Bachelor of Computer Science
(Course Code: C2001)

Enrolment Information
Semester 2, 2019

Faculty of Information Technology
Academic and Student Services
Enquiries: ask.monash
Telephone: +61 3 9902 6011
Web: monash.edu.au/it
Ground Floor, 25 Exhibition Walk,
Clayton Campus
WELCOME TO THE FACULTY OF INFORMATION TECHNOLOGY

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

When enrolling you should think carefully through your choices and the decisions you are about to make.

Have a look at the course maps attached on pages 10 - 11. There are course maps for each specialisation - Advanced Computer Science and Data Science. Your degree consists of:

- **8 core (compulsory) units**: FIT1008, FIT1045, FIT1047, FIT1049, FIT2004, FIT2014, MAT1830 and MAT1841.

- **8 specialisation units**: Your choice of either Advanced Computer Science or Data Science will impact on your unit selection this semester.

- **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 6-8 for information on majors and minors.

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 or online.

Consider your career aspirations and interests when choosing electives. To find out about the units being offered this year, check the Monash 2019 handbook.

Please refer to available advisors if you have any questions or need any advice.
COURSE NOTES

Credit points - Unless specified, all units are worth 6 credit points
Bachelor of Computer Science: 24 units x 6 credit points = Total of 144 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 - 3 years full-time, 6 years part-time

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

Monash University Handbook - Students should follow the course requirements for the year the course was commenced.

SPECIALISATIONS

Advanced computer science: As a graduate with this specialisation, you will be equipped with the theory and practice of computing, necessary to create substantial pieces of software, with practical applications spanning all disciplines, including science, engineering, business and commerce, the creative and performing arts and the humanities. If you enjoy solving many-sided computational problems requiring analytical thinking, and have a mathematical and technical bent then advanced computer science is the specialisation for you.

Data science: As a graduate with this cutting-edge specialisation, you will be equipped with ways to capture, manage, analyse and interpret large volumes of data generated in the fast-progressing world of the Information Age. If you are interested in a career solving the information challenges surrounding 'big data' in fields as diverse as marketing, medicine or finance, then data science is the specialisation for you.
ELECTIVES

The Bachelor of Computer Science has 8 free electives. You can use the electives to select units of your choice (making sure you meet the course requirements). You can use your electives to:
- complete a major from the Bachelor of Information Technology
- complete a major from another faculty
- complete one or two minors
- complete a selection of eight units of your choice.

Majors
A major sequence consists of 8 units, and a minor of 4 units. These are optional unit sequences you can consider taking. Majors will appear on your testamur and academic transcript, however minors will only be listed on your academic transcript. You may wish to complete a major or minor 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

For more information on the units required to complete each of these majors, please refer to the course maps and handbook entries.

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

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

Explore the comprehensive list of majors and minors offered at Monash in the 2019 handbook.
Minors

It is also possible to take two different minors instead of one major. Below is a list of minors offered by the Faculty of Information Technology. You can use your electives to complete 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.

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

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

FIT1006 Business information analysis (S1)
FIT1013 Digital futures: IT for business (S2)
FIT1033 Foundations of 3D (S2)
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
MTH1030 Techniques for modelling (S1, S2) Prerequisite – Year 12 Specialist Mathematics
PHS1031 Physics for the living world (S1)
PHS1011 Classical physics and relativity (S1) Prerequisite – Yr 12 Physics or Yr 12 Specialist Mathematics
PHS1022 Fields and quantum physics (S2) Prerequisite – PHS1011
SCI1300 Climate change: From science to society (S2)

Arts
You may want to consider language electives or other units offered by the Arts faculty.

You can also 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 of $18,000 per placement. It is available to domestic and international students.

Students can complete one placement in the BCS, pending entry requirements to the IBL program being met. Prerequisite units for BCS students are one of FIT1045, FIT1048, FIT1051 or ENG1003 and FIT1049. You will complete FIT1045 and FIT1049 as core units in your degree.

For the Advanced computer science specialisation: An IBL placement will replace FIT3161, FIT3162 and the approved CS elective on your course map.

For the Data science specialisation: An IBL placement will replace FIT3163, FIT3164 and one approved DS elective on your course map.

Information on how to apply will be on the website during semester 2.

