Bachelor of Computer Science Advanced (Honours)
(Course Code: C3001)

Enrolment Information 2019

Faculty of Information Technology
Academic and Student Services
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Telephone: +61 3 9902 6011
Web: monash.edu.au/it
Ground Floor, 25 Exhibition Walk
Clayton Campus
BACHELOR OF COMPUTER SCIENCE ADVANCED (HONOURS)

Welcome to the Faculty of Information Technology and congratulations on your offer of a place in the Bachelor of Computer Science Advanced (Honours), (BCSAH).

When enrolling in units, you should think carefully through the choices and the decisions you make.

Have a look at the course maps on pages 9-10. Your degree consists of:

- **13 core (compulsory) coursework subjects**: FIT1047, FIT1049, FIT1053, FIT1054, FIT2004, FIT2099, FIT2014, FIT2102, FIT3155, FIT3143, FIT3171, MAT1830 and MAT1841.

- **2 or 3 Computer Science electives**: From an approved list.

- **6 research units**: Including a 4th year 24 point Honours project.

- **An IBL or research placement OR Advanced Computer Science Project**: 12 to 18 points.

- **8 free electives**: Here is where you have a huge range of choices. You can take a major, 2 minors, a minor and 4 other electives, or any 8 units you’re interested in. Please see pages 5-7 for information on majors and minors.

You will need to add your two electives (one for each semester) to complete your 2019 enrolment.

When choosing units, please keep in mind any pre-requisite units you need to complete.

You can change your enrolment

- Up until the end of week 2 of semester 1 for semester 1 units
- Up until the end of week 2 of semester 2 for semester 2 units

Units can be added or discontinued by either:

- Making the change via the Web Enrolment System (WES) (preferred method) or
- Completing and submitting an ‘Enrolment Amendment’ form available from the Faculty office (25 Exhibition Walk).

Consider your career aspirations and interests when choosing electives. To find out about the units being offered this year, check the Monash handbook.

*The information in this publication is correct at time of publication. Updates may be made without further notice. Students are advised to check websites for updated information.*
Course Notes

Credit points - Unless specified, all units are worth 6 credit points
Bachelor of Computer Science Advanced (Honours) - 32 units x 6cp = Total of 192 credit points

Year level requirements –
1) Normally 48 points, and a maximum of 60 points of first year level units will be counted;
2) At least 36 points must be completed at third year level.

Unit requisites - All pre-requisite and co-requisite requirements must be undertaken in order to be able to enrol into a specific unit.

Duration of degree - 4 years full-time, 8 years part-time

Time limit - Students have ten years in which to complete this award from the time they commence first year. Periods of intermission are counted as part of the ten years.

Monash University Handbook - Students should follow the course requirements for the year the course was commenced http://monash.edu/pubs/2019handbooks/courses/index-byfaculty-it.html

To remain in the program you are required to maintain at least a distinction average (70 per cent) throughout your degree. If you do not meet this standard you will be required to transfer to C2001 Bachelor of Computer Science or C2000 Bachelor of Information Technology.
ELECTIVES

The Bachelor of Computer Science Advanced (Honours) has 8 free electives. You can use the electives to select units of your choice (making sure you meet the course requirements).

A major sequence consists of 8 units, and a minor of 4 units. These are optional unit sequences you can consider taking in your elective spaces. Majors will appear on your testamur and academic transcript, however minors will only be listed on your academic transcript.

**Majors**
You may wish to complete a major with your free electives. For example, our Bachelor of Information Technology degree has the following majors available, which you may be interested in taking:

- Business information systems
- Computer networks and security
- Games development
- Interactive media
- Software development

Alternatively, you may wish to consider a major from another faculty at Monash, e.g. Science.

Some non-IT majors you might like to consider are:
- Applied mathematics
- Mathematics
- Languages
- Physics

A comprehensive list of majors and minors offered at Monash can be found at: [http://monash.edu/pubs/2019handbooks/aos/index.html](http://monash.edu/pubs/2019handbooks/aos/index.html)
Minors

Below is a list of Minors offered by the Faculty of Information Technology. You can use your electives to do one or two minors. Each minor is made up of 4 units, separate from the major.

- Business information systems
- Computer networks and security
- Cybersecurity
- Data science**
- Games design
- Games development
- Interactive media
- IT for business
- Mobile apps development
- Software development*
- Software engineering*
- Web development

* These minors contain a unit that has a prerequisite of Year 12 maths or MTH1010 or equivalent.
** This minor contains a unit that has a prerequisite of Year 12 maths or MTH1010 or equivalent AND a unit that has a prerequisite of Level 1 mathematics.

