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|  | Aerospace Engineering. |

**Aerospace Engineering**

**Individual Investigative Project**

###### Title of Your Project

##### Ann M Smith

##### Month Year

**Supervisors: Dr A N Other1 and Dr A N Other2**

**Dissertation submitted to the University of Sheffield in partial fulfilment of the requirements for the degree of**

**PLEASE INSERT EITHER**

**Master of Engineering or Bachelor of Engineering**

**and ensure this paragraph is at the bottom of the page with a section break (not a page break) immediately after**

**Abstract**

This template is in the correct format - just type over it and save it as your document. Before you start writing, look at Appendix 2 of the Aerospace Engineering Individual Investigative Project Handbook which gives guidelines on technical writing, the dissertation structure and general advice.

The first item in your dissertation should be an abstract of a few short paragraphs (200 words maximum) summarising the dissertation. This should not be a re-statement of the original project outline. A suggested flow is background, project aims and main achievements. From the abstract a reader should be able to ascertain if the project is of interest to her/him and presents results that s/he would like to know details of.

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Appendix 1: Information on Appendices

**Nomenclature**

You may wish to include a nomenclature if you have many mathematical symbols. Remember that your reader may not be an expert in the field of your project. In any case, symbols should be defined on first appearing in the text.

List the symbols in alphabetical order.

Separate lists for Roman and Greek letters, subscripts and superscripts.

The International System for units (SI) should be used:

ρ density of fluid

CD drag coefficient of body

v velocity of body

Vx, velocity components in horizontal and vertical directions, respectively

**Acknowledgement**

You may wish to include an acknowledgement. This should be a maximum of one page and is usually much less. In this you should thank whoever may have helped you in any way. This will usually be your project supervisor, but could include other staff such as technicians, and anyone else you would like to thank.

The acknowledgments are written in the first person singular, i.e.

“I would like to thank my ……. .”

NOTE: Please read what follows in red font.

There is a section break at the end of the section in red, on page vi, following the advice on Unfair Means. Do not delete this section break. If you do, the page numbering will be incorrect.

IMPORTANT REMINDERS

FAILING THE PROJECT

A Project grade below 40 will result in a FAIL degree regardless of the aggregate coursework and examination grade.

BE SAFE – BE PARANOID ABOUT LOSING FILES

Always back up your dissertation after every session on the computer. Keep at least one, preferably two back up copies. Losing files or network crash will NOT be an acceptable reason for late submission of dissertation.

LENGTH OF DISSERTATION

As a guide the final report should be no longer than about 50 pages (BEng) or 70 pages MEng) (excluding appendices but including all other parts of the report).

Everything that is essential for the understanding of the report should be included in the main body.

Additional material may be introduced into the Appendices. These allow you to include data that you feel adds to the understanding but is not essential. Appendices will not be marked.

You must include a list of references and ensure you are clear about how to reference properly. If you are in any doubt you should consult your project supervisor.

PROOF READING

You must never rely solely on the spell and grammar checker. It is ESSENTIAL that you proof read your dissertation manually before printing the final copy for submission.

UNFAIR MEANS

**What constitutes unfair means?**

The basic principle underlying the preparation of any piece of academic work is that the work submitted must be your own work. **Plagiarism**, **submitting bought or commissioned work**, **double submission (or self plagiarism),** **collusion** and **fabrication of results** are not allowed because they violate this principle (see definitions below). Rules about these forms of cheating apply to all assessed and non-assessed work.

**1. Plagiarism (either intentional or unintentional)** is the stealing of ideas or work of another person (including experts and fellow or former students) and is considered dishonest and unprofessional. Plagiarism may take the form of cutting and pasting, taking or closely paraphrasing ideas, passages, sections, sentences, paragraphs, drawings, graphs and other graphical material from books, articles, internet sites or any other source and submitting them for assessment without appropriate acknowledgement.

**2. Submitting bought or commissioned work (**forexample from internet sites, essay “banks” or “mills”) is an extremely serious form of plagiarism. This may take the form of buying or commissioning either the whole assignment or part of it and implies a clear intention to deceive the examiners. . The University also takes an extremely serious view of any student who sells, offers to sell or passes on their own assignments to other students.

**3. Double submission (or self plagiarism)** isresubmitting previously assessed work on one or more occasions (without proper acknowledgement). This may take the form of copying either the whole assignment or part of it. Normally credit will already have been given for this work.

