



DIPLOMA OF IT SOFTWARE DEVELOPMENT LEVEL 6



TECHSCHOOL
AT NZSE

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PROGRAMME OVERVIEW

Learn the fundamentals of information systems, hardware and software infrastructure, user applications and communication. Deep-dive into theory and practice of a range of computing systems and networks, and how these systems are used to support business practices. This programme also embeds the NZ Diploma of Software Development (Level 6).

WHAT WILL I LEARN?

SOFTWARE DEVELOPMENT: YEAR 1

Technical Infrastructure For Today

- Explain past, and present ICT developments in the context of near-future ICT.
- Explain operating systems basics.
- Describe computer architectures and platforms as relevant for near-future ICT developments.
- Describe data storage techniques and technologies of relevance to near-future ICT.
- Identify and discuss near-future developments, advancements and opportunities.

Visual Programming

- Design small computer programs as solutions to problems of low complexity.
- Implement, test, debug and document small computer programs.
- Identify the fundamental data requirements of an intermediate-level program.
- Write a complete program whilst adhering to available coding standards.
- Describe different types of data, system data objects, and operations on data.
- Create simple database designs to solve given business problems.
- Implement simple database designs to solve given business problems in a relational database using a software package and using SQL.
- Explain the meaning of the terms used in a database management Environment.

Business Technologies

- Identify and describe the functions, structure and cultural context of business including the impact of IT on business.
- Explain the interaction of software and databases within the computer system model.
- Define the parts of an information system model.
- Describe Information management and retrieval processes and issues including privacy and security responsibilities.
- Apply basic principles of media design, web design, and interaction design including Human Computer Interaction and accessibility.
- Define Internet services and e-Commerce models.
- Apply problem solving and systems thinking in the recommendation of ICT solutions

AT A GLANCE

Course duration:

2 academic years

Course credits:

285 credits

Campus:

**New Lynn
Manukau**

Tuition

Domestic: \$8,685 NZD (per year)

International: \$37,000 NZD (2 years)

Entry Requirements:

Academic Criteria:

A computing certificate in Level 5 or equivalent knowledge, skills and experience.

English Criteria:

IELTS Academic score of 6.0 with no band less than 5.5 or NZCEL Level 4 or equivalent.

Certifications

NZ Diploma in Software Development (Level 6)

What's next?

Refine Your Knowledge:

- Diploma in Applied Network & Cloud Technologies (Level 7)
- Bachelor of Information Sciences (Massey University)

Get Employed:

- Help Desk Operator
- Network Support Technician
- Computer Systems Administrator
- User Support Specialist
- System Coordinator
- LAN Coordinator
- PC Support Specialist

Technology in a Digital World

- Demonstrate competence in understanding key technical issues concerning the operation, implementation, and application of digital systems.
- Critically appraise past, present and future application of digital systems with particular emphasis on their impact on society in general and also upon the individual.
- Formulate personal ethical positions in relation to the development, manufacture, application, expansion and disposal of digital systems.
- Demonstrate competence in core academic skills
- Critically reflect on the use of collaborative software and new media resources as used in learning practice.

Programming 1

- Read, comprehend, describe and explain existing small scale computer program source code.
- Design, implement and compile small scale computer programs that are syntactically correct, well documented and adhere to a programming standard.
- Test, debug and modify small scale computer programs to resolve logic and runtime errors.
- Use development tools to assist in the construction, maintenance and testing of computer programs.
- Write computer programs that feature program output and user input.
- Select appropriate data types for variables and use variables to store, retrieve and process simple data in computer memory.
- Write computer programs that contain statements which control the sequence, selection, and iteration of computer instructions.
- Create modular and reusable functions featuring simple data input, output and the performance of a particular task.
- Write computer programs that use arrays and simple structures to store, retrieve and process data in computer memory.
- Write computer programs that use computer file storage for data input, simple processing and data output.

