



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

School of Computer Science & Statistics (SCSS)
Faculty of Science, Technology, Engineering and Mathematics (STEM)

BA (Mod) in Computer Science Master in Computer Science (MCS)

COURSE CODE TR033

Special Entry Requirements:

Leaving Certificate: H4 Mathematics

Other Examination Systems:

www.tcd.ie/Admissions/undergraduate

Computer Science

Computer science is a professional discipline concerned with everything to do with computers and our relationship with them.

Computers are critical to the efficient running of modern societies, dealing with health, security, banking and finance, transportation, and now increasingly our interaction through social networks. Computing professionals, like their counterparts in medicine, law, engineering, accountancy and finance, deal with theoretical issues, solve complex problems, deal with matters of ethics and with society at large.

Computer Science at Trinity

Trinity Computer Science students study for an honours Bachelor's degree over four years and have the option to study for a fifth year leading to a Master in Computer Science (MCS) degree.

A core component of the MCS is an industry/research internship.

As a Trinity Computer Science graduate you will be able to work at the highest level in the global technology industry. You will develop entrepreneurial skills to enable you to build new products and solutions, making decisions that will affect all our futures.

Graduates find employment in many sectors from communications and entertainment to manufacturing and transportation, government, healthcare, education and many more.



Our Approach

Our approach is to teach you the theory and practice of computer systems, exposing you to the whole range of computing technology from hardware to software, from telecoms to social networking.

About the Programme

The choice to study over four years for a Bachelor's degree (BA Mod in Computer Science) or over five years for a Master's degree (MCS) is made at the start of the fourth year of the programme.

If you opt for the Bachelor's degree, you will undertake a Final Year Project in your fourth year and you will begin specialisation in areas of interest.

If you opt for the Master's degree you will undertake an internship in your fourth year and you will also begin your specialisation in areas of interest. In your fifth year, you will deepen your specialisation and you will also undertake a substantial research dissertation. Students graduating from the MCS will also graduate with the BA (Mod) in Computer Science.

Careers

“I have just completed the five year MCS course, finishing with a B.A. (Mod.) in Computer Science, and a Master in Computer Science. I am currently working as a research intern with the ADAPT Centre for Digital Content Technology, here in Trinity College. I am working with my Master’s Dissertation supervisor, with the goal of publishing some of my work.



I enjoy problem solving, creativity, innovation, and working with cutting edge technology. I believe your job should be rewarding, and a constant source of learning. I am striving for a career that compels and enthuses me every day. Technology is an industry that is always evolving, and encourages new ideas and fresh thinking. Computer Science at Trinity is a natural step on this career path.

The course builds strong skills in all the fundamentals required for a Computer Scientist, such as programming, algorithms, architecture etc. It also gives huge opportunity for students to find their niche, with a great variety of module options to choose from, computer vision, graphics, database design, artificial intelligence, and many more.

The internship option provides invaluable experience. Employers are keen to take students from Trinity Computer Science, and turn these interns into graduate hires. As part of the 4th year, I worked as a Software Engineer Intern with MasterCard. I was offered a permanent position before coming back to complete the 5th year, and am looking forward to returning to MasterCard.”

Tara Matthews MCS Computer Science graduate

“After taking 7 years out of education to play online poker, returning to college was both a daunting and an extremely rewarding experience. I chose to study Computer Science as I love logical problem solving and have an analytical mind-set but didn’t want to study something as theoretical as pure maths.



I found the course extremely interesting and thorough with a focus on complete knowledge of Computer Science from low level digital logic and assembly code to higher level languages like Java and C++. I found it very different from Leaving Cert style memorising – instead the focus was on learning how to think, analyze and break-down any problem.

Although the course was really very challenging, I found the lecturers were extremely supportive, knowledgeable and up-to-date in what is an ever-changing landscape of new languages and technologies.

The highlight of the 4 years for me was the 2nd half of the final year which is divided into a group project and a large individual project with our own choice of topic.

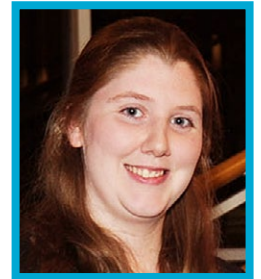
I already had a huge interest in Bitcoin and was delighted to find a Cryptocurrency and Cryptography expert in Prof. Donal O’Mahony who guided me in a very interesting individual project in building a proof-of-concept for a fully decentralised poker site using Bitcoin as currency.

I am very proud to be graduating this Summer and have already had a large choice of potential employers as Trinity Computer Science graduates seem to be viewed extremely favourably by employers and Dublin is already a hub for tech jobs. I have chosen to begin my career as a developer for the largest online poker site, Pokerstars.

I can whole-heartedly recommend this course to anyone with a similar passion for problem solving who wishes to begin an ambitious career path in computing and I have nothing but gratitude to have had the opportunity to have benefited from such an education.”

