



Types of Technology Careers

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Skills

- A passion for modern technology
- Strong ability in computer languages and coding
- A flair for design
- Strong organisational skills
- Maths skills
- Keeping up to date with developments and trends in the tech and modern media
- The ability to learn quickly
- The ability to interpret and follow technical plans
- A creative approach to problem-solving
- Strong communication skills

Typical employers

- Android and iOS app development companies
- Software companies
- Self-employment is possible with experience
- The retail sector
- Health
- Travel and tourism
- Entertainment industry
- Financial services

Typical salary

Graduate/Starting	€30,000
Senior/Potential	€80,000+ for experienced developers

Typical qualifications

The job is open to several degree course graduates. These include:

- computer science/engineering
- software engineering
- information systems
- mathematics
- business/management
- physical/mathematical/applied science

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- Irish Computer Society: www.ics.ie
- Irish Software Research Centre: www.lero.ie

- Engineers Ireland: www.engineersireland.ie
- Electric Sheep: www.androidappdevelopment.ie/
- Video: *Day in the life of a mobile app developer*;
www.youtube.com/watch?v=ulSxrbaj5rs

If you are interested in a career in Android/iOS development, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Animator

Use your creativity and technological know-how to win an Oscar. The Irish animation industry is growing fast and winning international awards for its distinctive, artistic films.

Some alternative job titles for this role

- Animation Technician
- Visual Effects Animator
- Graphic Designer
- Animation Editor
- Flash Animator
- Digital Painter
- Storyboard Artist

Introduction

Animators are artists who use old and new technology to produce animated films that stand alone or are for commercials, computer games, pop music videos and websites. They create films or visual effects for production companies, major animation studios and computer games companies. They use various computer animation programmes and tools to improve light, texture and shadow.

The animation industry in Ireland is currently gaining a world-wide reputation for excellence and is growing rapidly with Irish studios producing and owning rights to more and more of their own original material.

What the job involves

- Work in collaboration with directors and other animators to develop storyboards which illustrate the desired look of the production
- Translate these initial ideas into graphics and animation using sophisticated animation programmes
- Write and plan scripts for narrative sequences
- Budget for the production
- Edit animation sequences
- Use traditional methods and the latest technology to create new visual effects
- Use specialist computer generation software such as Maya, Flash and After Effects

How your career can develop

Building up a body of work that showcases your flair, artistry and creativity is essential. Work experience is extremely helpful but difficult to get. Look out for short film competitions advertised online or in newspapers/magazines for opportunities to showcase ideas and material.

Why it matters?

Newry born animator Tomm Moore has received Oscar nominations for his work. On the basics of animation he says; “Keep on learning to draw as there is no point being impressed with yourself because you can do something in a software package because it will change next week. Drawing is the fundamentals of animation. The other things you need are persistence and teamwork.”



Image: 'Song of the Sea' by Cartoon Saloon.

Skills

- Creativity
- Artistry
- Flair for creative software applications
- Love of storytelling and film
- Dedication and perseverance
- Excellent written and verbal communications skills
- Ability to work under pressure

Typical employers

- Animation studios
- Film studios
- TV production companies
- Games developers
- Graphic design studios
- Marketing companies

Typical salary

Graduate/Starting	€30,000
Senior/Potential	€60,000+ (approx.) for experienced animators

Typical qualifications

Usually a degree level 8 NFQ. A primary degree in a relevant subject such as illustration, 3D/graphic design or computer/computer-aided engineering is an alternative gateway in the profession. A Masters in animation is also beneficial.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information:

- The Irish Film Board: www.irishfilmboard.ie
- Animation Ireland: www.animationireland.com
- Animated in Ireland: an overview of the industry in Ireland from the Irish Film Board; www.irishfilmboard.ie/files/reports/Animated%20in%20Ireland%20Brochure%20for%20web.pdf
- Video: *Career option for animators*; www.youtube.com/watch?v=I5d4pPOlfoo

If you are interested in a career in animation, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Computer Scientist

The work of computer scientists and computer engineers overlap in certain areas but computer science is a discrete profession and one that attracts some of the world's brightest minds.