Programming 2

- Read, comprehend and explain existing object-oriented programs.
- Design object-oriented programs to solve problems.
- Encapsulate logic and data with classes.
- Apply appropriate data structures and algorithms in problem solving.
- Develop tests to identify errors in programs.
- Develop strategies to fix errors in programs.
- Develop interactive program.
- Apply programming and documentation standards

Computer Network Principles

- Plan, design, install, deploy, configure, operate, maintain, troubleshoot and document a small Local Area Network (LAN) using routers and switches.
- Demonstrate knowledge of the fundamentals of networking including both the practical and conceptual skills that build the foundation for understanding basic networking.
- Demonstrate knowledge of the human versus network communication and the two major models used to plan and implement networks: OSI and TCP/IP.
- Demonstrate knowledge of the "layered" approach to networks and examine the OSI and TCP/IP layers in detail to understand their functions and services.
- Demonstrate knowledge of network devices, network addressing schemes and the types of media used to carry data across the network.
- Use networking utilities and tools to provide a test environment where a range of network services and data can be observed and analysed.
- Discuss the impact and application of sustainable engineering design in networking.

Interface Design & User Experience

- Apply design principles for interaction.
- Describe the relationship between Human Computer Interface and User Experience Learning.
- Use prototyping to assist in usability and user experience testing.
- Apply the principles of responsive design.
- Apply the principles of multi-media design

Communication Skills

- Discuss and apply the theories of communication to relevant situations.
- Discuss the influence of culture and historical events such as the Treaty of Waitangi on communication in the New Zealand context.
- Demonstrate an understanding of group processes and participate in a group assessment.
- Present a persuasive argument orally to an audience using appropriate visual aids.
- Write clearly using suitable content in prescribed formats.
- Describe computer architectures and platforms.
- Research and write a short analytical academic report.

Mathematical Concepts

- Evaluate functions & calculate limits.
- Differentiate basic functions that arise in the physical sciences.
- Differentiate distribution functions that are used in statistics.
- Integrate a statistical density function.
- Calculate probabilities & compute statistics.

SOFTWARE DEVELOPMENT: YEAR 2

I.T. Project Management

- Explain the purpose of project management in an information technology context.
- Compare and contrast some modern project management methodologies and their applicability (e.g. PMBOK, PRINCE2, Agile approaches, COTS-based approaches).
- Compare important modern IT project management practices in the areas of requirements management, change management, communications management, risk management, quality assurance, estimation and people management.
- Apply some modern project management practices, particularly in planning, and communications.
- Use a project management information system to support planning, scheduling and estimation.
- Discuss team dynamics and the characteristics and competencies of a project manager that contribute to highly performing project teams.
- Discuss the need for professional and ethical standards

Logical Database Design

- Explain the importance of data, and the difference between file management and database.
- Explain the design of database management system architectures and understand the concepts of relational algebra.
- Explain and apply conceptual design methodologies, in particular using Entity Relationship Modelling.
- Apply the relational model and mappings from conceptual designs, in particular, normalisation. Learning Outcome 5
- Demonstrate knowledge of SQL by designing, implementing and executing complex queries for realistic business cases.
- Understand the Database System Development Lifecycle and Design methodologies.
- Understand the basic concept of transactions management, distributed database system and data warehousing.

Physical Database Design

- Implement physical database structures, giving consideration to size and performance needs.
- Implement a security policy to control multi-user access.
- Implement checks to ensure data and referential integrity using a variety of tools
- Use procedural database programming languages to solve complex data management problems.
- Implement procedures to control Concurrency in a multi-user transaction based environment.
- Optimise the efficiency of data manipulation language statements.
- Be aware of methods used by third party products to interface to a relational database.
- Be aware of current techniques to build and use a data warehouse efficiently.
- Have a basic awareness of Data Mining and its associated tools and techniques

Program Design and Construction

- Describe the fundamental issues, concepts and practices associated with software design and construction.
- Demonstrate the ability to adopt and apply new technical knowledge & skills.
- Apply appropriate design techniques to the development of object oriented software.
- Assess the quality of software designs.
- Explain software reuse as a concept.
- Select and apply appropriate approaches to software reuse.
- Explain the principles of effective user interface design and apply these to user interface development.
- Describe the principles and objectives of software testing.
- Apply appropriate testing techniques to ensure software quality.