**4. Collusion** is where two or more people work together to produce a piece of work, all or part of which is then submitted by each of them as their own individual work. Collusion does not occur where students involved in group work are encouraged to work together to produce a single piece of work as part of the assessment process.

1. **Fabrication** is submitting work (for example, practical or laboratory work) any part of which is untrue, made up, falsified or fabricated in any way. This is regarded as fraudulent and dishonest.

All students should refer to the University’s guidelines on Plagiarism and Collusion: Unfair Means in the Assessment Process (included in the Appendix 4 of the Aerospace Engineering Individual Investigative Project Handbook, available on MUSE). You must ensure that all referenced material is correctly cited according to the guidelines contained in Section 6 of this document.

When you submit your dissertation, you will be required to sign a declaration with respect to plagiarism and collusion. You will also be required to submit your dissertation in electronic format. This will allow the dissertation to be checked for plagiarism and collusion with special screening software made available by the University.

Both plagiarism and collusion are strictly forbidden. Students are warned that the piece of work affected may be given a grade of zero. In the case of projects this is likely to result in failure of the degree. Students will also be subject to disciplinary action which may result in exclusion from the University.

IMPORTANT FOR FORMATTING

There is a section break at the bottom of this page. Please do not delete it. If you do, the page numbering will be incorrect.

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# 1. INTRODUCTION (style - Heading 1)

Main section headings should be numbered 1, 2, 3 …. and be in 16 pt upper case bold.

Main sections should start on a new page.

The style and form of the dissertation must at all points reflect a truly professional attitude by the author.

This section/chapter is the start of the main body of the dissertation and should be numbered page 1.

The introduction has several purposes. Clearly one is to set the scene for the project by giving a little relevant background information - try to grab the reader's interest early. Another is to clearly elucidate the aims and objectives of the project and the constraints that might affect the way in which the project is carried out. If the project involves the solution of a specific problem or the production of a specific system this should be clearly specified in an informal way. Finally, the introduction should summarise the remaining chapters/ sections of the dissertation, in effect giving the reader an overview of what is to come.

# 2. BACKGROUND AND LITERATURE REVIEW(style - Heading 1)

Start this section on a new page (as with all main sections). At this point you may wish to start introducing sub-headings. Do so using the style on the following page.

This section should include reviews of previous work by others that are relevant to the project. A review does NOT mean reproducing in details material given in text books, reports and papers. It DOES mean summarising the information so that a reader is informed of where to look for the information.

It is often useful to start this chapter with an overview of its contents, giving the reasoning behind why you have structured it in a particular way. The main thrust of the chapter is a review of relevant work by other authors and the relationship between this and your own work. If several other people have done closely related work in a different way then the reasons for your approach should be summarised here.

A good literature review is synthetic: general trends and positions in your research area should be identified, and the papers you cite should be compared and contrasted. A literature review is not simply an annotated list of papers you may have read.

A literature review should cover a range of relevant material to your project. Everything you use should be cited by reference to the bibliography at the end of your dissertation. As an example: "...some early work by Brooks (1975) suggests that throwing men at a problem is counter-productive". This would then be listed in the reference section as follows:

Brooks, F.P., 1975. The Mythical Man Month: Essays on Software Engineering, Addison-Wesley.

Everything that you write must be your own words and you must cite other people using references. You may also quote sentences from the work of others. These must be included in quotation marks and again the relevant work must be cited. Your signed declaration means that you will fail your dissertation if you do not indicate where the work of others has been quoted.

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## 2.1 Background and literature review section sub heading (style - Heading 2)

Sub-section headings should be numbered 1.1, 1.2, 1.3 ... and be 14 pt lower case bold.

Main text should be in Times New Roman 12pt, 1.5 line spacing and justified. Do not indent the beginning of a paragraph. (Style - Body text Indent).

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### 2.1.1 Background and literature section further sub-section (style - Heading 3)

Further sub-sections should be categorised as 1.1.1, 1.1.2, 1.1.3 etc. and be 12pt lowercase bold.

### 2.1.2 Margins, page numbering and other formatting (style - Heading 3)

These should be as follows:

* Top 2.5 cm (bullet points use style – List Bullet)
* Bottom 2.5 cm
* Left 3.0 cm
* Right 2.5 cm
* Header 0 cm
* Footer 1.27 cm
* Number the main body of text, that starts with the Introduction, and appendices with Arabic numbers 1, 2, ..
* Number all other pages, including the contents page with Roman numerals ie. i, ii, .. etc
* Footers should contain only the page number at the centre of the page.
* Headers should not be included.
* Leave two spaces after full stops.

