

# Career View

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## Information Technology

Information Technology (IT) is part of our everyday lives whether we are using the Internet to send an e-card to a relative overseas, watching digital TV, text messaging on our cellphones, booking a theatre or airline seat online, or ordering our groceries on the web. We have access to an increasing range of services and products which can be purchased from anywhere in the world.

As workers IT helps us to do our jobs more efficiently whether it's turning out documents that are attractive and visually appealing, viewing images of Mars, communicating instantaneously with co-workers around the globe, or permitting access to information or knowledge that will contribute towards better decisions and problem solving. Organisations are able to market themselves on the Internet and use sophisticated software to monitor their business performance to ensure that they are efficient and competitive. Scientific data can be analysed so as to provide results within weeks rather than years.

Multimedia applications have added new dimensions of utility and user friendliness to IT systems. Whether you are playing multi-person computer games over the Internet, or using a simulation package to design a house, or audio editing software to build your own music library or video, multimedia is all the rage. Special effects that previously were considered impossible or prohibitively expensive are now taken for granted.

As a graduate in Information Technology what will the future hold for you? You may use state of the art software to produce animation for the movie industry, or design the first keyboard free computer or an 'expert' system that can diagnose

the earliest stages of disease. You may help develop a computer chip for human implantation or design a probe to travel through a black hole in space. The industry is so fast paced that it's possible, even likely that you'll be working with technology that simply doesn't exist yet.

### *Where do IT graduates work?*

Annual graduate destination survey reports demonstrate that IT graduates work in a wide range of fields which include, but are not limited to, banking and finance, insurance, defence, manufacturing, the petroleum industry, telecommunications, the dairy industry, transportation, insurance, energy, medical research, market research and forestry. IT companies, business consultancies, central government, city councils are among employers of new graduates. Even the smallest organisations use IT and so graduates have an extremely wide range of employment options both within NZ and overseas. There's room too for the graduate entrepreneur, and many graduates of Victoria work for "new" companies or have successfully started up their own.

A degree in Information Technology is a great beginning and some of the roles that graduates with an

*Topical coverage of career related issues brought to you by Victoria University Career Development and Employment.*

*Areas covered include how degrees and courses relate to employment opportunities, to life/work planning, graduate destination information and current issues or material relevant to the employment scene.*

*Your comments and suggestions always welcomed*



appropriate first or postgraduate degree may enter include:

Computer Scientist, Applications Programmer, Systems Programmer, Multimedia Programmer, Analyst/Programmer, Test Analyst, Systems Analyst, Systems Integrator, IT Consultant, Database Administrator, Computer Sales Support, Software Engineer, Hardware Engineer, Computer Engineering Technician, Computer Support Technician, Internet or Web Developer, Web Master, Software Developer, IT Entrepreneur

Roles requiring a degree plus two or three years relevant industry experience include:

Systems Designer, Systems Architect, Systems Developer, Information Systems Manager, Business Improvement Analyst, Project Manager, Network Engineer, Management Consultant - Strategic, Network/Systems Administrator, Information Scientist

Brief descriptions for typical entry level positions are included later in this issue. If you are considering combining IT with another degree as many do, there are even more employment possibilities. A Careers Adviser and a Course Adviser can help you to explore your options.

### What skills are employers looking for?

Technology dates quickly so it's important to gain a good understanding of the principles and maintain a willingness to keep learning and developing skills by applying those principles to evolving technology.

Skills in *programming* (or evidence that you have the intellectual capacity to learn programming quickly) are critical for entry into the industry. A working knowledge of how good systems work - *systems architecture and systems engineering* - needs to be acquired early on for a successful career in the industry. Systems engineers and architects understand how a system is designed,

from hardware, to operating and applications software. What is it that we want done? What is the most effective way to do it? How can we create a system with the correct checks and balances that will run efficiently, allowing the user to move seamlessly between applications and allow effective communications between computers and users? The *user interface* is also important - people don't use systems that are hard to understand or that fail to produce the results they are looking for. As building systems from scratch happens fairly infrequently, adding to existing systems and avoiding software incompatibility so that systems are integrated can be challenging.

