



# Computer Science with Data Science

Sample pathway for Computer Science with Data Science\*

<p><b>YEAR</b></p> <p><b>1</b></p>	<p><b>YEAR</b></p> <p><b>2</b></p>	<p><b>YEAR</b></p> <p><b>3</b></p>	<p><b>YEAR</b></p> <p><b>4</b></p>
<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>- Computer Science in Practice</li> <li>- Software Engineering Project I</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> <p>- One elective module</p>	<p><b>Broaden your knowledge</b></p> <p>In Second Year (Stage 2), students broaden their knowledge of Computer Science and Data Science before choosing their degree subject at the end of the year.</p> <p><b>Computer Science with Data 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> <p>- Two elective modules</p>	<p><b>Focus on your chosen subject</b></p> <p>In Third Year (Stage 3), students refine their knowledge of Computer Science with Data Science.</p> <p><b>Computer Science with Data Science</b> <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Data Science in Python</li> <li>- Probability Theory</li> <li>- Introduction to Artificial Intelligence</li> <li>- Network Analysis</li> <li>- Data Science in Practice</li> <li>- Industry Internship</li> <li>- Information Visualisation</li> <li>- Programming for Big Data</li> <li>- Information Security</li> </ul> <p>- Two elective modules</p>	<p><b>Refine your knowledge</b></p> <p>In Fourth Year (Stage 4), students complete their undergraduate studies and in Computer Science with Data Science this will include a research project.</p> <p><b>Computer Science with Data Science</b> <i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Data Science Project</li> <li>- Machine Learning</li> <li>- Deep Learning</li> <li>- Data Mining</li> <li>- Cloud Computing</li> <li>- Connectionist Computing</li> <li>- Parallel and Cluster Computing</li> <li>- Text Analytics</li> <li>- Human Language Technology</li> <li>- Spatial Information Systems</li> <li>- Information Security</li> <li>- Linear Models</li> <li>- Human Computer Interaction</li> <li>- Information Theory</li> <li>- Unix Programming</li> <li>- Information Ethics</li> </ul>

## Career & Study Opportunities

### BSc (Honours) Computer Science with Data Science

#### MSc (Taught)

- MSc Computer Science (Negotiated Learning)
- MSc Business Analytics
- MSc Cognitive Science

#### Research

Many graduates pursue MSc and PhD studies as well as postdoctoral research in Ireland and abroad in diverse areas such as:

- Artificial Intelligence
- Software and Systems Engineering
- Networks and Distributed Systems

#### Industry

- Banking and Financial Services
- Consultancy (e.g. Accenture, Deloitte)
- Internet companies such as Google, PayPal and Meta
- Established ICT companies such as IBM, Microsoft and Intel
- ICT Startups

#### Conversion Courses

- UCD Michael Smurfit Graduate Business School postgraduate degrees, e.g., Master of Management

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