Software Testing

- Define software quality in terms of fitness for purpose, correctness, design quality, usability, and maintainability.
- Test software, and know the appropriate tests for different aspects of quality.
- Devise procedures for managing their software configuration, and be familiar with suitable software tools.
- Create test strategies and plans, design test cases, prioritize and execute them.
- Apply modern software testing processes in relation to software development and project management.

Software Development Practice

- Understand the role of software engineering processes and practices in managing the complexity, quality and timeliness of software development projects.
- Collaborate within a team to scope, plan, and manage a software development project.
- Control the quality, production, and appropriateness of project deliverables.
- Display an increase in the range of development languages, tools and technologies at their disposal

Business and Process Modelling

- Describe the foundational concepts associated with an iterative and incremental approach to object-oriented analysis and design.
- Analyse textual descriptions related to different problem scenarios in order to develop appropriate UML models to represent user requirements.
- Understand the benefits of modelling and how it supports the analysis and design process in systems development.
- Select appropriate models and diagrams for a given problem domain.
- Produce analysis and design models for a problem domain using appropriate UML models.

I.T. Service Provision

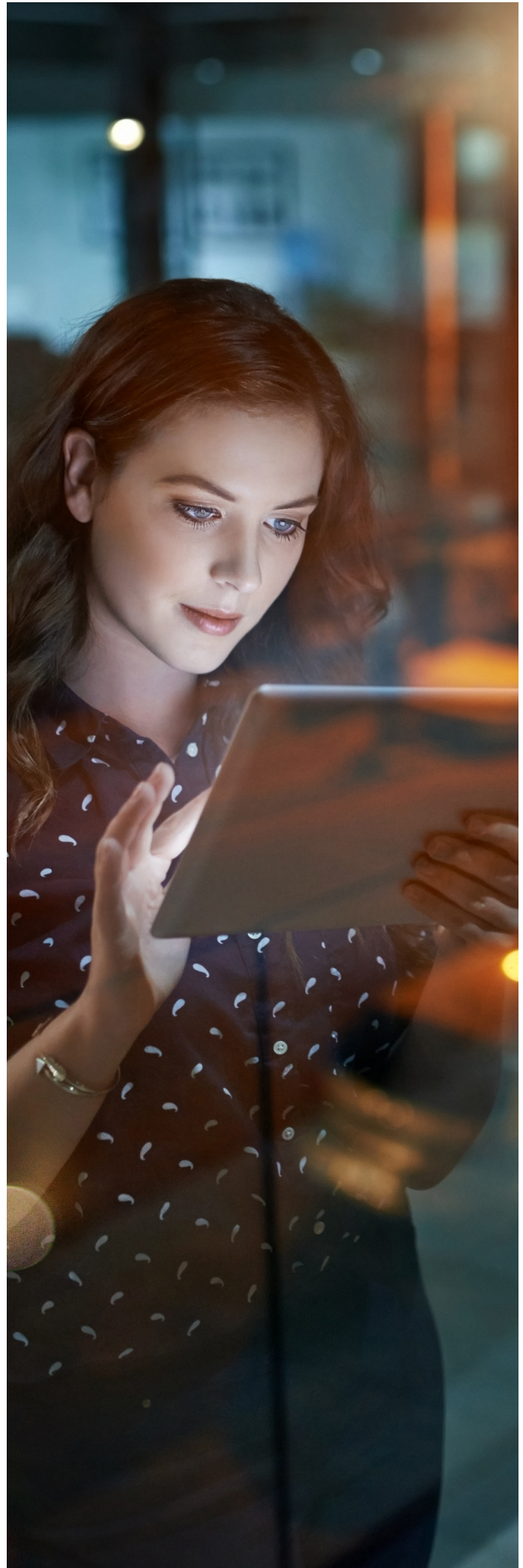
- Discuss the concepts of IT Service Science in the use of IT service and operations standards and procedures.
- Discuss the elements involved in providing quality customer service.
- Describe processes and techniques that comprise IT services acquisition.
- Analyse and apply processes that comprise IT service and solutions deployment essentials

Mobile and App Development

- Evaluate and implement features of client-server systems using Java Enterprise edition and/or .NET.
- Implement mobile systems utilizing messaging, Bluetooth, push registrations, and location-based services.
- Demonstrate mastery of distributed algorithms.
- Research and apply contemporary remote technologies such as RMI, CORBA, .NET remoting, and web services.
- Apply standard design principles and algorithms in the construction of a distributed system.

