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CIT CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Department of Computer Science

Programme Brochure

INTRODUCTION TO THE DEPARTMENT OF COMPUTER SCIENCE

The Department of Computer Science at Cork Institute of Technology is one of the largest Computer Science departments in the country. We offer a broad range of modern undergraduate programmes and a host of opportunities at Masters and PhD level. Our industry engaged programmes match the needs of our economy and have a reputation for producing the most employable computer science graduates in the region. These highly skilled graduates are in huge demand and contribute significantly to the development of the region. As technology plays a greater role in our society the growth in the demand for these graduates continues year after year.

Our programmes teach students how to think critically and apply logical reasoning to solve complex problems. Students learn key transferable skills that make them both competitive and adaptable when they enter the workforce. The increasing demand for our graduates has led to above average and faster wage growth in this field relative to others. There are many exciting industry and research opportunities for graduates in roles such as Software Development, Cybersecurity, System Administration, Big Data, Analytics, Internet of Things (IoT), Research, IT Management and many more.

The field of Computer Science is always growing and changing. Our cities, homes, cars and accessories will become smarter as they connect to the Internet and to each other. New and improved computing technology will continue to create new opportunities and challenges. Our graduates have the skills to meet these challenges and opportunities. Staff from the Department of Computer Science work closely with industry to create programme content that's current and relevant. As a result, students gain relevant skills and knowledge that will benefit them for years to come.

Today, there are two main branches of Computer Science and we offer programmes in both:

- Software Development programmes teach you how to design and build new applications.
- IT programmes teach you how to work in and/or manage an IT department in a company and how to set up or maintain existing systems and services.

Scholarships for Level 8 Programmes

A number of scholarships are available post first year. These include the Yves Beretta Memorial Scholarship sponsored by eSentire and the Alejandro de la Flor Memorial Scholarship sponsored by McAfee.

What CIT Computer Science graduates had to say about our programmes:

"The hands-on nature and sheer breadth of the programmes and modules in CIT really meant that I was prepared for anything that my career has brought my way."
Glenn Attridge, BSc (Hons), MSc, Head of Threat Management & Cyber Security, Security & Resilience, RBS

"My time as a student studying computer science at CIT was both challenging and rewarding, it nurtured in me a curiosity for all things technical and equipped me with problem solving skills that are still relevant today."
Frank O'Connor, BSc (Hons), MSc, Founder/ Director ServusNet Informatics

"The CIT degree provided me with a strong and practical foundation to progress my academic qualifications and also gave me the opportunity to build a strong IT career in a number of industries including financial services and pharmaceuticals."
Timothy J. O'Sullivan, BSc (Hons), MSc, PhD, MBA, Solution Architect in Novartis.

Why should you study at CIT?

Highly Respected Qualification: CIT is internationally recognised for its excellence in research, learning and engagement with industry.

Small lab groups: We operate small lab groups to ensure no one gets lost in the crowd and everyone can get the help they need to progress.

Focus is on labs/practicals: 50% to 80% of time spent with the lecturer on each module is in labs. The best way to learn is by doing.

Fundamental to Advanced: In the first semester, you'll learn the basics of several Computer Science topics. Each semester, you'll build on that knowledge to an advanced level by final year.

Quality: Computer Science lecturers are highly-qualified experts and researchers in many areas including:

- Programming (Java, Python, C, PHP, and JavaScript - the languages that allow you to create applications to do things)
- Data Analytics (making sense of the information in our world)
- Internet of Things (creating smart everyday items)
- Information Security (keeping your private information safe)
- Cloud Computing (store/process information in the cloud)
- Machine Learning (making computers/machines think like us)

Progression: Whether you start at Level 7 or Level 8, you'll have the opportunity to progress all the way to Level 9 (Masters, taught or research) and/or Level 10 (PhD) within the department.

Paid work placement: This is organised through the department for 3rd year students with local and national companies. You'll get hands-on experience in industry, your first professional job reference, perhaps an exciting Final Year Project with a company, or maybe even a future job opportunity. Some of the companies recently involved in providing work placement opportunities are:

ASA Marketing, AvNet, Azotel, Bons Secours, Boston Scientific, Clearstream, Crest Solutions, Dassault, Dell-EMC, Digisoft, Eirteic, Eli Lily, eSentire, FireEye, Global Shares, Huawei, IBM, Intel, Janssen, Johnson Controls, Market-Hub, McAfee, McKesson, MPStor, NGINX, Nimbus, Nutribio, Pfizer, Pilz, Pivotal, PMD, Qualcomm, SnapOn Diagnostics, SNIPP, Soft-Trace, SolarWinds, Teamwork, TIC, Treemetics, Trend Micro, VMware, WaveBreak Media and many, many more!

Job Opportunities: Recent graduates are working in the companies above and in many others.

Flexibility: It's difficult to be certain of the programme you want to complete before you start it. There's a large amount of flexibility for students to change programmes after first year because the first year curriculum is common for all degrees in the Department of Computer Science.

Are you interested in studying at CIT but not sure which programme you'd like to do?

