

Guidelines for Honours Projects

Department of Computer Science
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1. Introduction

We'd like to give you some hints on carrying out your honours project. The most important one is: *Consult your Supervisor, regularly!*

The Supervisor's Role

The supervisor guides the project work. The supervisor, together with the second reader mark the project proposal and make sure that the team's project proposal is feasible and at the right level for honours. It also has to be clear that each student's work can stand by itself as an honours level project. This is moderated by the entire academic staff of the Department at the honours proposal presentation.

During the course of the project the supervisor will advise you on executing the work and what to do in the case of difficulties.

When it comes to the report the supervisor can generally be expected to provide detailed comments on a selected draft chapter. Your supervisor will also be willing to read through a draft of the final report and provide either verbal or written feedback. Such requirements for feedback must be scheduled in advance (as part of the project plan) and you can expect feedback within a week; you cannot expect a response within 24 hours. For details on how the report is marked please see the separate "Honours Project Report Assessment" document.

The Student's Role

Complete tasks on time and to plan; ensure that the work of the group is coordinated and up to date.

Part of the idea with the honours project is to teach you project and people management skills. Your group will meet regularly with your supervisor and as needed with any outside client. The meetings will be chaired and minuted by members of the group in rotation. The project group should also schedule their own meetings and minute them as well. The agenda should cover progress on agreed actions, new action points and specific issues to raise with your supervisor. Minutes include a record of attendance.

It is a good idea to create your project website early and place all your documentation on that site. Keep the minutes of meetings on the Web site as well.

1.1 Problems

Discuss issues with your supervisor in the first place. You can also approach the second reader assigned to the project. If this does not resolve the issue you can take the matter to the honours course coordinator, your class representative or the head of department.

1.2 Major Deliverables

There are four major deliverables due at the end of the year for your honours project. The most important is undoubtedly the *Honours Project Report* (see Section 2 below). After you have submitted your project report you will submit three other assignments: a zip file of the Project Web pages for archiving; both individual and group pages (see Section 3), a Poster for the group project (Section 4), and a Self Reflection Report (Section 5).

2. The Honours Project Report

A couple of maxims, especially for coders who do not like writing:

"If you don't write it in your report, it didn't happen".

You will get credit even for mistakes if lessons learnt are described. It is unlikely that you will recall the lessons learnt during the project if you do not take notes along the way (see Section 5.1).

“Describe your system in a top-down fashion”

Most programmers program bottom up (whatever they might be told), however this is the worst way to describe a system. First describe things at the highest level and then work your way down: you *can* do it!

2.1 Format for Honours Project Reports

This section only discusses the appearance of the report. For further information refer to your lectures in Research Methods and *consult your supervisor*. You will be asked to hand-in *two* bound printed copies — a plastic ring binding is fine, and you might want to make a third copy for yourself. An electronic copy must also be placed on your project web page.

Please make sure that you have discussed the weightings you want to give to the various marking categories with your supervisor and that these weights are given on the cover as required.

All honours project reports must be prepared in the following sequence:

1. Front cover (clear plastic sheet)
2. Title page
3. Abstract
4. Acknowledgment page (if any)
5. Table of contents
6. List of Figures (and perhaps list of tables)
7. Main report, numbered from page 1.
8. References: Please use ACM or other recognized style (e.g., Harvard APA) for references.
9. Appendices
10. Back hard cover

The total length of the main report should be between 35–50 pages and must not exceed 55 A4 pages (or about 30 000 words). The report should include only relevant material. Including only enough detail shows you have learnt how to distinguish the important issues from the trivial ones. The text of the main report should be single spaced, with a font size of at least 11 pts. Use at least a 2.5 cm margin on all sides of the pages. Please use “styles” for formatting if you are using a word processing package (such as MS Word [2][3][4]) to ensure consistency (or use LaTeX).

Appendices (such as test results) should be kept short and bound together with the main report. If needed a CD can be added to the report to show multi-media output or code and will be treated as an Appendix to the report. However, if your project requires documents such as user manuals, programmer manuals and bulky data dictionaries, these should be bound separately. Please consult your supervisor if you are unsure what you should include in the main report and appendices.

Title Page

At the top you should put “Honours Project Report”. A third of the way down the page put the title of the project in a larger bold font, your name below that, then “Supervised by” and your supervisor(s).