Please refer to the handbook for a list of units that make up each IT major and minor.

Please contact the Faculty of Information Technology via Ask.Monash, if you have any queries regarding a major or minor sequence.
Free electives

The BCSAH has 8 free electives. You can use the electives to select units of your choice (making sure you meet the course requirements). Instead of a major and two minors, you may choose to complete one minor and 4 free electives, or 8 free electives.

Information Technology electives to consider

FIT1006 Business information analysis (S1)
FIT1013 Digital futures: IT for business (S2)
FIT1033 Foundations of 3D (S1)
FIT1046 Interactive media foundations (S2)
FIT1048 Fundamentals of C++ (S2)
FIT1050 Web fundamentals (S1)
FIT1051 Programming fundamentals in java (S1, S2)
FIT1052 Digital futures: IT shaping society (S1)

Electives from other faculties to consider

Business and Economics
ACC1100 Introduction to financial accounting (S1, S2)
ACC1200 Accounting for managers (S1, S2)
MGC1010 Introduction to management (S1, S2)

Science
PHS1031 Physics for the living world (S1)
PHS1022 Fields and quantum physics (S2) Prerequisite – PHS1011 or PHS1080
PHS1001 Foundation physics (S1)
SCI1300 Climate change: From science to society (S2)

Arts
You may want to consider language electives or other units offered by the Arts faculty. Details of units offered by Arts can be found at: https://monash.edu/pubs/2019handbooks/units/index-byfaculty-arts.html

You can check the handbook for a list of electives from other faculties.
Industry Based Learning (IBL)

The Industry Based Learning (IBL) program partners Monash University with leading global and Australian organisations to offer students outstanding placement opportunities and scholarships valued up to $18,000. It is available to domestic and international students.

In the BCSAH, you have the choice to apply for an IBL placement (FIT3045) (pending entry requirements to the IBL program being met), or for a research placement (FIT3153). BCSAH students are strongly encouraged to apply for an IBL placement, as industry experience complements the already strong research experience present throughout and particularly in the Honours part of their degree.

IBL Prerequisite units for BCSAH students are FIT1053 and FIT1049. You will complete FIT1053 and FIT1049 as core units in your degree.

A note on the importance of Mathematics

For students undertaking studies in Computer Science it is not only desirable but essential to also take Mathematics. Many fundamental concepts in Computer Science can only be fully understood using ideas drawn from Mathematics. This extends even to practical issues like the study of computer graphics and computer animation in general; these topics call for descriptions of curves and surfaces and these descriptions are specified using the language of Mathematics. A topic of current interest in Computer Science is encryption of messages and the safe transfer of information on the Internet. Another rapidly growing field is that of Artificial Intelligence and automated reasoning. These topics depend on a basic knowledge of aspects of mathematical logic.

Most companies and organisations have realised that success depends critically on the level of analytical, quantitative and statistical skills of their administrative and management staff and they therefore seek employees with sound mathematical training. If you have done two Mathematics units at school then don’t let them go to waste! You can continue to pursue those interests. Whether you want to prepare for employment or continue with postgraduate studies, Mathematics will give you a powerful competitive advantage in your career in computing.

For further information, contact a Mathematics Advisor:

Dr Simon Clarke
Simon.Clarke@monash.edu
Tel: 9905 4421

Or contact the School of Mathematical Sciences
Level 4, 9 Rainforest Walk
Clayton Campus
Email: enquiries@maths.monash.edu.au
Tel: 9905 4465

Visit the Mathematical Sciences web site
### BACHELOR OF COMPUTER SCIENCE ADVANCED (HONOURS) (C3001) – 2019

#### Year 1 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT1053</th>
<th>Introduction to computer systems, networks and security</th>
<th>MAT1830</th>
<th>ELECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Algorithms and programming in python (advanced)</td>
<td></td>
<td>Discrete mathematics for computer science</td>
<td></td>
</tr>
<tr>
<td>Second Semester</td>
<td>FIT1054</td>
<td>IT professional practice [12 points FIT units]</td>
<td>MAT1841**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer science (advanced)</td>
<td></td>
<td>Continuous mathematics for computer science</td>
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<tr>
<td></td>
<td>[FIT1053]</td>
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</tbody>
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#### Year 2 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT2004</th>
<th>Innovation and research in computer science</th>
<th>FIT2099</th>
<th>ELECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Algorithms and data structures</td>
<td>Object oriented design and implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[FIT1008 or FIT1054 &amp; 6 pts Level 1 Maths]</td>
<td>[FIT1053 or FIT1054]</td>
<td></td>
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</tr>
<tr>
<td>Second Semester</td>
<td>FIT2014</td>
<td>Theory of computation</td>
<td>FIT2082</td>
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<tr>
<td></td>
<td>[FIT1053 and MAT1830]</td>
<td>Computer science research project</td>
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</tbody>
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#### Year 3 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT3144</th>
<th>FIT3171</th>
<th>ELECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advanced computer science project</td>
<td>Databases</td>
<td></td>
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<tr>
<td></td>
<td>[FIT2004 &amp; FIT2083]</td>
<td>[FIT1053]</td>
<td></td>
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<tr>
<td>Second Semester</td>
<td>FIT3155</td>
<td>FIT3143</td>
<td></td>
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<tr>
<td></td>
<td>Advanced data structures and algorithms</td>
<td>Parallel computing</td>
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<tr>
<td></td>
<td>[FIT2004]</td>
<td>[FIT2004]</td>
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</tbody>
</table>