Some alternative job titles for this role

- Computer Engineer
- Software Scientist
- Software Engineer
- Computing and Information Scientist

Introduction

Computer science is the study of how data and instructions are processed, stored and communicated by computers. It involves designing software and addressing important scientific questions about computing procedures but also involves many aspects of hardware and physical components of a large computer systems.

In a nutshell, computer scientists are scientists and mathematicians who develop new ways to process, understand, store, communicate, and secure data. They also create the brains in our smartphones, they keep airplanes from falling out of the sky, they help surgeons do a better job and automate machines, to name but a few.

What the job involves

- Solve computing and maths-related problems and challenges
- Develop new products
- Research and develop new designs, hardware, techniques and materials
- Research modelling procedures (replicate a process using a computer)
- Work as part of a research team with programmers, IT professionals, and mechanical, electrical or software engineers to solve problems and create new products
- Study and investigate technology such as artificial intelligence, robotics or virtual reality
- Improve the performance of existing computer systems and software

How your career can develop

Graduate computer scientists can work across a huge selection of career fields with plenty of opportunities to specialise and grow.

Why it matters?

The Higher Education Authority's annual survey of graduate prospects shows computer science students are most likely to be snapped up by employers after graduation. Some 77%

of computer science graduates with an honours bachelor (level 8) degree last year were in employment nine months after graduation.

Skills

- Excellent maths skills
- Excellent computer and technology knowledge and skills
- Ability to analyse problems and trace them to their core causes
- An analytical approach to work and problem solving
- Attention to detail
- Strong ability to solve problems
- A born organiser – able to organise and classify large amounts of information

Typical employers

- Research foundations
- Large computer and software companies
- Social media companies
- Government
- Large manufacturers
- Financial service providers

Typical salary

- Graduate/Starting €30,000
- Senior/Potential €65,000+

Typical qualifications

A computer science or computer science and information technology degree is the norm. Gateway degrees also include Electronic Engineering, Software Engineering, Physics and Mathematics. Postgraduate study to PhD level is common in the profession, especially in academic research.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- Irish Computer Society: www.ics.ie
- Irish Software Research Centre: www.lero.ie
- Engineers Ireland: www.engineersireland.ie
- The Institute of Electrical and Electronics Engineers (IEEE) – Irish branch: www.ieee-ukandireland.org
- Artificial Intelligence Association of Ireland: www.4c110.ucc.ie/aiai

- Video from MIT in the US – *What do computer scientists do?*
www.ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-00-introduction-to-computer-science-and-programming-fall-2008/video-lectures/lecture-24/

If you are interested in a career in computer science, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

IT security Specialist

IT security is fast becoming one of the most important roles in the tech sector as cybercriminals and hackers become more sophisticated than ever.

Some alternative job titles for this role

- Cybersecurity Specialist
- Network Security Specialist
- Information Security Specialist
- Cybersecurity Software Engineers

Introduction

Any computer connected to the Internet is vulnerable to cyber-attacks. Cyber security is the technique used to protect computers and networks from these types of intrusions and from criminal attack. Specialists in cybersecurity are among the most sought-after professionals in the tech sector, as business and governments seek to fight off an increasingly daring and ruthless group of global cybercriminals and hackers. With some of the world's biggest firms and banks as well as governments under constant fire of threats, skilled, clever and dedicated security specialists work in a field that demands a mix of artistry and technical expertise. They need to be one step ahead of the hackers and organised criminals at all times.

