

March-April 2018

Review of New Zealand ICT Qualifications

Final Qualifications Consultation -
proposed addition of Cybersecurity
and Software Testing Qualifications

Consultation Document

**Final draft of new Qualifications for
Cybersecurity and Software Testing**

29 March - 20 April 2018

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1. Introduction and stakeholder consultation

NZQA National Qualifications Services and IT Professionals New Zealand, as co-developers of sub-degree IT and computing qualifications in New Zealand, invite feedback on the refined cybersecurity and software testing qualifications proposed to be added to the suite of current computing and IT qualifications, following *approval to develop* being granted by NZQA Approvals and Accreditation (A&A) on 11 December 2017.

Feedback prior to finalising and submitting the qualifications for listing can be provided at <https://itp.nz/quals> before 20 April 2018.

Further qualification development work has been undertaken in stage two of the review process, with a particular focus on refining the draft qualifications to reflect the relatively minor issues raised by A&A, and including specifications and conditions relating to the qualifications and adjusting some graduate profile outcomes.

The working groups have considered the feedback from A&A and made adjustments to the draft qualifications. 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, and these qualifications have been developed to address that need.

We are now seeking your feedback on the following draft cybersecurity and software testing qualifications before they are finalised for submission for '*approval to list*'.

- 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 A&A, Quality Assurance Division, for '*Application for approval to list a qualification*'.

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 feedback at <https://itp.nz/quals/>

Consultation closes 5pm, Friday 20 April 2018

If you would prefer, additional comments and submissions in relation to the consultation may be sent to ICTQuals.Review@nzqa.govt.nz

2. Background and progress to date

NZQA National Qualifications Services 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, and on the draft qualifications that were submitted and were approved for development in December 2017.

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](#). A full stakeholder consultation was undertaken in September 2017 to consider the draft qualifications prior to them being adjusted and submitted for 'approval to develop' in November 2017.

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. The working groups were reconvened in October 2017 to refine the draft qualifications prior to submitting for approval to develop, and again in January/February 2018 to consider the evaluator feedback and further refine the draft qualifications prior to this consultation.

A full consultation on the draft qualifications is now being undertaken and results from this will be used to determine whether the qualifications are supported to proceed to approval to list. Please consider whether the above issues have been adequately addressed in the qualifications.

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 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.

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 have been updated by the expert working group following feedback from stakeholders in the September consultation, and from the evaluator feedback from the *approval to develop* application. More detailed information, including the qualification specifications, general conditions, and the conditions associated with each outcome, 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. Ascertain data inputs, organisational processes, outputs, systems and stakeholders' roles and responsibilities to interpret organisational contexts from a security perspective (10 credits)
2. Analyse an IT environment's 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, select, plan, implement and validate cybersecurity approaches and controls to support organisational objectives and operations (25 credits)
5. Analyse cybersecurity events, perform security incident classification, and apply relevant security incident handling techniques, whilst participating in an incident handling process (15 credits)
6. Analyse the legal, privacy and ethical impacts of the regulatory environment, and organisational decisions to advise the decision makers on cybersecurity implications and organisational obligations applicable to a particular situation (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 Software 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 Software Testing.

The Diploma will share the core skills required of all IT graduates at Level 6, and include specialised learning from a Software 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 entry level testing 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 have been updated by the expert working group following feedback from stakeholders in the September consultation, and from the evaluator feedback from the *approval to develop* application. More detailed information, including the qualification specifications, general conditions, and the conditions associated with each outcome, 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 the fundamental principles of testing that underpin sound testing practice to support the delivery of quality systems consistent with industry standards. (15 credits)
2. Perform the role of tester within a development 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. Locate issues, analyse and report testing outcomes and findings in multiple scenarios to enable defect management and effective decision making by the development team. (15 credits)
5. Select, configure and apply appropriate 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 in systems.

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 key addition is the practical experience wording, which will also apply to the existing strands once the new version is published, and providers will have a transition phase to adjust existing programmes to ensure they meet the new requirements.

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 in systems (25 credits)

Further refinement of the draft qualifications may occur following this consultation to address any issues raised in the feedback, and prior to submitting the application for 'approval to list' the new cybersecurity and software testing 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 Web Design & Development (120 credits) [Ref:2598]	<i>Pathways from any of these other NZ Dip quals</i>	
			NZ Diploma in Information Technology Technical Support (120 credits) [Ref:2596]	NZ Diploma in Information Systems (120 credits) [Ref:2597]						
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 to ensure they have been amended to best meet industry and learner needs before moving to the next stage of seeking approval to list the new qualifications.

