







# Computer Science

## Sample pathway for Computer Science\*

<b>YEAR</b> 	<b>YEAR</b> 	<b>YEAR</b> 	<b>YEAR</b> 
<p><b>Engage with the principles</b></p> <p>In First Year (Stage 1), students engage with the principles. Students complete modules in Computer Science and Mathematics.</p> <p><b>Computer Science</b>  <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Algorithmic Problem-Solving</li> <li>- Computer Programming</li> <li>- Introduction to Computer Architecture</li> <li>- Formal Foundations</li> <li>- Software Engineering Project I</li> <li>- Statistics with Python</li> <li>- Introduction to Functional Programming</li> </ul> <p><b>Mathematics</b>  <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Matrix Algebra</li> <li>- Foundations of Mathematics for Computer Science</li> </ul> <ul style="list-style-type: none"> <li>- One elective module</li> </ul>	<p><b>Broaden your knowledge</b></p> <p>In Second Year (Stage 2), students broaden their knowledge before choosing their degree subject at the end of the year.</p> <p><b>Computer Science</b>  <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Computer Networking</li> <li>- Data Structures &amp; Algorithms</li> <li>- Introduction to Java</li> <li>- Discrete Mathematics for Computer Science</li> <li>- Software Engineering Project II</li> <li>- Linear Algebra II</li> <li>- Databases and Information Systems I</li> <li>- Digital Systems</li> <li>- Introduction to Operating Systems</li> </ul> <ul style="list-style-type: none"> <li>- Two elective modules</li> </ul>	<p><b>Focus on your chosen subject</b></p> <p>In Third Year (Stage 3), students refine their knowledge of Computer Science.</p> <p><b>Computer Science</b>  <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Foundations of Computing</li> <li>- Object-Oriented Programming</li> <li>- Software Engineering Project III</li> <li>- Introduction to Artificial Intelligence</li> <li>- Program Construction I</li> <li>- Computer Graphics I</li> <li>- Web Development</li> <li>- Programming for Big Data</li> <li>- Computer Systems</li> <li>- Industry Internship</li> <li>- Information Security</li> </ul> <ul style="list-style-type: none"> <li>- Two elective modules</li> </ul>	<p><b>Refine your knowledge</b></p> <p>In Fourth Year (Stage 4), students complete their undergraduate studies and in Computer Science this will include a research project.</p> <p><b>Computer Science</b>  <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Computer Science Project</li> <li>- Spatial Information Systems</li> <li>- Distributed Systems</li> <li>- Advances in Wireless Networking</li> <li>- Cloud Computing</li> <li>- Mobile App Development</li> <li>- Computer &amp; Network Security</li> <li>- Human Computer Interaction</li> <li>- Contemporary Software Development</li> <li>- Programming for IOT</li> <li>- Information Theory</li> <li>- Multi-Agent Systems</li> <li>- Performance of Computer Systems</li> </ul>

## Career & Study Opportunities

### BSc (Honours) Computer Science

MSc (Taught)	Research	Industry	Conversion Courses
<ul style="list-style-type: none"> <li>- MSc Computer Science (Negotiated Learning)</li> <li>- MSc Business Analytics</li> <li>- MSc Cognitive Science</li> </ul>	<p>Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:</p> <ul style="list-style-type: none"> <li>- Artificial Intelligence</li> <li>- Software and Systems Engineering</li> <li>- Networks and Distributed Systems</li> </ul>	<ul style="list-style-type: none"> <li>- High-Tech Sector</li> <li>- Financial Sector</li> <li>- Consultancy</li> <li>- Software Development</li> <li>- Tech Start-ups</li> <li>- Education (Third Level)</li> </ul>	<ul style="list-style-type: none"> <li>- UCD Michael Smurfit Graduate Business School postgraduate degrees, e.g., Master of Management</li> </ul>

\*This pathway is an example only and is not guaranteed by UCD. Modules are subject to change each year.