Writing a Science Master's Dissertation

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Part I

Rules, Regulations, Admin

Rules and Regulations

- https://www.aber.ac.uk/en/regulations/modular-masters/
- In the event of discrepancy, the online rules and regulations supersede anything written in these overheads.

MSc Project and Dissertation

- A 60 credit module
- So about 600 hours work
- 15,000 word limit
- Methods and results of a research project, but not required to make an 'original contribution to learning'

Dissertation Content

Modular Master's Degrees

- Title page
- Statements and declaration
- Acknowledgements
- Abstract – max. 300 words
- Table of contents
- The main body of the dissertation
- Bibliography

Title Page

- Title of the project
- The fact that it was submitted for a particular degree at Aberystwyth
- The name of the author
- The name of the supervisor

Abstract

- Stands alone as a very short version of the dissertation
- The abstract should
  - State the scope and principal objectives of the project
  - Describe the methods
  - Summarize the results
  - State the principal conclusions

Acknowledgements

- Brief statement of thanks to those who have helped
- Customary but not obligatory

Table of Contents

- Usually only list the chapters and sections within the chapter – not the subsections

Bibliography

- A list of the books, articles, technical reports, company literature, web sites from which information was gathered
- Usually at the end of the main text of the dissertation
- Should enable readers to locate the documents themselves
- More later on citation, referencing and formatting

Presentation

- Depends on the degree and the department
- Electronic submission for Computer Science
- Check with your supervisor

Part 2

The body of the dissertation

The project shows that you can

- Bring together knowledge that you have acquired from taught modules
- Carry out a substantial task
- Use the professional and academic literature to extend your knowledge to meet the challenges of the project
- Critically evaluate other people's work and your own

The body of the dissertation

- Introduction – leading to project aims and objectives
- Literature review
- Reporting on the project – the core chapters
- Discussion
- Conclusion

The Introduction

- What problem was tackled
- Why was that problem tackled
- How (in outline) was the problem tackled
- Clear statement of project aim and objectives
- Guide to subsequent chapters
- Usually drafted early, and finalized last

Literature Review

- What related knowledge are you building on?
- Similar products
- Related research
- Use your own words
- Show the relevance of what's included to your project aim
- The literature review will refer extensively to the bibliography

Different kinds of sources

- Research papers
- Books
- Web pages
- Technical documents
- Standards documents
- User manuals

Citation and References

- Check style required by your own department
- Common styles include Harvard (author, date) and IEEE
- Others are possible
- Tools let you switch styles

Harvard citation style

- In the text (the citation):
  - '… (Jones, 2010)' or '… as described by Jones (2010)'
- In the bibliography:
  - Jones, I.W., (2010) 'New kinds of red ink', *Inky Journal of Pigments,* Poppleton University Press, vol 336, no. 5, pp 55-58

IEEE citation style

- In the text (the citation):
  - '… [7]' or '… as described by Jones [7]'
- In the bibliography:
  - [7] Jones, I.W., 'New kinds of red ink', *Inky Journal of Pigments,* Poppleton University Press, vol 336, no. 5, pp 55-58, March 2010

Managing your bibliography

- Use a bibliography tool
  - Like BibTeX
  - or Endnote
  - or any other suitable tool of your choice
- Do start building up some bibliographies right away
- Use https://primo.aber.ac.uk/ to obtain references

The core chapters

- These depend very much on the kind of project you undertake
- Some different kinds of project
  - Design and build
  - Research, investigative project
  - Theoretical project
  - Survey

Design and Build

- The most usual kind of project
- Arrangement of core chapters will depend on the process followed
- But they will address analysis, design (both overview and detail), implementation and testing
- Should provide enough information so that the reader could repeat the development process

Research/Investigative Project

- Identify a research question
- Formulate a hypothesis
- Design a way to test the hypothesis
- (Think about different investigative methods)
- Carry out the test(s)
- Document the results
- Reflect on what has been achieved

Theoretical Project

- Introduce concepts with suitable examples
- Investigate further examples
- Make and test conjectures
- Develop theorems and proofs
- Evaluate the results
- Consider possible applications

Critical Evaluation

- Discussion, leading to conclusion
- Examiners view this as very important
- Shows that you can not only carry out a substantial piece of work, but that you can reflect on it, and think critically about how you might have done it better
- Essential part of a master's degree

Part 3

Academic Crimes

Two kinds of Academic Misconduct (there are others)

- Plagiarism
- Falsification of results
- University regulation on unacceptable academic practice
  - https://www.aber.ac.uk/en/regulations/uap/

Plagiarism

- Passing off the work or ideas of others as one's own
- Unattributed quotation
- Copying without acknowledgement
- Copying and then trying to disguise the copy by replacing words and phrases (aka *sinister buttocks*)
- Submission of joint work as individual work
- Unacceptable Academic Practice

To avoid plagiarism

- Make sure your bibliography is complete
- Surround all direct quotations with inverted commas and cite the precise source
- Use quotations sparingly
- Never remove annotation that identifies the original author of code or design materials that you are using or modifying
- Consult your supervisor

Falsification of results

- Claiming to have obtained results or evidence that you have not in fact obtained
- Inventing questionnaire responses
- Falsifying test results
- Adding a few points to a graph
- Claiming falsely that you have completed an experiment
- Just don't do it!

Part 4

Summary and Conclusion

We have looked at

- Rules and regulations, admin. details
- The core of the project
- Academic misconduct and how to avoid it

The project is a major learning opportunity

- Brings everything you have learnt together
- Allows you to study the relevant literature in depth
- Allows you to tackle an interesting piece of academic work
- And to hone your critical thinking skills
- Allows you to write a substantial academic document

Enjoy your project and dissertation