Technical skills are not the whole story. Employers are also looking for skills in:

- **Learning agility** - the ability to constantly and proactively update technical knowledge and skills and quickly apply that learning to new situations.
- **Interpersonal skills** - the ability to listen, influence and manage people in both team and leadership roles and build strong relationships.
- **Communication skills** - an excellent grasp of technical information and industry jargon but also the ability to explain complex ideas in simple terms.
- **Analysis** - drawing on technical skills, people knowledge and commercial awareness to grasp key issues, explore options and identify appropriate solutions.
- **Problem solving** - persistence and confidence in the face of what may seem insurmountable problems and impossible deadlines. Resourcefulness and good judgement in handling difficult situations.
- **A 'can do' attitude** - a reluctance to say this is impossible just because it's never yet been done.
- **Commercial awareness** - an understanding of how technology supports the objectives of individuals and organisations.

## Graduate Profiles

### Iris Lee

**Senior Consultant, Enterprise Risk Services, Deloitte Touche Tohmatsu**

I came to New Zealand from Malaysia to study at Victoria, after getting a scholarship. I chose to study a commerce degree with a double major in Information Systems (IS) and Management because I felt that the Information Systems major in particular would help me get my first job quickly when I graduated.



Looking back at my study years at Vic, I think that the area I enjoyed the most in my IS major was the research essay. The challenge of IS is that it is such a dynamic area of study. My younger sister did an IS major a few years after I did, and my flatmate is currently doing one too - and I've been impressed at how the degree major has changed in such a short time, constantly reflecting the current technical skills that are in demand.

I applied for a number of graduate positions towards the end of my studies and I found that the 'big five' audit firms and IT firms were the most receptive to the qualification I had. I started my first job with the Enterprise Risk Services group at Deloitte Touche Tohmatsu in Wellington a few months after I graduated. The most beneficial thing about working in a consulting firm is the exposure to different clients - in both the public and private sectors, and the variety in the type of work. My work is wide-ranging from auditing information systems (i.e. reviewing general computer controls, reviewing security of operating systems, applications and databases), to assisting clients with their business continuity and disaster

recovery planning, to developing and presenting IT training courses to clients.

Since starting work I have been constantly challenged. The IS degree has given me useful analytical skills and a technical foundation upon

which to build more technical skills as I learn the job. To anyone contemplating an IS major, I'd say don't expect to learn everything there is to learn during your degree - the learning curve for any graduate starting a first job is high, and probably more so in the IT area. Expect to be constantly up-skilling - I started studying for the Certified Information Systems Auditor exams within my first year at Deloitte and intend to study towards other certification this year.

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### Darren Keall

**Consultant, Sequel Software**



When I started university, I drifted through my first couple of years doing a range of Commerce and Science papers. By this stage I had found that Commerce wasn't my thing, and having always had a

bit of an interest in computers and technology, decided to try some Computer Science papers. I found them interesting and intellectually stimulating, and my studies were soon focused on Computer Science.

One of the most enjoyable aspects of this degree were the projects. I relished the opportunity to put theory into practice. It was challenging and fun to read through the requirements of a project, design a solution and then test your

solution by implementing your design. I particularly liked the fact that we weren't constrained to one 'right' solution, and alternative solutions were accepted and often encouraged. Aside from all this, it was always satisfying to have a piece of functioning software at the end of a project (well, most of the time it at least kind of functioned!). Another thing I always appreciated about Computer Science was that the material being covered was current and would be useful in the real world.

I gained a wide range of skills from my studies. The practical experience was invaluable in giving me proficiency in a number of programming languages, as well as developing my general programming, analysis and design skills. My communication and reasoning skills were greatly enhanced from time spent discussing problems

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and issues with others in the labs and in tutorials. In my third year I took the software engineering project paper. This was one of

my favourite courses, and an excellent introduction to software engineering in the real world. It improved my team work and time management skills no end, as without these our project would have quickly sunk.

I graduated from Victoria with a BSc in Computer Science and got a job with Sequel Software. Sequel is a small niche firm working with Oracle, and I am part of the development team. The technical skills I gained at university allowed me to be, almost immediately productive as a programmer, as well as giving me the background to learn and extend myself into a variety of areas. My communication skills have been a great asset in relating to clients and essential in allowing me to work as part of a small effective team. I also found that managing time effectively is essential in the IT industry as there are often a number of deadlines to be met and there can be significant consequences if you don't produce results when required.

## Rachel Goldstone

*Analyst Programmer, Datacom Systems Ltd*



When I left school I wanted to be an architect. I completed the pre-entry courses for Architecture, but missed out on the limited number of places available for degree. I had gained my best mark in an

introductory Computer Science course so changed my enrolment to a BSc, majoring in Computer Science.