Read on to find out about the different programmes available, in an area and at a level that suits you!

Contact Information
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LEVEL 8 DEGREES

BSC (HONS) IN SOFTWARE DEVELOPMENT

(CAO Code CR106)

Overview

The BSc (Honours) in Software Development programme will give you the skills and knowledge you need to design and build applications that people use every day, for desktop PC, for web and for mobile devices (such as smart phones and tablets). As a Software Developer, you will be involved in all stages of an application from start to finish. You will learn how to take a concept or idea from a description and develop it to make a fully working application. Along the way you will develop problem solving and programming skills to solve simple and eventually complex real-world problems. The programme has a significant work placement element where students are placed with selected employers for up to 9 months starting in January of year three.

Curriculum

One of the benefits of this degree is that it has a range of modules that are modern, relevant and interesting. These modules cover current and future trends in industry. The main focus of the degree is on programming, so you will learn languages such as Python, Java, C, JavaScript and PHP. You will also learn about Databases, NoSQL, Data Structures & Algorithms, Operating Systems, Object-Oriented Programming, Programming Mobile Devices, Application Development Frameworks, Security for Software Systems, Game Development, Big Data & Analytics, Microservies, Advanced OS & Virtualisation, Machine Learning and many more. Elective modules in a selection of areas are also available. You will complete projects on your own and in groups throughout the degree, which will prepare you for working in industry.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals (such as IBM, EMC, Intel, Pilz, Johnson Controls, etc), and also with smaller Irish companies. Software Development graduates work in a diverse range of roles.

Further Studies

There are many postgraduate opportunities in the Department of Computer Science, these are listed at the end of this brochure.

Contact Information

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Admission

For admission to the programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 6 subjects

Subjects O6/H7	Subjects H5	Maths Grade	English or Irish Grade
4	2	O3/H7	O6/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR106

"After completing my undergraduate degree, I considered options for furthering my education and began a PhD at CIT. My PhD research involved algorithm design and the development of software support tools, both leveraging skills gained from my degree programme. Although programming technologies can change very rapidly, the degree provided me with an excellent foundation in problem solving and the ability to approach problems in a methodical way; this is a critical skill for any career.

Currently, I am responsible for the technical leadership of applied research programmes and core activities related to the Internet of Things and User Interaction at the Nimbus Research Centre, CIT Bishopstown Campus. I work with multidisciplinary teams of researchers and industry across Europe developing innovative research solutions for real world problems."

Dr Alan McGibney -
Senior Research Scientist
at the Nimbus Centre

"This programme gave me a great opportunity to gain solid programming skills as well as a good understanding of databases and networking. With the variety of modules offered you will not be bored.

It provides a specific set of skills that companies look for in the line of work I'm in."

Anna Gadek -
Senior Application Developer, London

"My daily work involves designing or implementing new features on platforms from web to Apple iOS.

It can be a mix of many things from requirement gathering to supporting third party companies integrate our software."

Shane Hallinan, Software Engineer, Inhance

"My first employment was with Yahoo! as a Junior Developer and within one year, I was promoted to Senior Developer. Another year on, I was promoted to Engineering Manager for the Travel and Autos categories. After four years with Yahoo!, I moved to Sydney and worked as a Project Manager with a leading web development company - SydneyWeb. Due to my experience, I was entrusted with some of its largest and more complex projects which I found very rewarding. I returned to Ireland in December 2007.

Several years later, I currently manage all aspects of many complex and diverse software projects at Murrion Software."

Garry Bennett -
Senior Project Manager
at Murrion Software

"I completed work placement in EMC and moved to CoreHR after graduation. My day-to-day work in CoreHR involves 50% development/ engineering and 50% meetings/ management.

Modules such as Software Engineering have allowed me to hold my own with management and senior developers, and allowed me to advance my career quickly. It's a fantastic degree.""

Kevin Moynihan - Software Software Developer and Team Lead, CoreHR

"The BSc (Hons) in Software Development degree gave me the knowledge and skills to tackle problems in a very efficient way."

Gary O'Brien
Asc Financial Ops Analyst, Dell EMC

LEVEL 8 DEGREES

BSC (HONS) IN WEB DEVELOPMENT

(CAO Code CR312)

Overview

The World Wide Web is the single most important content and software distribution platform in the world today. Graduates pursuing a career involving Web Development can expect to work on many aspects of the web whether it's creating front-end interfaces, back-end software, or a combination of the two. A developer, with an understanding of all aspects of web development from the data layer to the visual interface that a user interacts with and the logic that connects the two, is of particular value in today's tech industry. This programme has a significant work placement element where students are placed with selected employers for up to 9 months starting in January of year three.

Curriculum

The BSc (Honours) in Web Development is a specialised degree that combines software development with the specialist skills/knowledge necessary for web development. The programme develops these skills in unison, encouraging students to develop complete solutions from start to finish utilising the abilities they have attained throughout the programme. This produces a graduate who has the capacity to take a project from the initial concept/design stage right through to delivering the final product.