#### Year 4 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT4441</th>
<th>FIT4442</th>
<th>FIT4443</th>
<th>FIT4444</th>
<th>ELECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 4/5 Computer Science</td>
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<td>Level 4/5 Computer Science</td>
<td>Level 4/5 Computer Science</td>
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<tr>
<td>Second Semester</td>
<td>FIT4443</td>
<td>FIT4444</td>
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<td></td>
<td>Honours thesis – part 3</td>
<td>Honours thesis – final</td>
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* Level 3 Approved Computer Science Electives:

- FIT3031 Network security
- FIT3077 Software engineering; architecture and design
- FIT3080 Intelligent systems
- FIT3081 Image processing
- FIT3088 Computer graphics
- FIT3094 Artificial life, artificial intelligence and virtual environments
- FIT3139 Computational science
- FIT3142 Distributed computing
- FIT3146 Maker lab
- FIT3152 Data analytics
- FIT3154 Advanced data analysis
- FIT3159 Computer architecture
- FIT3165 Computer networks
- FIT3173 Software security
- FIT3175 Usability
- FIT3181 Deep learning
- MTH3170 Network mathematics

Note that not all units will be taught in every year and come will be offered only in alternate years.

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- **Unit requisites**: All pre-requisite and co-requisite requirements must be undertaken in order to be able to enrol into a specific unit.
- **Duration of degree**: 4 years full-time, 8 years part-time.
- **Time limit**: Time limit = 10 years. Students have ten years in which to complete this award from the time they commence first year. Periods of intermission are counted as part of the ten years.

**If you require other mathematics for a non-computer science elective major or minor you may replace MAT1841 with approval.**
**BACHELOR OF COMPUTER SCIENCE ADVANCED (HONOURS) (C3001) – 2019 (IBL/RBL placement)**

### Year 1 (48 credit points)

#### First Semester
- **FIT1053** Algorithms and programming in python (advanced)
- **FIT1047** Introduction to computer systems, networks and security
- **MAT1830** Discrete mathematics for computer science
- **Elective**

#### Second Semester
- **FIT1054** Computer science (advanced) [FIT1053]
- **FIT1049** IT professional practice [12 points FIT units]
- **MAT1841** Continuous mathematics for computer science
- **Elective**

### Year 2 (54 credit points)

#### Summer Semester
- **Elective**

#### First Semester
- **FIT2004** Algorithms and data structures [FIT1008 or FIT1054 & 6 pts Level 1 Maths]
- **FIT2083** Innovation and research in computer science [MAT1841 or MTH1030]
- **FIT2099** Object oriented design and implementation [FIT1053 or FIT1054]
- **Elective**

#### Second Semester
- **FIT2014** Theory of computation [FIT1053 and MAT1830]
- **FIT2102** Programming paradigms [FIT1054 or FIT1008]
- **FIT2082** Computer science research project [FIT2083]
- **Elective**

### Year 3 (42 credit points)

#### First Semester
- **FIT3153** Research-based learning OR **FIT3045** Industry-based learning (18 points)

#### Second Semester
- **FIT3155** Advanced data structures and algorithms [FIT2004]
- **FIT3143** Parallel computing [FIT2004]
- **FIT3171** Databases [FIT1053]
- **Elective**

### Year 4 (48 credit points)

#### First Semester
- **FIT4441** Honours thesis – part 1
- **FIT4442** Honours thesis – part 2
- **Level 4/5** Computer Science Approved Elective
- **Elective**

#### Second Semester
- **FIT4443** Honours thesis – part 3
- **FIT4444** Honours thesis – final
- **Level 4/5** Computer Science Approved Elective
- **Elective**

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