Game Programming

- Analyse, design, document and develop technical solutions for game scenarios.
- Select, adapt and apply a variety of game-related simulation techniques, data structures and algorithms for implementation in game scenarios.
- Develop, test, debug and modify real-time interactive video game software in an industry appropriate language, with professional development tools
- Write clear and efficient game source code, which adheres to a programming standard.
- Utilise third-party application programming interfaces and middleware in the development of game scenarios.
- Develop game software as part of a development team.
- Utilise game project management techniques to plan, schedule, manage, communicate and report on the game development process.



OCCUPATIONAL OUTLOOK




New Zealand’s tech sector is diverse and advanced. It’s a breeding ground for innovation and competes successfully on the world stage. The industry is a major and growing business for New Zealand, growing 12% last year. NZ’s ICT companies have earned an international reputation for being flexible, resilient, adaptable and entrepreneurial.

Growing digitisation and increased use of ICT across the economy is generating employment growth across a range of skill-sets, including software engineering and development, project managers, marketers, sales, administrators and business analysts.

According to Immigration New Zealand, there are skill shortages in:

- Business Analyst
 - Developer Programmer
 - Software Engineer
 - Project Manager
 - Security Specialist
 - Software Tester
 - Telecommunications Network Engineer
 - Database Administrator
- Software Quality Assurance Engineer
 - Multimedia Specialist
 - ICT Project Manager
 - Systems Analyst
 - Web Developer
 - Software & Applications Programmer
 - Developer Programmer

Source: <http://skillshortages.immigration.govt.nz/long-term-skill-shortage-list.pdf>

JOB PROSPECTS	HIGH	12% GROWTH IN THE PAST YEAR		DEMAND FOR I.T SPECIALIST IN AUCKLAND 50%, WELLINGTON 27%, CHRISTCHURCH 12%
INCOME	HIGH	MEDIAN: \$48,000 IT AVERAGE: \$80,856		HIGHEST EARNING IT JOB IN NZ: INFORMATION ARCHITECT: \$135,000
FEES	MEDIUM	\$20,500- DOMESTIC		TECHSCHOOL OFFERS ZERO-FEE & FIRST YEAR FREE PROGRAMMES

Source: www.newzealandnow.govt.nz/work-in-nz/nz-jobs-industries/information-technology-jobs
www.payscale.com/research/NZ/Job=Information_Technology_Specialist/Salary

