### 3.3.1.7 Computational Thinking Requirement

**Computational Thinking Requirement**

To remain relevant in the workplace of tomorrow, undergraduates should acquire basic computational skills, i.e. computational thinking (CT).

For FoS Students admitted in AY2017/18 onwards, the options to fulfil the CT requirement, by the respective Major Programmes are described below:

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<tr>
<th>MAJORS</th>
<th>OPTIONS TO FULFIL COMPUTATIONAL THINKING REQUIREMENT</th>
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<tbody>
<tr>
<td>Computational Biology, Data Science &amp; Analytics, Mathematics &amp; Applied Maths, Quantitative Finance, Statistics</td>
<td>These Majors will continue to acquire higher-order computational and programming skills in the form of CS1010S Programming Methodology (or its variants) (within the Major’s core requirement) Where the major allows CS1101S Programming Methodology to be read in place of CS1010S (or its variants), CS1101S will also fulfil the higher-order computational and programming skills requirement for the student from that major.</td>
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<tr>
<td>Life Sciences, Pharmaceutical Science, Physics</td>
<td>Option 1: COS2000 – Computational Thinking for Scientists or Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology</td>
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<td>Chemistry, Food Science &amp; Technology</td>
<td>Option 1: COS2000 – Computational Thinking for Scientists or Option 2: CM3267 – Computational Thinking and Programming in Chemistry* or Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology</td>
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<tr>
<td>MAJORS</td>
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| Pharmacy | For Cohort AY2018/19 and after, to read one of the following as an Unrestricted Elective module:  
Option 1: COS2000 – Computational Thinking for Scientists  
or  
Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology |
| Bachelor of Environmental Studies (BES) | All undergraduates (from FASS and FoS, in BES, inclusive of BES students in the UTCP or USP programme), will be required to do GET1031A.  
BES students doing the UTCP at Residential College 4 (RC4) are exempted from GET1031A as the RC4 programme encourages explicit use of representing thinking, using computer models. |

**Notes:**

- For all FoS majors, the option to take “CS1010S (or its variants), or CS1101S – Programming Methodology” is open (even if it is not within your major programme requirements), and can be used to fulfil the CT requirement. However, do note that the availability of this module is subject to successful bidding.
- COS2000 will count as a module from the Computing Sciences subject group of the FoS Faculty requirements.
- CM3267 will be offered with effect from Sem 2 AY2018/19, and can count as a module from the Computing Sciences subject group, or from the Chemical Sciences subject group of the FoS Faculty requirements.

**Special Programme in Science students**

Students who have completed the Special Programme in Science (SPS)'s requirement, by successfully passing the following modules:

1. SP2171 Discovering Science,  
2. SP2173 Atoms to Molecules,  
3. SP2174 The Cell,  
4. SP3172 Integrated Science Project,  
5. SP3175 The Earth, and  
6. SP3176 The Universe,

are deemed to have fulfilled the CT requirement.
A student who does not complete the SPS requirement by passing all 6 SPS modules, would need to ensure that he/she fulfils the CT requirement by reading a module that counts towards the CT requirement, according to the options to fulfil CT requirement for his/her major.

**Double Degree Programmes (DDP)**

Higher-order computational skills, such as coding or programming methodology, will be required for the following schools and faculties - Science, Business, Engineering, Design & Environment, and Computing. For FASS, basic skills in CT are required, and this is achieved via compulsory module, GET1031A.

1. For students doing DDP in Science and FASS, the CT requirement for FoS will prevail.
2. In the case of a student who is required to do higher-order CT (e.g., BComp (Hons) - BSc (Hons)) in both degrees, the higher-order CT module which has been listed as a common requirement by both faculties, will apply. Otherwise, the Home Faculty’s CT requirement should then take precedence.

**Double Majors (DMP)**

The same set of principles to apply – refer to DDP (1) and (2) above, if your 1st major is from FoS, and your 2nd major is from another Faculty.

If both your majors are from FoS, as long as you have read a module fulfilling CT requirement in either one of your majors, you would be deemed to have fulfilled the CT requirement.

**Transfer cases (full credit transfer):**

1. A student transferring out of FASS to FoS, who brings his or her grade obtained for GET1031A, should still fulfil the CT requirement stipulated by the new Home Faculty, FoS.

2. A student transferring out of a School or Faculty which has higher-order CT requirement, may fulfil CT requirement with this grade and credit obtained. Nevertheless, if the new Home Faculty has another CT module being listed as a compulsory programme requirement, he or she must still fulfil the new Home Faculty's programme requirement. FoS students transferring to another Faculty should check with their new Home Faculty on how to fulfil the CT requirement.