# 754AA Bachelor of Science (Degree with Honours)

<table>
<thead>
<tr>
<th>Year and Campus:</th>
<th>2012 - Parkville</th>
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<tr>
<td>CRICOS Code:</td>
<td>014791D</td>
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<tr>
<td>Fees Information:</td>
<td>Subject EFTSL, Level, Discipline &amp; Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a></td>
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<tr>
<td>Level:</td>
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<tr>
<td>Duration &amp; Credit Points:</td>
<td>100 credit points taken over 12 months full time. This course is available as full or part time.</td>
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<tr>
<td>Coordinator:</td>
<td>Professor Aleks Owczarek</td>
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## Course Overview:

The final intake into this course will be semester 1 2012.

Honours comprises advanced fourth year level coursework and an individual research project designed to extend students' knowledge and skills. In particular, the honours programs offered by the Faculty of Science aim to enable students to define and solve problems relating to their speciality and to conduct research in the field.

Honours graduates possess the skills and qualifications needed to progress to a higher degree such as a Master of Philosophy or Doctor of Philosophy, or to enter the science and technology industries.

The Bachelor of Science (Degree with Honours) (754AA) is only available in four disciplines, namely

- **Computer Science**
- **History and Philosophy of Science**
- **Mathematics and Statistics**
- **Physics**

It is only available to students who have completed a teach-out University of Melbourne undergraduate science degree:

-教出 Bachelor of Science (Course code 755 - final first year intake 2008)
- Bachelor of Arts and Sciences (Course code 113)
- Any formal combined degree where one component is the Bachelor of Science (teach-out degree).

Graduates of the Melbourne Model Bachelor of Science degree (i.e. the New Generation Bachelor of Science) are not eligible to undertake this course.

Graduates of the Melbourne Model Bachelor of Science degree and other graduates interested in Honours should consider the New Generation Bachelor of Science (Degree with Honours) (course code BH-SCI). A range of department/discipline programs is available within that course, but this does not include Computer Science, History and Philosophy of Science, Mathematics and Statistics or Physics.

## Objectives:

Honours is a fourth-year program which gives students the opportunity to draw together previous science or technology studies and focus knowledge, skills and intellect on an exciting piece of original research.

Honours programs are comprised of two components:

- The advanced research project provides student with the chance to use knowledge and technical skills on a research project.
- The advanced coursework component continues the structured education of a student's previous undergraduate studies, increasing knowledge in particular areas of interest or expanding the theoretical basis to pursue research work.
Investing in the additional year at University required to complete Honours provides students with the opportunity to draw together early years of study and adds significant value to students’ resumes. Honours is very different from earlier undergraduate years, allowing and requiring a greater degree of independence and flexibility that will help develop the maturity and skills for transition to employment in a range of occupations and industries or for a research higher degree.

Course Structure & Available Subjects:
The Bachelor of Science (Degree with Honours) program involves the completion of one or more advanced coursework subjects and a research project subject. The relative weighting of these subjects varies between departments.

Advanced coursework subjects may involve fourth year level lectures and tutorials, journal clubs, literature reviews, oral presentations, and other departmental activities. In some departments students enrol in a number of advanced coursework subjects. The research project subject comprises a research project completed under the guidance and supervision of an academic.

Students’ academic transcripts will record a separate result for each advanced coursework subject they undertake as part of the BSc (Honours) course, and the research project subject. Refer to the departmental entries below for more information.

Honours usually involves one year of full-time study between February and November. Some departments offer a two-year part-time honours program and some offer mid-year commencement. Further details are provided in the departmental entries that follow.

Course Requirements
To qualify for the Bachelor of Science (Honours) degree students must:

# pass 100 points at the honours level and
# achieve an overall weighted average of at least 65 percent for their honours studies.

Some departments have hurdle requirements that must also be met.

Students are not allowed to repeat an honours subject/component for which they have received a mark of less than 50 percent.

Majors/Minors/ Specialisations
Department of Computing and Information Systems

The Department of Computing and Information Systems offers the following honours programs:

# Computer science;
# Combined mathematics and statistics/computer science honours program.

Computer science honours program

Overview
The honours program in computer science is designed to:

# provide an introduction to the process and practice of research in computer science;
# enable the acquisition of current research skills in specific areas;
# encourage the development of the ability to think critically and independently;
# consolidate and extend the student’s understanding of a range of aspects of the discipline of computer science; and
# improve oral and written communication skills.

