CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

biological sciences @cit

biological sciences @cit

Thank you for taking the time to read our departmental brochure. We hope that you find the information you need to plan the next step of your scientific career. Our department has always been one of the premier providers of biology related courses in the country, and we look forward to training the next generation of future biologists.

Dr Brendan O'Connell (Head of Department).

Department of Biological Sciences ...

- Experienced provider of career focused education
- Expert training with high practical content in all our courses
- Modern teaching facilities
- 16 week work placement programme
- Innovative research and development ethos
- Strong industry collaborations
- Small class sizes

All our courses are designed to be career focused ensuring each graduate is equipped with the necessary skills to maximise their employment potential.

Employer focused courses

We place a great emphasis on training biologists for real world positions. With this in mind, we incorporate significant practical content into all our courses. Additionally, in 3rd year, all our students participate in a 16 week work placement programme based in a relevant scientific industry or company, either locally or internationally. Consequently our graduates have a distinct advantage when applying for full time positions.

Applied Biosciences

CR 006 Level 7 Award

>> Progression to Honours Degrees & Postgraduate Programmes
▲ Higher Certificate Option

Application: CAO
Award Title: Depends on Specialisation. Choose from:
- Bachelor of Science in Food & Health Science
- Bachelor of Science in Applied Biosciences & Biotechnology

Duration: 3 Years (6 Semesters)
Places: 40

Minimum Entry Requirements
Leaving Certificate in 5 Subjects

Subjects D3 (O/H)	Subjects C3 (H)	Maths Grade	English or Irish Grade
5	0	D3 (O/H)	D3 (O/H)

What is Applied Biosciences?

Applied Biosciences is the study of complex biological systems, and how they work, for example how bacteria generate energy from the breakdown of sugars. Applied Biosciences also involves the use of living organisms and bioprocesses in engineering, technology, medicine and agriculture – in other words, the application of scientific and technical advances in the life sciences to develop commercial products.

Helpful Leaving Certificate Subjects

Chemistry, Biology, Physics, and Mathematics.

Work Placement

There is a mandatory work placement of a minimum of 16 weeks in Year 3.

Potential Areas of Employment

- Pharmaceutical Industry
- Food and Healthcare Industries

myCIT myCourse

"The course provides a fantastic range of both lectures and labs that are delivered by dedicated and approachable lecturers who are both interested in what they teach and up-to-date in their course material. The work placement element in Year 3 provides a great opportunity to experience a real working environment."
Chloe Huseyin

www.cit.ie/course/CR006

Module Information
http://modules.cit.ie/cr006

CIT has developed a website which gives full details of all modules for all courses. The website also has information on recommended textbooks, average weekly workload, assessments and exams.

About the Course
In CR 006 Applied Biosciences, Years 1 and 2 are common. Students will not be required to choose their preferred qualification (Food & Health Science or Applied Biosciences and Biotechnology) until the beginning of Year 3.

Knowledge of environmental science, analytical techniques, quality management and bioprocessing are seen as key requirements and these disciplines are studied in detail. Laboratory work forms a substantial part of the course. The development of high-level laboratory skills and the ability to use them in the service of advanced industrial biology are key aims of the course. Opportunities currently exist for a number of students on courses to participate in EU funded exchange programmes involving colleges and enterprises in Europe.

The Bachelor of Science in Applied Biosciences and Biotechnology meets the demands of biotechnology, food and pharmaceutical industries for technologists and analysts. In addition, the requirements of the services and research laboratories for staff trained in advanced biologically based analytical techniques are met by graduates of the course.

The Bachelor of Science in Food & Health Science meets the changing needs of the Food, Pharmaceutical and Biotechnology industries for technicians and analysts. Graduates are in great demand from multinational pharmaceutical companies, as well as the traditional employers in the food and drink sectors.

Advanced manufacturing in the food, health care, cosmetic, pharmaceutical and chemical industries have been employment destinations for graduates of this course as well as state and local authority laboratories.

Further Studies
For details, see www.cit.ie

Suitably qualified graduates of the BSc in Food & Health Science may apply for entry to Year 4 of
→ BSc (Honours) in Nutrition & Health Science

Suitably qualified graduates of the BSc in Applied Biosciences & Biotechnology may apply for entry to Year 4 of
→ BSc (Honours) in Pharmaceutical Biotechnology

Career Opportunities
Graduates from this course have traditionally gained employment in the Pharmaceutical, and Food and Healthcare industries, where graduates function in a variety of roles including; quality analysts, microbiologists, purification specialists, researchers and technicians. Graduates also have the option to progress to further academic studies at Level 8 within the Department of Biological Sciences.

Contact Information
Dr Roy Sleator
Department of Biological Sciences
T: 021 433 5405
E: roy.sleator@cit.ie

Question Time
If I am not sure what area of Biological Sciences I'd like to specialise in, would this be a good course choice for me?
This course provides a broad grounding in the core principles of the biological sciences; allowing students to gain a solid understanding of core concepts and techniques for two years before deciding to specialise in their chosen field in Year 3.

