

August - September 2017

Review of New Zealand ICT Qualifications

Proposed addition of Cybersecurity
and IT Testing Qualifications

Consultation Document

**Draft Qualifications for Cybersecurity
and Software Testing**

29 August – 28 September 2017

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1. Introduction and stakeholder consultation

NZQA National Qualifications Service and IT Professionals New Zealand, as co-developers of sub-degree IT and computing qualifications in New Zealand, invites feedback on the draft cybersecurity and software testing qualifications proposed to be added to the suite of current computing and IT qualifications.

Feedback can be provided at <https://itp.nz/quals> before 28 September 2017.

Significant industry consultation has been undertaken to ascertain whether there is genuine industry demand for specialised qualifications in the areas of Software Testing and Information/Cyber Security.

The draft qualifications have been developed by expert working groups, and we are seeking your feedback on the drafts before they are prepared for submission for *'approval to develop'*.

We invite feedback from industry, providers and other interested parties on the following proposed cybersecurity and software testing qualifications

- NZ Diploma in Cybersecurity (Level 6) (120 credits)
- NZ Diploma in Software Testing (Level 6) (120 credits)
- NZ Certificate in Information Technology (Practitioner) (Level 6; 40 credits) [Ref [2599](#)] – additional strand in Software Testing (*already a strand in IT Security*)

We invite you to consider this consultation document which includes detail on each of the proposed qualifications, and complete a consultation response to share your view. Alternatively, general comments or more detailed submissions on the draft qualifications may be emailed to ictquals.review@nzqa.govt.nz.

If endorsed by this consultation, these draft qualifications (or a revised set depending on the nature of feedback received) will be submitted to NZQA Quality Assurance for *'Application for approval to develop a qualification'*.

Further qualification development work will be undertaken in stage two of the review process, with a particular focus on refining the draft qualifications and including specifications and conditions relating to the qualifications and graduate profile outcomes.

Further information about the project can be found on the review webpage: <http://www.nzqa.govt.nz/qualifications-standards/qualifications/information-technology-and-computing-qualifications-at-levels-1-6/development-of-security-and-testing-qualifications-2017/>.

Please provide your submission at <https://itp.nz/quals/>
Consultation closes 5pm, Thursday 28 September 2017

2. Background and consultation feedback to date

NZQA National Qualifications Service and IT Professionals New Zealand, as co-developers of sub-degree IT and computing qualifications in New Zealand, have undertaken significant industry consultation to ascertain whether there is genuine industry demand for specialised qualifications in the areas of Software Testing and Information/Cyber Security.

Consultation included hosting multiple workshops with stakeholders in March 2017, one-on-one discussions with key industry stakeholders and education providers (since mid-2016), as well as a formal written consultation process for employers and experts in June 2017. More than 200 specialist companies, experts and educators have participated in the consultation exercise to July 2017. Notes from the workshops are available from the review [webpage](#).

Following detailed consideration of the consultation evidence, the co-leads concluded that:

- There is clear and consistent evidence of industry demand for a sub-degree Software Testing qualification pathway to a "tier 1" Test Analyst role or similar, and therefore the co-leads proceeded with development of a qualification in this space (Level 6 Diploma, 120 credits).
- Clear evidence to support adding a Testing strand in the existing 40-credit NZ Certificate in IT Practitioner qualification [Ref: [2599](#)].
- There is clear and consistent evidence of industry demand for a dedicated qualification pathway in cyber / information security. The consultation was inconclusive as to whether this should be at a sub-degree, graduate level, or both. A significant percentage of experts who responded were concerned that (1) the quantity and complexity of knowledge necessary for a specialist "tier 1" Security Analyst role, and (2) the level of prior education or knowledge necessary prior to commencement of study for a specialist qualification in this space, would necessitate a qualification at the post-graduate level rather than the sub-degree level.
- Notwithstanding these concerns, there was evidence of industry demand and a very high level of support for proceeding with the initial development of a sub-degree qualification. The co-leads have therefore proceeded with the development of a draft qualification (Level 6 Diploma, 120 credits), recognising it will be necessary to conclusively test the relevance of this draft qualification with employers prior to listing to ensure that a sub-degree qualification is able to contain sufficient quantity and complexity of learning to meet industry needs.

Two expert working groups (security and testing) established to develop the qualifications were convened in July and August, and an e-support network were invited to consider the drafts and provide feedback to inform the refinement of the proposed qualifications.

A full consultation on the drafts is now being undertaken and results from this will be used to determine whether the qualifications are supported to proceed to approval to develop.

When considering the qualifications we ask that you consider whether the above issues have been adequately addressed.

3. Proposed additions to the suite of computing and IT qualifications

The suite of IT and computing qualifications are designed to recognise generalist skills and knowledge relevant to many contexts, and also include specialist areas to allow for separate credentialing in the IT Professional areas.

The proposed additional Cybersecurity and Software Testing qualifications include:

- New Zealand Diploma in Cybersecurity (Level 6) (120 credits)
- New Zealand Diploma in Software Testing (Level 6) (120 credits)
- New Zealand Certificate in IT Practitioner (Level 6) (40 credits) – new strand in Software Testing

The qualifications are expected to be delivered and obtained in a range of contexts, with strong practical experience integrated. Feedback to the review indicated support for these proposed additions to the suite of IT qualifications, and to provide opportunities for linkages to international industry certifications where appropriate, such as those offered by ISTQB, Microsoft, and others.

The overall message from feedback was in support of relevant certifications ‘dropping out’ of broader NZ qualifications through programme design. Also, that these regularly updated international vendor certifications should not just be repackaged as an NZ qualification for funding purposes, but be available as an opportunity for providers to include in their design of current programmes towards the proposed new qualifications to meet the needs of the sector. The proposed qualifications are worded in a way that allows enough flexibility for a range of programmes to be developed with potential linkages to current internationally recognised industry certifications.

New Zealand Diploma in Cybersecurity (Level 6) (120 credits)

The *NZ Diploma in Cybersecurity* is intended to provide a pathway for learners with existing IT qualifications or relevant industry experience to use this qualification to extend their knowledge and technical expertise with specialised re-training into the field of cybersecurity.

The Diploma will share the core skills required of all IT graduates at Level 6, and include specialised learning from an IT security perspective such as cybersecurity risk assessment, controls, reporting, ethical impacts, incident classification and handling processes, and IT business continuity. It would equip graduates for roles such as security analyst, security tester, security administrator, incident analyst, information assurance analyst, security assessor/auditor, security engineer, security developer or other cybersecurity related support roles.