The programme covers a wide range of modules which will be useful in any type of development role such as programming, networking, databases, web development, app development, server-side web development, web applications security, and data visualisation. There is also an opportunity to choose other Computer Science elective modules.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals and also with up and coming Irish companies. There are a large number of companies in Ireland developing, and reliant upon, web based applications. The trend in software development has been towards web based systems and this is set to continue for the foreseeable future. (Check out webdev.cit.ie to see where our latest graduates are working)

- Web Developer
- Software Developer
- Full Stack Developer (Back-end & Front-end)
- UI/UX Engineer

Further Studies

There are many postgraduate opportunities in the Department of Computer Science, which are listed at the end of the brochure.

Contact Information

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Admission

For admission to the programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 6 subjects

Subjects O6/H7	Subjects H5	Maths Grade	English or Irish Grade
4	2	O6/H7	O6/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR312

"By the end of 4th year in CIT, I had multiple job offers from several major tech companies, all thanks to the staff and classes in CIT. I took a job as a software engineer at a company called Teamwork.com where I have worked as both a Front-end and a Back-end engineer and use my knowledge daily.

Within 7 months of joining Teamwork, I was promoted to lead a team within the company because of my skills. I would highly recommend the BSc (Honours) in Web Development at CIT as the software engineering skills you will learn in this course will give you the flexibility and the knowledge to work in both Front-end and Back-end design or Dev-Ops."

Robert Gabriel - Lead Web Developer at Teamwork.com

"With a focus on languages such as HTML, CSS, JavaScript, jQuery, Java, etc., there is no corner left unturned. I found the lecturers very knowledgeable and helpful. If you like the web and how it works, this is the programme for you. You will learn how to build fantastic websites and web applications."

Kyron Laffan - Web Developer at Archie Promotions

"The programme showed me how to develop my ideas to full applications along with writing documentation to show theoretical research, development and progression of my applications.

This programme is ideal for a self-motivated person who has ideas and wants to learn how to develop them into working applications and websites. The course, and lecturers, will push you to extend the limits of your skill set and promotes productive learning within a highly structured co-operative environment."

Louise Jennings, Web Developer, Barry Design

"The opportunities available for graduates from this programme are fantastic, and CIT sets students up to take full advantage of these opportunities.

I would highly recommend the BSc (Honours) in Web Development due to the high standard of support, knowledge and education provided throughout the duration of the course."

Jane Lee, Graduate Software Developer, Apple

"Within two months of completing my Web Development degree, I was appointed to a permanent position for EMC, Cork, as a Cloud Developer. I'm part of the Global Cloud Services team where I develop cloud services for public and private cloud infrastructures for customers all over the world.

CIT provided me with a great foundation to grow my programming skills from foundation to a very advanced level using many different programming languages which I still use daily. I would highly recommend Web Development to anyone as the opportunities in IT, especially in Ireland, are endless."

Dean O'Halloran – Cloud Developer at EMC

"My work placement with McAfee gave me exposure to a structured way of developing software, enabled me to work with tools and processes that would enhance my career prospects and gave me the opportunity to work with a fantastic team.

My time at CIT, my work placement and my own personal interest in the subject ensured that I was ideally positioned for several software development roles before finishing my final exams. I started work as a Web Developer a week after I finished up and have been exploring advanced architecture and software development concepts ever since as part of an amazing team."

Adam Lloyd, Full Stack JavaScript Developer, Johnson Controls

LEVEL 8 DEGREES

BSC (HONS) IN COMPUTER SYSTEMS

(CAO Code CR116)

Overview

A Computer System is the combination of hardware, software, computational processes and networks that combine to create a system. If you successfully complete this programme, you will be a software developer who has the programming, analysis and design skills combined with the knowledge to build embedded/network/Internet and cloud-based applications. You will understand how computing devices (such as embedded, desktop computers and tablets) communicate with each other and the world around them. You will be able to plan and design the infrastructure and systems that will enable this functionality. An in depth knowledge of the hardware and software of a computer system will be highly sought after in the future cyber physical and Internet of Things (IoT) computing world. You will also learn general computer science skills that will benefit you in many industries. The programme has a significant work placement element where students are placed with selected employers for up to 9 months starting in January of year three.

Curriculum

One of the benefits of this programme is the focus on developing software for different types of computer systems. You will learn several programming languages such as Python, Java and C Programming and apply those skills to distributed client/server, embedded, and real-time systems. You will also learn about areas of networking (connection to and communication across the Internet) such how to route and switch networks, networking for embedded systems, and how to control networks programmatically. You will be able to design and implement embedded/cyber physical systems such as those for the control of drones, cars and medical devices. You will study elective modules in a variety of areas. You will complete projects on your own and in groups throughout the degree, and gain experience similar to working in industry.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals (such as IBM, Dell-EMC, Intel, Johnson Controls, Pilz, etc.), and also with smaller Irish companies. You will be qualified to work in a wide variety of industries, such as embedded systems, telecoms, data storage, and finance. Computer System graduates work in many roles, including the following:

- Software Developer
- Embedded Engineer
- Network Engineering
- Network Specialist
- Internet of Things (IoT) Specialist
- Quality Assurance Engineer

Further Studies

There are many postgraduate opportunities in the Computing Department, which are listed at the end of the brochure.

