# MSc Data & Computational Science

## (1 Year Full Time)

The MSc Data & Computational Science is designed for students from highly quantitative disciplines who wish to work in data analytics or computational science. Computational Science is at the crossroads between modern applied mathematics and statistics, and our programme recognizes this fact by combining aspects of both in a unique set of tailored modules including scientific computing, mathematical modelling, and data analytics.

The programme will equip you to solve complex scientific problems and analyse large data sets using a range of theoretical tools, from deterministic mathematical modelling to Bayesian analysis. The intensive programming modules will allow you develop a range of sought-after skills in practical programming and data analytics, including applications in high performance computing.

## Course Content and Structure

<table>
<thead>
<tr>
<th>Research Stream</th>
<th>Taught Stream</th>
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<tbody>
<tr>
<td>60 taught credits</td>
<td>90 taught credits</td>
</tr>
<tr>
<td>Autumn/Spring trimester</td>
<td>Autumn/Spring/Summer trimester</td>
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<tr>
<td>+</td>
<td>+</td>
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<tr>
<td>30 credit research project</td>
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<tr>
<td>Summer trimester</td>
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The structure of the programme includes the following:

### Core modules in computational science and mathematics:
- Scientific Computing
- High-performance Computing
- Mathematica for Research
- Applied Matrix Theory
- Transferrable Skills

### Core modules in statistics and data analytics:
- Predictive Analytics
- Advanced Predictive Analytics
- Statistical Machine Learning
- Data Programming with R
- Bayesian Analysis

### Optional Modules Include:
- Numerical Algorithms
- Monte Carlo Inference
- Probability & Statistics
- Time Series Analysis
- Data Programming with Python
- Topics in Computational Science & Machine Learning

Modules and topics shown are subject to change and are not guaranteed by UCD.

## Entry Requirements

- This programme is intended for applicants who have an upper second class honours degree or higher, or the international equivalent, in a highly quantitative subject such as Mathematics, Physics, Statistics, Engineering.
- Applicants whose first language is not English must also demonstrate English language proficiency of IELTS 6.5 (no band less than 6.0 in each element), or equivalent, such as TOEFL (iBT) score of 90 or PTE score of 63.

## Career Opportunities

The unique combination of modules and skills offered by this programme will equip graduates to work in a range of specific sectors in data analytics, data science, quantitative modelling in finance, and computational science and engineering. Recent past graduates from this programme and other similar past programmes in the school, work in firms including ICT companies (e.g. Facebook, Google, LinkedIn, BAE Systems), the financial services industry (e.g. AIB, AXA, Citi, Deloitte, Geneva Trading, KBC, Permanent TSB, Murex), and other data-intensive businesses (e.g. Accenture, AXA, Paddy Power, SAP, ESB, LexisNexis).

## Graduate Profile

Cian O’Callaghan, Paddy Power

I would thoroughly recommend the MSc Data & Computational Science to students interested in pursuing a career/further studies in data science. The lecturers and tutors are both extremely knowledgeable and approachable. The course strikes a balance between understanding the theory behind computational and machine learning algorithms and applying this theory to real-world problems.