The draft qualification document is included as appendix A, and includes detail such as the purpose, education and employment pathways, outcomes and conditions (including entry requirements and practical experience). The working group proposes programmes include

learners completing at least half of the study in practical settings to apply their theoretical learning in cybersecurity.

The proposed graduate profile outcomes follow, and more detailed information, including the conditions associated with each, is included at the end of the qualification document in appendix A.

The graduate of this qualification will be able to:

Technical skills (90 credits)

1. Identify data inputs, organisational processes, outputs, systems and stakeholders to understand organisational contexts from a security perspective (10 credits)
2. Analyse IT environments to understand the technology stack from a security perspective and identify issues that could impact organisational performance and business risks (15 credits)
3. Perform cybersecurity risk assessments and communicate the results to support the organisational risk management process (20 credits)
4. Assess and determine appropriate cybersecurity controls to support the operation of the organisation (25 credits)
5. Analyse cybersecurity events, perform security incident classification, and participate in an incident handling process (15 credits)
6. Analyse the legal, privacy and ethical impacts of organisational decisions to advise on cybersecurity implications (5 credits)

Core skills (30 credits) – these are consistent across the suite of published Level 6 IT Diplomas

7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits)
8. Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment. (10 credits)
9. Apply project management tools and techniques to an IT related project, to analyse and solve problems. (10 credits)

New Zealand Diploma in Software Testing (Level 6) (120 credits)

The *NZ Diploma in IT Testing* is intended to provide a pathway for learners with existing IT qualifications or relevant industry experience to use this qualification to extend their knowledge and technical expertise with specialised re-training into the field of IT Testing.

The Diploma will share the core skills required of all IT graduates at Level 6, and include specialised learning from an IT Testing perspective such as principles underpinning sound testing practice, tester's role in development, creating and executing tests (including creating and running test scripts to automate testing), analysing and reporting testing outcomes to enable effective decision making. It would equip graduates for roles such as test analyst, tester, test engineer or other testing related support roles.

The draft qualification document is included as appendix B, and includes detail such as the purpose, education and employment pathways, outcomes and conditions (including entry

requirements and practical experience). The working group proposes programmes include learners completing at least half of the study in practical settings to apply their theoretical learning in software testing.

The proposed graduate profile outcomes follow, and more detailed information including the conditions associated with each is included at the end of the qualification document in appendix B.

The graduate of this qualification will be able to:

Technical skills (90 credits)

1. Apply fundamental principles of testing to underpin sound testing practice. (15 credits)
2. Understand the tester's role within the team to support the test process across both traditional/waterfall and agile/lean development methodologies. (5 credits)
3. Analyse test basis, create and execute tests of various types in a context of traditional/waterfall and agile/lean methodologies to determine whether systems meet requirements. (30 credits)
4. Identify, analyse and report testing outcomes and findings in multiple scenarios to enable effective decision making. (15 credits)
5. Use tools to support testing activities across a range of software architectures, application types and industries. (10 credits)
6. Create, maintain and run test scripts using a scripting language to automate testing. (15 credits)

Core skills (30 credits) – these are consistent across the suite of published Level 6 IT Diplomas

7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits)
8. Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment. (10 credits)
9. Apply project management tools and techniques to an IT related project, to analyse and solve problems. (10 credits)

NZ Certificate in Information Technology Practitioner with strands in Server Administration, Network Administration, and Information Technology Security (Level 6) (40 credits)

The current IT practitioner qualification is stranded in order to recognise the specific skills and knowledge required of practitioners to update specialist skills to remain current in one of the specified areas of IT practice (Server Administration, Network Administration, and IT Security), and stakeholders support the addition of a software testing strand.

The NZ Certificate in Information Technology (Practitioner) is intended to meet the supply and demand needs of learners and industry in providing the short, sharp training that is required to enable learners to remain up to date in a sector that operates in an ever-changing landscape. The intent is to produce a graduate profile that is sufficiently generic and flexible enough to enable a range of programmes and internationally recognised vendor certifications to be aligned to the certificate, through programme design.

The proposed Software Testing strand will share the core skills required of all graduates of strands in the Level 6 NZ Certificate in IT Practitioner, and additionally graduates will be able to

apply current and emerging knowledge, skills and techniques of software testing in one or more test disciplines to highlight quality issues and risks.

The current core plus the proposed graduate profile outcome for the new software testing strand follow, and more detailed information is included at the end of the qualification document in appendix C.

The graduate of this qualification will be able to:

1. Investigate and generate solutions to problems using specialised IT knowledge in a current or emerging area of IT specialisation. (10 credits)
2. Apply effective interpersonal, collaborative and communication skills professionally and with cultural sensitivity when working with clients and colleagues in an IT environment. (5 credits)

Graduates of the Information Technology Security strand will also be able to:

- 6 Implement secure solutions for access and use of devices, servers, networks, and data storage through the application of updated expertise and emerging IT security techniques. (25 credits)

Graduates of the **Software Testing strand** will also be able to:

- 7 Apply current and emerging knowledge, skills and techniques of software testing in one or more test disciplines to highlight quality issues and risks (25 credits)

Further development and consistency work will occur following the application for 'approval to develop', to refine the graduate profile outcomes, clarify conditions and other requirements applicable for each qualification, and ensure consistency across the suite of ICT qualifications.

The proposed landscape is contained on the following page.

Computing and IT Qualifications Landscape - Proposed additions August 2017 (Cybersecurity and Software Testing)										
NZQF Level	IT as a Tool	IT as a profession								
1	General education review	1								
2	NZ Certificate in Computing (User Fundamentals) (40 credits) [Ref:2591]	2								
3	NZ Certificate in Computing (Intermediate User) (60 credits) [Ref:2592]	3								
4	NZ Certificate in Computing (Advanced User) (60 credits) [Ref:2593]	4	NZ Certificate in Information Technology Essentials (60 credits) [Ref:2594]							
5		5	NZ Certificate in Information Technology (60 credits) [Ref:2595]							
			NZ Diploma in Information Technology Technical Support (120 credits) [Ref:2596]	NZ Diploma in Information Systems (120 credits) [Ref:2597]	NZ Diploma in Web Design & Development (120 credits) [Ref:2598]					<i>Pathways from any of these other NZ Dip quals</i>
6		6	NZ Diploma in Networking (120 credits) [Ref:2600]	NZ Diploma in Systems Administration (120 credits) [Ref:2601]	NZ Diploma in Database Administration (120 credits) [Ref:2602]	NZ Diploma in Info Systems (strands in Business Analysis, User experience, IT Project Management, and IS Innovation) (120 credits) [Ref:2603]	NZ Diploma in Software Development (240 credits) [Ref:2604]	NZ Certificate in Information Technology Practitioner (strands in Server Administration, Network Administration, IT Security, ADD Software Testing) (40 credits) [Ref:2599]	NZ Diploma in Cyber security (120 credits)	NZ Diploma in Software Testing (120 credits)
Possible pathways.....			Bachelor Degrees (Level 7); Industry Certifications (Level 5, 6, 7)							

4. Consultation Questions

The purpose of this consultation is to gather information and stakeholder feedback about the draft Cybersecurity and Software Testing qualifications so that they can be amended to best meet industry and learner needs before moving to the next stage of the development process.