Below this put the following table describing the mark breakdown that you have chosen as follows (replacing the ‘?’ by the weights you have chosen):

	Category	Min	Max	Chosen
1	Requirement Analysis and Design	0	20	?
2	Theoretical Analysis	0	25	?
3	Experiment Design and Execution	0	20	?
4	System Development and Implementation	0	15	?
5	Results, Findings and Conclusion	10	20	?
6	Aim Formulation and Background Work	10	15	?
7	Quality of Report Writing and Presentation	10		10
8	Adherence to Project Proposal and Quality of Deliverables	10		10
9	Overall General Project Evaluation	0	10	?
Total marks		80		80

Towards the bottom of the page put “Department of Computer Science”, “University of Cape Town” and the year. All the text should be centred.

Abstract Page

The next page is titled Abstract and has the abstract of the report of between 200 and 300 words.

Below the abstract please list the documents and other deliverables that comprise the full report (such as manuals and guides).

3. Web Pages

Your project Web pages contain material relevant to the project as a whole and to your individual contribution to the project. The Web site must be self-contained with relative links only. Web sites must be completely static — this means no PHP, ASP, server-side JS or any such scripts. If your project is a web-accessible application, you must add an absolute link from the project Web site to the Web application, labelling it as a non-permanent external link. Please be sparing with external links and only link to well-established sites that are likely to remain for a long time.

The entry point to the project is the project (group) Web page. This must indicate the accomplishments of the project and have the documents produced jointly by the team (like the project proposal). In future this will be the first impression people get of the work you did for your honours project. The main entry page must be called *index.html* and must be located in the root directory of the website.

Individual Web sites are a statement of the work of the individual. A mark is assigned for this when the Web pages are evaluated. All supporting documentation must be part of each Web site. Document files must be in a portable format (e.g., PDF, HTML), with Microsoft Word and LaTeX files converted as needed. Source code should be linked into Web pages as compressed archives.

Submitting your Web pages for archiving and evaluation

All Web sites must be packaged and submitted along with other documents for archival purposes. The final submission must be a single ZIP file containing all files for all members of the project, named by an underscore-separated list of the project abbreviation and the last names of the students involved (e.g., fooproj_jones_smith_baker.zip).

To submit your website, place the ZIP file in a web-accessible location and send the URL of the ZIP file to hussein@cs.uct.ac.za, by the indicated deadline.

3.1 Project Web Site Marksheet

An individual mark is given for each student.

Content	<i>How informative is content?</i>	Project goals	5
		Results	5
		Context/background	5
	<i>Information organization</i>	Logical flow	5
	<i>Relevance/completeness</i>	Additional resources	5
		PDF project docs	5
Layout	<i>Techniques</i>	Style sheets etc	5
	<i>Coherence/Navigability</i>		5
	<i>Completeness</i>	Links all functional etc	5
	<i>Standards Conformance</i>	W3 compliant etc	5
Total			50

4. Poster

The purpose of the poster is to interest the observer in your work. It should allow the audience to see the theme of your project quickly and grasp your intended message. It should act as an abstract of your project; not that it uses exactly those words, but rather that it is a synopsis that draws on the most significant achievement in the work your team has done. Discuss the theme of your poster with your project supervisor. The poster must gain a person's attention, hold it, and inform them. Ultimately they should be inspired to read the reports.

Poster Size

The size of paper required for your poster is A1 (840 mm × 594 mm) in portrait layout. Your poster must fit the rails provided in the lab. Please do not use a non-standard size.

Size of Text

Text on a poster must be legible from 2 metres away. Pages of typed text will reduce the legibility and your ability to attract the observer.

Based on this, the minimum size you should use is about 30pt — in general the larger the better. Headings should be larger, say 45pt or more. The title should be at least 50mm high (with a maximum size of about 100 mm). Graphs and charts should be at least A4 size or larger.

Colours and Contents

The poster should adopt a coherent colour scheme (for example, you may make use of the UCT colours —white background with black and powder-blue text, take a look at www.uct.ac.za). The poster should also contain the University Crest, Departmental Logo and contact details in the footer. List the team members and supervisor(s) on the poster!

Use headlines, bullet lists, charts, figures, tables, equations, and photographs to highlight the important technical content.