Admission requirements
In addition to satisfying the Faculty of Science entry requirements, students interested in entering the computer science honours program must:

# have completed at least 50 points of Level 3 computer science subjects;
# COMP20004 Discrete Structures;
# have passed at least 25 points of Level 1 mathematics or statistics subjects.

Applications will also be evaluated with regard to prerequisites for Level 4 subjects, strength in areas related to research interests in the department, and overall academic strength.
While 50 points of Level 3 study in computer science is the minimum for entry to BSc (Honours), students should note that the Level 4 subjects offered by the department have individual prerequisites that may not be satisfied by some combinations of 50 points of Level 3 subjects.

**Honours coordinator**
Dr Aaron Harwood

**Duration and commencement of course**
The BSc (Honours) program in computer science can be undertaken on a full-time or part-time basis, commencing in late February. The program requires one year of full-time study, or two years of part-time study.

**Assessment**

**Hurdle assessment requirements**
In addition to the honours degree course requirements, students enrolled in the BSc (Honours) program in Computer Science must pass 100 points of approved subjects, including the Computer Science Research Project, and must have a weighted average mark of at least 65 percent.

Students enrolled in the computer science honours program are also expected to have a satisfactory level of attendance at departmental seminars.

Students will be advised of hurdle requirements for the individual coursework subjects at the commencement of each subject.

**Components of assessment**
Honours comprises a research project subject and five advanced coursework subjects. These subjects with their relative weightings are as follows:

- Computer Science Research Project subject = 37.5 percent
- Advanced Coursework subjects: five at 12.5 points each = 62.5 percent

The final honours grade is the weighted average mark over the 100 points included in these two components.

**Advanced coursework 62.5 points**
Five subjects totalling 62.5 points, consisting of Level 4 or Level 9 subjects taught by the Department, subject to restrictions identical to 384AA Bachelor of Computer Science (Honours). ([384AA](../view/2012/384AA))

Students may also enrol in up to 25 points of subjects at honours or masters level in cognate areas from outside the Department, subject to approval being granted by the Honours Coordinator.

Students are not allowed to enrol in project-based subjects as part of the 62.5 points of advanced coursework subjects. Approval of the Honours Coordinator is required to enrol in each advanced coursework subject.

**Research project**
In addition to the advanced coursework, students must complete a total of 37.5 points of enrolment in the Computer Science Research Project subject. This enrolment can be across more than one semester.

The Computer Science Research Project subject comprises a research report of up to 40 pages (20,000 words) and an oral presentation not exceeding 30 minutes. Students are required to obtain a mark of at least 65 percent in this subject.

**Further information**
If you require further information about this honours program please contact:
Dr Aaron Harwood

Email: comp-hons-coord@unimelb.edu.au ([comp-hons-coord@unimelb.edu.au](mailto:comp-hons-coord@unimelb.edu.au))

Department of History and Philosophy of Science

**History and Philosophy of Science honours program.**

**Overview**
Honours study in History and Philosophy of Science (HPS) provides training at an advanced level in various aspects of the discipline, and prepares students with requisite background to proceed to postgraduate research.
Admission requirements
In addition to satisfying the Faculty of Science entry requirements, students interested in entering the history and philosophy of science honours program need to have completed:

- a minimum of 25 points of HPS subjects at Level 2;
- a minimum of 37.5 points of HPS subjects at Level 3;
- a grade average of H2B across five subjects in HPS at Levels 2 and 3.

Honours coordinator
Dr Kristian Camilleri

Duration and commencement of course
This particular honours program may be undertaken on either a full-time or part-time basis. Students are advised to commence their supervised research projects during the non-instruction periods. Students undertaking part-time study in HPS must complete the HPS thesis over two consecutive semesters.

Assessment
Hurdle assessment requirements
Students must satisfy the honours degree Course requirements.

Components of assessment
Students undertaking Honours in HPS must complete the following:

- HPSC40010 HPS Thesis (37.5 points)
- Five 12.5 point honours subjects in HPS (totalling 62.5 points)

Advanced coursework
The advanced coursework component requires completion of five 12.5 point honours/postgraduate subjects, chosen in consultation with the HPS Honours coordinator. Additional information on advanced coursework subject choices in the honours program in History and Philosophy of Science is available in the equivalent Handbook entry for the program in History and Philosophy of Science (../../view/current/%21BH-ARTS-SPC%2B1019) through the Bachelor of Arts (Degree with Honours).

Thesis
The HPS Thesis subject requires completion of a 12,000 word thesis on an approved topic, carried out under the supervision of a member of the department. Students meet regularly with their supervisor over two consecutive semesters. The thesis is due at the end of the second semester of enrolment.