Students commencing in semester 2 with no credit will apply for entry to the program during their third semester (semester 2, 2020).
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 Leo Brewin  
Leo.Brewin@monash.edu  
Tel: 9905 4456

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 for more information.
### BACHELOR OF COMPUTER SCIENCE (C2001) – Mid-Year 2019
#### Advanced Computer Science Specialisation

#### Year 1 (24 credit points)

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>FIT1045 Algorithms and programming fundamentals in python</th>
<th>FIT1047 Introduction to computer systems, networks and security</th>
<th>MAT1841 Continuous mathematics for computer science</th>
<th>Elective</th>
</tr>
</thead>
</table>

#### Year 2 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT1008 Introduction to computer science [FIT1045 or FIT1053]</th>
<th>FIT2099 Object-oriented design and implementation [One of FIT1045, FIT1048, FIT1051, FIT1053, FIT1054 or FIT1008]</th>
<th>MAT1830 Discrete mathematics for computer science</th>
<th>FIT1049 IT professional practice [12 points FIT units]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Semester</td>
<td>FIT2014 Theory of computation [FIT1045 or FIT1048 or FIT1051 or FIT1053 or ENG1003 &amp; MAT1830]</td>
<td>FIT2102 Programming paradigms [FIT1008 or FIT1054]</td>
<td>FIT2004 Algorithms and data structures [FIT1008 or FIT1054 and 6 points of Level 1 Maths]</td>
<td>Elective</td>
</tr>
</tbody>
</table>

#### Year 3 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT3161 Computer science project 1 [FIT2004]</th>
<th>FIT3171 Databases [One of FIT1045, FIT1048, FIT1051, FIT1053 or ENG1003]</th>
<th>Elective</th>
<th>Elective</th>
</tr>
</thead>
</table>

#### Year 4 (24 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Level 3 Computer Science Approved Elective*</th>
<th>Elective</th>
<th>Elective</th>
<th>Elective</th>
</tr>
</thead>
</table>

### *List of Approved Computer Science Electives:

<table>
<thead>
<tr>
<th>FIT3031 Network security</th>
<th>FIT3077 Software engineering: architecture and design</th>
<th>FIT3080 Intelligent systems</th>
<th>FIT3081 Image processing</th>
<th>FIT3088 Computer graphics</th>
<th>FIT3094 Artificial life, artificial intelligence and virtual environments</th>
<th>FIT3139 Computational modelling and simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIT3142 Distributed computing</td>
<td>FIT3146 Maker lab</td>
<td>FIT3152 Data analytics</td>
<td>FIT3159 Computer architecture</td>
<td>FIT3165 Computer networks</td>
<td>FIT3173 Software security</td>
<td>FIT3175 Usability</td>
</tr>
</tbody>
</table>

Note: Not all units will be taught in every year and some will be offered only in alternate years.
### Bachelor of Computer Science (C2001) – Mid-Year 2019

#### Data Science Specialisation

**Year 1 (48 credit points)**

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<tr>
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<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>Second</td>
<td>FIT1045</td>
<td>Algorithms and programming fundamentals in python</td>
<td>FIT1043 Introduction to data science</td>
<td>MAT1841 Continuous mathematics for computer science</td>
</tr>
<tr>
<td></td>
<td>FIT1047</td>
<td>Introduction to computer systems, networks and security</td>
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**Year 2 (48 credit points)**

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<tbody>
<tr>
<td>First</td>
<td>FIT1008</td>
<td>Introduction to computer science</td>
<td>FIT2094 Databases [One of FIT1045, FIT1048, FIT1051 or FIT1053]</td>
<td>MAT1830 Discrete mathematics for computer science</td>
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<tr>
<td></td>
<td>FIT1043</td>
<td>Introduction to data science</td>
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<tr>
<td>Second</td>
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<td>Theory of computation [FIT1045 or FIT1048 or FIT1051 or FIT1053 or ENG1003 &amp; MAT1830]</td>
<td>FIT1049 IT professional practice [12 points FIT units]</td>
<td>FIT2004 Algorithms and data structures [FIT1008 or FIT1054 and 6 points of Level 1 Maths]</td>
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<td>MAT1830</td>
<td>Continuous mathematics for computer science</td>
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<tr>
<td>First</td>
<td>FIT3163</td>
<td>Data science project 1 [FIT1043, FIT1049, FIT2004, FIT2086, FIT2094]</td>
<td>Level 3 Data Science Approved Elective*</td>
<td></td>
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<tr>
<td></td>
<td>FIT3179</td>
<td>Data visualisation [24pts Level 1]</td>
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<tr>
<td>Second</td>
<td>FIT3164</td>
<td>Data science project 2 [FIT3161]</td>
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<td></td>
<td>FIT3181</td>
<td>Data analytics</td>
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<td></td>
<td>FIT3182</td>
<td>Advanced data analysis</td>
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<td></td>
<td>FIT3183</td>
<td>Deep learning</td>
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<td></td>
<td>FIT3184</td>
<td>Elective</td>
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**Year 4 (24 credit points)**

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<td>First</td>
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<tr>
<td></td>
<td>FIT3163</td>
<td>Data science project 1 [FIT1043, FIT1049, FIT2004, FIT2086, FIT2094]</td>
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<td>FIT3184</td>
<td>Elective</td>
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* Approved Data Science Electives:

- FIT3003 Business intelligence and data warehousing
- FIT3139 Computational modelling and simulation
- FIT3152 Data analytics
- FIT3154 Advanced data analysis
- FIT3181 Deep learning

Note: Not all units will be taught in every year and some will be offered only in alternate years)