Please visit <https://itp.nz/quals/> to provide your response.

Consultation **closes at 5pm on Thursday 28 September 2017.**

General

1. Please provide your contact details.

Name: Email: Employer: Position:

2. Please indicate the stakeholder group you most closely relate to:
 - a) IT Industry (including IT-related roles in non-IT companies and non-technical management roles in IT companies)
 - b) Government
 - c) Polytechnic or Institute of Technology (ITP)
 - d) Private Training Establishment (PTE)
 - e) Wānanga
 - f) A secondary school or other educational organisation
 - g) Community group
 - h) Student/individual
 - i) Other (please specify)

The following questions are about specific qualifications, followed by your overall impressions. You may choose to provide feedback by responding to all or some of the questions.

NZ Diploma in Cybersecurity (Level 6) (120 credits) qualification

Previous consultations have found evidence of industry demand for a dedicated qualification pathway in cyber / information security, however have been inconclusive about whether this should sit at Level 6 (equivalent of the second year of a Bachelors Degree) or higher (eg as further study after completing a Bachelors Degree).

The proposed qualification is at Level 6 (*equivalent to the second year of a Bachelors degree*). Graduate qualifications at Level 7 or above are outside the scope of this project, although there is evidence of need for higher level cyber/information security qualifications in addition to the proposed Level 6 qualification.

1. Referring to the draft qualification document, what could be done to improve the qualification?
2. What do you think is the most appropriate title for this qualification?
 - a. NZ Diploma in Cybersecurity (Level 6)
 - b. NZ Diploma in Information Security (Level 6)
 - c. Other (please specify, noting it should start with "NZ Diploma in...")

3. The proposed qualification is at Level 6 (equivalent to the second year of a Bachelors Degree). Looking at the graduate outcomes in the consultation pack, do you agree or disagree that this proposed level of this qualification is appropriate?

Why?

4. Do you agree or disagree that the proposed cybersecurity diploma qualification at Level 6 adequately addresses the needs of the IT industry and learners?

Why?

5. Please provide any further comments you have about the proposed qualification.

NZ Diploma in Software Testing (Level 6) (120 credits)

Previous consultations have found clear evidence of industry demand for a dedicated qualification pathway in Software Testing, and there has been general support for the proposed qualification to be at Level 6 (*equivalent to the second year of a Bachelors degree*).

6. Referring to the draft qualification document, what could be done to improve the qualification?
7. What do you think is the most appropriate title for this qualification?
 - a. NZ Diploma in Software Testing (Level 6)
 - b. NZ Diploma in IT Testing (Level 6)
 - c. Other (please specify, noting it should start with "NZ Diploma in...")
8. The proposed qualification is at Level 6 (equivalent to the second year of a Bachelors Degree). Looking at the graduate outcomes in the consultation pack, do you agree or disagree that this proposed level of this qualification is appropriate?

Why?

9. Do you agree or disagree that the proposed software testing diploma qualification at Level 6 adequately addresses the needs of the IT industry and learners?

Why?

10. Please provide any further comments you have about the proposed qualification.

NZ Certificate in Information Technology (Practitioner) (Level 6; 40 credits) – additional strand in Software Testing (already a strand in IT Security)

11. Referring to the draft qualification document, do you agree or disagree that the addition of a software testing strand in this current qualification [Ref [2599](#)] adequately addresses the needs of the IT industry and learners?
12. What could be done to improve the strand in the qualification?
13. Please provide any further comments you have about the proposed new strand.

Overall impressions

14. Do you agree or disagree that the proposed qualifications adequately address the needs of learners preparing for an IT related career in cybersecurity or software testing or further study?

15. Do you support these qualifications being developed and made available in New Zealand?
YES/NO
16. Please provide any further overall comments you have about the proposed new qualifications, or the landscape as a whole.

Thank you for taking the time to consider the draft cybersecurity and software testing qualifications consultation documents, and provide feedback to inform the review.

Please visit <https://itp.nz/quals/> to provide your response

Appendix A: Draft NZ Diploma in Cybersecurity (Level 6) (120 credits)

Qualification details

Title	New Zealand Diploma in Cybersecurity (Level 6)		
Version	DRAFT	Qualification type	Diploma
Level	6	Credits	120
NZSCED	029901 Information Technology > Other Information Technology > Security Science		
Qualification developer	IT Professionals New Zealand (ITP) and NZQA National Qualifications Services (NQS)		
Next review	Mmmm 2021		
Approval date	Dd Mmmm YYYY		
Strategic purpose statement	<p>The purpose of this qualification is to provide Aotearoa New Zealand with people who have attained industry-relevant knowledge and technical skills that will equip them to work in entry-level roles in the specialised field of cybersecurity or to proceed to further study.</p> <p>Graduates will be capable of applying current cybersecurity skills, knowledge and practice and will gain internationally relevant transferable skills and knowledge necessary for assuring information and systems security, integrity and availability. They will be able to operate within the applicable professional standards and practice, both independently and as part of a team.</p> <p>With the increasing reliance on digital technology, it is essential to consider cybersecurity when designing, building and managing IT. Businesses, organisations and communities will benefit from having cybersecurity professionals who are able to identify, mitigate and respond to cybersecurity risks and incidents.</p>		
Outcome Statement	Graduate profile	<p>The graduate of this qualification will be able to:</p> <p><i>Technical skills (90 credits)</i></p> <ol style="list-style-type: none"> 1. Identify data inputs, organisational processes, outputs, systems and stakeholders to understand organisational contexts from a security perspective (10 credits) 2. Analyse IT environments to understand the technology stack from a security perspective and identify issues that could impact organisational performance and business risks (15 credits) 3. Perform cybersecurity risk assessments and communicate the results to support the organisational risk management process (20 credits) 4. Assess and determine appropriate cybersecurity controls to support the operation of the organisation (25 credits) 	