Contact Information

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Admission

For admission to the programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 6 subjects

Subjects O6/H7	Subjects H5	Maths Grade	English or Irish Grade
4	2	O3/H7	O6/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR116

"I'm currently pursuing a PhD in the Nimbus Centre, CIT. I chose Software Development & Computer Networking (retitled Computer Systems) because of the skill-set it offered. Both software and networking are core to most areas of IT, so this programme provided me with a range of opportunities after graduation.

During the programme, I completed work placement in the Bon Secours Hospital IT department. It was a fantastic experience to use the skills I had learned and to see my work make a difference in a challenging environment." Dylan won a RISAM CIT scholarship to undertake a PhD and his Final Year Project won second place prize in the global IEEE COMSOC student competition.

Dylan Smyth – PhD candidate

"After my final year project - a predictive ordering system based on neural networks, an idea that came from my work experience at Musgraves, I began to narrow my interest to development.

Since graduating over 7 years ago, I have found that Software Development and Networking (retitled Computer Systems) is in high demand in Ireland as well as other countries. I have been in several IT & Software Development positions including a 2-year position in Rennes, France, where I found that regardless of the native language, IT development remains the same."

Caroline O'Connell - Senior Software Developer at EMC

"As an SRE technical writer, I document internal Google infrastructure, team processes and policies, and operational information related to running Google products and services reliably at scale. Recently, I worked on a 20% project with Google Fiber, helping them with their internal documents.

My degree and masters were both heavily focussed on networking that was fully integrated with the Cisco curriculum. In combination with this, my Final Year Project involved deploying services across multiple networks. All of this sparked an interest in networking which continues today. During my masters, I had to digest vast amounts of information about the space I was working in. The ability to understand, create and document complex technical concepts is critical to my day-to-day role.

Also, I didn't enter CIT directly from second-level school. I spent a number of years working before I decided to go back. If I can go back and get a degree from scratch, anyone can. Also, getting to work on the biggest network in the world is awesome!"

Gary O'Connor – Site Reliability Engineer (SRE) Technical Writer at Google

"This programme allowed me access to a wide variety of modules all while being taught in a great environment. I highly recommend it."

Ezgi Muderrisoglu - Technical Support Representative at SolarWinds

"I originally chose Software Development & Computer Networking (Now Computer Systems) because it was clear from the outset what it focuses on.

I was worried about my lack of coding skills entering the course but need not have been as the course teaches coding and networking from scratch. My placement company asked me to do a Final Year Project for them, from which they offered me a research MSc in Computer Science. I am now employed by the company full time and the research I do for them will be my masters.

Sean Ahearne - MSc. Research Student at Tyndall National Institute

"Studying this programme allowed me to gain a diverse and wide range of skills from developing software to artificial intelligence and network designing. The placement at CIT allowed me to gain industry experience in EMC where I ended up staying on part time until I finished my studies.

From there I worked at IBM on a software project which we had the opportunity to present at the IBM European Conference. After this I was offered a role as a Software Engineer back at EMC where I stayed for a year and now I've found myself back at CIT doing a full time PhD with the SIGMA research team. My research aims to use visual analysis and artificial intelligence to help with dementia care patients."

Michael Healy, PhD Student, Department of Computer Science, CIT

LEVEL 8 DEGREES

BSC (HONS) IN IT MANAGEMENT

(CAO Code CR310)

Overview

The IT management degree will teach you how to manage IT services in an organisation including how to set up or maintain existing systems. Along with learning about IT management principles, you will also learn about Cybersecurity which is a rapidly expanding sector of the computer industry. As more technology goes online, you will learn how private/ sensitive information may be at risk and the steps you can take to protect it. This programme has a significant work placement element where students are placed with selected employers for up to 9 months starting in January of year three.

Curriculum

This programme covers a wide range of modules which will prepare you for many types of IT management roles including: network analysis, IT security analysis, system administration, IT project management, IT planning and design, security monitoring and offensive security. You can also choose Computer Science electives from a range of modules.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals and also with smaller Irish companies. These roles exist in many sectors such as Tech, Financial Services, Banking, Healthcare and Pharmaceutical. IT Management graduates work in many roles, including the following:

- IT Project Manager
- Cloud Security Specialist
- Security Operations Analyst
- Network Manager
- Systems Manager

Further Studies

There are many postgraduate opportunities in the Computing Department, which are listed at the end of the brochure.

Contact Information

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Admission

For admission to the programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 6 subjects

Subjects O6/H7	Subjects H5	Maths Grade	English or Irish Grade
4	2	O6/H7	O6/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR310

"After I graduated I got employment with a CyberSecurity company called eSentire as a Junior SOC analyst. This programme gave me the opportunity to gain the knowledge and the skills required to get employment within the Cyber Security sector.