During my degree, I studied many aspects of Computer Science. The diversity of topics such as Database Structures, Artificial Intelligence and the theory-based Algorithm courses not only kept me interested but, also, added more depth and variety to the skills and knowledge I was gaining.

When I graduated, I already had a job in an unrelated field but due to a lack of job security and the desire to utilize my degree, I started to look for a job in the IT industry. I was worried that because I had achieved only average grades during my years at Victoria, I would find it hard to find work in an industry that is stereotyped as being the playground of teenage computer geniuses. I applied for only one position, as a trainee programmer with Datacom Systems Limited. I got the job 2 days after my graduation ceremony.

After working for Datacom for almost 2 years, I now know that knowledge gained at University is important, but more important are the personal skills gained during the 4 years it took to complete my BSc. The ability to work to deadlines, being able to work as an individual and as part of a team and to continuously learn and educate myself, these are the skills that helped me further my role in the team. In an

industry where technology and knowledge changes so rapidly, I believe that the ability to learn new information quickly is as important as the knowledge itself.

*I can't think of any other industry that has the opportunity for such enormous growth and development in so many areas of human life; medicine, crime, research, technology.*

Although I still crunch code, my role at Datacom has changed drastically since that first week. I have been involved in the

analysis of modifications required to the New Zealand Post Point-of-Sale system "Post Link" to meet specifications by the Trinidad & Tobago Postal Corporation, and I am currently a part of the 24-hour support team for the Post Link deployment in South Africa.

To anyone contemplating studies in Computer Science or Information Technology in general, I would say that although there are still people whose eyes glaze over when you mention computers, I can't think of any other industry that has the opportunity for such enormous growth and development in so many areas of human life; medicine, crime, research, technology.

## Antony Currington

**Analyst Technical Consultant,  
The Integrators**

I started at Victoria with the intention of completing an Architecture degree, transferred to a Computer Science degree and three years later graduated and walked straight into my current job.



I work for a 25 person computer software company that sells and develops Customer Relationship Management (CRM)

software. The product comes as a complete package, with an environment to allow people to write their own applications on top of a base set of tools. Within this job, I started writing modules for people to use - like subscription management and quoting and order systems - and supporting existing solutions and clients. Eventually as staff in the office changed I became the team leader for a development team in the Wellington Office.

As a small company, each person in our team needs to have a wide variety of knowledge and experience to support our customers. I do everything from managing new projects to implementing solutions, to working with customers to define their requirements. With a number of sites in New Zealand and Australia I get to travel a few times a year and work with a number of very enthusiastic clients, surely one of the best parts of the job.

I learned many things at Victoria, but the most valuable is the ability to analyse problems and work out solutions quickly. This has helped me out no end in my job. When a customer wants to know if an idea they have is possible, they usually need

someone that can work out options quickly. I am usually the one that they call when

someone wants to know if we can bend our software in some way to find a solution for the client. There is something quite satisfying about writing programs and seeing your work being used to solve a client's issue.

