







# Mathematics

DN200

Stream: Mathematical, Physical & Geological Sciences (MPG)

## Sample pathway for Mathematics\*

 <p><b>YEAR 1</b></p>	 <p><b>YEAR 2</b></p>	 <p><b>YEAR 3</b></p>	 <p><b>YEAR 4</b></p>
<h3>Engage with the principles</h3> <p>First Year (Stage 1), students interested in Mathematics must study modules in Mathematics, Applied &amp; Computational Mathematics and Statistics. The <a href="#">Stage 1 (First Year) Guide</a> details the modules required for each degree subject. Please email <a href="mailto:gary.dunne@ucd.ie">gary.dunne@ucd.ie</a> if you have any questions.</p> <p><i>Modules available include:</i></p> <ul style="list-style-type: none"> <li>- Applied Mathematics: Mechanics and Methods</li> <li>- Calculus in the Mathematical and Physical Sciences</li> <li>- Numbers &amp; Functions</li> <li>- Linear Algebra in the Mathematical and Physical Sciences</li> <li>- Mathematical Analysis</li> <li>- Applications of Differential Equations</li> <li>- Statistical Modelling</li> <li>- One elective module</li> <li>- One small-group project</li> </ul>	<h3>Choose your subjects</h3> <p>In Second Year (Stage 2), the majority of MPG students study a minimum of two subjects but many students will study three subjects. The following is just one example of subjects you could combine with Mathematics in Second Year.</p> <p><b>Mathematics</b></p> <p><i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Linear Algebra 2</li> <li>- Calculus of Several Variables</li> <li>- Groups, Rings &amp; Fields</li> </ul> <p><b>Applied &amp; Computational Mathematics (Optional)</b></p> <p><i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Computational Science</li> <li>- Vector Calculus</li> <li>- Oscillations in Mechanical Systems</li> <li>- Classical Mechanics and Special Relativity</li> </ul> <p><b>Statistics (Optional)</b></p> <p><i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Probability Theory</li> <li>- Stochastic Models</li> <li>- Inferential Statistics</li> </ul> <p>- Two elective modules</p>	<h3>Focus on your chosen subject</h3> <p>In Third Year (Stage 3), students focus their studies on one degree subject.</p> <p><b>Mathematics</b></p> <p><i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Advanced Linear Algebra</li> <li>- Metric Spaces</li> <li>- Fourier Analysis</li> <li>- Measure Theory &amp; Integration</li> <li>- Functions of One Complex Variable</li> <li>- Topology</li> <li>- Number Theory</li> <li>- Coding Theory</li> </ul> <p>- Two elective modules</p>	<h3>Refine your knowledge</h3> <p>In Fourth Year (Stage 4), students complete their undergraduate studies and in Mathematics this will include a research project.</p> <p><b>Mathematics</b></p> <p><i>Modules include:</i></p> <ul style="list-style-type: none"> <li>- Mathematics Research Project</li> <li>- Differential Geometry</li> <li>- Set Theory</li> <li>- Combinatorics</li> <li>- Functional Analysis</li> <li>- Cryptography</li> <li>- Ring Theory</li> <li>- Stochastic Analysis</li> <li>- Numerical Algorithms</li> <li>- History of Mathematics</li> <li>- Predictive Analytics</li> <li>- Advanced Mathematical Methods</li> </ul>

## Career & Study Opportunities

### BSc (Honours) Mathematics

#### MSc (Taught)

- MSc Financial Mathematics
- MSc Mathematical Science
- MSc Statistics
- MSc Actuarial Science
- MSc Business Analytics
- MSc Data Analytics

#### PhD

- Students can pursue a PhD in universities in Ireland or abroad

#### Industry

- Banking & Finance
- Mathematical Modelling
- Information and Communications Technology
- Actuarial Science

#### Conversion Courses

- Professional Master of Education (PME)
- MSc Computer Science (Conversion)
- MSc Quantitative Finance

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