Plan your Layout

The poster must have a clear flow that draws the eye of the observer in the direction required. This is to indicate to the viewer a logical progression through your presentation. Use arrows and colour to suggest flow to the observer, you may even number your posted material in sequence. Avoid having too many small 'bits' on your poster since that will make it cluttered and spoil its impact.

Make a mock up with pieces of paper. Test the flow. Make sure it is legible.

4.1 Poster Check List

Check for yourself how well your poster fares under the following topics. To get a feel for the process, evaluate the posters that were produced last year — they are up on the walls in the Honours lab.

A poster must:

- Attract attention;
- Hold attention;
- Be informative;
- Have the correct level of detail;
- Have a message.

Technical aspects include:

- Appropriate use of colour;
- Text readable from 2m;
- Well planned logical layout with good flow; indication of flow using colour, arrows, etc.;

4.2 Poster Production

If you do not have a specialized layout package then MS PowerPoint or OpenOffice Impress is a good choice as a poster creation tool.

Please use standard fonts (they were specifically designed to be readable!). Titles and headings are best set out using a sans-serif bold font such as Helvetica or Arial and serif fonts such as Times or Garamond are better suited for body text.

Remember that the final page size is A1 (and please leave at least 25 mm border). If you work in that file size then images can be at 150 dpi. If you work on smaller file sizes then the images must be at an equivalently higher resolution. Jpeg is not a good compression scheme if you are going to enlarge the images, use tiff instead.

Printing and laminating a poster will take about 5 days — have everything ready on time. The Department arranges and pays for printing and lamination. Give your file an appropriate name using your project abbreviation (*not* poster.ppt). You should also provide a pdf version of the poster that can be used as a proof copy.

4.3 Poster Marksheet

A single mark is given for the whole group.

Scale 0-5 (0=very poor; 5=very good).	5 max
Appearance	
Attracts viewer's attention (overall impression: sloppy → pleasant → stunning)	
Balance: white space (lots is good), Text vs. Graphics (too much / too little text), use of colour	
Text Size. Can be viewed 1.5-2 metres away (main text only or all text incl annotations in figures?)	
Flow: lost in solid mass/scattered bits → kind of builds argument → well organized, logical and easy to move through poster	
Content	
Identification: Title, author, supervisor, department & university, contact details	
Objectives: can't find → buried → explicit	
Main Point: can't find → there but not obvious → clear	
Detail: Waffle → nothing unnecessary	
Conclusion: absent → implicit → has good "summary"/"conclusion"/"results" section	
Overall: worthless → OK → really good	
Total (/50)	

5. Reflection on the Honours Project

After completing your honours project we would like you to stand back and think about what happened and what you got out of doing it. We expect this to be based partly on the notebook that you are encouraged to keep. You may write about whatever seems important to you about the project. You can relate the project to the honours course as a whole (or even your experience of doing Computer Science over the past four years) but the marks will be based on your insight into the impact of the project on you. Sometimes students use the reflection paper to *justify* what they did in the project, but doing this is to misunderstand the aim of the reflection paper. The aim is to show an understanding of what happened.

Reflecting on the Reflection Paper (!)

This final assignment is an invitation to mature reflection. If you have not yet had much experience of reflection then this is an exercise to encourage that. There is no right or wrong, the marks are for depth and breadth of insight gleaned.

You will have been through an important and intense experience. Some of the things that happened were good and others bad. By reflecting on these, you can sort out what was important; what was due to you; what was due to others; what good things should be retained and nurtured; what bad things should be addressed. The idea is that, by reflecting on the experience, some (life) lessons get sorted and fixed. It is an important step in maturing as a computer scientist.

5.1 Notebook

In order to produce this report you are strongly encouraged to keep a notebook or logbook (or possibly, if you want to go public, a blog on your Web site). Many supervisors will however insist on your keeping an A5 notebook.

The notebook is a tool for managing your work. In this notebook you will make notes of meetings (for later conversion to minutes if that is your task) and notes and ideas on further actions agreed. All agreed deadline dates will be recorded in the notebook. As you start building and testing your system it will become a detailed working record, with bugs found and solved, interesting references found, sketches and graphs, experimental results, ideas for analysis etc.