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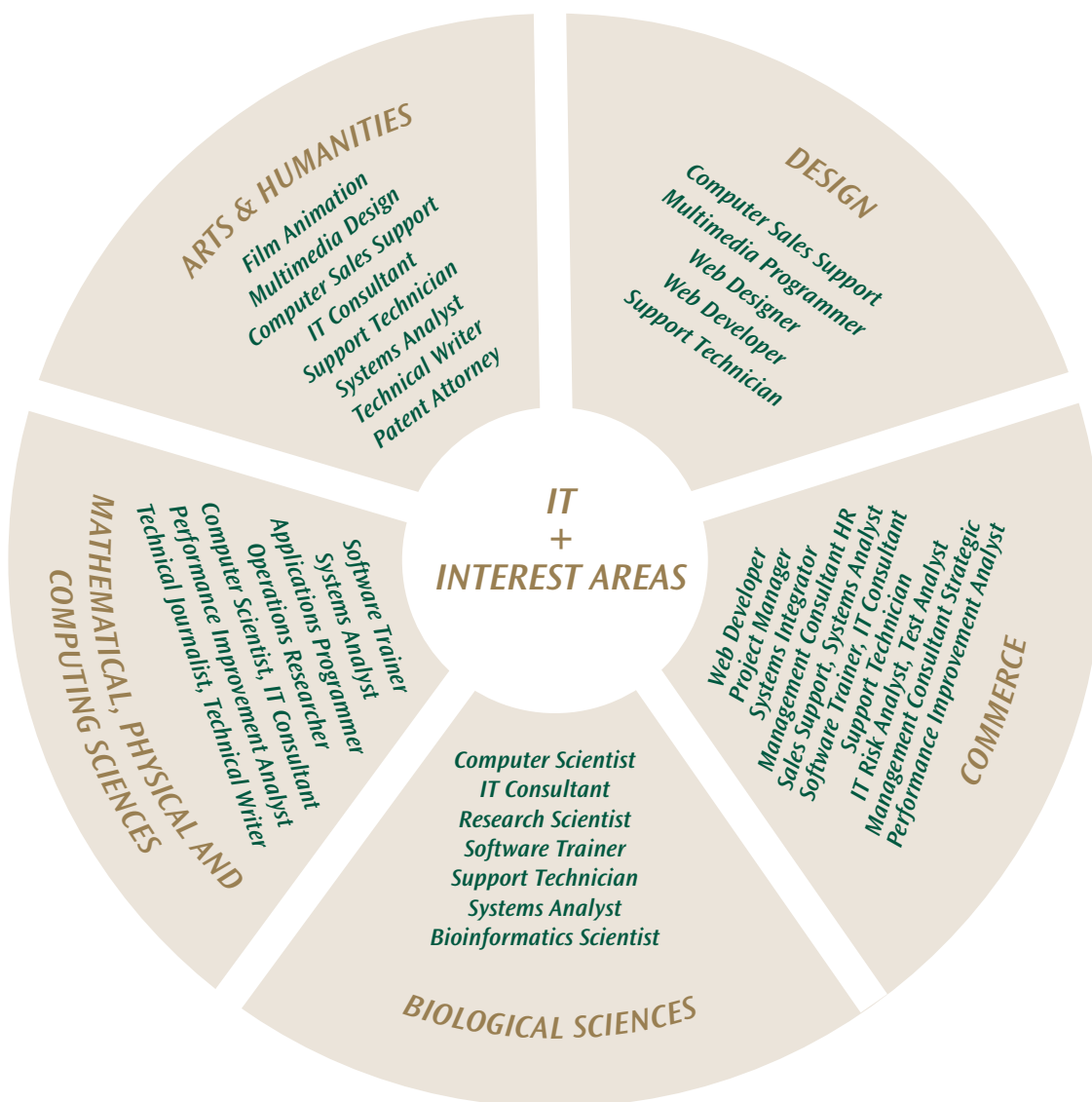


## A sampling of Entry Level Jobs for Graduates in the IT Industry

1. **Analyst/Programmers** combine the roles of both analyst and programmer and would tend to undertake smaller projects from analysis through to implementation. Most specialise in commercial applications.
2. **Bioinformatics Computer Scientists** apply computer technology to the management of biological information.
3. **Business Improvement Analyst, Performance Review Analyst, Business Process Re-engineer, Change Analyst, Process Analyst, Productivity Analyst** are role titles common to the business analysis profession which aims to improve business performance or productivity by examining processes; for example how an order for a new computer is handled from the initial customer contact to dispatch and after sales support.
4. **Computer or Applications Programmers** write, test and maintain the detailed instructions that computers follow, called programmes or software. There are many computer languages that programmers use to write or 'code' in. They may write flight simulation software for use in pilot training or software for general distribution like computer games.
5. **Computer Engineering Technicians** perform technical tasks, usually under the direction of computer engineers.
6. **Computer Sales Support Personnel** provide technical advice on all aspects of the installation and use of computer systems both before and after the sale of the system to a customer.
7. **Computer Scientists** are computer professionals who usually design computers and the software that runs them, develop information technologies, and develop and adapt principles for applying computers to new uses. They may perform many of the same duties as other computer professionals but usually work as theorists, researchers, or inventors.
8. **Computer Support Technicians** provide technical assistance, support, and advice to customers and users. This group includes *Technical Support Specialists, Help-desk Technicians, and Customer Service Representatives*. These trouble-shooters interpret and resolve problems, often using automated diagnostic programs and provide technical support for hardware, software, and systems.
9. **Database Administrators** use database management systems software to work out the best ways to organise and store data securely and ensure that databases continue to meet an organisation's needs.
10. **Hardware Engineers** design, develop, test and supervise the manufacture of computer hardware such as mobile radios, satellite navigation, etc.
11. **Information Scientists** deal with requests for information, ensure that critical information is available to the organisation and may be responsible for auditing how information and the knowledge it might provide are actually used.
12. **Information Technology Consultants** help organisations make the best use of existing or new information technology to solve their business problems.
13. **Multimedia Programmers** draw together text, sound, graphics, animation, still or moving pictures using specialised software. They need strong design and computing skills to produce interactive websites, CD ROMs, downloadable screen savers and so on.
14. **Network or System Administrators** support an organisation's computer network. This includes maintaining network hardware and software, monitoring the network to ensure its availability to system users and managing network security.
15. **Software Developers** co-ordinate the production of software products from choosing content providers, assembling graphic creators, working with programmers to actual assembly, pressing and distribution of the final product. The process is often compared to cooking - assembling all the ingredients in order to create a wonderful dish.
16. **Software Engineers** design and develop software systems. They have programming skills but they design programmes rather than code them and ensure that software and hardware systems work together seamlessly, whether built for NASA or a home PC.
17. **Software Trainers/Teachers** train others to use particular software packages.
18. **Systems Analysts** belong to a group called system development workers, which also include *Systems Developers and Systems Architects*. They are more specialised than IT consultants, solving computer problems rather than business ones. They help plan and develop new computer systems or devise ways to make existing systems do more. Systems analysts may design new systems, including both hardware and software, or add a new software application to harness more of the computer's power.
19. **Systems Integrators** specialise in building complete computer systems by putting together components from different vendors. They enable organisations to use off-the-shelf hardware and software packages to meet their needs.
20. **Systems Programmers** write and modify operating systems, and low-level applications support software, including communications software.
21. **Test Analysts** use test scripts and customised test software to test new or modified software. For example, on-line banking software will have been tested to ensure that customer details cannot be accessed by an unauthorised person.
22. **Web or Internet Developers/Web Designers** use specialist software to design, layout and code pages on the web.
23. **Webmasters** are responsible for all technical aspects of a website, including performance issues such as speed of access, number of visitors and for approving site content.