What personal skills are most suited to the course and subsequent careers?
The best students and professional biotechnologists all possess a keen interest in biology and a desire to understand how complex biological processes work.

myCIT myCareer

Jurate Daugelaite
Postgraduate Student

Following the BSc in Applied Biosciences and Biotechnology in 2009, Jurate undertook the BSc (Honours) in Pharmaceutical Biotechnology.

She is currently pursuing the MSc in Computational Biology, a one year taught Master of Science programme at CIT's Department of Biological Sciences and hopes to progress further to PhD level on completion of the Masters.

Biomedical Science (Honours)

CR 320 Level 8 Award

>> Progression to Postgraduate Programmes

Application: CAO
Award Title: Bachelor of Science (Honours) in Biomedical Science
Duration: 4 Years (8 Semesters)
Places: 30
Campus: CIT and UCC

Minimum Entry Requirements
Leaving Certificate in 6 Subjects

Subjects D3 (O/H)	Subjects C3 (H)	Maths Grade	English and Irish Grade
4	2 (Note 1)	D3 (O/H)	D3 (O/H)

Note 1: A C3 at Higher Level must be obtained in a Laboratory Science subject (from Chemistry, Physics, Biology or Physics and Chemistry (joint)).
NB: Agricultural Science is accepted as a subject and attracts CAO points, but does not meet the requirement for the Laboratory Science Higher C3 subject.

What is Biomedical Science?

Biomedical Science is the term for the investigations carried out by Biomedical Scientists on samples of tissue and body fluids to diagnose disease and monitor the treatment of patients.

Helpful Leaving Certificate Subjects

Chemistry, Biology, Physics, Mathematics and English.

Work Placement

This work placement (clinical placement) is offered post-graduately and is optional. However, in order for graduates to be eligible to work as Medical Scientists in hospitals in Ireland, they must have completed a clinical placement training which takes a full academic year.

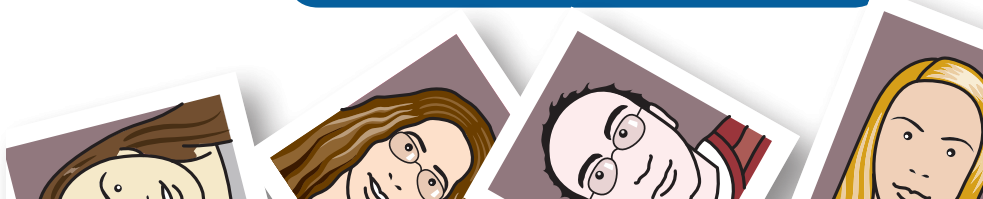
Potential Areas of Employment

- Medical Scientist in Hospitals
- Biopharmaceutical & Biotechnology Industries
- Public Health
- Sales & Marketing of Medical Products

myCIT myCourse

The extensive laboratory training incorporated throughout the course combined with the clinical placement in a teaching hospital, allows me to become proficient in all disciplines of medical science. Each student was well known by lecturing staff which aids the learning process immensely as information and advice can be obtained easily."
Laura O'Brien

www.cit.ie/course/CR320



Module Information
http://modules.cit.ie/cr320

CIT has developed a website which gives full details of all modules for all courses. The website also has information on recommended textbooks, average weekly workload, assessments and exams.

About the Course
This Honours Degree course is offered jointly by Cork Institute of Technology and University College Cork. Biomedical scientists work in partnership with doctors and other health-care professionals to perform many different roles in medical laboratories. Biomedical Science is a continually changing dynamic profession and involves study of the diverse areas of medical science including Biochemistry, Microbiology, Cellular Pathology, Haematology and Transfusion Science. It provides training in state-of-the-art technologies to facilitate investigation of disease and medical research.

Accreditation
This Honours Degree course with clinical placement is fully accredited by the Academy of Medical Laboratory Sciences (AMLS).

Further Studies
For details, see www.cit.ie

The CIT/UCC joint BSc (Honours) Degree in Biomedical Science is one of only three Honours Degrees in the Republic of Ireland which are recognised by the Academy of Medical Laboratory Sciences (professional body) as enabling graduates to practise in hospitals in the State. However, this BSc (Honours) must be accompanied by clinical placement training. Graduates of the BSc (Honours) will be offered the opportunity to complete this placement in a designated hospital laboratory.

Suitably qualified graduates are eligible to apply for a postgraduate degree at CIT:
- MSc in Biomedical Science (Taught)
- MSc in Computational Biology (Taught)
- MSc (by Research)
- PhD

Career Opportunities
Biomedical Science prepares the student for a career in laboratory medicine and related areas in the health-care industry and biopharmaceutical industry. Biomedical Science graduates work as Medical Scientists in hospitals, and in research, the biopharmaceutical and biotechnology industries, public health and sales and marketing of medical products.