What the job involves

- Implement security protocol at the development stages of software systems, networks and data centres
- Look for vulnerabilities and risks in hardware and software
- Find the best way to secure the IT infrastructure of an organisation
- Build firewalls into network infrastructures
- Constantly monitor for attacks and intrusion
- When the cybersecurity specialist finds a potential threat or attempted breach, close off the security vulnerability
- Identify the perpetrator and liaise with the police if necessary

How your career can develop

There is strong demand for skilled, qualified IT security specialists both in Ireland and around the world as the threat from cybercriminals and hackers grows. There is great potential for career progression, especially in larger organisations and financial service providers. There is also scope for experienced security professionals to set up their own business as consultants.

Why it matters?

Months after American hackers demonstrated how easily they could disable an electric car while it was in motion, carmakers are under growing pressure to do something about the threat. U.S. senators are asking carmakers to provide updates on what they were doing to protect motorists from unwanted intrusions. The Canadian military are now looking for car hackers to study "the security of automotive vehicles, including understanding their

vulnerabilities and assessing the potential mitigation measures”. Similarly, Tesla and General Motors are hiring security researchers to help them secure their vehicles before release.

Skills

- Strong IT skills and knowledge including hardware, software and networks
- Attention to detail
- Ability to use logic and reasoning to identify the strengths and weaknesses of IT systems
- A forensic approach to challenges
- A deep understanding on how hackers work and ability to keep up with the fast pace of change in the criminal cyber-underworld
- Ability to seek out vulnerabilities in IT infrastructures

Typical employers

- Network providers
- Government
- Banks
- Schools and universities
- Airlines
- Any large organisation with a database
- Security consultancy firms

Typical salary

- Graduate/Starting €42,000
- Senior/Potential €75,000+

Typical qualifications

Degrees in IT security, computer programming, computer science, information science, computer engineering, and software engineering are common gateways.

Alternative routes to a bachelor’s degree in this area may apply to students that have a PLC qualification in a related course or general computing certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- Irish Software Association: www.software.ie
- Irish Computer Society: www.ics.ie
- BCS, The Chartered Institute for IT champions the global IT profession: www.bcs.org
- Infosecurity Ireland: www.infosecurityireland.org
- Irish Internet Association: www.iaa.ie
- Video: *A career in cybersecurity*; www.youtube.com/watch?v=EhIp3b8iGm4

If you are interested in a career in IT security, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Games Designer

The Irish games industry is growing rapidly and making waves on the international stage. Now is an ideal time to put all those hours spent zapping aliens to good use and become a games designer.

Some alternative job titles for this role

- Video Game Environment Designer
- Video Game Systems Designer
- Video Game Mechanics Designer

Introduction

Games developers design and programme games for a variety of formats, such as consoles, wireless applications, the internet and mobile phones. They are involved in various stages of the creation of a game. Most specialise in a particular area such as design, programming, animation, audio, editing or production. Lead designers coordinate the design aspects. A game mechanics designer works on the balance of the game and its rule system to allow the player to experience the full range of activity in the game. The environmental designer creates the different scenarios and environments of the game.

What the job involves

- Create new and appealing game ideas
- Develop ideas for gameplay
- Experiment with several themes and genres
- Develop plots and storylines
- Develop characters
- Develop maps, scenarios, and levels of difficulty
- Establish new ways of winning and losing the game
- Develop user interface concepts
- Improve existing games

How your career can develop

Creativity, innovation and technical know-how and experience are all-important in the games world.

Why it matters?

The head of Nintendo, Shigeru Miyamoto, also invented the first fitness video game of note known as the Wii Fit. This method of gaming is now being used for physiotherapy rehabilitation and has been adopted by various health clubs around the world including the US Navy. Research in this area is taking place in Ireland's national centre for Data Analytics, Insight, spearheaded by Prof Brian Caulfield. His team is using large stores of data associated with movement collected by wearable sensors. They can extract the movements for a given injury and then integrate these movements into a computer game.