## Combining Personal Interests with Careers in IT

It is possible to combine studies in IT with a whole range of other subjects. As a result you may increase the career opportunities available to you and make yourself a more exclusive product by choosing an unusual combination like IT with Design or IT with Linguistics and Modern Languages. It may be a challenge to work out the combination of studies that's right for you but seek out assistance from Careers Advisers and Student Recruitment Advisers and the rewards will make your efforts very worthwhile.



## Information Technology at Victoria

VUW offers a set of complementary degree programmes, each with a different focus on information technology. You may study information technology within the Bachelor of Arts (BA), Bachelor of Commerce and Administration (BCA), Bachelor of Information Technology (BIT), Bachelor of Science (BSc) and Bachelor of Science and Technology (BScTech) degrees. Most of these degree programmes offer a choice of more than one major or concentration.

The BIT offers four majors within a four year degree solely focused on information technology. All students complete a set of required papers that ensure a broad knowledge across IT, the use of IT in organisations and the basics of management. Students may major in *Computer System Engineering*, *Information Systems*, *Internet Computing* or *Software Engineering*. The degree programme involves both work placement and industry related projects.

The BCA provides a primary focus on organisations and how they use and manage information. There are two information technology focused majors, *Information Systems* and *e-Commerce*. *Information Systems* focuses on the use of information by organisations. *e-Commerce* addresses the ways in which information technology is changing how we conduct commerce.

Within the BSc you may major in either *Computer Science* or *Electronic and Computer Systems*. *Computer Science* focuses on the principles of design, algorithms and

software architectures that go into modern IT systems. *Electronic and Computer Systems* has a focus on the design of embedded systems and instrumentation.

You also have the opportunity to combine studies in Science with Commerce and Administration by undertaking the conjoint BCA/BSc. This demanding programme of study offers two degrees in four years. You must complete a major requirement for both degrees, for example Computer Science within the BSc could be combined with Management for the BCA.

A BScTech in *Electronics and Instrumentation* provides another option combining papers in computing and electronics. You may study in detail analogue, digital, and computing electronics with applications in communications, signal processing, sensing, instrumentation and control systems.

The *Computing* major in the BA has been designed for students wishing to combine computer science with subjects in the humanities and social sciences such as Media Studies or Film and Theatre.

Each major within a degree programme has requirements that must be completed. Beyond those requirements you may choose papers to tailor your individual programme of study to your liking. Some students focus on an area in which they hope to be able to apply their IT knowledge, others choose papers that satisfy their personal interests. Seek advice from a university careers adviser or course adviser.

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