This programme has both management and technical modules which gave me a solid foundation and understanding of network infrastructures and the management skills that are required to gain employment in the IT sector. The security modules intrigued my curiosity in the areas of malware, programming, and network security. I knew this was the sector that I wanted to work in.

This programme will teach you all the skills required to gain employment in the IT sector and will develop your understanding how the IT sector can and does drive business. It will also feed your curiosity in all things IT."

Joseph Foley – Security Operations Centre(SOC) Analyst at eSentire

"After I graduated I worked as an Associate Network Engineer in EMC. In this role, I was responsible for configuring network devices, troubleshooting network issues and providing support to EMC offices in Europe, the Middle East and Africa. My degree helped me gain valuable networking and programming skills which boosted my employability."

Olga Linek, Professional Services Engineer at Aspera (an IBM company), Sophia Antipolis, France.

"As the EMEA Information Security Manager for Tyco my role is quite diverse. However, the end goal is the same, to help protect the key assets of the company. I've worked in IT for over 20 years in various sectors such as telecommunications, pharmaceutical, financial services, and engineering. While the industries are different, the challenges are very similar.

The BSc (Honours) in Computer Services Management (retitled IT Management) programme was a perfect blend of technical and management modules. One of the technical modules offered was IT Security, and while I had some exposure to IT Security through work, this module was excellently taught and assisted me in gaining further insight in to areas such as Encryption, Network Security, and Wireless Security to name a few.

In addition, the management side of the programme included looking at IT security standards and frameworks which I use today in my job. I can safely say this programme was a key stepping stone for me as my career advanced. Technology is constantly changing, and work environments need to change with it to keep up with the pace. CIT acknowledges this and continuously offers programmes to reflect this dynamic career."

Mike Costello – EMEA Information Security Manager at Tyco

"Working in operations with Microsoft Exchange, managing 70,000 user mailboxes. My day to day work involves, working with databases, PowerShell and a lot of scripting.

In third year I got a very good work placement with EMC, then as a result I got a position on the company's grad program and now working in Exchange which is something I always wanted to do."

Shane Goulding, IT Service Ops Engineer, Dell-EMC

"I am extremely happy I chose IT Management as my third level programme. I have gained a variety of new skills and knowledge as well as true friends and fantastic workplace connections. The benefits of the programme are endless."

Aisling Cullinane - Technical Support Engineer at VMware

'The IT Management modules provided me with great perspective and today this allows me to deal with systems and derive the most value-add benefits from daily operations. "

James Kiely - eSystems Administrator, Zenith Technologies

"The BSc (Hons) in IT Management degree gave me the technical skills required to get a great job in the IT security industry."

David Monaghan - Security Operations Analyst, eSentire.

LEVEL 7 DEGREES INTRODUCTION

When you are finishing second-level school or if you have been working for a number of years, it can be difficult to commit to a 4-year degree programme from the start.

In the Department of Computer Science, you can start with a 3-year Level 7 programme, such as the BSc in Software Development or the BSc in Information Technology. These programmes share all the same 1st year modules with the BSc (Hons) degree programmes. There are several progression and qualification possibilities which are shown below:

Level 7 BSc in Software Development

YEAR 1	YEAR 3	YEAR 4	BEYOND
Enter Level 7 BSc in Software Development	After Year 3, you may graduate with a BSc in Software Development or it's possible to pursue an Honours Degree	After Year 4, you will graduate with a BSc (Hons) in Software Development.	After an Honours degree, you may pursue postgraduate study, e.g. Masters or PhD

Level 7 BSc in Information Technology

YEAR 1	YEAR 3	YEAR 4	BEYOND
Enter Level 7 BSc in Information Technology	After Year 3, you may graduate with a BSc in Information Technology or it's possible to pursue an Honours Degree	After Year 4, you will graduate with a BSc (Hons) in IT Management	After an Honours degree, you may pursue postgraduate study, e.g. Masters or PhD

In the Department of Computer Science, you can enter a Level 7 programme, get a degree after three years and have the opportunity to progress even further (to 4th year of an Honours degree programme, depending on the programme and availability), which many students have done when they worked hard and realised how much they enjoyed studying at CIT.

In the Department of Computer Science, there are many paths and possibilities to pursue a programme that suits you, and to excel in it with the expert help and support from staff!

LEVEL 7 DEGREES

BSC IN SOFTWARE DEVELOPMENT

(CAO Code CR016)

Overview

The BSc in Software Development is a programme which provides a solid grounding in many of the areas of Computer Science. You will learn the skills and knowledge you need to design and build applications that people use every day, for the desktop PC, for the web, and for mobile devices (such as smart phones and tablets). You will be taught how to take a concept/idea from a description and develop it to make a fully working application. You will develop problem solving and programming skills to solve simple (and eventually complex) real-world problems using computers. The programme has a significant work placement element where students are placed with selected employers for up to 9 months starting in January of year three.

