

Honours in the School of Computing

Introduction

Students who have completed three years of their undergraduate degree program, or equivalent, and who have attained at least 65% average in their third year, results are eligible to apply for admission into an additional Honours year of study. The purpose of this additional year is to enable the student to pursue specific areas of Computer Science in depth and to expand their knowledge and skill-base for careers in industry, or for those who wish to proceed to a higher degree.

Honours is the main pathway for students who wish to pursue post-graduate research degrees - Masters or PhDs - in all major universities, including Curtin. Such degrees are also becoming more important for careers in public and private research organisations and the computer industry.

For all the above reasons, the Honours year is strongly recommended to all students who qualify.

Course Overview

The Honours programme in the School of Computing is distinguished by its focus on the research project (resulting in a dissertation) which is worth 100 credit points. The remaining 100 credits consist of only four units, one of which is compulsory and bears directly on the purpose of the Honours year. The other three units are electives and may be chosen according to the student's interests. However, as shown below, some constraints apply. The choice of the electives must be sanctioned by the Course Controller or Head of School.

Normally the Honours year runs from January to December which means continuous education for home students. Under some circumstances students who have completed their three year undergraduate degree 6 months out of phase may be allowed to continue their Honours year out of phase. This is only allowed in exceptional circumstances. For example a student from the northern hemisphere where degree and school courses run out of phase with Australia may be admitted to Honours out of phase. Unless there are exceptional circumstances a person who fails to complete their degree in minimum time is not allowed into the Honours programme.

Graduation is normally in the semester following completion of the Honours year.

Unit Descriptions

The major component of the Honours year is the research project. The compulsory unit Scientific Research Methods 451 covers research training and consist of numerous topics such as how to search for information, fraud, ethics, writing large documents, philosophy of science etc. The other three units are chosen by the student from a pool of recommended units and can be related to the project. There is a certain amount of flexibility in the choice of these two units. However they must be of honours level standard.

Dissertation: Research Project

This constitutes the single major component of the course and is intended to expose students to the processes involved in developing research projects as typically occur in university, research institute or industrial domains. Honours dissertations are also viewed as a real opportunity for the student to conduct individual research: to develop their own ideas, to pursue topics which interest them and to learn new skills and appreciate new knowledge not typically available in the undergraduate courses.

Care should be taken by those students who propose to do a project with a strong industrial emphasis and particularly those which are actually based in industry. It must be remembered that the same criteria are used to evaluate this type of work as are used in the School-based projects. That is, for all projects students must take care to apply the appropriate research methods, analysis and critical evaluation techniques.

Creativity is highly valued and students should be aware that direct implementations of standard procedures is not necessarily the best type of project to become involved in. However, novel applications of well-known algorithms are seen as highly appropriate. The student must display evidence of critical thought in their dissertation. See the section on assessment below for more details on the requirements for Honours Dissertations.

In all cases students should be aware of the limitations of time, equipment and their own knowledge/skill base before and during the project.

Choosing a dissertation topic

This is of utmost importance. Students have to balance interests with available staff skills and computing equipment. They also have to be aware or become aware of what is regarded as substantive in their interest area and so should combine their own knowledge with that of the supervisor to arrive at a solid, practical project which retains their interest and creativity.

For these reasons the choice of supervisors is most important and students are advised to read carefully the descriptions of staff research expertise. It has been proved over and over that students who are adamant about what they should do - and against the advice of their supervisors - perform poorly on their projects. Good research usually builds on the past work of others and it is most unlikely that "off-the-cuff" ideas, without any literature to support the proposal, would be fruitful at the Honours level.

Students are also reminded that it is not always the best strategy to choose a supervisor with many students as the Honours work requires a good deal of commitment and knowledge by the supervisor.

Students should discuss interests with possible supervisors over the Summer break and even commence reading in the area during this period. Leaving dissertation selection until well into the semester can be dangerous. Perhaps one of the most difficult aspects of an Honours dissertation is that it has to be completed in a specific time - by the end of the second semester. Computing projects involve many hours of programming and students (following good software engineering management practice) have to include this in their planning. This means that they have to consider down times, etc., and alternate strategies under adverse implementation conditions.

Honours dissertations may result in publications in conference proceedings or even refereed journal papers and we encourage students, even given the above warnings, to aim at a level that occurs in the very literature that has motivated the research.

Deadlines, Responsibilities and Assessment

In order to have objective and equitable evaluation of students, strict adherence to all deadlines is enforced. This means that formal rules for variation of deadlines exist and these include the need for medical certificates, letters from Employers, etc. for any extensions or other forms of special consideration. If students do not submit on the due date and there is no application for special consideration, then the student can be awarded a "Fail" score on that item of work.

All such requests must be made to the Honours Course Controller or Head of School as well as the lecturers/supervisor(s) involved.

Students should be aware that the class of degree awarded is determined by a Board of Examiners which examines the marks for each unit of the course. For a student to get a particular class of degree, the following rules are applied to the unit marks for each degree class. To get a First Class degree the student must obtain:

- greater than or equal to 80% for the dissertation,
- greater than or equal to 80% for the average mark over all units,
- greater than or equal to 80% for at least two of the four coursework units.