Further information
For further information about this honours program please contact:
Dr Kristian Camilleri
Email: kcam@unimelb.edu.au

Department of Mathematics and Statistics

Mathematics and statistics honours program
Overview
The honours program in mathematics and statistics is designed to train graduates in advanced mathematics and statistics topics and to provide an opportunity for students to participate in...
research. The program involves completion of an advanced coursework subject and a research project subject.

**Admission requirements**

In addition to satisfying the Faculty of Science entry requirements, students applying for the mathematics and statistics honours program need to have attained an H3 or better in at least four Level 3 mathematics/statistics subjects. Students who do not meet these requirements, but who have achieved very good results in other areas, may be considered for entry to honours on the recommendation of the Head of the Department of Mathematics and Statistics.

**Honours coordinator**

Professor Omar Foda

**Duration and commencement of course**

This particular honours program can be undertaken on a full-time or part-time basis.

**Assessment**

**Hurdle assessment requirements**

Students must satisfy the honours degree course requirements.

**Components of assessment**

Honours comprises a research project subject and advanced coursework component (6 x 12.5 point subjects). These components with their relative weightings are as follows:

- Mathematics and Statistics Research Project subject = 25 percent
- Mathematics and Statistics Advanced Coursework component = 75 percent

**Advanced coursework**

In consultation with the Honours coordinator students should select 6 x 12.5 point subjects from the list of postgraduate level subjects contained in the Handbook entry for the Master of Science (Mathematics and Statistics) ([../../view/current/MC-SCIMAT](http://handbook.unimelb.edu.au/view/current/MC-SCIMAT)). Each of these subjects is one semester in length and comprises 36 contact hours. Full-time students are advised to undertake four postgraduate level subjects in the first semester and two postgraduate level subjects in the second semester.

**Research project**

Honours students are required to conduct research under the supervision of an academic staff member in the department. Intending honours students should approach individual staff members to discuss possible research projects. Information about the Department's research groups and possible supervisors can be found at the following websites respectively:


Any difficulties in reaching decisions about research topics should be discussed with the Honours Coordinator. Preliminary reading should commence in the first month of the program, with the bulk of the project being completed in the second half of the program.

Assessment of the research project will consider: clarity and exposition; mathematical accuracy; mathematical insight displayed; coverage of the field and references, and may be complemented by one or more of the following: description of the application and/or business context; mathematical modelling; presentation and analysis of numerical results.

Honours students will be required to give two seminars before their results are finalised, including one presentation on their research projects towards the end of the program. Honours students should consider themselves a part of the research strength of the department and view departmental seminars as a method of broadening their knowledge. It is therefore expected that students will attend all research seminars in the broad area of their chosen field.

**Further information**

For further information about this honours program please contact the honours coordinator:

Professor Omar Foda

Department of Mathematics and Statistics

Tel: +61 3 8344 5550

**Combined mathematics and statistics/physics honours program**

**Overview**
This honours program is available only in consultation with the honours coordinators of both mathematics/statistics and physics. It is designed to train graduates in advanced mathematics/statistics and physics topics, and to provide an opportunity for students to participate in research.

The program involves completion of an advanced coursework subject and a research project subject.

**Admission requirements**

In addition to satisfying the Faculty of Science entry requirements, students should plan a course of study that is approved by both the mathematics/statistics and physics honours coordinators. An H3 average will be required in the subjects that are prerequisites for the honours level subjects the student plans to study.

Selection into the combined honours program must be endorsed by both departments.

**Honours coordinator**

Professor Omar Foda (Mathematics and Statistics)

Dr Nicole Bell (Physics)

**Duration and commencement of course**

This particular honours program can be undertaken on a full-time or part-time basis commencing at the start of semester one.

**Assessment**

**Hurdle assessment requirements**

Students enrolled in honours need to obtain a minimum of 65 percent for both the research project subject and the advanced coursework subject.

**Components of assessment**

Honours comprises a research project subject and advanced coursework component (6 x 12.5 point subjects). These components with their relative weightings are as follows:

- Mathematics and Statistics and Physics Research Project subject = 25 percent
- Mathematics and Statistics and Physics Advanced Coursework component = 75 percent

**Advanced coursework**

Students should establish with the honours coordinators the relative weighting of each piece of mathematics/statistics or physics work that is required for this subject.

**Research project**

The research project is marked by two examiners appointed by the coordinators. Assessment of the research project will consider: clarity and exposition; mathematical accuracy; mathematical insight displayed; coverage of the field and references, and may be complemented by one or more of the following: description of the application and/or business context; mathematical modelling; presentation and analysis of numerical results.