Contact Information
Dr Brigid Lucey
Department of Biological Sciences
T: 021 433 5484
E: brigid.lucey@cit.ie

Question Time
What do you need to work as a Biomedical Scientist in Ireland?
Graduates with a BSc (Honours) in Biomedical Science from CIT/UCC, GMIT, or DIT, who have completed clinical placement are eligible for membership of the Academy of Medical Laboratory Science, which qualifies the graduate to practice as a Biomedical Scientist.

Is it an advantage to have Chemistry and Physics coming into the course?
It is always an advantage to have Chemistry and Physics coming into a course such as Biomedical Science. However, it is feasible to take up one or both of these subjects on entry to the course, and the first year programme is tailored to support students who enter the programme without prior knowledge of these subjects.

What kind of person should you be?
This profession requires scientists who are mindful of their responsibility when dealing with human health. It also means that they are often privy to information concerning patients that they cannot divulge for ethical reasons other than in the course of their work.

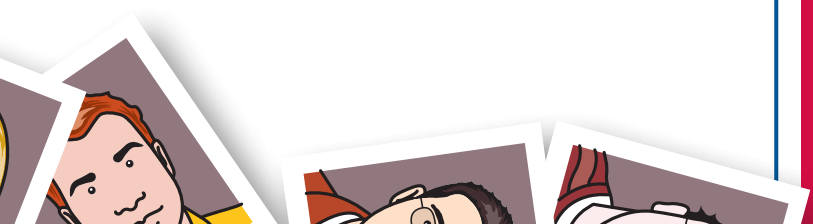
What is the time divide between CIT and UCC?
The programme for the BSc (Honours) in Biomedical Science is taught equally by CIT and UCC, so this means that the students will expect to spend some days in one institution or the other. The timetable is arranged to minimise travel between the two colleges.

myCIT myCareer

Dr Annmarie Mollaghan
Medical Scientist

Having completed the BSc (Honours) in Biomedical Science in Cork, Annmarie began work as a Medical Scientist in the Microbiology Department of St. James's Hospital in Dublin until she embarked on a postgraduate research scholarship at CIT in 2008.

During the intervening period, until her graduation in October 2011 with a PhD in Molecular Biology, Annmarie also undertook short part-time locum positions as a Medical Scientist in the Irish Blood Transfusion Service (IBTS) in Cork, and in the Microbiology Department of the Bon Secours Hospital in Cork. She currently works as a Medical Scientist in the Microbiology Department of the Cork University Hospital.



Herbal Science (Honours)

CR 330 Level 8 Award

>> Progression to Postgraduate Programmes

Application: CAO
Award Title: Bachelor of Science (Honours) in Herbal Science
Duration: 4 Years (8 Semesters)
Places: 20

Minimum Entry Requirements
Leaving Certificate in 6 Subjects

Subjects D3 (O/H)	Subjects C3 (H)	Maths Grade	English or Irish Grade
4	2	D3 (O/H)	D3 (O/H)

What is Herbal Science?

The Herbal Science programme covers all aspects of herbs and natural products with applications in the healthcare, food, cosmetic and biopharmaceutical industries.

Helpful Leaving Certificate Subjects

Biology, Chemistry and Mathematics.

Work Placement

There is a mandatory work placement of 10 weeks in Year 3.

Non-Standard Applicants

Encouragement will be given to non-standard applicants, including mature students, to enter the course. In the case of these applicants, their academic qualification and recognised prior learning (RPL) will be assessed and evaluated by the Department of Biological Sciences. It is anticipated that up to 30% of places will be offered to non-standard applicants.

Potential Areas of Employment

- Healthcare, Biopharmaceutical and Cosmetic Industry
- Food and Nutraceutical Industry
- Plant Production and Natural Product Ingredient Manufacture
- Clinical Herbal Medicine after further training

myCIT myCourse

"Although this course specialises in the science of herbs and natural products it offers a broad range of subjects that can be applied to other fields of science. I cannot recommend this course highly enough, the skills and knowledge learned are very valuable."
Niamh O'Brien

www.cit.ie/course/CR330

Module Information
http://modules.cit.ie/cr330

CIT has developed a website which gives full details of all modules for all courses. The website also has information on recommended textbooks, average weekly workload, assessments and exams.

About the Course
The main core of the programme is focused on the production, characterisation and applications of herbal extracts and natural products that are ingredients used in medicinal, pharmaceutical, cosmetic and food industries. The Herbal Science course is structured along streams of study based on plant science and plant production, human body systems, food and nutrition, and herbs and natural product applications.

The specific biological subjects are supported by more general analytical techniques and foundation skills that provide our graduates with broad scientific education while retaining an appropriate level of specialisation to offer a wide range of opportunities in industry, in research or in business development.

Further Studies
For details, see www.cit.ie

Suitable qualified graduates may progress to academic qualifications in a number of areas which include plant science, pharmacy, ethnobotany, microbiology, and pharmacognosy at Master's and Doctoral Degree level.