		<ol style="list-style-type: none"> 5. Analyse cybersecurity events, perform security incident classification, and participate in an incident handling process (15 credits) 6. Analyse the legal, privacy and ethical impacts of organisational decisions to advise on cybersecurity implications (5 credits) <p><i>Core skills (30 credits)</i></p> <ol style="list-style-type: none"> 7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits) 8. Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment. (10 credits) 9. Apply project management tools and techniques to an IT related project, to analyse and solve problems. (10 credits)
	<p>Education pathway</p>	<p>This qualification provides a pathway to further specialisation through industry specific training in specialist fields of cybersecurity. Other possible pathways include degree qualifications; this qualification may also equip learners to attempt optional industry certifications at the appropriate level and area of specialty.</p> <p>This qualification provides an education pathway from the</p> <ul style="list-style-type: none"> • New Zealand Diploma of Information Technology Technical Support (Level 5) [Ref: 2596] • New Zealand Diploma of Information Systems (Level 5) [Ref: 2597] • New Zealand Diploma of Web Design and Development (Level 5) [Ref: 2598] • New Zealand Diploma of Software Development (Level 6) [Ref: 2604] <p>or other Level 5 IT related qualifications.</p> <p>Learners with existing IT qualifications or relevant industry experience may use this qualification as specialised re-training into the field of cybersecurity.</p>
	<p>Employment pathway</p>	<p>Graduates of this qualification will have the skills and knowledge to gain employment in entry-level roles such as security analyst, security tester, security administrator, incident analyst, information assurance analyst, security assessor/auditor, security engineer, security developer or other cybersecurity related support roles.</p> <p>Graduates also have the background to progress into more advanced roles including cybersecurity analyst, engineer or manager.</p>

Qualification specifications

<p>Qualification award</p>	<p>This qualification may be awarded by any education organisation with an approved programme towards this qualification accredited under section 250 of the Education Act 1989.</p> <p>The graduate will be awarded the qualification by the education organisation when the accredited and approved programme has been successfully completed.</p> <p>The formal document certifying the award of this qualification will display the full qualification title, date of award, the NZQF logo, and may also include the name and/or logo of the qualification developer or programme owner or other awarding education organisation.</p>
<p>Evidence requirements for assuring consistency</p>	<p>The core evidence requirements for assuring consistency may include:</p> <ul style="list-style-type: none"> - effective internal and external moderation systems and processes, including results relating to graduate outcomes; - results of end-user surveys and actions taken or proposed from feedback. This includes consultation with graduates and employers to obtain destination information and end-user feedback specifically assessing the graduates against the graduate profile (e.g. employment, progression, further study); - samples of assessment materials and learners assessments/work (e.g. portfolios of work); - evidence of any benchmarking activities. <p>Detailed information regarding arrangements for managing consistency will be published and updated via the NZQA website. For more information, please visit http://www.nzqa.govt.nz/providers-partners/consistency-of-graduate-outcomes/ and download the guidelines.</p>
<p>Minimum standard of achievement and standards for grade endorsements</p>	<p>The minimum standard of achievement required for the award of the qualification will be the achievement of all the graduate outcomes in the graduate profile.</p> <p>There are no grade endorsements for this qualification.</p>
<p>Other requirements for the qualification (including regulatory body or legislative requirements)</p>	<p>Learners enrolling are recommended to hold one of the following:</p> <ul style="list-style-type: none"> • New Zealand Diploma of Information Technology Technical Support (Level 5) [Ref: 2596], • New Zealand Diploma of Information Systems (Level 5) [Ref: 2597] • New Zealand Diploma of Web Design and Development (Level 5) [Ref: 2598] • New Zealand Diploma of Software Development (Level 6) [Ref: 2604] • first year of an IT degree <p>or equivalent knowledge, skills and experience.</p> <p>International students must have an appropriate level of English proficiency for the level at which they intend to study. Details of English language entry requirements are contained in the NZQF Programme Approval and Accreditation Rules 2013 (Appendix 2). E.g. IELTS Academic score of 6, with no band score lower than 5.5; or the New Zealand Certificate in English Language (Academic) (Level 4) [Ref: 1883].</p>

General conditions for the programme leading to the qualification

<p>General conditions for programme</p>	<p>Regulatory</p> <p>This qualification includes the common core of Level 6 skills and builds on the generalist IT Technical skills developed at Level 5, or equivalent relevant experience.</p> <p>Professional practice must be an integral part of the curriculum and delivery. It is expected that all programmes have professionalism and cybersecurity perspectives both purposefully taught and integrated with the application of technical content. Here, professional practice includes the 'soft skills' of communication, team work, interpersonal skills, and ethical principles.</p> <p>Programmes must reflect quality practice and maintain currency with amendments to, and replacements of, relevant legislation, regulations, Australia/New Zealand standards (AS/NZS), and security responsibilities including cyber safety.</p> <ul style="list-style-type: none">- Current legislation and regulations can be accessed at http://legislation.govt.nz- Current AS/NZS standards can be accessed at http://standards.co.nz <p>Programmes must consider relevant codes of ethics and professional practice such as:</p> <ul style="list-style-type: none">- The <i>ITP Code of Ethics</i> - can be accessed at https://itp.nz/Members/Code-of-Ethics- The <i>ITP Professional Practice Guidelines</i>, including the ITP Code of Practice and ITP Professional Knowledge Curriculum can be accessed at https://itp.nz/Members/Practice-Guidelines <p>Practical experience</p> <p>Practical experience is an essential component of programmes leading to the award of this qualification and it is recommended that programmes include learners completing at least half of the study in practical settings to apply their theoretical learning in cybersecurity.</p> <p>Programmes must develop the structure and requirements for learners to engage in professional practice, including assessment of learners' skills/competence in a real or realistic IT setting. Practical settings include workplaces, labs or other simulated realistic environments, table-top walk through exercises. Specific assignment tasks, competencies, and responsibilities should be evident in the learner's practice. These should be cumulative over the course of the programme.</p> <p>Diversity</p> <p>Consideration should be given to bicultural, multicultural, and gender issues when designing programmes, in relation to encouraging a greater diversity within the professional IT workforce.</p> <p>Programmes may be developed based on Māori principles and values, and are intended to enable Wānanga to meet obligations under the Education Act (1989, section 162(4)(b)(iv)).</p>
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Conditions relating to the Graduate profile

