

Computer Science with Data Science

CAO code: DN201



- Learn key skills to demonstrate basic knowledge and understanding of the fundamentals of data science.
- Develop the technical depth and the practical experience that you will need to stand out in an increasingly demanding market-place.

Professor Cunningham is Head of the School of

Computer Science and Professor of Knowledge and Data Engineering. He has been involved in research in Data Analytics for over 20 years and has published over 200 papers in the area. He is a founding director of the Insight Centre for Data Analytics (insight-centre.org) and the Centre for Applied Data Analytics (ceadar.ie), both located in UCD. Through CeADAR and Insight the UCD School of Computer Science collaborate with over 70 companies on Data Science research.

Professor Pádraig Cunningham, Staff



Sample pathway for a degree in Computer Science with Data Science *

YEAR 1

ENGAGE WITH THE PRINCIPLES

COMPUTER SCIENCE

Topics include:

- ▶ Algorithmic Problem-Solving
- ▶ Computer Programming
- ▶ Introduction to Computer Architecture

- ▶ Formal Foundations
- ▶ Computer Science in Practice
- ▶ Software Engineering Project 1

MATHEMATICS

Topics include:

- ▶ Matrix Algebra
- ▶ Foundations of Mathematics for Computer Science

- ▶ Two Elective modules

YEAR 2

BROADEN YOUR KNOWLEDGE

COMPUTER SCIENCE WITH DATA SCIENCE – Topics include:

- ▶ Data Structures & Algorithms
- ▶ Introduction to Java
- ▶ Discrete Mathematics for Computer Science
- ▶ Software Engineering Project 2

- ▶ Linear Algebra II
- ▶ Databases and Information Systems I
- ▶ Digital Systems
- ▶ Introduction to Operating Systems
- ▶ Introduction to Functional Programming

- ▶ Two Elective modules

YEAR 3

FOCUS ON YOUR CHOSEN SUBJECT

COMPUTER SCIENCE WITH DATA SCIENCE – Topics include:

- ▶ Data Science in Python
- ▶ Introduction to Project Management
- ▶ Probability Theory

- ▶ Introduction to Artificial Intelligence
- ▶ Graphs & Networks
- ▶ Data Science in Practice

- ▶ Industry Internship
- ▶ Information Visualisation
- ▶ Programming for Big Data

- ▶ Two Elective modules

YEAR 4

REFINE YOUR KNOWLEDGE

COMPUTER SCIENCE WITH DATA SCIENCE – Topics include:

- ▶ Data Science Project
- ▶ Machine Learning
- ▶ Cloud Computing
- ▶ Data Mining
- ▶ Collective Intelligence
- ▶ Multi-Agent Systems

- ▶ Parallel and Cluster Computing
- ▶ Text Analytics
- ▶ Human Language Technology
- ▶ Connectionist Computing
- ▶ Spatial Information Systems
- ▶ Information Security

- ▶ Linear Models
- ▶ Unix Programming
- ▶ Networks and Internet Systems
- ▶ Information Theory
- ▶ Inferential Statistics

BSc (Honours) Computer Science with Data Science

MSc (Taught)

- ▶ MSc Computer Science (Negotiated Learning)
- ▶ MSc Digital Investigation & Forensic Computing
- ▶ MSc Cognitive Science

Research

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

- ▶ Artificial Intelligence
- ▶ Software and Systems Engineering
- ▶ Networks and Distributed Systems
- ▶ Postdoctoral Research

Industry

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

Conversion Courses

- ▶ Smurfit Business School postgraduate degrees, e.g., Masters in Business Administration; Masters in Business Analytics

*See pages 4 and 5 for information on the terminology used above. Potential combinations shown here are examples only and are not guaranteed by UCD. Topics are subject to change each year.



www.myucd.ie/courses/science/computer-science-data-science/

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Professor Pádraig Cunningham
UCD School of Computer Science

computerscience@ucd.ie
+353 1 716 2483
facebook.com/UCDSchool
twitter.com/ucdscience