Eamon McNamee, BA (Mod) Computer Science graduate

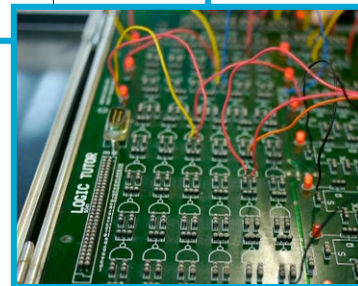
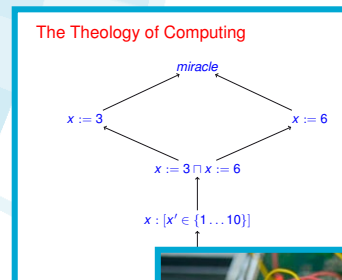
I always enjoyed problem solving and discovering how things worked on the computer. Following some transition year work experience in the IT industry and at Trinity I knew I wanted to study computer science.



What I really liked about the course was the exposure to software, hardware and telecommunications which allowed the courses to piece together to see the entire view of a system rather than as separate components. I found the lecturers to be knowledgeable and approachable. We were also required to take part in many group activities which developed our communication and teamworking skills which in turn prepared us well for the workplace environment. Being a male dominated science, I think we need more girls to think seriously about studying computer science at college.

During my summers at Trinity, I undertook a number of internships both in Ireland and abroad. One of these internships resulted in a full time graduate job offer in London.

Katharine Burton, BA (Mod) Computer Science graduate



Each year the School invites leading employers in the sector to attend a special recruitment fair at which students can chat informally regarding many career opportunities.

Internship

Fourth-year students who opt for the master's degree undertake a seven-month internship in industry or in a research laboratory. The aim is to develop your understanding of how design and theoretical aspects of computer science are applied in a commercial or research workplace. Many companies find that hosting an intern provides the opportunity to focus on special projects.

See www.tcd.ie/scss/courses for further information.

Frequently asked questions

How much do I need to know about computers to do Computer Science?

No prior knowledge of computers is required. An interest in solving problems is essential.

What programming languages do you use?

Computer professionals need to be comfortable with lots of languages. We currently teach Java, C, C++, Python, Assembly Language, Haskell, Prolog, R and we use many others. We teach ARM assembly language and VHDL for courses in computer architecture and hardware design. We teach full stack techniques for modern application development. Students can avail of individual advice and help from our Programming Centre.

How many hours of lectures, labs and tutorials will I have each week?

You should expect to have approximately twenty contact hours per week. In the first year you will have about twelve hours of lectures, four hours of tutorials and four hours of labs each week. You will need to spend additional time studying, working on coursework projects and assignments, in teams and on your own.

Can you describe first year for me?

In first year you will study programming, mathematics, computer hardware, electronics and telecommunications. In addition you will take part in a team-based programming project and explore relationships between computers and the wider society.

What supports will I have over the course of my studies?

All college supports are open to every student and include our unique tutoring system, health service, student counselling service, disability services, careers advisory service, and many more.

Do I need to be really good at maths?

You don't need to be a genius at maths but you need to be comfortable using mathematical techniques to solve problems.



BA (Mod) in Computer Science/Master in Computer Science (MCS)

First Year
Computer Programming
Team Programming Project
Mathematics and Statistics
Microprocessor Systems
Digital Logic
Electronics and Information Technology

Second Year
Computer Programming
Team Programming Project
Mathematics and Statistics
Algorithms and Data Structures
Information Management
Operating Systems and Concurrency
Microprocessor Systems
Computer Architecture

Third Year
Software Engineering
Team Programming Project
Mathematics and Statistics
Information Management
Artificial Intelligence
Computer Networks
Concurrent Systems
Computer Architecture
Symbolic Programming
Functional Programming

Fourth Year (BA (Mod) Computer Science)
Human Factors
Technology Entrepreneurship
Four of the following options: Fuzzy Logic, Formal Verification, Topics in Functional Programming, Next Generation Networks, Computer Graphics, Computer Vision, Internet Applications, Machine Learning, Advanced Computational Linguistics.
Team Programming Project
Individual Project

OR

Fourth Year (Master in Computer Science)
Human Factors
Technology Entrepreneurship
Four of the following options: Fuzzy Logic, Formal Verification, Topics in Functional Programming, Next Generation Networks, Computer Graphics, Computer Vision, Internet Applications, Machine Learning, Advanced Computational Linguistics.
Industrial or Research Lab Internship

Fifth Year (Master in Computer Science)
Research Methods
Five of the following options: Innovation, Machine Learning, Optimisation Algorithms for Data Analysis, Applied Statistical Modelling, Data Visualisation, Computer Vision, Mathematics of Light and Sound, Real-time Rendering, Augmented Reality, Real-time Animation, Computer Graphics, Knowledge and Data Engineering, Artificial Intelligence, Information Retrieval and Web Search, Text Analytics, Adaptive Applications, Scalable Computing, Internet of Things, Next Generation Networks, Urban Computing, Security and Privacy, Distributed Systems.
MCS Dissertation

The range and combination of options offered in Third, Fourth and Fifth Year is subject to change.



These courses are co-funded by the Irish Government and the European Union under the European Social Fund.



Faculty of Science, Technology, Engineering and Mathematics (STEM)
 School of Computer Science and Statistics

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The College reserves the right to update aspects of the course at any time.