The course gives the educational foundation necessary to pursue a career as a medical herbalist. The IIMH accepts and recognises this BSc Honours Degree as constituting Part 1 of its professional training requirement for qualification as a medical herbalist/practitioner in Ireland. Further study/ training is required to achieve Part 2 of the IIMH professional requirements. The course also provides the student with an enormous opportunity to develop the skills necessary to commence herbal research or clinical training at an advanced level.

Career Opportunities
Graduates can expect to work in a variety of sectors including the Healthcare/Cosmetic Industry; Food Industry/ Nutraceutical Industry; Biopharmaceutical Industry; Quality Control/Analysis; and Medicinal Plant Production.

Contact Information
Anna-Maria Keaveney
Department of Biological Sciences
T: 021 433 5402
E: anna-maria.keaveney@cit.ie

Question Time
When I graduate, will I be based in a Lab?
Graduates can work in a variety of settings from growing herbs and extracting natural products to manufacturing and production in a range of industries (cosmetic, biopharmaceutical, food, etc.). You can chose to work in a lab undertaking research and product development or quality control. You can make other choices based on the modules covered in this course for a wide variety of career options and work placements.

What postgraduate qualification do you need to be qualified as a Herbalist?
There are a number of options available to graduates when it comes to postgraduate study, including professional training in Herbal medicine. If you chose to specialise in Herbal Medicine you will need further specialist postgraduate training accredited by the professional body that can be contacted for further information.

Alternatively you can pursue a research Master's through CIT's Graduate School which can be based in any one of a number of life science disciplines. From this you may choose to pursue a structured PhD such as the ED4LIFE programme which includes the tradition of original research but offers graduates a range of generic and subject specific skills so that they are industry ready upon graduation. Generic modules include entrepreneurship, communications, personal effectiveness, and research methodology.

Many other postgraduate opportunities can be availed of in other third level institutions in Ireland and abroad.

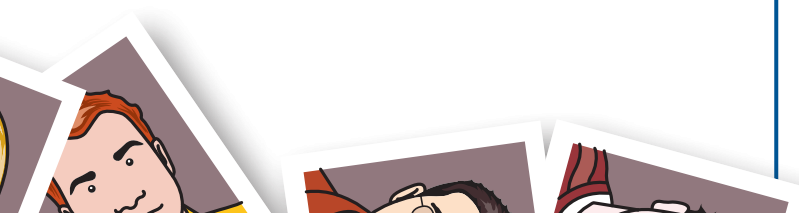
myCIT myCareer

Tracey Ryan
Company Owner

Tracey graduated in 2011 and has set up her own business, Bia Beauty.

"I really enjoyed the broad range of subjects studied on the Herbal Science Degree, from Botany to Biochemistry. But what really helped me was the emphasis on Innovation, Entrepreneurship, and Product and Process Development.

It was here that I got a taste of business from which I have now set up my own company making and selling natural cosmetics. This Degree has prepared me in many ways to run my business, from selecting appropriate herbs, to researching their benefits and creating a suitable manufacturing environment."



Nutrition & Health Science (Honours)

CR 333 Level 8 Award

>> Progression to Postgraduate Programmes

Application: CAO
Award Title: Bachelor of Science (Honours) in Nutrition & Health Science
Duration: 4 Years (8 Semesters)
Places: 40

Minimum Entry Requirements
Leaving Certificate in 6 Subjects

Subjects D3 (O/H)	Subjects C3 (H)	Maths Grade	English or Irish Grade
4	2	D3 (O/H)	D3 (O/H)

What is Nutrition & Health Science?

This course is designed to meet the need for technically competent managers, analysts and officers in the design, development, production, and upgrading of products which are ingested, injected, implanted, inhaled, inserted or topically applied to the bodies of humans or animals for the maintenance, restoration and promotion of their health and wellbeing.

Helpful Leaving Certificate Subjects

Biology, and Chemistry.

Work Placement

There is work placment of a minimum of 16 weeks in Year 3.

Potential Areas of Employment

- Research Scientist in food, nutraceutical, and related healthcare industries
- Production, Management and Marketing in food, nutraceutical and related healthcare industries
- Governmental agencies responsible for food
- Quality Assurance

myCIT myCourse

I'm delighted I chose this science course as it is very broad with modules ranging from Animal Physiology and Nutrition to Bio-Analytical Science. It offers great experience in laboratories where we get to carry out experiments nearly five days a week. It's always nice when a lecturer recognises you by name, something very common in CIT.
Anne Bourke

www.cit.ie/course/CR333

Module Information
http://modules.cit.ie/cr333

CIT has developed a website which gives full details of all modules for all courses. The website also has information on recommended textbooks, average weekly workload, assessments and exams.

About the Course
First and second year modules provide the student with a strong foundation in nutrition as well as other biological science modules such as cells, microbiology, biochemistry, biotechnology and science of food and health.