You will also use the book to record inspirations and ideas — your own and ones you got from others. Comment on your own progress in the book. This commentary includes things you learnt as well as forming a kind of diary of how the group worked.

The notebook will be an invaluable aid when you come to write the final report and especially the self-reflection report. It will allow you to show others how you worked on the project and it will show yourself how you progressed.

5.2 Assignment: Reflection on the Honours Project

After completing your honours project we would like you to reflect on the process of doing the project and the impact it has had on you. You are encouraged to write about what seems important to you about the project. As a starting point you might want to think about the most important thing that you would have liked to do differently.

Please provide your report with a suitable introduction. The report has to have an overall flow and be logically and coherently constructed. It needs a conclusion that is an overall critical evaluation of the honours project process. Your complete self-evaluation should be about three pages long.

We would like you to cover the following topics explicitly:

Computer Science

1. What have you learnt from doing the project, both in terms of specific knowledge but also in terms of integration of knowledge areas that may have seemed disconnected before.
2. What have you discovered about the actual practice of doing Computer Science — meaning, how ones goes about it? This can involve systems development, scientific experimentation, mathematical investigation, designing algorithms or designing usable devices, or one of the many other ways in which we are creative in computing.

How did things come together when you had to use your knowledge in a big project?

Project Management

3. Did you meet the goals you set for the project? If there are differences, how justified were they? Do you think you did all it took to get the project done? Was it a good quality deliverable?
4. Were your skills and those in your team adequate for the project in the end?
5. How successful were you at managing the project and keeping the planning up to date? Did you set the right priorities?

People

6. What was it like working in a team? What worked and what would you like to tackle differently next time? Were you a good and reliable team player?
7. Was there an external client for the project? Or a user group that had to be satisfied? What was it like trying to balance their demands?
8. What guidance did you receive and what useful habits have you picked up from your supervisor?

Project Impact

9. Did any ethical issues or issues relating to professionalism arise while you were doing the project? How were they dealt with and were these anticipated at the start?
10. If your project produced some prototype or other form of Intellectual Property, have you considered how it might be deployed or developed further? Are there plans for commercializing the outcome?
11. Are you going to write up the project as a scientific paper? Are you considering taking the research further, perhaps as a master's study?

5.3 Marking the Reflection Paper

Marking this paper is not simple as the papers differ a great deal. Marks are given if you express an opinion based on reflection on what happened. The paper is marked by the second reader and the marks moderated by the honours coordinator who goes through all of them.

The markers are asked to assess the depth of reflection in the following areas:

1. Computer Science (learnt from project): knowledge, integration of knowledge, practice of doing CS;
2. Project Management: goals met, team skills, management success;
3. People: how did team work go?, any clients?, supervision;

4. Project Impact: ethics, prototype or IP/commercialization, research;
5. Conclusion: overall critical evaluation of the honours project process.

In each they are asked to give a mark as follows: 0 – no evidence of reflection; 1 – very superficial; 2 – some interesting insights; 3 – overall integrative insight; 4 – good reflective depth; 5 – excellent and useful insight.

6. Finally

You can have a look at past honours projects on the Department's document repository (pubs.cs.uct.ac.za/honsproj).

Doing your honours project can be the most rewarding part of the past four years spent at University. We will do all we can to ensure that this is so.

Identifying and Rescuing a Failing Project

Occasionally things go wrong with the process, we have already indicated in the introduction who you can contact in that case (Section 1.1). The most important thing is to acknowledge that problems exist early and act to correct them.

One early way to see that things are going wrong is to notice that you are falling behind on your project plan. Another warning sign is destructive relations between group members. There may be a feeling that some people are not doing their part or that one person is acting as a loner.

In all such cases you must raise this with your supervisor who must then act as facilitator for the group and who may call in the second reader or other colleagues to assist. Possible solutions may include revising the project scope, changing work allocation, setting further intermediate milestones, team building, and so forth.

Bibliography

- [1] A Guide to Learning Engineering Through Projects. PBLE: Project Based Learning in Engineering. University of Nottingham. www.pble.ac.uk November 2003.
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- [3] Understanding Styles in Microsoft Word: addbalance.com/usersguide/styles.htm
- [4] Style basics in Word: office.microsoft.com/en-us/word/HA102308821033.aspx?WT.mc_id=42