Overview
The BSc Data Science offers a combination of programming, mathematics, communication and analytics skills that creates valuable insight and professional expertise. The degree has been developed in close collaboration between DCU, global centres of research excellence (Insight, ADAPT) and major industry partners. The objective of this degree programme is to produce graduates who:

— Are equipped with the knowledge and abilities to apply the full spectrum of computing and analytics to real world data issues
— Have a unique combination of mathematics, statistics, computing and communication skills
— Understand fundamental and applied machine learning, artificial intelligence, data mining and data analytics and how these tools are used in a range of application domains including finance, health, media and natural language processing
— Can participate in data science teams and communicate effectively to other team members
— Think creatively to solve challenges using data-driven techniques

Programme Outline
Year One: Students study fundamentals in mathematics, statistics, programming and databases (SQL), and get a taste of the world of data analytics.

Year Two: Continuing study of statistics and multivariate calculus. More detailed study of data, programming in both Python and R, machine learning, visualisation and data engineering, warehousing and mining.

Year Three: Students explore graph databases, professional skills and practical applications are employed involving large data sets and complex problem solving using real world scenarios in domain specific data science pods. The second half of year three is the INTRA placement with data science teams in data-driven organisations.

Year Four: The latest developments in programming for large and distributed data problems, computational modelling, advanced machine learning and natural language technologies will be studied and students complete an individual project in the data science arena.

Work Experience
Students from the BSc Data Science will have the ability to work in many computing roles, some of which are listed here:

— Data Scientist
— Business Intelligence Analyst
— Customer Insights
— Knowledge Engineer
— Risk Analyst
— Data Programmer
— Real time data processing
— Software Engineer
— Machine Learning and AI
Relevant Work Experience

INTRA (INtegrated TRAining) work placements

Relevant work experience through DCU’s internship programme “INTRA” (INtegrated TRAining) is a mandatory element of the BSc Data Science. Students are required to complete an 8 month INTRA placement at the end of third year, from February to September. INTRA Vacancies will be advertised every year from October to the end of January.

Students are available for interview from October onwards. For more information, contact:

INTRA Unit, Student Support & Development, DCU, Glasnevin, Dublin 9. Ireland.

T: +353 1 700 5515
E: maeve.long@dcu.ie
W: dcu.ie/intra
LinkedIn: in/dcu-intra-office

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Programming (Python)</td>
<td>Computer Programming 3 (Data Structures and Algorithms)</td>
<td>Data Exploration Using Graph Theory</td>
<td>Application Domains 2</td>
</tr>
<tr>
<td>Data Science and Databases</td>
<td>Computer Programming 4 (Object Oriented Programming)</td>
<td>Professional and Research Practice for Data Science</td>
<td>Advanced Machine Learning</td>
</tr>
<tr>
<td>Collaboration and Innovation</td>
<td>Statistics</td>
<td>Software Engineering: Building Better Software</td>
<td>Data Analysis at Speed and Scale</td>
</tr>
<tr>
<td>Digital Innovation Management and Enterprise</td>
<td>Calculus of Several Variables</td>
<td>Search Technologies</td>
<td>Building Complex Computational Models</td>
</tr>
<tr>
<td>Linear Mathematics</td>
<td>Data Processing and Visualization</td>
<td>Application Domains 1 (e.g., finance, health, education)</td>
<td>Natural Language Technologies</td>
</tr>
<tr>
<td>Calculus</td>
<td>Data Warehousing and Data Mining</td>
<td>INTRA</td>
<td>Application Domains 3</td>
</tr>
<tr>
<td>Probability</td>
<td>Introduction to Machine Learning</td>
<td></td>
<td>Final Year Project</td>
</tr>
<tr>
<td>Probability</td>
<td>Programming for Data Analysis (R language)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INTRA