Qualification outcomes	Conditions
	Technical Skills (90 credits)
1	<p>Identify data inputs, organisational processes, outputs, systems and stakeholders to understand organisational contexts from a security perspective (10 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • classifying assets and sensitivity of data • understanding potential risks and weaknesses in processes • stakeholder roles and responsibilities • information management principles and terminology
2	<p>Analyse IT environments to understand the technology stack from a security perspective and identify issues that could impact organisational performance and business risks (15 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • current and emerging technology • enterprise and systems interdependencies • complexity of a modern information systems landscape and vulnerabilities
3	<p>Perform cybersecurity risk assessments and communicate the results to support the organisational risk management process (20 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • understanding and communication of risk appetite and cost/benefit trade offs • understanding and use of risk management frameworks and threat modelling • concepts of ongoing risk monitoring and review • Concepts of integrating security throughout the software development life cycle (SDLC)
4	<p>Assess and determine appropriate cybersecurity controls to support the operation of the organisation (25 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • security by design concepts and secure development techniques • classifying, categorising and determining pros and cons of different security controls and approaches • relationship between usability and security • vulnerability analysis and other testing methods • the interdependency of cybersecurity with physical controls and human factors
5	<p>Analyse cybersecurity events, perform security incident classification, and participate in an incident handling process (15 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • identifying the information needed for security incident classification • security incident handling techniques including obtaining and preserving forensic evidence, root cause analysis and chain of events
6	<p>Analyse the legal, privacy and ethical impacts of organisational decisions to advise on cybersecurity implications (5 credits)</p> <p>Programmes must include:</p> <ul style="list-style-type: none"> • role of regulators/Governments, and identifying the implications of laws, regulations, and international treaties applicable to a particular situation • building on the core professional practice concepts underpinned in the seventh outcome, with focus on the organisational rather than individual obligations

		<ul style="list-style-type: none"> grey areas such as unauthorised testing, exploit marketplaces, vulnerability disclosure
	Core Skills (30 credits)	
7	Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits)	<p>Programmes must include:</p> <ul style="list-style-type: none"> Application of professional and ethical practice, including sustainability, equity, social and contemporary cultural issues relevant to an IT organisational environment (e.g. Treaty of Waitangi and accessibility issues) Organisational implications of managing and complying with legal and regulatory requirements (e.g. health and safety, contract management, licensing, privacy); observing security responsibilities and industry codes of practices, and codes of conduct (e.g. IITP), relevant to an organisational environment.
8	Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment. (10 credits)	<p>Programmes must include:</p> <ul style="list-style-type: none"> Information representation design for multiple situations e.g. data visualisation; technical writing - help documents, user instructions, specifications; Personal and interpersonal skills including customer service, leadership, teamwork, negotiating, self-management, social and multicultural awareness, relationship and conflict management.
9	Apply project management tools and techniques to an IT related project, to analyse and solve problems. (10 credits)	<p>Programmes must include:</p> <ul style="list-style-type: none"> Critical thinking, business logic, organisational processes, innovation and enterprise skills; Project planning, management and control – cost, risk, quality, stakeholder, change, configuration, contracts, and maintenance management.

Transition information

Replacement information	Not applicable
(Write any additional transition information here or delete the row)	

Appendix B: Draft NZ Diploma in Software Testing (Level 6) (120 credits)

Qualification details

Title	New Zealand Diploma in Software Testing (Level 6)		
Version	DRAFT	Qualification type	Diploma
Level	6	Credits	120
NZSCED	029999 Information Technology > Other Information Technology > Information technology not elsewhere classified		
Qualification developer	IT Professionals New Zealand (ITP) and NZQA National Qualifications Services (NQS)		
Next review	Mmmm 2021		
Approval date	Dd Mmmm YYYY		
Strategic purpose statement	<p>The purpose of this qualification is to provide Aotearoa New Zealand with people who have attained industry-relevant knowledge and technical skills that will equip them to work in entry-level roles in the specialised field of Software Testing, or to proceed to further study.</p> <p>Graduates will be capable of applying current testing skills, knowledge and practice and will gain internationally relevant transferable skills and knowledge necessary for verifying and validating IT systems to support their quality. They will be able to operate within the applicable professional standards and practice, both independently and as part of a team.</p> <p>With the increasing reliance on digital technology, it is essential to test while designing, building and managing IT systems. Businesses, organisations and communities will benefit from having testing professionals who are able to identify, analyse and communicate product and organisational risks.</p>		
Outcome Statement	Graduate profile	<p>The graduate of this qualification will be able to:</p> <p><i>Technical skills</i></p> <ol style="list-style-type: none"> 1. Apply fundamental principles of testing to underpin sound testing practice. (15 credits) 2. Understand the tester's role within the team to support the test process across both traditional/waterfall and agile/lean development methodologies. (5 credits) 3. Analyse test basis, create and execute tests of various types in a context of traditional/waterfall and agile/lean methodologies to determine whether systems meet requirements. (30 credits) 4. Identify, analyse and report testing outcomes and findings in multiple scenarios to enable effective decision making. (15 credits) 5. Use tools to support testing activities across a range of software architectures, application types and industries. (10 credits) 6. Create, maintain and run test scripts using a scripting language to automate testing. (15 credits) 	

		<p><i>Core skills</i></p> <ol style="list-style-type: none"> 7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society. 8. Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment. 9. Apply project management tools and techniques to an IT related project, to analyse and solve problems.
	Education pathway	<p>This qualification provides a pathway to further specialisation through industry specific training in specialist fields of software testing. Other possible pathways include degree qualifications; this qualification may also equip learners to attempt optional industry certifications at the appropriate level and area of testing specialty.</p> <p>This qualification provides an education pathway from the</p> <ul style="list-style-type: none"> • New Zealand Diploma of Information Technology Technical Support (Level 5) [Ref: 2596] • New Zealand Diploma of Information Systems (Level 5) [Ref: 2597] • New Zealand Diploma of Web Design and Development (Level 5) [Ref: 2598] • New Zealand Diploma of Software Development (Level 6) [Ref: 2604] <p>or other Level 5 IT related qualifications.</p> <p>Learners with existing IT qualifications or relevant industry experience may use this qualification as specialised re-training into the field of software testing.</p>
	Employment pathway	<p>Graduates of this qualification will have the skills and knowledge to gain employment in entry-level roles such as test analyst, tester, test engineer or other testing related support roles.</p> <p>Graduates also have the background to progress into more advanced roles including test manager, senior/lead test analyst/engineer.</p>