The first two rules ensure that the dissertation and the final mark are first class. The third rule allows poor performance in two coursework units to be offset by excellence in the other two. The above rules *may* be modified at the discretion of the Board of Examiners in special circumstances e.g. borderline between Upper Second and First class honours. To obtain an Upper Second, Lower Second or Third Class honours the above numbers are replaced by 65%, 55% and 50% respectively.

The following are the relevant details from the Faculty of Science Guidelines relating to the assessment of Honours Dissertations.

In reporting on the grading of dissertations written after completion of a research project, examiners shall base their recommendations on the extent to which the dissertation demonstrates that a student has:-

- (a) surveyed the literature relevant to the dissertation in a critical and perceptive manner;
- (b) developed adequate skills relating to the gathering and analysis of information, and shown ability to carry out supervised research in a scientific manner; and
- (c) demonstrated a capacity to report on the research in a clear, concise and scientific manner.

Examiners shall have regard to criteria to be met for the different grades of award for the dissertation as follows:

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| First Class: | Evidence that the student has excellent scientific skills; a demonstrated capacity to interpret data and make logical deductions; report approaching publication standard; excellent research potential. |
| Upper Second Class: | Good literature review and presentation of data; interpretation shows some originality; evidence that the student has demonstrable intellectual capacity and research capability. |
| Lower Second Class: | Good presentation and interpretation of data; evidence that the student not demonstrated a capability for originality in research. |

Third Class: Adequate data but poor presentation; no significant interpretation of data; poor general presentation.

Fail: Dissertation deficient in quantity and quality of data; substandard presentation.

The Honours Panel

The progress of the student's project will be monitored by the Honours Panel which consists of Academic Staff and as such represents the Board of Examiners. Duties of the Panel include:

- Approval of the project descriptions.
- Approval of the project proposals.
- Moderation of the dissertation marks.
- Report to the Board of Examiners.

The Panel is used to ensure consistency of assessment throughout the School.

Regulations for the Honours Degree Dissertation

This section details the regulations for the honours dissertation. It includes details of the format of the dissertation including some general advice about how to plan the research and write it up. To give the student an idea of the way the dissertation and project are assessed, see the guide-lines to examiners applicable in the Faculty of Applied Science (see above). There are a number of forms that need to be completed during the course of the year; these are itemised later in this document.

General Points

A number of dates and deadlines are mentioned in this section. These vary from year to year and are available from the School Office.

Consult with appropriate staff in the teaching area in which you wish to study to discuss research topic interests, supervisory capabilities and availability of facilities.

Agree on a clearly defined statement of the objectives of the research indicating its breadth and limits of study, together with the topic of the dissertation.

Submit copies of the Project Dissertation Form to the lecturer in charge and supervisor(s) by the required date. This form will contain the title of the project and a one page short description of the research project detailing resources required.

With your supervisor(s), generate a research plan together with a work plan and time table consistent with the stated duration of the programme.

A formal proposal will be required towards the end of the first semester. This will describe the work you are to perform along with a discussion with references of seminal and relevant work in the research area. The bibliography will contain at least 30 references you have read.

Throughout the period of study, meet with your supervisor(s) on a weekly basis to enable both the supervisor(s) and yourself to assess your progress.

When performing experiments, writing code etc. always bear in mind the need to write a dissertation and make presentations. This will encourage you to make notes, record papers read, take hard copies of results etc. It is a good idea to have a file or notebook for this information.

When writing up discuss the contents and format of the dissertation with your supervisor(s). Generate a draft of the dissertation and submit to the supervisor(s) at the required time. Note that it is not the job of the supervisor(s) to write or proof read the dissertation. However the supervisor(s) will help with the overall structure and advise on what to include.

Two copies of the dissertation must be submitted for examination. These are to be lodged with the Departmental Office together with a Copyright Release form. The date for submission is stated in the UNIT OUTLINE for the particular year of study.

Any corrections required by the examiners must be made and four copies of the corrected dissertation submitted to the Departmental Office, one for the student, one for the supervisor(s), one for the Department and one for the University Library. At least three of these will then be bound at the student's expense (submit the appropriate fee when submitting the four copies) in a form similar to that used for Masters and PhD theses. The student should realise that a good quality bound copy of their dissertation is evidence of a professional attitude to research and suitable to show to prospective employers. At the same time the supervisor(s) may wish to have the fourth copy bound at the department's expense in some form. The date of resubmission will be agreed by the student, supervisor(s) and course controller and must be before the deadline for submission of degree classifications to the University (usually the end of January). Failure to submit the dissertation copies and the

binding fee may result in delayed graduation. The dissertation will be marked in combination with presentations, preliminary reports, work done during the year, etc. as detailed in the UNIT OUTLINE for the dissertation. The outline also defines dates for submission of reports and timetables for presentations.

The contents of the dissertation are in the public domain unless confidentiality is requested e.g. by an outside organisation collaborating in the project through funding, supply of data etc. There are University guidelines for confidentiality that can be obtained from the lecturer in charge.