Third and fourth year cover more specialised topics such as food and healthcare chemistry, toxicology and microbiology, clinical nutrition and population health, health products regulation, biomanufacturing and food processes as well as food innovation. The lectures are supplemented with relevant case studies, projects, assignments and there is a strong focus on gaining in depth practical experience in the laboratory.

The work placement module is an integral and essential part of the course programme in which the student is introduced to a structured work environment. The student develops an understanding of the organisation, practices and procedures current in the organisation and the area of activity in which it is involved.

Further Studies
For details, see www.cit.ie

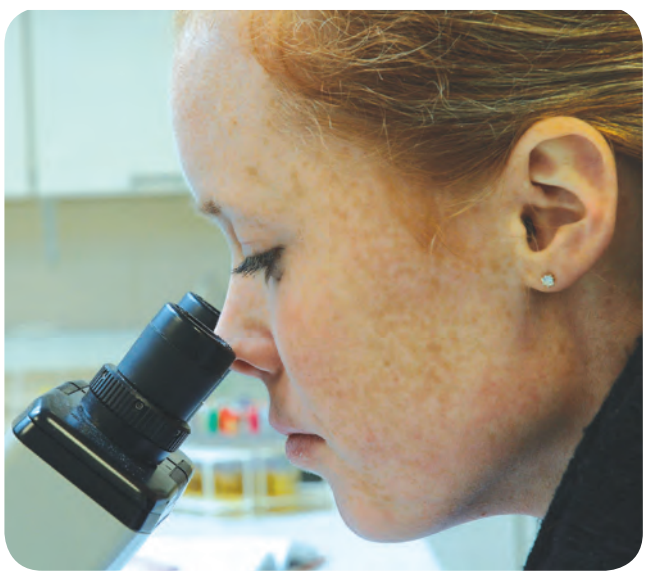
This course is an excellent platform for further studies, both in terms of short add-on courses, and more structured post graduate degrees such as Master of Science and PhD programmes.

Career Opportunities
It is envisaged that a graduate of this course will be employed in any sector of the Food/Nutraceutical or Healthcare Industries. Areas such as: management, development, production, quality assurance or marketing of products and/or services for the Food, Nutrition, Medical Devices, Cosmetic, Pharmaceutical, Animal feed and Veterinary Care sectors. In addition, there are employment opportunities within governmental agencies responsible for food. Nutrition & Health Science Degree graduates have many opportunities to engage in continued education and training (e.g. pursue a career in Dietetics).

Contact Information
Dr Helena Stack
Department of Biological Sciences
T: 021 433 5919
E: helena.stack@cit.ie

Question Time
Can I become a Dietician from CR 333?
Completion of the BSc (Honours) in Nutrition & Health Science does not qualify the graduate to practice as a Dietician. However, graduates of the course CR 333 can undertake further studies in other third-level institutes to pursue a career as a Dietician.

What personal skills are most suited to the course and subsequent careers?
Individuals pursuing a career in Nutrition & Health Science should be dedicated, logical, analytically minded, good with people, a team player, have good attention to detail and excellent organisational skills.



myCIT myCareer

Julie Grace
Postgraduate Student

"I found first and second year covered a wide range of subjects which gave me a great understanding and foundation in Nutrition & Health Science.

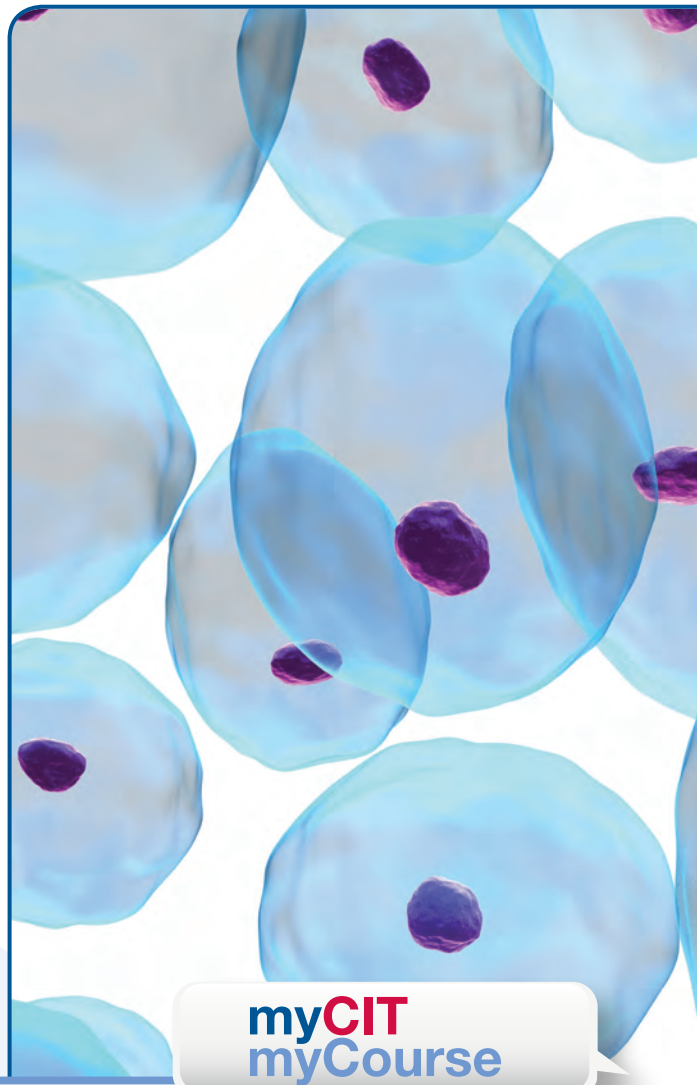
I gained excellent laboratory experience, which I was able to demonstrate in my third year work placement in Canada. I am currently studying for a Master's in Food Science, from which I hope to gain employment in the area of quality assurance in a food related industry.