Curriculum

The main focus of the degree is programming, so you will learn languages such as Python, Java, C and PHP. You will also learn about databases (where and how data is stored), operating systems, object-oriented programming, application development, software testing and many more topics. You will complete projects on your own and in groups throughout the degree, which is similar to working in industry.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals (such as IBM, EMC, Intel, Tyco), and also with smaller Irish companies. Computer Science graduates work in many roles, including the following:

- Software Developer
- Software Tester
- Network Engineer
- Software Support Engineer
- Web Developer
- Database Developer

Further Studies

Graduates of this programme usually progress to an Honours Degree. You will have the opportunity to progress to 4th year of BSc (Honours) in Software Development.

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Admission

For admission to a programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 5 subjects

Subjects O6/H7	Maths Grade	English or Irish Grade
5	O6/H7	O6/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR016

"In CIT I learned about all aspects of technology. CIT covers every aspect from web to App development. On graduating, I had the skills to work on any aspect of software, from high-tech startups, where I developed a climate change computer graphics engine, to smart phone application development.

I currently make Android and iPhone apps in the United States and the apps I work on are used by millions of users. The skills I learned in CIT are relevant to my job on a daily basis." William completed the BSc in Software Development and then went on to complete BSc (Hons) in Software Development, followed by a Masters by Research in Software Development."

William Lynn – Software Developer at Inhance Technology

LEVEL 7 DEGREES

BSC IN INFORMATION TECHNOLOGY

(CAO Code CR888)

Overview

This Information Technology (IT) programme will provide you with the skills necessary to work in an IT Department. IT is an area of major growth so there is always a demand for IT graduates. Along with learning about IT systems, you will learn about Information Security which is a rapidly expanding sector in the computer industry. As more technology goes online, you have to learn how private/sensitive information may be at risk and the steps you can take to protect it. The programme has a significant work placement element where students are placed with selected employers for up to a nine months starting in January of year three.

Curriculum

This programme covers a wide range of modules which will be useful in any type of IT role such as networking, web services, databases, system administration, operating systems, computer security principles, project management and network security. Electives can be chosen in many other Computer Science modules.

Career Opportunities

You will have career opportunities in Cork, Ireland and abroad, with large multinationals and also with smaller Irish companies. IT graduates work in many roles, including the following:

- IT Support Engineer
- Web Administrator
- Network Administrator
- System Administrator
- Cybersecurity Specialist

Further Studies

Graduates of this programme usually progress to an Honours Degree. You will have the opportunity to progress to 4th year of BSc (Honours) in IT Management.

Contact Information

Dr Olivia Brickley
Department of Computer Science

T: +353 (21) 433 5582
E: olivia.brickley@cit.ie

Admission

For admission to the programme, standard applicants must

- score the necessary CAO points and
- meet the minimum entry requirements

Minimum Entry Requirements
Leaving Certificate in 5 subjects

Subjects O6/H7	Maths Grade	English or Irish Grade
5	O6/H7	06/H7

Computer Science Choices

The first year curriculum is common for all degrees in the Department of Computer Science. All first year students study the same modules and this means that students can transfer to another programme in the department in year two if they meet the CAO entry requirements for that programme when they enter CIT. This offers great flexibility for qualifying students who may wish to change programmes after year one. This flexibility allows a student to make a more informed decision one year into his/her studies.

More information: www.cit.ie/course/CR888

I am currently doing my Masters by Research in the area of Software Defined Networking for Optical Communications. With the help of very knowledgeable lecturers and the varied modules this course gave me a comprehensive knowledge of the networking world. The diversity of modules helps students to get a feel for the different area so that in the final year you can concentrate on the subject you like the most and do your Final Year Project in that area. Also work placement in 3rd year of the course is a way to practice the knowledge and skills gained in the course in the real world, gives you a great idea of what the IT world has to offer.

The nice benefit of the course is that you can do an add-on year and get Level 8 qualification which helps in future when you decide to go further and do MSc or PhD. In the IT Management course you will learn that strategy is important in order to make IT drive the business. It gives a view from a business perspective and how to work to the benefit of the organisation or individual.

I enjoyed the course, I made some great friends and also developed many skills that are benefiting me in the job market. I progressed from the Level 7 Information Technology programme to the Level 8 Information Technology Management programme in 4th year."

Yuliya Verbishchuk, MSc Student at University College Cork and Tyndall National Institute.

The BSc in Information Technology helped me gain networking knowledge that is very useful in my career. Practical labs in System Administration and Security related topics were also very useful."

Marcin Iwinski, Principal OpenStack Deployment Engineer, Mirantis, Poznan, Poland

"My daily work involves assessing Mac machines and repairing them under Apple warranty. I'm also a specialist in iOS devices.

The content of the BSc in Information Technology degree has helped me greatly, especially networking and command line knowledge which has great real world applications."

Cathal Harrington, iOS Technician, iConnect, Cork

"The BSc in Information Technology has given me a foundation in core IT areas which have helped me settle into my role. It has given me the communication skills needed to enter into a corporate and IT environment.

