Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University

BSc Biotechnology - INTRA Programme (DC181)

Objective

Biotechnology is defined as the controlled and deliberate manipulation of biological systems for the efficient manufacture or processing of useful products. The objective of this four-year, full-time degree is to produce graduates for the Bioprocessing Industries, with skills developed at laboratory and pilot plant scale in microbiology, biochemistry, molecular biology, genetics and process engineering.

Programme Outline

The first year of the BSc Biotechnology concentrates on the disciplines of biology, chemistry, physics and mathematics with an introduction to bioprocessing. The second year develops the biological and engineering aspects of Biotechnology and in third year, specialist areas of biology are introduced such as cell biology, recombinant DNA cloning and bioinformatics. In engineering, students are introduced to bioreactors, primary separations and downstream processing. In fourth year, all students study industrial bioprocessing, proteins and proteomics, genetics and cell biology, immunology and animal cell culture. They also undertake a detailed literature survey. Students then have the opportunity to specialise in one of two Streams, either (1) Biotechnology and Life Science, which includes a laboratory research project, or (2) Biopharma, which features bioprocessing and advanced bioanalysis laboratories, plus three biopharma-themed lecture modules.

Work Experience

Relevant Work Experience through DCU's work experience programme INTRA (INtegrated TRAining) is an integral part of our Biotechnology degree and has been a central feature of education at DCU since its foundation. Students from the BSc Biotechnology are required to complete an INTRA placement of up to eight months' duration at the end of third year, during the period February to September.

Skills

Biotechnology students will have the ability to work in roles listed below:

- Process/Bioprocess Engineering
- Process validation
- Protein separation and purification
- Fermentation
- Project Engineering
- Quality control/assurance
- Immunodiagnostics
- Animal/plant cell culture
- Molecular biology/genetics
- Food Processing
- Biochemical Analysis
- Microbiological Analysis
- Environmental Monitoring and Analysis
- Waste Treatment

Work Areas

Work Areas to date, Biotechnology graduates have worked successfully in the following industries worldwide:

- Pharmaceutical
- Biomedical
- Diagnostics
- Fine Chemicals
- Medical
- Brewing
- Food
- Dairy Production
- Agricultural
- Bulk Chemicals
- Plant Science
- Veterinary

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 8877
E: carol.power@dcu.ie
W: dcu.ie/intra
in/dcu-intra-office

Year 1	Year 2	Year 3	Year 4
Core Modules	**Process Engineering**	**Cell and Molecular Biology**	**Stream 1 Biotechnology and Life Science**
Biology	Bioprocess Engineering Principles	Gene Cloning and Gene Expression	Research Project
Chemistry	Transport Processes	Cell Biology, Recombinant DNA Cloning and Bioinformatics	Commercial Biotechnology and Biopharma
Physics	Bioprocessing and Instrumentation Laboratory	Advanced Cell Biology	Human Inheritance and Population Genetics
Mathematics	**Biology**	**Bioprocess Engineering**	Population Genetics
Introduction to Bioprocessing	Biomolecules and Metabolism	Bioreactors and Primary Separations	**All Students**
	Microbiology and Genetics	Downstream Processing	Industrial Bioprocessing Proteins, Proteomics and Biopharma
	Cell Structure and Function	Bioprocessing Laboratory	Current Topics in Genetics and Cell Biology
	Practical Biochemistry Laboratory	**INTRA (up to 8 months)**	Immunology and Immunoanalysis
	Practical Microbiology and Genetics Laboratory	INTRA	Animal Cell Biotechnology
	Scientific Topics		Literature Survey and Experimental Design
	Statistics		**Stream 2 Biopharma**
	Organic Chemistry		Bioprocessing Laboratory
	Scientific Literature		Advanced Bioanalysis Laboratory
			Biopharmaceutical Industry
			Regulation and Management
			Biopharmaceutical Facility Design and Operation
			Formulation and Delivery of Biopharmaceuticals