The length of the dissertation is not fixed as it depends on the type of project. For example a theoretical study may result in less pages than a detailed description of the implementation of algorithms. It is important for the student to realise that the dissertation is assessed on the quality of the content and not the quantity of writing or pages presented. Discuss this with your supervisor(s) and study some of the dissertations produced by past honours students in the School. Note the length of the main body of the dissertation must not exceed 60 pages.

Regulations for the Production of the Dissertation

The dissertation, in fulfilment of the requirements for the honours degree, must be presented in a consistent format and scholarly manner. Many will eventually be cited as references for subsequent research projects both within and outside the University and as teaching references. It is important that during the writing of the dissertation, standard methods of layout and use of references are followed.

If a dissertation requires alteration following examination, it will be returned to the student and the binding fee retained to cover subsequent permanent binding of the altered dissertation. In the event of the dissertation being rejected, it will be returned together with the fee for permanent binding.

A dissertation may need to be made confidential and not released into the public domain. It may contain material and ideas that are patentable or be commercially sensitive as might be the case for an industry based project. In these circumstances, the dissertation is usually made public after two years.

The School recommends the LaTeX typesetting package be used to produce the dissertation. However the student may use any other word or text processing system but should be aware that it may not be supported by the School. The following specifications should be adhered to when setting out the dissertation. It must be produced on good quality bond paper of international A4 size, on only one side of the page with margins of not less than 4.0 centimetres on the left, and 2.5 centimetres on the right, top and bottom of the page. One and a half spacing should be used between lines of text. The content of the thesis should in the order of:

- Cover,
- Title page,
- Table of contents,
- List of figures,
- List of tables,
- Abstract (1 page maximum),
- Preface (include any acknowledgements here),
- Body of the report,
- Bibliography (or Literature Cited), and
- Appendices.

The LaTeX Article document style has many of these sections available and the others are easily defined. The LaTeX files natbib.bst and natbib.sty implement the Harvard bibliography style. A page formatting style file will be supplied by the Course Controller. The following are specific points relating to the format:

- Text pages shall be numbered sequentially starting from page one for the body of the report. Table of contents, list of figures etc. should be numbered using roman numerals: i, ii, iii, iv,...
- The title page on which is set out the student's full name, title of the dissertation, a statement that is "presented as part of the requirements for the award of the Degree of Bachelor of Science (Computer Science) (Honours) of the Curtin University of Technology" and the year. Students are responsible for the correct numbering and collating of the pages.
- Illustrations, diagrams, tables, maps, etc. to be incorporated in the text shall be drawn in ink or computer generated (using drawing packages etc.) and mounted securely on paper of the same size and equivalent weight as that used for the text. Such illustrations etc. shall be clearly numbered and identified, and referred to by these numbers through the text.

- If it is so desired, copies of the dissertation may be prepared by offset lithography or other such printing or duplicating processes as may be approved by the University Librarian for a specific dissertation.
- The Harvard standard must be used for all referencing. This is School policy as defined in the Bibliographic Standard (see Appendix). Exceptions to this may only be approved by the Head of School.
- Source code can be included in the appendices if relevant to the content of the dissertation. It is not recommended to include code just to increase the size of the dissertation. In many cases pseudo code may be more appropriate and understandable. No source code to be included unless fully documented.
- Where a collection of papers is presented, some control numbering shall be imposed by the student in order to establish the correct sequence of papers.
- Papers extracted from journals, books, etc. should be clearly identified with the source, publication and authorship acknowledged.
- Appendices, including computer programs, manuals etc., may be included or submitted as an additional document.

Where a dissertation, in whole or part, comprises materials that cannot be presented in conformity with the above criteria, the student through the supervisor(s) should seek approval for a variation from the Honours Controller to ensure that the materials are prepared in a permanent form with respect to factors such as ink, paper etc. They should also be capable of being secured for purposes of examination and presentation.

Categories of materials likely to fall within the above provisions are:

- Art Works,
- Architectural, Engineering or Design drawings,
- Maps, and
- Photographs.

Where three dimensional objects (sculpture, architectural models, engineering construction etc.) form part of a dissertation submission, their presentation and preservation (if required) is a matter for consultation with the School of Computing. Students are required to inform in writing of the existence, size, nature and location of any such object when presenting their text.

Access to computing and other facilities

Honours students are regarded as members of the School research community and therefore will have access to facilities usually unavailable to undergraduates. Unix workstations will be available for research and document preparation in the appropriate research area. Personal computers may be available for honours student use depending on the demand and availability. There is not, however, not an infinite resource pool. Carefully assess the requirements of your research and the availability of appropriate equipment before you start. Honours students have access to photocopying and laser printing facilities. School policy is that a certain amount of photocopying and laser printer use is free. However excessive use will result in the student being charged for paper, toner etc. on a *pro rata* basis. Usage of these facilities will be logged on an individual basis to achieve this. You are strongly urged to consider whether you really need to print many drafts and photocopy large amounts. Note there are numerous draft printing facilities in the School.