Qualification specifications

Qualification award	<p>This qualification may be awarded by any education organisation with an approved programme towards this qualification accredited under section 250 of the Education Act 1989.</p> <p>The graduate will be awarded the qualification by the education organisation when the accredited and approved programme has been successfully completed.</p> <p>The formal document certifying the award of this qualification will display the full qualification title, date of award, the NZQF logo, and may also include the name and/or logo of the qualification developer or programme owner or other awarding education organisation.</p>
Evidence requirements for assuring consistency	<p>The core evidence requirements for assuring consistency may include:</p> <ul style="list-style-type: none"> - effective internal and external moderation systems and processes, including results relating to graduate outcomes; - results of end-user surveys and actions taken or proposed from feedback. This includes consultation with graduates and employers to obtain destination information and end-

	<p>user feedback specifically assessing the graduates against the graduate profile (e.g. employment, progression, further study);</p> <ul style="list-style-type: none"> - samples of assessment materials and learners assessments/work (e.g. portfolios of work); - evidence of any benchmarking activities. <p>Detailed information regarding arrangements for managing consistency will be published and updated via the NZQA website. For more information, please visit http://www.nzqa.govt.nz/providers-partners/consistency-of-graduate-outcomes/ and download the guidelines.</p>
<p>Minimum standard of achievement and standards for grade endorsements</p>	<p>The minimum standard of achievement required for the award of the qualification will be the achievement of all the graduate outcomes in the graduate profile.</p> <p>There are no grade endorsements for this qualification.</p>
<p>Other requirements for the qualification (including regulatory body or legislative requirements)</p>	<p>Entry requirements</p> <p>Learners enrolling are recommended to hold one of the following:</p> <ul style="list-style-type: none"> • New Zealand Diploma of Information Technology Technical Support (Level 5) [Ref: 2596], • New Zealand Diploma of Information Systems (Level 5) [Ref: 2597] • New Zealand Diploma of Web Design and Development (Level 5) [Ref: 2598] • New Zealand Diploma of Software Development (Level 6) [Ref: 2604] • first year of an IT degree <p>or equivalent knowledge, skills and experience.</p> <p>International students must have an appropriate level of English proficiency for the level at which they intend to study. Details of English language entry requirements are contained in the NZQF Programme Approval and Accreditation Rules 2013 (Appendix 2). E.g. IELTS Academic score of 6, with no band score lower than 5.5; or the New Zealand Certificate in English Language (Academic) (Level 4) [Ref: 1883].</p>

General conditions for the programme leading to the qualification

<p>General conditions for programme</p>	<p>Regulatory</p> <p>This qualification includes the common core of Level 6 skills and builds on the generalist IT Technical skills developed at Level 5, or equivalent relevant experience.</p> <p>Professional practice must be an integral part of the curriculum and delivery. It is expected that all programmes have professionalism and fundamental principles of testing both purposefully taught and integrated with the application of technical content. Here, professional practice includes the 'soft skills' of communication, team work, interpersonal skills, and ethical principles.</p> <p>Programmes must reflect quality practice and maintain currency with amendments to, and replacements of, relevant legislation,</p>
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regulations, Australia/New Zealand standards (AS/NZS), and security responsibilities including cyber safety.

- Current legislation and regulations can be accessed at <http://legislation.govt.nz>
- Current AS/NZS standards can be accessed at <http://standards.co.nz>

Programmes must consider relevant codes of ethics and professional practice such as:

- The *ITP Code of Ethics* - can be accessed at <https://itp.nz/Members/Code-of-Ethics>
- The *ITP Professional Practice Guidelines*, including the ITP Code of Practice and ITP Professional Knowledge Curriculum can be accessed at <https://itp.nz/Members/Practice-Guidelines>

Practical experience

Practical experience is an essential component of programmes leading to the award of this qualification and it is recommended that programmes include learners completing at least half of the study in practical settings to apply their theoretical learning in software testing.

Programmes must develop the structure and requirements for learners to engage in professional practice, including assessment of learners' skills/competence in a real or realistic IT setting. Practical settings include workplaces, labs or other simulated realistic environments, table-top walk through exercises. Specific assignment tasks, competencies, and responsibilities should be evident in the learner's practice. These should be cumulative over the course of the programme.

Diversity

Consideration should be given to bicultural, multicultural, and gender issues when designing programmes, in relation to encouraging a greater diversity within the professional IT workforce.

Programmes may be developed based on Māori principles and values, and are intended to enable Wānanga to meet obligations under the Education Act (1989, section 162(4)(b)(iv)).

Glossary

Rather than include definitions for the technical terms used in the qualification, we recommend using a published glossary of the terms used in software engineering such as IEEE or ISTQB:

- IEEE Standard Glossary of Software Engineering Terminology IEEE Std 610.12-1990, which identifies terms currently in use in the field of software engineering. Standard definitions for those terms are established. Available at <http://ieeexplore.ieee.org/document/159342/> or <http://segoldmine.ppi-int.com/content/external-ieee-std-61012-1990-ieee-standard-glossary-software-engineering-terminology>
- ISTQB - International Software Testing Qualifications Board Glossary, available at <http://glossary.istqb.org/search> or <http://www.istqb.org/downloads/send/20-istqb-glossary/186-glossary-all-terms.html>

Conditions relating to the Graduate profile

Qualification outcomes	Conditions
Technical Skills (90 credits)	
<p>1 Apply fundamental principles of testing to underpin sound testing practice (15 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • Testing terminology • Types of testing • Where testing fits within the software development lifecycle (SDLC) - what, why, when, who, where and how to test, and when to stop • Industry standards impacting testing such as NZ Government web standards, appropriate International Organisation for Standardisation (ISO) and Institute of Electronic and Electrical Engineers (IEEE) standards
<p>2 Understand the tester's role within the team to support the test process across both traditional/waterfall and agile/lean development methodologies (5 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • Purpose of a test strategy and planning • Test management Team management including team composition, responsibilities and dynamics
<p>3 Analyse test basis, create and execute tests of various types in a context of traditional/waterfall and agile/lean methodologies to determine whether systems meet requirements (30 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • Creating comprehensive test plans and estimating test effort • Functional and some non-functional test types using static and dynamic test techniques such as requirements review, boundary value analysis • Common causes of IT system and project failure
<p>4 Identify, analyse and report testing outcomes and findings in multiple scenarios to enable effective decision making (15 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • The purpose and design of reports and metrics appropriate to key stakeholders • Use of defect tracking tools to accurately and comprehensively report bugs
<p>5 Use tools to support testing activities across a range of software architectures, application types and industries (10 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • Familiarity with a variety of technology stacks and any associated standards • Test tools, configuration management tools, test environment and data provision
<p>6 Create, maintain and run test scripts using a scripting language to automate testing (15 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • When and why automation is implemented • Understanding of common frameworks and design patterns in automation • Awareness of capabilities of various automation tools/languages, including functional and non-functional testing
Core Skills (30 credits)	
<p>7 Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • Application of professional and ethical practice, including sustainability, equity, social and contemporary cultural issues relevant to an IT organisational environment (e.g. Treaty of Waitangi and accessibility issues)

