School of Computer Science and Applied Mathematics
UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

General Guides for COMS Honours Research Report

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Contents

1 Submissions

Important dates [1]

- **Date_1** – Submission of research report: **14:00 pm, Monday, November 13, 2017**.
- **Date_2** – Poster presentation and demonstration (Innovation Day): **9:00 am – 15:00 pm, Friday, November 24, 2017**.

Submission of report

- A hard copy of your report must be placed in the designated submission box by Date_1.
- The hard copy must be printed double sided except the title page, declaration, abstract and acknowledgement (if applicable).
- An electronic copy of your report, together with any supporting documents, must be sent to Hairong Wang (`hairong.bau@wits.ac.za`) by Date_1. The electronic copies will be retained for external examiners when applicable.
- An electronic copy of your poster must be submitted by 9:00 am, Friday, November 24, 2017.
- Any student who submits her/his report or poster late without a formal extension granted by the school will be penalized.
- Failure to present on Innovation Day will result in the presentation mark to be zero.

Further information will be communicated regarding the Innovation Day.

[1] These are subject to change on occurrence of unforeseen incident such as disruptions of the normal academic activities at the university.

2 Honours Research Report Writing

Research report is the main piece of work comprising all aspects of a student's research project during the time period of Honours study. It has the bulk of weight (70%) towards the final mark for evaluating students' research skills. A few reminders are put as follows.

1. Include the following in your report.

   Title page (see the template)

   Declaration page (see the template)

   Abstract: A summary of your research that can stand alone, with a focus on what you did!

   Acknowledgements If applicable.

   Table of contents

   Introduction: Include research problem motivation; very brief summaries of key literatures that lead to your research problem; clear statement of research problem/question/hypotheses; clear statement of research aim/objective; summary of methodology and results. You may view the introduction as a miniature of the whole report.

   Background or related work: This should be brief, since an extensive literature survey is already done in your proposal earlier.

   Methods: Detailed descriptions of techniques used and the source materials. The primary goal of this section (or chapter) is to provide detailed information on your research methods, so that one can reproduce your results.

   Results and discussion: Experimental setup, data, proper presentations of the results using tables, figures etc. Arguably, methodology and results are the most important part of your report which should comprise 60% – 80% of it. Very importantly, give discussions on your results. How do you interpret the results? How do they relate to your research problem/question/hypotheses?

   Conclusion: What conclusions can be drawn from your findings? To what extent the set research objectives are achieved? Future work? Recommendations? and so on.

   References

   Appendix: If applicable.

2. **Writing in a standard report style is encouraged. See the provided template of a report, including the title, declaration pages which should be used as standards.**

3. Writing in a paper style is optional. The template for IEEE paper style is provided, including the title and declaration pages that must be included.

4. In scientific writing, a concise, precise, and clear sentence is much more preferred than a lengthy, vague, and ambiguous one. That is, a prolonged report is not necessarily a good report, especially if your own work is only about 5-10% of that whole report.

5. In general, aim at producing a clear, concise, correct, and complete report. The logical flow in a report is the key. To put it simply, a main line of thought should be supported and grown throughout the report. If a reader follows this kind of sensible flow, at the end, she/he will have a total understanding of what is the report about.

6. **For a reasonable research outcome at Honours level, a report of 5000 – 8000 words is appropriate**. For the standard report style, using 11pt, single spacing, margin of 2.5cm, 12 – 20 pages (excluding the title page, table of contents, references, declaration etc.), are OK. If you are writing your report using paper style, and using 10pt, single spacing, then 5 – 8 pages (excluding the references, declaration etc.) are OK. I strongly encourage you to put your report well within the limit.

7. Put the figures, tables, diagrams in an appropriate scale, that is, not too big or small.

8. **PROOF READING!!** Before the submission, you must read carefully your completed report (or paper) to eliminate as much as possible the spelling mistakes, wrong grammars etc.

