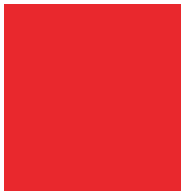
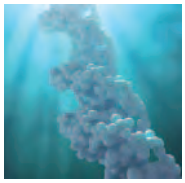
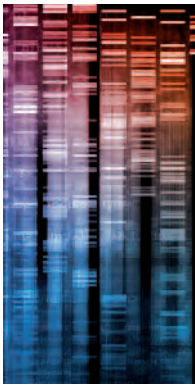
College of Science,
Engineering & Food Science

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

School of
Microbiology
Scoil na
Micribhitheolaíochta

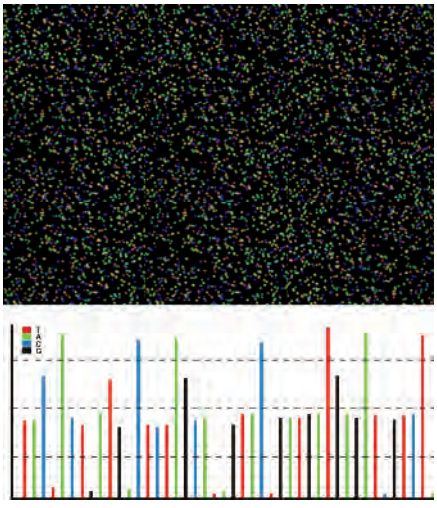

MSc in BIOINFORMATICS and COMPUTATIONAL BIOLOGY

University College Cork
University College Cork is one of Ireland's oldest institutions of higher education, and Ireland's first 5-star University. UCC was originally founded in 1845 and 150 years later the University is internationally acclaimed as Ireland's leading research institution.

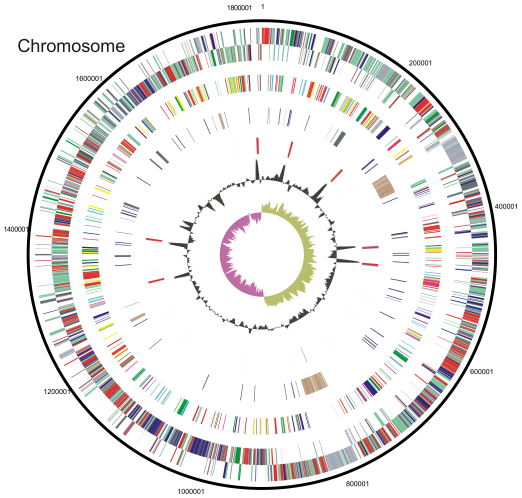
Overview of Programme
The MSc in Bioinformatics and Computational Biology at University College Cork is a one-year taught Masters course running from October to September.

Bioinformatics is a fast-growing field at the intersection of Biology, Mathematics and Computer Science. It seeks to create, advance and apply computational algorithms and statistical techniques to solve formal and practical problems arising from the management and analysis of very large biological data sets.

Major research efforts in the field include: the generation and analysis of genome sequences such as the human genome; the human microbiome, analysis of genetic variation within populations, and analysis of gene expression and protein-protein interaction data. Another emerging area within bioinformatics is systems biology, which examines how individual biological components (e.g. genes, proteins, cells) interact in a network within a whole organism or body.



Aim
This MSc course will provide theoretical education coupled to a practical training to students that already possess a BSc in a Biological Science, Computer Science, Mathematics, Statistics, Engineering, or a related degree, to allow them to understand and apply the principles underlying bioinformatics.



The course has four different streams, for Biology, Mathematics, Statistics and Computer Science graduates (graduates of related disciplines such as Engineering, Physics, Medicine, etc. will be enrolled in the most appropriate stream). This will allow graduates from different backgrounds to increase their knowledge and skills in areas in which they have not previously studied, with particular emphasis on hands-on expertise relevant to bioinformatics.
As part of the MSc course, students will carry out a three-month research project in a research group in UCC or in an external university, research institute or industry.