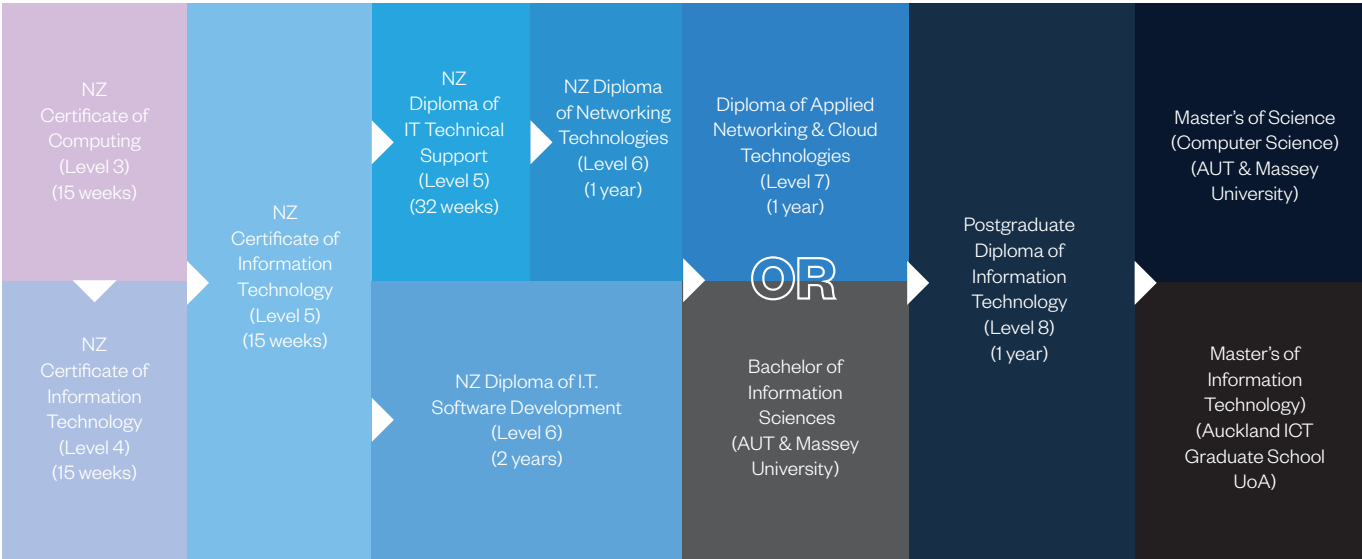


OUR ACADEMIC PARTNERS

NZSE have partnerships with universities and polytechnic institutions across New Zealand to provide students with higher educational pathways.

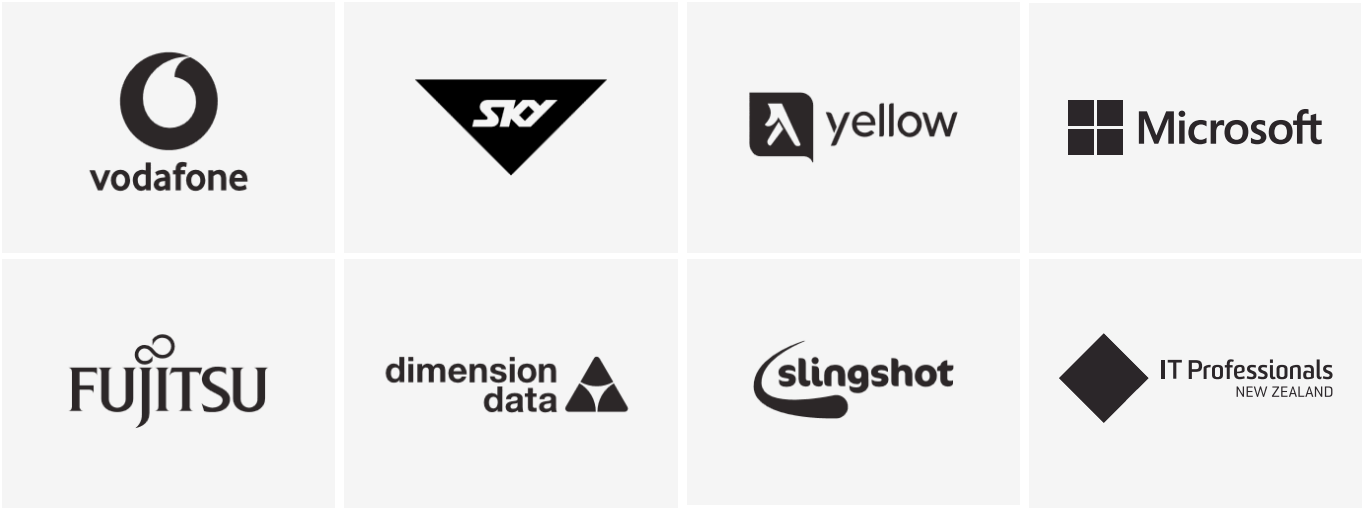


PROGRAMME PATHWAYS



OUR INDUSTRY PARTNERS

TechSchool at NZSE had built an extensive network of industry partnerships, which enables our students to learn in an immersive environment, solving real problems and making connections with industry experts. As a student, you'll have access to our connections, site visits, internships, work placements & research.





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