Skills

- Creativity
- Artistic vision
- A passion for the world of video games
- Storytelling ability
- Wide-ranging knowledge of gaming trends
- Strong analytical frame of mind
- Excellent programming skills
- Ability to work as part of a team

Typical employers

- Video games developing companies
- Marketing companies

Typical salary

- Graduate/Starting €36,000
- Senior/Potential €70,000+ dependant on experience

Typical qualifications

Degrees in computer games development/design, graphic design, animation, software engineering or computer science are common gateways. However, experience and a portfolio of work are all-important in a very competitive industry.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- Irish Games Developers: www.gamedevelopers.ie
- Ireland's Annual Games Fleadh: www.gamesfleadh.ie
- Irish Software Association: www.software.ie
- Irish Computer Society: www.ics.ie
- Video: *Top 10 iconic video games designers*; www.youtube.com/watch?v=4HgazUS1sS4

If you are interested in a career in games design, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Programmer

A programmer writes code – but that’s not all there is to the job. Programmers must have a range and depth of skills and a strong knowledge of related areas to create “good” code.

Some alternative job titles for this role

- Software Developer
- Systems Programmer
- Applications Programmer
- Hardware Programmer

Introduction

What’s the difference between a programmer and a software developer? Well, programmers write code. A software developer works with clients and develops a solution or product that suits their needs.

A programmer often works alone using a variety of computer languages, such as Visual Basic (.Net), Java (J2EE), XML and C++ to write software programmes. They modify the programme designs made by engineers and developers into a language that the computer can understand and follow.

What the job involves

- Use programming languages to write new programmes
- Expand and update existing programmes
- Run tests to find any errors or bugs
- Work with software developers to help create a product
- Write and design coding flow charts and models
- Redesign programmes to suit other platforms

How your career can develop

Opportunities for promotion are good; a background in programming is valued for most IT careers as it provides a solid backbone of knowledge. Programmers with a flair for teamwork and communication often end up becoming project managers.

Why it matters?

Computer programmers are at the forefront of designing elaborate artificial intelligence systems, crossing over into the fields of robotics and computer science.

Skills

- Mathematical aptitude and strong problem-solving skills
- Excellent IT and coding skills
- Excellent organisational, time and project management skills
- Accuracy and attention to detail
- An understanding of the latest trends and their role in a commercial environment

- Teamwork skills because most projects require input from individuals with different roles
- Self-development skills to keep-up-to-date with fast-changing trends
- Professional approach to time, costs and deadlines

Typical employers

- Financial services
- Manufacturing firms
- Educational institutions
- Banks
- Specialist software development houses
- Consulting firms
- Telecommunications firms
- Public sector organisations
- Self-employed

Typical salary

- Graduate/Starting €28,000 to €30,000
- Senior/Potential up to €75,000 for experienced Java or C++ coders

Typical qualifications

Degrees in computer programming, computing, information technology, software development and software engineering are common gateways to the profession.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- The Code Institute of Ireland: www.codeinstitute.net/
- Irish Software Association: www.software.ie
- Irish Computer Society: www.ics.ie
- Irish Software Research Centre: www.lero.ie
- Video: *Is programming a good career choice?*;
www.youtube.com/watch?v=einEGoBc0V8

If you are interested in a career as a programmer, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Technical Writer

An expanding and interesting career demanding creative writing ability with technical know-how.

Some alternative titles for this role

- Technical Author
- Technical Communicator

Introduction

Technical writers turn complex, technical information into clear and simple language that is easy for either tech professionals or the general public to understand. They compose a variety of documents, such as software manuals, training manuals, assembly instructions, online customer service guides and technical reports. Technical writers often specialise in one field, such as software reporting or medical writing.

What the job involves

- Write, edit and proofread texts
- Collate and verify information
- Create and edit pictures and diagrams
- Liaise with printers, photographers and translators
- Produce indexes and catalogues

How your career can develop

With the rapid pace of progress in technology, medical and scientific advancements and the need for professionals to translate specialised data for non-professionals, prospects are bright for dedicated technical writers. Many opt to for self-employment and build their own business.