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

Consultation **closes at 5pm on Friday 20 April 2018.**

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 cybersecurity / information security, and the proposed Level 6 Diploma qualification (equivalent of the second year of a Bachelors Degree) was approved for development 11 December 2017.

We are now seeking your feedback prior to finalising the qualification for submitting for listing.

1. 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. NZ Diploma in IT Security (Level 6)
 - d. Other (please specify, noting it should start with “NZ Diploma in...”)
2. Looking in particular at the graduate outcomes and associated conditions in the qualification document (*final pages*), do you agree or disagree that the proposed outcomes and conditions of this qualification are appropriate? (*from “Strongly Disagree” to “Strongly Agree” in the answer scale*)

Why, and/or please provide any suggestions for improvement.

3. Looking in particular at the 'General conditions for the programme leading to the qualification' do you agree or disagree that the proposed 'Practical experience' wording for this qualification is appropriate (*learners completing at least half of the study in practical settings...*)? (*from "Strongly Disagree" to "Strongly Agree" in the answer scale*)

Why, and/or please provide any suggestions for improvement.

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, and/or please provide any suggestions for improvement.

5. Referring to the draft qualification document, what could be done to improve the qualification?
6. 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 the proposed Level 6 Diploma qualification (*equivalent to the second year of a Bachelors degree*) was approved for development 11 December 2017.

7. Looking in particular at the graduate outcomes and associated conditions in the qualification document (*final pages*), do you agree or disagree that the proposed outcomes and conditions of this qualification are appropriate? (*from "Strongly Disagree" to "Strongly Agree" in the answer scale*)

Why, and/or please provide any suggestions for improvement.

8. Looking in particular at the 'General conditions for the programme leading to the qualification' do you agree or disagree that the proposed 'Practical experience' wording for this qualification is appropriate (*learners completing at least half of the study in practical settings...*)? (*from "Strongly Disagree" to "Strongly Agree" in the answer scale*)

Why, and/or please provide any suggestions for improvement.

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, and/or please provide any suggestions for improvement.

10. Referring to the draft qualification document, what could be done to improve the qualification?
11. 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)

12. Referring to the draft qualification document, and understanding the purpose of this Certificate is to update existing practitioners, 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?

13. Looking in particular at the 'General conditions for the programme leading to the qualification' do you agree or disagree that the proposed 'Practical experience' wording

for the new strand of this qualification is appropriate (*learners completing at least half of the study in practical settings...*)?

Please note: If accepted, this wording will relate to the new strand, but programmes already approved for the existing strands won't need to be adjusted before the next review of the existing strands is undertaken in 2019 (*from "Strongly Disagree" to "Strongly Agree" in the answer scale*)

Why, and/or please provide any suggestions for improvement.

14. Referring to the draft qualification document, what could be done to improve the new strand in the qualification?
15. Please provide any further comments you have about the proposed new software testing strand.

Overall impressions

16. Do you agree or disagree with IT Professionals New Zealand (ITP) and NZQA National Qualifications Services (NQS) being the Qualification Developer for these qualifications? If disagree, who do you recommend should be the Qualification Developer?
17. 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?
18. Do you support these qualifications being submitted for listing and made available in New Zealand? YES/NO
19. 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	December 2022		
Approval date	Dd Mmmm 2018		
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 Information Technology (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>Graduates of this qualification will be able to:</p> <p><i>Technical skills (90 credits)</i></p> <ol style="list-style-type: none"> 1. Ascertain data inputs, organisational processes, outputs, systems and stakeholders' roles and responsibilities to interpret organisational contexts from a security perspective (10 credits) 2. Analyse an IT environment's 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, select, plan, implement and validate cybersecurity approaches and controls to support organisational objectives and operations (25 credits) 5. Analyse cybersecurity events, perform security incident classification, and apply relevant security incident handling 	

		<p>techniques, whilst participating in an incident handling process (15 credits)</p> <p>6. Analyse the legal, privacy and ethical impacts of the regulatory environment, and organisational decisions to advise the decision makers on cybersecurity implications and organisational obligations applicable to a particular situation (5 credits)</p> <p><i>Core skills (30 credits)</i></p> <p>7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society. (10 credits)</p> <p>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> <p>9. Apply project management tools and techniques to an IT related project, to analyse and solve problems. (10 credits)</p>
	Education pathway	<p>This qualification provides a pathway to further specialisation through industry specific training in specialist fields of cybersecurity. Other possible pathways include higher level IT degree related qualifications. This qualification may also equip learners to attempt optional industry certifications at the appropriate level and area of cybersecurity 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>
	Employment pathway	<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 skills and knowledge to progress into more advanced roles including cybersecurity analyst, engineer or manager.</p>