Students are expected to submit a detailed outline of their research project by the end of their first semester of honours study. They are also required to give two seminars before their results are finalised, including one presentation on their projects towards the end of the program.

Honours students should consider themselves a part of the research strength of the departments and view departmental seminars as a method of broadening their knowledge. They are therefore expected to attend all research seminars in the broad area of their chosen field.

**Further information**

For further information about this honours program please contact:

Professor Omar Foda

Department of Mathematics and Statistics

Tel: +61 3 8344 5550

**Combined mathematics and statistics/computer science honours program**

**Overview**

This honours program is available only in consultation with the honours coordinators of both mathematics/statistics and computer science. It is designed to train graduates in advanced
mathematics/statistics and computer science topics, and to provide an opportunity for students to participate in research. The program involves completion of an advanced coursework subject and a research project subject.

**Admission requirements**

In addition to satisfying the Faculty of Science entry requirements, students should plan a course of study that is approved by both the mathematics/statistics and computer science honours coordinators and have completed the prerequisite subjects with at least an H3 average. Selection into the combined honours program must be endorsed by both departments.

**Honours coordinators**

Professor Omar Foda (Mathematics and Statistics)

Dr Aaron Harwood (Computer Science)

**Duration of course and commencement of course**

This particular honours program can be undertaken on a full-time or part-time basis commencing at the start of semester one.

**Assessment**

**Hurdle assessment requirements**

Students must satisfy the honours degree Course requirements.

**Components of assessment**

Honours comprises a research project subject and advanced coursework component (6 x 12.5 point subjects). These components with their relative weightings are as follows:

- Mathematics and Statistics and Computer Science Research Project subject = 25 percent
- Mathematics and Statistics and Computer Science Advanced Coursework component = 75 percent

**Advanced coursework**

Students should establish, with the honours coordinators, the relative weighting of each piece of mathematics and statistics or computer science work that is required for this subject.

**Research project**

The research project is marked by two examiners appointed by the coordinators. Assessment of the research project will consider: clarity and exposition; mathematical accuracy; mathematical insight displayed; coverage of the field and references, and may be complemented by one or more of the following: description of the application and/or business context; mathematical modelling; presentation and analysis of numerical results.

Students are expected to submit a detailed outline of their research project by the end of their first semester of honours level study. They are also required to give two seminars before their results are finalised, including one presentation towards the end of the program.

Honours students should consider themselves a part of the research strength of the departments and view departmental seminars as a method of broadening their knowledge. They are therefore expected to attend all research seminars in the broad area of their chosen field.

**Further information**

For further information about this honours program please contact:

Professor Omar Foda

Department of Mathematics and Statistics

Tel: +61 3 8344 5550

**School of Physics**

**School of Physics**

The School of Physics offers the following honours programs:

- physics honours program;
- Combined mathematics and statistics/physics honours program

The physics program is described below.

**Physics honours program**
Overview

The honours program in physics is designed to:

# enhance students' knowledge of physics on a broad front and to a professional level, and to allow students to develop their abilities to an international level for all career paths;
# introduce students to current research literature in specialised areas; and
# engage students in their own research by participation in the activities of a research group in the school.
# on completion of the physics honours program, students will be able to:
# demonstrate a knowledge and understanding of physics at a superior level;
# demonstrate an understanding of the process and practice of physics research;
# demonstrate individual and collaborative investigative skills;
# think critically, evaluate information and interpret experimental data and/or theoretical results;
# present research results both orally and in the written form; and
# understand and apply laboratory safety procedures.

Admission requirements

All prospective students are strongly encouraged to consult the School of Physics about admission requirements.

In addition to satisfying the Faculty of Science entry requirements, students interested in entering the physics honours program must have completed the four core Level 3 physics subjects:

# One of 640-321 Quantum Mechanics (Advanced), 640-341 Quantum Mechanics, PHYC300118 Quantum Physics
# Plus one of 640-322 Thermal Physics (Advanced), 640-342 Thermal Physics, PHYC3007 Statistical Physics
# Plus one of 640-323 Electrodynamics (Advanced), 640-343 Electrodynamics, PHYC30016 Electrodynamics
# Plus one of 640-353 Atomic, Molecular and Solid State Physics, PHYC30020 Quantum Systems

PLUS completion of one of the following additional conditions:

1 25 points of Level 3 physics laboratory work; or
2 12.5 points of Level 3 physics laboratory work and 25 points of Level 3 mathematics
   selected from the following: 620-311 Metric Spaces, 620-312 Linear Analysis, 620-321 Algebra, 620-322 Topology, 620-331 Applied Partial Differential Equations, 620-332 Integral Transforms and Asymptotics, [03]620-341 Dynamical Systems and Chaos and 620-342 Industrial and Applied Mathematics (or equivalent mathematics subject offered in 2010 or 2011);
3 12.5 points of Level 2 physics laboratory work and 50 points of Level 3 mathematics

Note that undertaking the third means of satisfying the entry requirements is recommended for only those students with a strong background and genuine interest in mathematics.