My daily work at AIB involves the management of central IT Risk issue and response, co-ordination of actions and response with internal and external stakeholders.

I also participate in and support the Group risk governance process, and work closely with the internal audit team to design controls and monitor operating effectiveness of controls"

David Ridgard - IT Risk Governance Analyst, AIB

"The BSc in Information Technology programme helped me gain knowledge of the IT sector and this got me a job. In my current role I provide support for all IT systems for a pharma company." .

Philip Twohig, IT Engineer, Westbourne IT, Cork

Shortly after I graduated, I began working for Pricewaterhouse Coopers (PwC), Dublin. A few years later, I was promoted to Senior IT Risk & Compliance Specialist, where I performed security risk assessments, security audits and dealt with clients across many areas. I'm now working as an ICT Security Specialist in the Information Security Services Department for Lease Plan Informationn Services (LPIS).

I'd recommend this programme to anyone who is looking for a great basis in different aspects of IT from Web development, Linux to IT Security. When you find your particular interest, you can focus your Final Year project on where your skills lie best and it can guide you into any area of IT." Ann-Marie initially completed a BSc in IT and then progressed to an add-on year for a BSc (Hons) in Computer Services Management (retitled IT Management).

Ann-Marie Fitzgerald - ICT Information Security Specialist at LPIS

"This degree gave me the broad knowledge and skill set required to interpret any problems that arise in my daily work."

Colin Healy - Business Data Analyst, Kerry Group

"The IT degree proved a very rewarding programme to undertake, socially and academically.

The programme modules are very well designed, delivering a highly relevant skill set. I recommend this programme to anyone who's thinking about a career in IT."

Kenny Williams - Enterprise Support Specialist at Rackspace

"This degree has giving me the confidence and knowledge to provide excellent support to Solarwinds customer.

As mature student, CIT was the perfect choice to return to education. The college, along with the lecturer provided support throughout ever semester, thanks to them I am now thriving in my career."

Amy Hennessy, Support Technician, Solarwinds, Cork.

"A great deal, employers are very pleased that I have this degree from CIT."

Stephen Field, Security Analysts, eSentire

LEVEL 9 DEGREES

Postgraduate Taught Opportunities

After you complete your undergraduate Honours degree it is possible to continue your full-time education in CIT and get a more specialised postgraduate qualification such as a Taught Masters (usually 1 year), a Research Masters (usually 18 months to 2 years), or a PhD (doctorate which is approximately 4 years of additional study).

Part-time or online options are also available for some of the postgraduate programmes below.

Masters (Taught)

- MSc in Cloud Computing
- MSc in Software Architecture & Design
- MSc in Information Design & Development
- MSc in Information Security

Please check http://cs.cit.ie for postgraduate programme updates and changes

Postgraduate Research Opportunities

The Department of Computer Science has a large number of lecturers who are actively involved in research and they mentor students pursuing research masters and PhD programmes.

Some of these lecturers talk about their research interests:

"My current research interests lie in the area of Software Defined Networking (SDN) and its application in the Internet of Things (IoT) environment."
-Dr Olivia Brickley

"I'm working in the research area of Optimisation and Decision Analytics, more specifically in the application of combinatorial optimisation techniques to the modelling and solving of real-life green computing- related problems."
-Dr Ignacio Castiñeiras

"My current research interests include cloud and online quality control, context awareness, Computing and business process methodologies, real time and computer simulation."
-Dr John Creagh

"My research interests include cyber physical and embedded systems, distributed systems, compiler design and operating systems."
-Dr Paul Davern

"My current research interests include Internet of Things (IoT) and cloud information security, penetration testing and exploit development, optimal and adaptive sensor systems, mobile sensor platforms and robotics."
-Dr Seán McSweeney

"The Internet of Things (IoT) refers to the ability to connect anything to the Internet, such as a watch, house, dog, car etc. Within this broad research space, my research focus is in the area of network virtualisation and service provisioning of novel IoT services."
-Dr Donna O'Shea

"I'm working in the research area of Optimisation and Decision Analytics, more specifically in the application of combinatorial optimisation techniques to the modelling and solving of real-life green computing- related problems."
-Dr Ignacio Castiñeiras

"I'm currently involved in a range of research projects such as cost optimisation for smart micro-grids, supply chain optimisation for offshore wind turbines, sentiment analysis for online bullying detection, modelling and optimization for Irish dairy-farm operation."
-Dr Ted Scully

"I currently lead several EU funded projects to analyse genomic big data for agriculture, develop computer-aided assisted-living technology for dementia patients and to develop computer technology to analyse the genetics of cancer tumours."
-Prof Paul Walsh, Head of CIT's SIGMA research group

