Naturally, this is not the last word on the subject. If you have time, you should have a look at one or more of the books recommended in the references and bibliography.

I have tried to encourage you to put some effort into the project report and laid down some guidelines for the layout and format. These are gradually becoming the 'standard' for design term reports within the department and will be amended and improved in the light of experience.

Other formats are possible and you may come across other regulations which contradict those laid down here, such as the placement of the summary, etc. I have tried to err on the side of simplicity and to keep the "regulations" to the minimum necessary for clarity.

If you have any suggestions as to how this document could be made more helpful, your comments will be appreciated.

I am looking forward to receiving some good reports this year.

APPENDICES

1. References

Strunk, W. (1983). *The Elements of Style*, Collier MacMillan, London.
Turabian, K. L. (1987). *A Manual for Writers of Term Papers, Theses, and Dissertations*, University of Chicago.
University of Limerick. (1994). *Postgraduate Academic Regulations and Procedures*, University of Limerick.

2. Bibliography

Adamson, A. (1986). *A student's guide for projects , field studies and research*, IPM.
Gowers, E. (1987). *The complete plain words*, Penguin, Harmondsworth.
Van Emden, J., and Easteal, J. (1994). *Report Writing*, Stanley Thornes, Cheltenham.

3. Referencing published material

When using published material (i.e. from the web, journal articles, books, magazines, technical manuals, manual pages, help pages) written (or produced) by other people there are a number of conventions you should observe.

a) When an idea is used, it is referred to in the text, for example
.... Fred's method of plastering (Fred 1997) is now recognized as the best....
or .... when it comes to splitting hairs the method proposed by Fred (1997) has many .....

b) if you actually quote from another work then this should be parenthesised and referenced, .e.g. ...in 1997 fred stated "my method of potting begonias is....", (Fred 1997)
c) if you copy or use a substantial amount of a figure, table or diagram at the end of the caption you should reference this fact. e.g. figure 1. A graph of the number of logs boiled per second using Fred's method (Taken from Fred 1997, figure N page NN) or figure 1. A graph showing the number of frogs identified using Fred's method (Adapted from Fred 1997 figure N page NN)
Note that copying material directly from a source without acknowledging the source is plagiarism and will result very negatively on your marking. If you are quoting a short direct comment from any source use the style stated in b) above