# Advanced Computer Science Specialisation

## 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  
- **MAT1841** Continuous mathematics for computer science  
- **FIT1054** Computer science (advanced)  
  - [FIT1053]

### Second Semester
- **FIT1049** IT professional practice  
  - [12 points FIT units]  
- **FIT1047** Introduction to computer systems, networks and security  
- **FIT1049** IT professional practice  
  - [12 points FIT units]

## Year 2 (48 credit points)

### First Semester
- **FIT2004** Algorithms and data structures  
  - [FIT1008 or FIT1054 & 6 pts L1 Maths]
- **FIT2083** Innovation and research in computer science  
  - [MAT1841 or MTH1030]
- **FIT2099** Object oriented design and implementation  
  - [One of FIT1045, FIT1048, FIT1051, FIT1008]

### Second Semester
- **FIT2014** Theory of computation  
  - [FIT1045 or FIT1053 and MAT1830]
- **FIT2102** Programming paradigms  
  - [FIT1008 or FIT1054]
- **FIT2082** Computer science research project  
  - [FIT2083]

## Year 3 (48 credit points)

### First Semester
- **FIT3144** Advanced computer science project  
  - [12 points]
  - [FIT2004 & FIT2083]
- **FIT3171** Databases  
  - [One of FIT1045, FIT1048, FIT1051, FIT1053 or ENG1003]
- **FIT3143** Parallel computing  
  - [FIT2004]

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

## Year 4 (48 credit points)

### First Semester
- **FIT4441** Honours thesis – part 1  
- **FIT4442** Honours thesis – part 2  
- **FIT4443** Honours thesis – part 3  
- **FIT4444** Honours thesis – final  
- **FIT4441** Honours thesis – part 1

### Second Semester
- **FIT4441** Honours thesis – part 1  
- **FIT4442** Honours thesis – part 2  
- **FIT4443** Honours thesis – part 3  
- **FIT4444** Honours thesis – final  
- **FIT4441** Honours thesis – part 1

*Level 3 Approved Computer Science Electives:*

- **FIT3031** Network security
- **FIT3077** Software engineering: architecture and design
- **FIT3080** Artificial intelligence
- **FIT3081** Image processing
- **FIT3088** Computer graphics
- **FIT3094** Artificial life, artificial intelligence and virtual environments
- **FIT3139** Computational modelling and simulation
- **FIT3142** Distributed computing
- **FIT3146** Maker lab

- **FIT3152** Data analytics
- **FIT3159** Computer architecture
- **FIT3165** Computer networks
- **FIT3173** Software security
- **FIT3175** Usability
- **FIT3181** Deep learning
- **FIT3183** Malicious AI and dark side security
- **MTH3170** Network mathematics
- **MTH3175** Network mathematics (Advanced)

Note that not all units will be taught in every year and some will be offered only in alternate years.
## BACHELOR OF COMPUTER SCIENCE ADVANCED (HONOURS) (C3001) – 2021

### Advanced Computer Science Specialisation
(Industry Based Learning/Research Based Learning placement)

### Year 1 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT1053</th>
<th>FIT1047</th>
<th>MAT1830</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithms and programming in python (advanced)</td>
<td>Introduction to computer systems, networks and security</td>
<td>Discrete mathematics for computer science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Semester</td>
<td>FIT1054</td>
<td>FIT1049</td>
<td>MAT1841</td>
<td>Elective</td>
</tr>
<tr>
<td>Computer science (advanced)</td>
<td>IT professional practice</td>
<td>Continuous mathematics for computer science</td>
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### Year 2 (54 credit points)

<table>
<thead>
<tr>
<th>Summer Semester</th>
<th>Elective</th>
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</table>

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT2004</th>
<th>FIT2083</th>
<th>FIT2099</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithms and data structures</td>
<td>Innovation and research in computer science</td>
<td>Object oriented design and implementation</td>
<td>[One of FIT1045, FIT1048, FIT1051, FIT1008]</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>FIT2014</th>
<th>FIT2102</th>
<th>FIT2082</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of computation</td>
<td>Programming paradigms</td>
<td>Computer science research project</td>
<td>[FIT2083]</td>
<td></td>
</tr>
</tbody>
</table>

### Year 3 (42 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT3153</th>
<th>FIT3045</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research-based learning (18 points) OR Industry-based learning (18 points)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>FIT3155</th>
<th>FIT3143</th>
<th>FIT3171</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced data structures and algorithms</td>
<td>Parallel computing</td>
<td>Databases</td>
<td>[One of FIT1045, FIT1048, FIT1051, FIT1008]</td>
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</tr>
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### Year 4 (48 credit points)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FIT4441</th>
<th>FIT4442</th>
<th>Level 4/5</th>
</tr>
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<tbody>
<tr>
<td>Honours thesis – part 1</td>
<td>Honours thesis – part 2</td>
<td>Computer Science Approved Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>FIT4443</th>
<th>FIT4444</th>
<th>Level 4/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honours thesis – part 3</td>
<td>Honours thesis – final</td>
<td>Computer Science Approved Elective</td>
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### Notes

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