		<ul style="list-style-type: none"> Organisational implications of managing and complying with legal and regulatory requirements (e.g. health and safety, contract management, licensing, privacy); observing security responsibilities and industry codes of practices, and codes of conduct (e.g. IITP), relevant to an organisational environment.
8	<p>Apply communication, information design, personal, and interpersonal skills, clearly and professionally to enhance working effectiveness, efficiency, and quality outcomes in an organisational environment.</p> <p>(10 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> Information representation design for multiple situations e.g. data visualisation; technical writing - help documents, user instructions, specifications; Personal and interpersonal skills including customer service, leadership, teamwork, negotiating, self-management, social and multicultural awareness, relationship and conflict management.
9	<p>Apply project management tools and techniques to an IT related project, to analyse and solve problems.</p> <p>(10 credits)</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> Critical thinking, business logic, organisational processes, innovation and enterprise skills; Project planning, management and control – cost, risk, quality, stakeholder, change, configuration, contracts, and maintenance management.

Transition information

Replacement information	Not applicable
(Write any additional transition information here or delete the row)	

Appendix C: Draft NZ Certificate in IT Practitioner (Level 6) (40 credits) – with proposed additional strand in Software testing

There is a current NZ Certificate in IT Practitioner (Level 6) with strands in Server Administration, Network Administration, and IT Security [Ref: [2599](#)].

The intent of this qualification is to provide a short (40 credits) upskilling qualification for practitioners, in response to changing needs and demands of the dynamic IT environment.

It is proposed that there be a strand added for software testing. This would primarily involve confirming the two 'core' outcomes and developing the additional outcome/s and any conditions associated with the new strand, and adjusting the qualification to the new template. Following is the current qualification document with the new strand added.

Qualification details [Ref: 2599]

Title	New Zealand Certificate in Information Technology Practitioner (Level 6) with strands in Server Administration, Network Administration, Information Technology Security, and Software Testing		
Version	2 draft new strand	Qualification type	Certificate
Level	6	Credits	40
NZSCED	029999 Information Technology > Other Information Technology > Information Technology not elsewhere classified		
Qualification developer	IT Professionals New Zealand (ITP) and NZQA National Qualifications Services (NQS)		
Next review	2019 (for version 1)		
Approval date	April 2015 (for version 1)		
Strategic purpose statement	<p>The purpose of this qualification is to provide Aotearoa New Zealand with people who have updated their knowledge and specialist skills to remain current in a specific area of Information Technology (IT) practice, in response to the changing needs and demands of the dynamic IT environment.</p> <p>Graduates will be capable of applying current IT skills, knowledge and practice that will be internationally relevant in the chosen strand. They will be able to operate within the applicable professional standards and practice, both independently and as part of a team.</p> <p>Businesses, organisations and communities will benefit from having an on-going supply of IT practitioners who are experienced and qualified in an area of current IT practice, and who may also meet the requirements of internationally recognised industry certifications.</p> <p>This qualification is stranded in order to recognise the specific skills and knowledge required of practitioners to update specialist skills to remain current in one of the following areas of IT practice:</p> <ul style="list-style-type: none"> • Server Administration • Network Administration • Information Technology Security • Software Testing 		

Outcome Statement	Graduate profile	<p>The graduate of this qualification will be able to:</p> <ul style="list-style-type: none"> - Investigate and generate solutions to problems using specialised IT knowledge in a current or emerging area of IT specialisation. - Apply effective interpersonal, collaborative and communication skills professionally and with cultural sensitivity when working with clients and colleagues in an IT environment. <p>Graduates of the Server Administration strand will also be able to:</p> <ul style="list-style-type: none"> - Apply a range of updated specialised server administration knowledge, skills and techniques to implement server and storage solutions. <p>Graduates of the Network Administration strand will also be able to:</p> <ul style="list-style-type: none"> - Monitor and maintain networks according to organisational requirements, using emerging and updated methods and techniques. - Design, configure and implement a network infrastructure to support organisational operations using updated network administration expertise. <p>Graduates of the Information Technology Security strand will also be able to:</p> <ul style="list-style-type: none"> - Implement secure solutions for access and use of devices, servers, networks, and data storage through the application of updated expertise and emerging IT security techniques. <p>Graduates of the Software Testing strand will also be able to:</p> <ul style="list-style-type: none"> - Apply current and emerging knowledge, skills and techniques of software testing in one or more test disciplines to highlight quality issues and risks
	Education pathway	<p>This qualification is designed for individuals with practical experience in the field of IT, or those who have completed studies that now require updating in a specific area of IT practice, primarily for employment outcomes.</p> <p>This qualification may also provide a pathway to further Information Technology (IT) qualifications; and is likely to equip learners to attempt optional industry certifications at the appropriate level and contextual area of specialty.</p>
	Employment pathway	<p>Graduates of this qualification will have the current skills and knowledge to be employed in an IT role specific to the area of IT practice their programme has focused on i.e. either server administration, network administration, IT security or software testing.</p>