## 

## 2.2 Equations

All equations should be numbered, eg. 2.1 where the first number refers to the section/chapter number and the second the equation number. Place the equation number on the left of the equation , eg:

2.1 

# 3. FURTHER CHAPTERS/SECTIONS

## 3.1 Introduction

You should not title these ‘Chapter/Section X’ but instead should give the chapters titles that reflect their content, e.g. ‘The Continuous Casting Process’. The content will depend on the type of project. A practical project may have a chapter in which the apparatus used (or built) is described; followed by chapters describing experimental or test procedures and discussion of results. A design project may have a chapter describing a particular design method, followed by chapters describing how the method has been applied, a discussion of reasons for design decisions and an analysis of the design.

## 3.2 Structure of chapters/sections

The body of each chapter will normally be split into sections and sub-sections each of which should have a heading. In technical reports and books the most common form of identification for headings and sub-headings and is the so called legal or decimal notation. For example:

3. THE CONTINUOUS CASTING PROCESS

3.1 Introduction

3.2 Overview of Process

3.3 Metal Pouring and First Stage

3.3.1 The Mould

3.3.2 The Strand Cooling Unit

It is seldom necessary to have more than three levels of heding. If you need further sub-division it is preferable not to number the sub-division. Simply give it an un-numbered heading.

# 4. NEXT CHAPTER: OTHER INFORMATION

## 4.1 Figures, photographs and tables

Figures, photographs and tables should be in numerical order eg. Figure 2.2, Table 2.1 etc. where the first number indicates the section number and the second number the figure/table number. The caption should be centred below the figure with the caption in italics (see Figure 4.1)

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Figure 4.1 An Example of How to Integrate Figures into Your Document.

Figures and tables should to be integrated into the text and not put at the end of the paper. Boxes around the figures are optional. If there are many figures, drawings etc that need documentation, then these can go in the appendices.

Figures should be suitable for reproduction in black and white, ie. colour images may be used but be aware that they may be photocopied. You must ensure that colour shadings also make sense in black and white!

## 4.2 Dissertation submission deadline

The deadline for submission is given in the Aerospace Engineering Individual Investigative Project Handbook.

## 4.3 Assessment procedures

The assessment procedures are given in the Aerospace Engineering Individual Investigative Project Handbook. It is important to note that a Project grade below 40 will result in a FAIL degree regardless of the aggregate coursework and examination grade.

# 5. RESULTS AND DISCUSSION

The main results of your work should be presented, together with critical discussion. The chapter should cover at least two things (although these would not be used as section headings):

Findings: Present all the results (products, experimental findings, theories etc) generated during the project. This may also include some off-topic findings that were not expected, or which were side-effects of other explorations.

Goals achieved: Describe the degree to which the findings support the original objectives laid out for the project. The goals may be partially or fully achieved, or exceeded. An experimental project may prove, or disprove the original thesis. A theoretical project may cover some or all of the example cases. Note that reporting of failures to achieve goals is important since a fundamental feature of the assessment procedures is that the processes (how you went about your project) are often as important as the products of the project.

# 6. CONCLUSIONS

The conclusions can be summarised in a fairly short chapter (3 or 4 pages). This chapter brings together many of the points that you will have made in other chapters, especially in the previous results and discussion chapter. Do not be afraid of repeating some of your earlier statements here, albeit using different wording. In this section you should also make suggestions for further work. This should address two things: firstly, new areas of investigation prompted by developments in this project, and secondly parts of the current work which were not completed due to time constraints and/or problems encountered. You should aim to give 3-4 new ideas for future work and describe them in some detail (at least a paragraph on each and not just a list).

# 7. REFERENCES

These have the following purposes:

1. To acknowledge the source of material being used.

2. To tell the reader where the confirmation of statements that you have made can be found.

3. To tell the reader where a more extensive or more detailed discussion of the subject (or related subject) can be found.

Every time you make use of someone else’s ideas, data, work etc. you must acknowledge where this has come from (the source). This is done by placing a marker (citation) in the text at the point where you refer to those ideas. This directs the reader to the reference list that provides details of where these can be found. The marker can be numerical, in which case the reference list will be numbered, or it can comprise the names of the authors(s) of the work and the year of publication

There are various methods of citation. You should, however, ensure that you use the Harvard (Author-Year) system, examples of which are given below:

**Examples of the Harvard (Author-Year) System:**

Stevens (1993) has proposed that …….