Qualification specifications

Qualification award	This qualification may be awarded by any education organisation with an approved programme of study towards this qualification accredited under section 250 of the Education Act 1989.
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	<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>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>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>

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 programme 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>
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	<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>Ascertain data inputs, organisational processes, outputs, systems and stakeholders' roles and responsibilities to interpret organisational contexts from a security perspective</p> <p>Credits 10</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • classifying organisational assets and sensitivity of data; • information management principles and terminology.

2	Analyse an IT environment's technology stack from a security perspective and identify issues that could impact organisational performance and business risks Credits 15	Programmes must include enterprise and systems interdependencies, and the potential vulnerabilities and weaknesses of current and emerging technologies and architectures.
3	Perform cybersecurity risk assessments and communicate the results to support the organisational risk management process Credits 20	Programmes must include: <ul style="list-style-type: none"> • understanding and use of risk management frameworks; • understanding and communication of risk appetite and cost/benefit trade-offs.
4	Assess, select, plan, implement and validate cybersecurity approaches and controls to support organisational objectives and operations Credits 25	Programmes must include: <ul style="list-style-type: none"> • security by design concepts and secure development techniques; • the interdependency of cybersecurity with physical controls and human factors, including the relationship with usability.
5	Analyse cybersecurity events, perform security incident classification, and apply relevant security incident handling techniques, whilst participating in an incident handling process Credits 15	Programmes must include identification of the information needed for security incident classification.
6	Analyse the legal, privacy and ethical impacts of the regulatory environment and organisational decisions, to advise the decision makers on cybersecurity implications and organisational obligations applicable to a particular situation Credits 5	Programmes must include risks and opportunities around legally grey areas such as unauthorised testing, exploit marketplaces, and vulnerability disclosure.
Core Skills (30 credits)		
7	Behave with integrity as a responsible Information Technology professional, to contribute positively to society. Credits 10	Programmes must include: <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. ITP), 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>Credits 10</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>Credits 10</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 B: Draft NZ Diploma in Software Testing (Level 6) (120 credits)

Qualification details

Title	New Zealand Diploma in Software Testing (Level 6)		
Version	1 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	December 2022		
Approval date	Dd Mmmm 2018		
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 Information Technology (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>Graduates of this qualification will be able to:</p> <p><i>Technical skills</i></p> <ol style="list-style-type: none"> 1. Apply the fundamental principles of testing that underpin sound testing practice to support the delivery of quality systems consistent with industry standards. (15 credits) 2. Perform the role of tester within a development 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. Locate issues, analyse and report testing outcomes and findings in multiple scenarios to enable defect management and effective decision making by the development team. (15 credits) 	

		<p>5. Select, configure and apply appropriate tools to support testing activities across a range of software architectures, application types and industries. (10 credits)</p> <p>6. Create, maintain and run test scripts using a scripting language to automate testing. (15 credits)</p> <p><i>Core skills</i></p> <p>7. Behave with integrity as a responsible Information Technology professional, to contribute positively to society.</p> <p>8. 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>9. Apply project management tools and techniques to an IT related project, to analyse and solve problems.</p>
	<p>Education pathway</p>	<p>This qualification provides a pathway to further specialisation through industry specific training in specialist fields of software testing. Other possible pathways include higher level IT-related 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:</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>
	<p>Employment pathway</p>	<p>Graduates of this qualification will have the skills and knowledge to gain employment in entry-level testing roles such as test analyst, tester, test engineer or other testing related support roles.</p> <p>Graduates also have the skills and knowledge to progress into more advanced testing roles including test manager, senior/lead test analyst/engineer.</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>
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<p>Evidence requirements for assuring consistency</p>	<p>Evidence requirements must 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>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 programme 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

Technical terms used in the qualification can be found at:

- 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 the fundamental principles of testing that underpin sound testing practice to support the delivery of quality systems consistent with industry standards</p> <p>Credits 15</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • testing terminology, concepts, techniques, types of testing • where testing fits within the software development lifecycle (SDLC)
<p>2 Perform the role of a tester within a development team to support the test process across both traditional/waterfall and agile/lean development methodologies</p> <p>Credits 5</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • purpose of a test strategy, test management, prioritising and planning • 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</p> <p>Credits 30</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • creating comprehensive test plans and test data which include functional and non-functional test types • estimating test effort to a good standard of Software Quality Assurance (SQA); • common causes of IT system and project failure
<p>4 Locate issues, analyse and report testing outcomes and findings in multiple scenarios to enable defect management and effective decision making by the development team</p> <p>Credits 15</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 comprehensively report bugs and support defect management
<p>5 Select, configure and apply appropriate tools to support testing activities across a range of software architectures, application types and industries</p> <p>Credits 10</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</p> <p>Credits 15</p>	<p>Programmes must include:</p> <ul style="list-style-type: none"> • awareness of capabilities and appropriate application of a range of automation tools/languages • understanding of common frameworks and design patterns in automation
Core Skills (30 credits)	
<p>7 Behave with integrity as a responsible Information Technology professional, to contribute positively to society.</p> <p>Credits 10</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) • 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. ITP), 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. Credits 10	Programmes must include: <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. Credits 10	Programmes must include: <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	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	December 2022		
Approval date	April 2015 (for version 1) XXXX 2018 (v2)		
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 has four strands to recognise the specific skills and knowledge enabling 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>Graduates 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 in systems.
	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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	developer or programme owner or other awarding education organisation.
Evidence requirements for assuring consistency	<p>Evidence requirements 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-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>
Minimum standard of achievement and standards for grade endorsements	<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 for the selected strand.</p> <p>There are no grade endorsements for this qualification.</p>
Other requirements for the qualification (including regulatory body or legislative requirements)	<p>Entry 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

General conditions for programme	<p>Programme design, delivery, and assessment, where applicable, will be conducted in and for the context of real or realistic organisations and/or settings; and be relevant to current and/or emerging practice.</p> <p>The graduate's capabilities must clearly align with the definition of a Level 6 graduate on the NZQF. See the NZQF level descriptors for further information. All programmes are to be developed with level 6 descriptors in mind – specialised technical knowledge and skills in a field of work, applied in specialised/strategic contexts.</p>
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Some programme content may be aligned with industry certifications. There is a preference for including open and vendor neutral standards, protocols and technologies where possible.

A programme of study leading to the award of this qualification may be offered through a provider with a licensing arrangement for the testing and award of internationally recognised IT industry certifications, at the appropriate level and area of specialty.

Regulatory

Professional practice must be an integral part of the curriculum and delivery. It is expected that all programmes have professionalism 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.

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.

- 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 the selected strand.

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

	<ul style="list-style-type: none"> Information Technology (IT) – the common term for the entire spectrum of technologies for information processing and related to computing technology, such as networking, hardware, software, the internet or the people that work these technologies Local Area Network (LAN) – is a computer network that interconnects computers within a limited area such as home, school, or office Networking: a computer or data network; the study and application of technical knowledge and skill to design, build, support, and manage infrastructure to connect computing devices which enables resource sharing and exchange of data Test disciplines - refer to areas of knowledge or specialty such as functional testing, performance testing, usability testing, test management, automation testing Virtual Local Area Network (VLAN) – is a type of network which allows you to have multiple devices on separate networks and bring them together as if there were on the same network. Wide Area Network (WAN) – a computer network that covers a broad area using media such as telephone lines, fibre-optic cable, microwaves, or radio waves, to span large distances such as across a city, or around the world Wireless local area network (WLAN) – a wireless computer network that links two or more devices using a wireless distribution method within a limited area such as home, school, or office building
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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	Programmes must include: <ul style="list-style-type: none"> Emerging server and storage technology; Server performance monitoring and software maintenance;

	implement server and storage solutions. Credits 25	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. Credits 25	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); • Risk/threat mitigation.
Software Testing strand:		
7	Apply current and emerging knowledge, skills and techniques of software testing in one or more test disciplines to highlight quality issues and risks Credits 25	

Transition information

Replacement information	

Other transition information	
Version 1 of this qualification was registered in April 2015. The last date for assessment against this version is 31 December 2021.	

Version 2 of this qualification was issued XXX 2018 following a review. A strand in Software Testing was added, and wording updated in the following sections: Evidence of requirements for assuring consistency; Other requirements for the qualification; and General conditions for programmes, particularly the addition of practical experience.

NZQF Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	April 2015	31 December 2021
Review	2	XXXX 2018	N/A