Overall, I would highly recommend this course and thoroughly enjoyed my time in CIT."

Pharmaceutical Biotechnology (Honours)

CR 325 Level 8 Award

>> Progression to Postgraduate Programmes



Application: CAO
Award Title: Bachelor of Science (Honours) in Pharmaceutical Biotechnology
Duration: 4 Years (8 Semesters)
Places: 25

Minimum Entry Requirements
Leaving Certificate in 6 Subjects

Subjects D3 (O/H)	Subjects C3 (H)	Maths Grade	English or Irish Grade
4	2	D3 (O/H)	D3 (O/H)

What is Pharmaceutical Biotechnology?

Many modern medicines such as vaccines, hormones, anti-cancer drugs are now made using biological cells. Insulin for example, which is used by diabetic patients worldwide is made using living cells as opposed to more traditional chemical synthesis based methods. This means there is a strong demand for biologists who can design innovative new medicines using biological approaches, and who have the skills to work with cells and the bio-active compounds they produce. This biotechnology course will teach students how to grow and engineer biological cells in order to make safe and effective medicines using the most up-to-date information and technologies available.

myCIT myCourse

"This course provides you with great career opportunities. After graduation, I qualified for a research grant which allowed me to pursue my dream of getting a PhD."
Monika Koziel

Helpful Leaving Certificate Subjects

Biology, and Chemistry.

www.cit.ie/course/CR325

Work Placement

There is a mandatory work placement of a minimum of 16 weeks in Year 3.

Potential Areas of Employment

- QC Analyst
- Microbiologist
- Bio-assay Specialist
- Research and Development

Module Information
http://modules.cit.ie/cr325

CIT has developed a website which gives full details of all modules for all courses. The website also has information on recommended textbooks, average weekly workload, assessments and exams.

About the Course
The course content is specifically designed to meet the needs of the many relevant employers both nationally and internationally, and contains topical, cutting edge, industry specific material. The lectures are supplemented with in depth analysis of relevant case studies, projects, assignments, interactive videos, web tools and site visits. At least 50% of the contact time is spent in the laboratory gaining practical experience.

Work Placement is a mandatory part of this course. In Year 3, students will spend a minimum of 16 weeks in a local, national or internationally approved work environment.

Many of the world's top Biotechnology companies have a strong presence in Ireland. In general, the industry is moving towards a more "bio–based" approach to pharmaceutical manufacture. Consequently, there is a greater need to produce highly trained graduates who possess Pharmaceutical Biotechnology related skills. This course is designed to specifically meet this need.

Further Studies
For details, see www.cit.ie

This course is an excellent platform for further studies, both in terms of short add-on courses, and more structured postgraduate degrees such as Master of Science and PhD programmes.

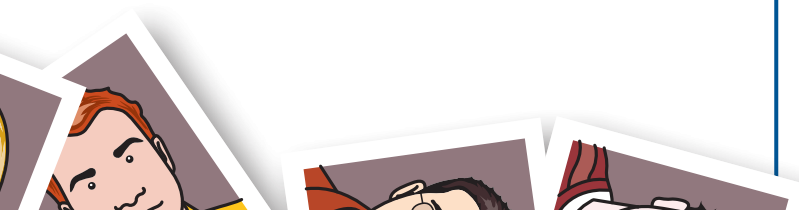
Career Opportunities
This course is very broad and is specifically designed to train students in all aspects of modern biotechnology. Graduates from this course are qualified to work in a number of areas within the biotechnology industry with many attaining employment immediately after graduating.

Contact Information
Dr Jim O'Mahony
Department of Biological Sciences
T: 021 433 5485
E: jim.omahony@cit.ie

Question Time
Does this course qualify me as a Pharmacist?
No. It trains you to work in the biotechnology industry where modern bio-medicines are discovered and made such as vaccines, hormones, antibodies and therapeutic enzymes.

What personal skills are most suited to the course and subsequent careers?
Good organisational skills, technical ability, team-working and ability to work to deadlines.