The Head of the School of Physics has the discretion to waive any of the above departmental requirements in special cases.

Honours coordinator

Dr Nicole Bell

Duration and commencement of course

This particular honours program can be undertaken on a full-time or part-time basis. The program commences in February and finishes in November.

Assessment

Hurdle assessment requirements

Students must satisfy the honours degree course requirements.

Components of assessment
Honours comprises a research project subject and advanced coursework component (4 x 12.5 point subject). These components with their relative weightings are as follows:

- Physics Research Project subject = 50 percent
- Physics Advanced Coursework component = 50 percent

**Research project**

The research project subject comprises an original, supervised research project (experimental and/or theoretical) in one of the school's current fields: pure and applied nuclear physics (including photonuclear reactions, proton microprobe and microanalysis), gravitation, astrophysics, optics (with light, X-rays, neutrons, atoms), particle physics, atomic physics or solid state physics (including high-resolution electron microscopy and physics of materials). The assessment is based on a written report (main text of the order of 20 pages) and a 15-minute talk on the research done during the year. The talk will be presented to the School of Physics shortly after the report has been submitted.

**Advanced coursework**

All subjects are 12.5 points each. Students must take:

- PHYC90007 Quantum Mechanics

In addition, and in consultation with the Honours coordinator, students should select 3 x 12.5 point discipline subjects from the list of postgraduate level subjects contained in the Handbook entry for the Master of Science (Physics) (/../view/current/MC-SCIPHY)

**Further information**

For further information about this honours program please contact:

Dr Nicole Bell
School of Physics
Email: n.bell@unimelb.edu.au

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**Entry Requirements:**

This course is only available to students who have completed a teach-out University of Melbourne undergraduate science degree:

- teach-out Bachelor of Science (Course code 755 - final first year intake 2008)
- Bachelor of Arts and Sciences (Course code 113)
- Any formal combined degree where one component is the Bachelor of Science (teach-out degree).

Graduates of the Melbourne Model Bachelor of Science degree (i.e. the New Generation Bachelor of Science) are not eligible to undertake this course.

Applicants must satisfy both the Faculty of Science entry requirements and the requirements of the department offering the relevant honours program.

**Faculty of Science entry requirements**

There are two faculty entry requirements which must be satisfied:

1. Admission to the BSc (Honours) requires completion of the teach out Bachelor of Science (755) or Bachelor of Arts and Sciences (113) from the University of Melbourne. The only exception to this is for those applicants currently enrolled in a BSc combined course at the University of Melbourne. These applicants need to have completed at least 300 course points, within which the science requirements of their combined course need to have been satisfied.

2. Graduates of the University of Melbourne must normally have a Science Honours Score of at least 65 percent, see Faculty Honours Score (below).

**Faculty Honours Score**

A Science Honours Score (SHS) is calculated as follows:

1. For graduates of the BSc single degree, their SHS is the weighted average mark of their best 87.5 points of science study at Level 3.

2. For graduates of a BSc combined course or the BASc, or students who are still enrolled in a BSc combined course and have completed at least 300 points within which the requirements of the BSc have been satisfied, their SHS is the weighted average mark of completed science subjects at Level 3, or their best 87.5 points of science study at Level 3, whichever is greater. For students and graduates of the BASc and BA/BSc courses, History and Philosophy of Science subjects and Geography subjects must count towards the Arts component of their
combined degree and therefore results for those subjects are not considered in calculating their SHS.

**Departmental Requirements**

Refer to the specific departmental requirements described within the individual departmental program entries.

**Core Participation Requirements:**

It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.

**Further Study:**

Graduates who successfully complete a Bachelor of Science (Honours) degree with the required average of 75% (H2A) are eligible to apply for admission to a M.Phil. - Science or PhD - Science.

**Graduate Attributes:**

Graduates should have: Drawn together the theory and practical skills gained in previous undergraduate studies; Developed new research and professional skills to take into the workforce or further study; and Gained an in-depth knowledge in a particular discipline.