The programming and data handling skills that students develop, along with their exposure to an interdisciplinary research environment, will be very attractive to employers. Graduates from the MSc will have a variety of career options including working in a research group in a university or research institute, industrial research, or pursuing a PhD in Bioinformatics.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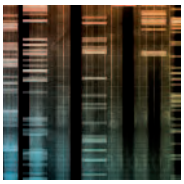

Departments Involved
The programme is organised and will be delivered by staff from across the Departments of Computer Science, Biochemistry, Microbiology and the School of Mathematics.

Entry & Eligibility
Candidates must be holders of an Honours Bachelor degree, or equivalent qualification, in a discipline with a significant element of Mathematics, Statistics, Computer Science or Biology, with a minimum of second class Grade 1. In addition, candidates with Second Class Honours Grade 2 may also be considered for places, following assessment by the Programme Director if they are also proficient in mathematics as evident from grades in Higher Leaving Cert maths, or undergraduate maths modules, and have at least one year of proven and relevant Biological, Mathematical or Computational experience. A candidate for the MSc Degree in Bioinformatics and Computational Biology must register full-time over one academic year (October-September, total 12 months), or as part-time over two academic years.

Fees
http://www.ucc.ie/en/financeoffice/fees/

Application Procedures
All applications for taught postgraduate programmes are made online via the UCC application portal.
For further information about applying, contact the UCC Postgraduate Admissions Office:

Telephone: +353 21 4902876
Email: graduatestudies@ucc.ie
Web: https://www.ucc.ie/en/ckr33/

Programme Structure
Students will complete the following modules (details, which are subject to change, can be found in the Book of Modules):

Stream for Biology graduates	Stream for Computer Science graduates	Stream for Mathematics graduates	Stream for Statistics graduates
Core modules	**Core Modules**	**Core Modules**	**Core Modules**
Data analysis I ST3300	Introduction to statistics ST5005	Dynamic Machine Learning AM6016	Dynamic Machine Learning AM6016
Data analysis II ST4400	Molecular Biology BC6002	Molecular Biology BC6002	Molecular Biology BC6002
Introduction to statistics ST5005	Biomolecules BC6003	Biomolecules BC6003	Biomolecules BC6003
Dynamic Machine Learning AM6016	Cells, Biomolecules, Genetics and Evolution BL6023	Cells, Biomolecules, Genetics and Evolution BL6023	Cells, Biomolecules, Genetics and Evolution BL6023
Open Source Infrastructure AM6020	Data mining CS6405	Open Source Infrastructure AM6020	Open Source Infrastructure AM6020
Data mining CS6405	Programming for Bioscientists 2 CS6502	Data mining CS6405	Data mining CS6405
Programming for Bioscientists 1 CS6501	Computational Systems Biology MB6300	Programming for Bioscientists 2 CS6502	Programming for Bioscientists 2 CS6502
Programming for Bioscientists 2 CS6502	Genomic Data Analysis MB6301	Computational Systems Biology MB6300	Computational Systems Biology MB6300
Computational Systems Biology MB6300	Computational Microbiome Analysis MB6302	Genomic Data Analysis MB6301	Genomic Data Analysis MB6301
Genomic Data Analysis MB6301	(Research) Dissertation MB6303	Computational Microbiome Analysis MB6302	Computational Microbiome Analysis MB6302
Computational Microbiome Analysis MB6302	Data analysis I (ST3300)	(Research) Dissertation MB6303	(Research) Dissertation MB6303
(Research) Dissertation MB6303	Data analysis II (ST4400)	**Elective modules**	Discrete Mathematics MS6005
Elective modules	**Elective modules**	Data analysis I ST3300 or	**Elective modules**
Discrete Mathematics MS6005 or	Discrete Mathematics MS6005 or	Data analysis II ST4400	Introduction to Relational Databases CS6503 or
Introduction to Relational Databases CS6503	Programming for Bioscientists 1 CS6501	Programming for Bioscientists 1 CS6501 or	Programming for Bioscientists 1 CS6501
		Introduction to Relational Databases CS6503	

Further Information
For questions relating to this course, please email Professor Marcus Claesson at M.Claesson@ucc.ie
For further information on the course, and on careers in Bioinformatics, see the course website:
https://www.ucc.ie/en/ckr33/

STARS RATED FOR EXCELLENCE 2015

GEORGE BOOLE* 200