9. Two templates, for standard report and IEEE paper, are provided for reference. Start from the file `main.tex` for each style.

10. A document titled 'Style guides for Theses, Dissertations and Research Reports' from the Faculty of Science, Wits University is also given as a reference. However, this document is intended primarily for MSc level and above.

3 Poster Presentations at CSAM Innovation Day

Poster is a good medium for students to present their research work and meet with attendees for presentations, discussions at various levels from introductory to in-depth technical ones. It is important that you display your work clearly and interestingly.

Please refer to the following few guidelines in the preparation of your poster:

- Cover only the key points. Do not attempt to include everything. Key points may cover a brief introduction for the purpose of showing the motivation, or relevance of your research; the main research problem or hypotheses; the methodology; the results and analysis (usually the biggest section); and a short conclusion. You can also include a few main references.

- If it is possible, use pictures, tables, diagrams, figures, cartoons etc. to convey your message instead of using words. However, keep in mind that this is an academic work display, and being concise and precise is paramount.

- It is common that the flow of a poster should be from top left to bottom right. Use arrows, colour highlights to guide your readers to follow the work flow easily. The fonts, figures, pictures etc. must be visible from some distance (1.5m to 2.0m).

- In addition to your poster, prepare a short, 3 to 5 minutes, presentation (basically a short talk) that you can give periodically to those people who might be interested in your work.

- Finally, a good poster is self explanatory.

4 What will an assessor look for in your report?

The major objective of Honours research project is to develop research skills in students. Such skills — critical thinking, innovation, problem solving, effective communication, analyse and summarize vast amount of information . . . — are invaluable in the various sectors of our society.

As the primary assessor of your research report, your supervisor(s) should know your research ability best. For them, it is almost a year long process of the conjunction of advising and assessing of your work. Thus, communication with your supervisor(s) is important. Consult with your supervisor(s) regularly; discuss with them the problems or challenges; find solutions to these issues timely; and so on. This process from your side is indicative of your approach in research work, and through this activity, one can judge the development of your research skills. Note that a good problem solving approach is relevant beyond the research work.

In an Honours student's research report, an examiner looks for the justification of merits from the following.

- Has the student justified the validity of the research problem/question/hypotheses that she/he proposed?
- Are the research problem/question/hypotheses and the research aim/objectives clearly stated?
- Has the student demonstrated good judgement and understanding of the methodology being used, and any limitations of that methodology?
- To what extent the literature resources, especially the key ones, are utilized? Are they appeared merely as summary, or well integrated into the student's research?
- Has the student demonstrated good judgement and understanding in the areas of data selection or collection, data analysis, interpretation of results?
- Is the student aware of the limitations of their experiments and factors which might have influenced the results?
- Has the student demonstrated ability to summarise, analyse and describe his/her results?
- Is it evident that the student has a certain (very high, high, moderate, poor) degree of insight and critical thinking in relation to the issues dealt with in her/his work?
- Is there a certain (very high, high, moderate, no) degree of originality in the student's work? Any interesting ideas?
- Do the experiments support the original hypothesis – if not, why not; Does the student suggest alternative hypotheses?
- Alternatively, if a student's work is primarily developing an application,
  - Has the student demonstrated certain degree of problem solving skills?
  - Has the student taken into consideration various advanced software design, developing techniques? Is there a good strategy to test the application?
  - Has the application demonstrated certain degree of commercial applicability?
  - Is it evident that the student has taken care of the quality of the application in various aspects such as robustness, scalability, efficiency etc.?
  - Is the student aware of any challenge still exists in solving the current problem? If yes, does the student have any solution to overcome it?
- Is the document structure well set? Is the report clear, comprehensive, and well written? Are the citations and references proper?

Well, beyond all these fine segments, never forget that the ultimate goal of all our endeavours is about innovation and breaking the barriers. Thus, the good research for us is to make contributions in advancing the science.