It has been concluded (Hutchinson and Xue 2005) that ……..

In work undertaken on aircraft wing loading (Moorhead 2006) …….

These would be included in an alphabetical list of references at the end of the report as follows:

Hutchinson, J.W. and Xue, Z., 2005. Metal sandwich plates optimized for pressure impulses. *International Journal of Mechanical Sciences*, 47, 545-569.

Moorhead, G., 2006. *Aircraft Wing Loading at High Lift Conditions*. MEng Dissertation, Aerospace Engineering, The University of Sheffield.

Stevens, G., 1993. *Identifying physical matrices*. 2nd ed. London: Emsworth Press.

You should ensure that you cite EVERYTHING when you use, or make any reference to, someone else’s work, ideas, data etc. This includes journal papers, books, conference papers, technical reports, theses/dissertations, websites. Examples (Dodd, 2006), using the Harvard system, are given below:

Book:

Author, Date. *Title*. Series. Edition. Place: Publisher. Volume.

Wahba, G., 1990. *Spline Models* *for Observational Data*. Series in Applied Mathematics. Philadelphia: SIAM. Vol. 50.

Journal:

Author, Date. Article title. *Journal title*, volume (part), pages.

Aizerman, M., Braverman, E and Rozonoer, L, 1964. Theoretical foundations of the potential function method in pattern recognition learning. *Automation and Remote Control*, vol. 25, no. 6, pp. 821-837.

Conference Paper:

Author, Date. Article title. Editor, *Book title*. Place: Publisher, volume, pages.

Simmons, G., 1967. Iterative storage of multidimensional functions in discrete distributed memories. In J. T. Tou, Ed., *Proceedings of the Second Symposium on Computer and Information Sciences*, Battelle Memorial Institute, August 22-24, 1966. Academic Press, pp. 261-280.

Technical Report:

Author, Date. *Title*. Report identifier, Institution.

Dodd, T.J. and Harrison, R.F., 2002. *Some Lemmas on Reproducing Kernel Hilbert Spaces*. Research Report 819, Department of Automatic Control and Systems Engineering, The University of Sheffield.

Thesis:

Author, Date. *Title*, PhD Thesis, Institution.

Dodd, T.J., 2000. *Prior Knowledge for Time Series Modelling*. PhD Thesis, University of Southampton.

Website:

Author, Date. *Title* [online]. Publisher. Available at: URL [Accessed Date].

Brookes, M., 2005. *The Matrix Reference Manual* [online]. Imperial College, London. Available at: http://www.ee.ic.ac.uk/hp/staff/dmb/matrix/intro.html [Accessed 8 July 2006].

Often the author and date will not be available. Where this is the case, then the citation in the main text should take the form of a tag which clearly identifies the correct reference in the bibliography, e.g. for a World-Wide Web reference for which the author is not known, the citation could take the form (WWWn) where n are consecutive numbers.

Dodd, T.J., 2006. *An Introduction to Report Writing*. ACS172: Introduction to Aerospace Design, Aerospace Engineering, The University of Sheffield.

You are strongly recommended to consult a booklet entitled ‘Citing References’ by David Fisher & Terry Harrison, which is available from Blackwells Bookshop, Mappin Street, and costs £1. A copy is available in the Aerospace Office (for inspection purposes, but not for loan).

Before starting to reference, you should ensure you read Appendix 4 in the Aerospace Engineering Individual Investigative Project handbook on unfair means. If you are in any doubt whatsoever about what, or how, to reference, you must consult your project supervisor.

**Appendix 1: Information on Appendices**

Appendices may be provided to include further details of results, mathematical derivations, certain illustrative parts of program code (e.g. class interfaces), user documentation, log of project milestones.  In particular, if there are technical details of the work done that might be useful to others who wish to build on this work, but that are not sufficiently important to the project as a whole to justify being discussed in the main body of the dissertation, then they should be included as appendices.

**Note:** Any appendices do not count towards the word length, but equally they are not treated as part of the dissertation for the purposes of assessing it.  In other words, there is **no expectation** that the examiners should read the appendices as part of the assessment process.  Hence, it is important that any material which will be significant to judging the quality of the dissertation or of the project as a whole should be in the main body of the dissertation, and not in appendices.