Why it matters?

Everything from a four page user manual for a calculator, to a 900 page document for a new computer, relies on the work of technical writers.

Skills

- Must be proficient in publishing software and programmes
- Ability to handle large amounts of complex data
- A sharp eye for detail
- Research skills
- Ability to work to strict deadlines
- Technical or scientific educational background
- Accuracy and attention to detail

Typical employers

- Telecommunications companies

- Engineering companies
- Computer hardware and software companies
- Technical publishers
- The civil service, Department of Defence and local authorities

Typical salary

- Graduate/Starting €30,000
- Senior/Potential €55,000

Typical qualifications

Entry is open to all degree disciplines, but some employers may prefer degrees in scientific, technical, engineering or computing disciplines.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- International Association of Business Communicators: www.iabc.com
- International Council for Technical Communication: www.intecom.org
- Technical Communication in Europe: www.tceurope.org
- Video: *How to become a technical writer*;
www.youtube.com/watch?v=kZ6_b4862Ho

If you are interested in a career as a technical writer, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.

Web Designer

With a mix of creativity and technology, web designers are the ones who give websites the look and “feel” that makes people want to visit them.

Some alternative job titles for this role

- Interaction Designer
- User Interface Designer
- Web developer

Introduction

With a mix of skills from different backgrounds - IT, design and business – Web designers design, test and maintain the websites and of companies and other organisations. They are familiar with programming languages such as HTML, ASP, Javascript, C++, SQL and Visual Basic.

The look and “feel” of a website is important and selecting the appropriate colours, font, layout and images creates the whole personality of the website. In addition to considering visual aspects, the ease of use of the website has to be a priority. It is important to create a page that the target market can relate to. The ever changing IT industry demands flexibility and the ability to master new technologies.

What the job involves

- Create a website with a specific design and eye grabbing graphics and details
- Work with the client to establish the needs or functions that the web page and the overall website must achieve
- Work with graphics software, such as Photoshop
- Work with languages like Javascript
- Work with a variety of media programs to add sound or film clips to web pages
- Edit and programme content

How your career can develop

There are currently good prospects for experienced web designers and even better career progression for those who specialise, for instance in media or animation. They may become involved in client consultancy and project management while many opt for self-employment.

Why it matters?

Web designers are responsible for creating a virtual ‘shop window’ for businesses,



which means they must be brand aware and design with the customer in mind, in addition to being technically capable.

Skills

- Excellent web language skills for instance in HTML, WYSIWYG and CSS
- JavaScript and Ajax skills
- PHP, ASP, Java, Perl and C++ skills
- Design sense – knowing what works and what doesn't
- Knowledge of database maintenance suites such as MySQL
- Search engine optimisation skills
- An artistic eye
- Up to data familiarity with current web trends
- Social media skills
- Business knowledge

Typical employers

- Software companies
- Technical/e-commerce/web consultancies
- Retail businesses
- Government/state organisations
- Airlines
- Entertainment companies

Typical salary

- | | |
|---------------------|---------|
| • Graduate/Starting | €25,000 |
| • Senior/Potential | €65,000 |

Typical qualifications

Degrees in computing/IT or web development are common gateways to the profession.

Alternative routes to a bachelor's degree in this area may apply to students that have a PLC qualification in a related course or general computing/IT certification or diploma. For further details on eligibility requirements for third level entry following a PLC qualification, students should visit the CAO course search at www.careersportal.ie/courses/simple_search.

Further information

- Irish Internet Association: www.iaa.ie
- Irish Software Association: www.software.ie
- Irish Computer Society: www.ics.ie
- Video: *A day as a web designer*; www.youtube.com/watch?v=mlfSZChro8E

If you are interested in a career as a Web Designer, visit Qualifax (www.qualifax.ie) to search for relevant courses at all levels and entry points.