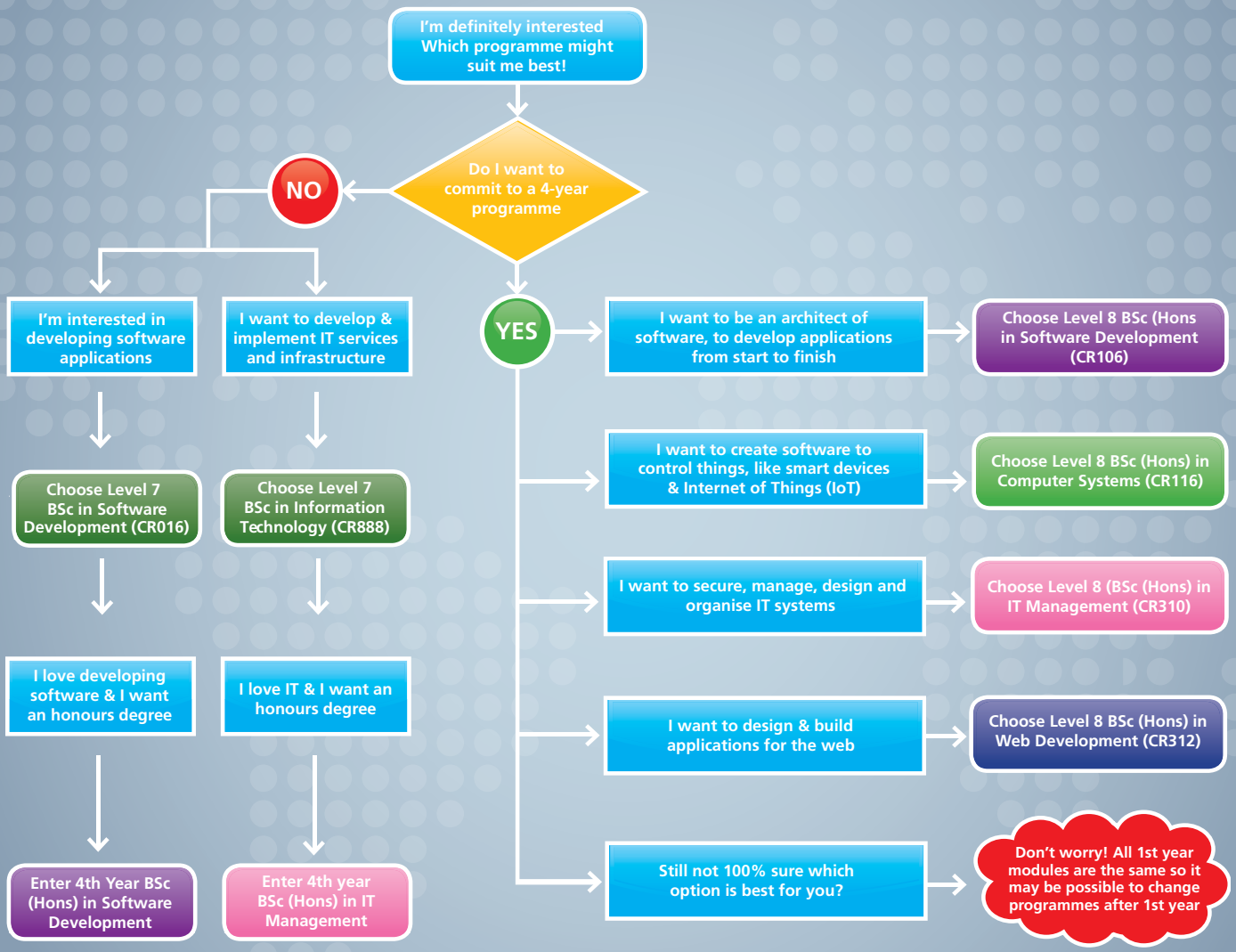
"My research involves the application of machine learning techniques and optimisation technologies to real-world problems, such as condition-based maintenance for trains (predict health of train components based on sensory data, schedule maintenance taking this prediction into account together with constraints on staff, maintenance depot, etc.), and energy optimisation (optimally schedule energy consumption such that cost is minimised using predicted energy prices), etc."
-Dr Diarmuid Grimes

"My research interests lie in the area of Cyber Security. Some of the areas I have been working on and/or plan to work in the near future include: Advanced Access Control Models; Insider Threats and Deception; Fraud Analytics and Prevention Techniques; Security, Privacy, and Trust issues in the Internet of Things (IoT)."
-Dr Samane Abdi

"My research revolves around the development of platforms for the monitoring and analysis of data and their subsequent application to real-world problems. Currently this involves the analysis of physiological data, road traffic networks and individuals interactions within organisations."
-Dr Ruairi O'Reilly

"My research interests are within the area of Decision Analytics and Optimisation, including among others sustainability problems. Specifically, I have been researching with Decision Analytics and Optimization techniques such as: Constraint Programming, Linear Programming and Metaheuristics. In addition, I am also extending my research interests to Data Mining and Machine Learning and their combination with Decision Analytics and Optimization techniques."
-Dr Laura Climent

"My current research interests include Cloud monitoring to gather data for making informed decisions. This involves the management of Cloud service provisioning, SLA and quality of service. Further areas include Cloud interoperability, Internet of Things integration with Clouds, energy efficiency and Cyber security."
-Dr Vincent Emeakaroha



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INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

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