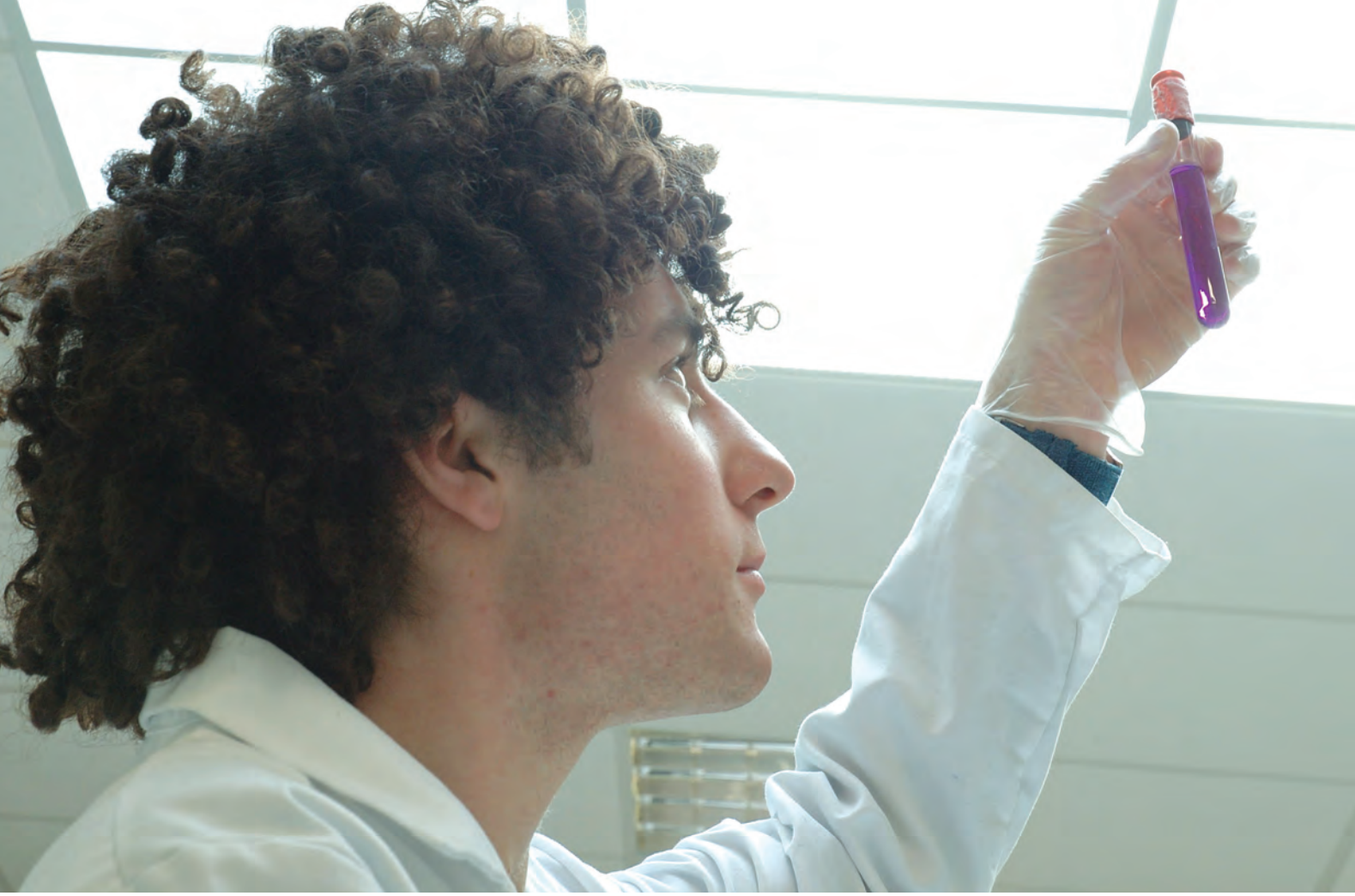
Is the biotechnology industry secure?
Pharmaceutical exports from Ireland typically exceed €24 billion per year. Approximately 25% of all US biotechnology based imports come from Ireland. Despite the current economic situation, biotechnology is still very vibrant and remains one of the biggest national employers.



myCIT myCareer

Colm O'Shea
Quality Control Analyst

"I completed a BSc (Honours) in Pharmaceutical Biotechnology at CIT in 2009. The course content and quality of lecturing were of a high scientific standard and I was much sought after by many of the multinationals here in Ireland. The work placement aspect of this course was invaluable in preparing me for the real working environment and provided a useful practical knowledge base. With the support and the quality of the lectures at CIT, I was well equipped with the scientific knowledge and technical ability for a successful career. Shortly after graduating, I secured employment as a Cell Culture Scientist at Pfizer Biotechnology facility in Dublin. I have since moved to Janssen Biologics where I have a full-time position as a Quality Control Analyst in the Pharmaceutical Development and Manufacturing Science Department."



Research/Further Studies

Some of our best graduates continue onto further studies after they complete their honours degrees.