Qualification specifications

Qualification award	<p>This qualification may be awarded by any education organisation with an approved programme towards this qualification accredited under section 250 of the Education Act 1989.</p> <p>The graduate will be awarded the qualification by the education organisation when the accredited and approved programme has been successfully completed.</p> <p>The formal document certifying the award of this qualification will display the full qualification title, date of award, the NZQF logo and may also include the name and/or logo of the qualification</p>
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	<p>developer or programme owner or other awarding education organisation.</p>
<p>Evidence requirements for assuring consistency</p>	<p>The core evidence requirements for assuring consistency may include:</p> <ul style="list-style-type: none"> - effective internal and external moderation systems and processes, including results relating to graduate outcomes; - results of end-user surveys and actions taken or proposed from feedback. This includes consultation with graduates and employers to obtain destination information and end-user feedback specifically assessing the graduates against the graduate profile (e.g. employment, progression, further study); - samples of assessment materials and learners assessments/work (e.g. portfolios of work); - evidence of any benchmarking activities. <p>Detailed information regarding arrangements for managing consistency will be published and updated via the NZQA website. For more information, please visit http://www.nzqa.govt.nz/providers-partners/consistency-of-graduate-outcomes/ and download the guidelines.</p> <p><i>MAY BE ADJUSTED AS ABOVE RATHER THAN THE FOLLOWING CURRENT VERSION</i></p> <p>New Zealand qualifications can be obtained through different programmes, pathways, and education organisations. The process of ‘assuring national consistency of graduate outcomes’ will be coordinated by NZQA, with a focus on comparing graduates from different programmes and education organisations in relation to the qualification graduate outcomes.</p> <p>All programme owners and education organisations arranging training or delivering approved programmes leading to the qualification must engage with arrangements for assuring consistency, including participating in the relevant consistency review event and covering actual and reasonable related costs.</p> <p>Detailed information regarding arrangements for managing consistency will be published and updated via the NZQA website. For more information, please visit: http://www.nzqa.govt.nz/providers-partners/consistency-of-graduate-outcomes/ and download the guidelines.</p> <p><i>Evidence for consistency</i></p> <p>Each education organisation is responsible for preparing a summary self-assessment report which uses evidence to demonstrate how well its graduates meet the graduate profile outcomes at the appropriate threshold. Each education organisation decides what specific evidence it will provide.</p> <p>The core evidence requirements for assuring consistency must include:</p> <ul style="list-style-type: none"> • Effective internal and external moderation systems and processes, including results relating to graduate outcomes. This may also include evidence of meeting requirements for external industry certifications and associated consistency demands where appropriate e.g. Certified/Authorised Partner Program (such as Microsoft, CompTIA, etc.) • Results of end-user surveys and actions taken or proposed from feedback. This includes consultation with graduates and employers to obtain destination information and end-

	<p>user feedback specifically assessing the graduates against the graduate profile (e.g. employment, progression, further study)</p> <ul style="list-style-type: none"> • Samples of assessment materials and learners assessments/work (e.g. portfolios of work) • Relevant External Evaluation and Review (EER) data, including programme/qualification completion data and course results • Comparison of the application of credit transfer and recognition of prior learning arrangements to graduate outcomes and/or qualifications • Documenting any action taken to improve quality and consistency of assessment. <p>The core evidence requirements for assuring consistency may include:</p> <ul style="list-style-type: none"> • Consultation with graduates and employers to obtain destination information and end-user feedback (e.g. employment, progression, further study) • Evidence of any benchmarking activities • Consideration of internal quality assurance processes and external reviews, including relevant feedback from programme developers (i.e. may include reviewing, comparing, and evaluating the assessment process, tools and evidence contributing judgements made by a range of assessors against the same graduate outcomes; evidence of appropriate skills and knowledge of staff in relation to the teaching and assessment)
<p>Minimum standard of achievement and standards for grade endorsements</p>	<p>The minimum standard of achievement required for the award of the qualification will be the achievement of all the graduate outcomes in the graduate profile.</p> <p>There are no grade endorsements for this qualification.</p>
<p>Other requirements for the qualification (including regulatory body or legislative requirements)</p>	<p>Learners enrolling are expected to have significant practical work experience in the field of IT, and will either have previously completed a minimum of a Level 5 IT related Diploma qualification or demonstrated equivalent knowledge, skills and experience in the specialised area of the selected strand.</p> <p>International students must have an appropriate level of English proficiency for the level at which they intend to study. Details of English language entry requirements are contained in the NZQF Programme Approval and Accreditation Rules 2013 (Appendix 2). E.g. IELTS Academic score of 6, with no band score lower than 5.5 or the New Zealand Certificate in English Language (Academic) (Level 4) [Ref: 1883].</p>

General conditions for the programme leading to the qualification

<p>General conditions for programme</p>	<p>TBC</p> <p>Glossary: Test disciplines refer to areas of knowledge or specialty such as performance testing, usability testing, test management, automation testing</p>
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Conditions relating to the Graduate profile

Qualification outcomes		Conditions
1	Investigate and generate solutions to problems using specialised knowledge in a current or emerging area of IT specialisation. Credits 10	Programmes must include: <ul style="list-style-type: none"> The design and implementation of solutions through the application of an appropriate methodology; Security considerations.
2	Apply effective interpersonal, collaborative and communication skills professionally and with cultural sensitivity when working with clients and colleagues in an IT environment. Credits 5	Programmes must include the following: <ul style="list-style-type: none"> Process of working with a client, demonstrating commitment, competence, creativity and craftsmanship; Professional and ethical practices, and consideration of social issues implicit in the specified context of an IT environment. This will include areas such as privacy, confidentiality, conflicts of interest, refusing inducements, risk management, compliance with relevant regulations and legislation.
Server Administration strand:		
3	Apply a range of updated specialised server administration knowledge, skills and techniques to implement server and storage solutions. Credits 25	Programmes must include: <ul style="list-style-type: none"> Emerging server and storage technology; Server performance monitoring and software maintenance; Programmes may include: <ul style="list-style-type: none"> Redundancy and disaster recovery processes.
Network Administration strand:		
4	Monitor and maintain networks according to organisational requirements, using emerging and updated methods and techniques Credits 10	Programmes must include: <ul style="list-style-type: none"> Current and emerging LAN, WAN, and WLAN networking protocols and technologies commonly used, and may include VLAN; A variety of physical and/or virtual networking devices; Managing switching and routing environments and understanding deployment considerations
5	Design, configure and implement a network infrastructure to support organisational operations using updated network administration expertise. Credits 15	Programmes must include: <ul style="list-style-type: none"> Current and emerging LAN, WAN, and WLAN networking protocols and technologies commonly used, and may include VLAN; A variety of physical and/or virtual networking devices
Information Technology Security strand:		
6	Implement secure solutions for access and use of devices, servers, networks, and data storage through the application of updated expertise and emerging IT security techniques.	Programmes must include: <ul style="list-style-type: none"> Analysis and implementation of security requirements on network attached devices, servers, and networks; Analysis of network traffic; Authentication, access control, and encryption (network and data storage);

	Credits 25	<ul style="list-style-type: none"> Risk/threat mitigation.
	Software Testing strand:	
7	<p>Apply current and emerging knowledge, skills and techniques of software testing in one or more test disciplines to highlight quality issues and risks</p> <p>(25 credits)</p>	

Transition information

Replacement information	
(Write any additional transition information here or delete the row)	