Many attain teaching qualifications, while others pursue MSc or PhD awards.

As our qualifications are internationally recognised, graduates can complete their continuing education elsewhere or can re-register at CIT for a number of taught post-graduate courses including:

- MSc in Biomedical Science CR_SBMSC_9
- MSc in Computational Biology

Our MSc and PhD researchers are constantly searching for new discoveries in food, health and agriculture that will impact positively on our daily lives.

Graduates can also apply to join our MSc and PhD programmes conducted at the CIT based BIO-EXPLORE research centre.

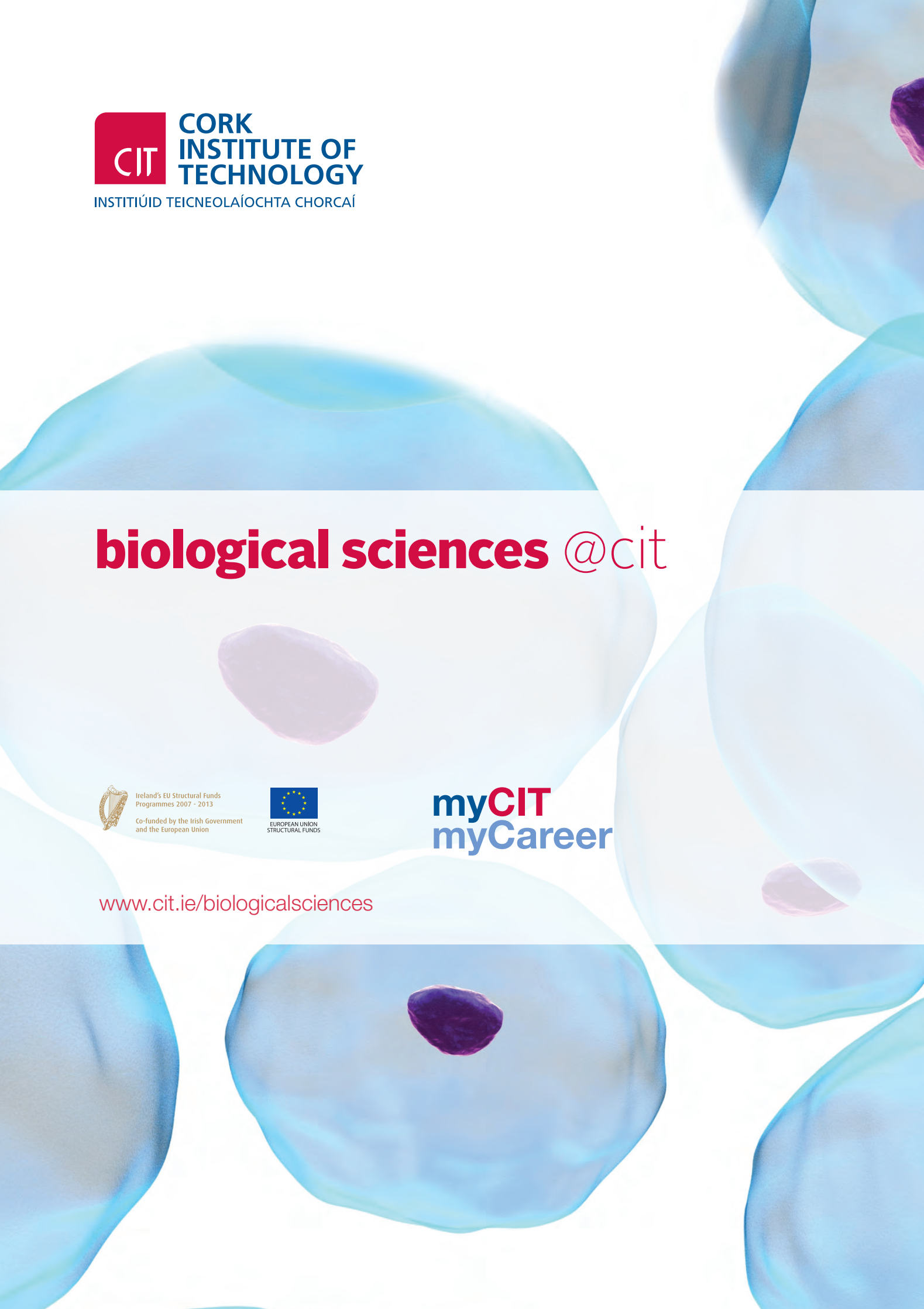
BIO

BIO-EXPLORE RESEARCH CENTRE

Our research active lecturing staff have secured almost €10 million in research funding over the last 10 years, allowing them to carry out world class public health based research at the CIT Department of Biological Sciences.

CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

biological sciences @cit



Ireland's EU Structural Funds Programmes 2007 - 2013
Co-funded by the Irish Government and the European Union
EUROPEAN UNION STRUCTURAL FUNDS

myCIT
myCareer

www.cit.ie/biologicalsciences