

**He Puka Whakaaetanga,
Whakamana Hōtaka |
Programme Socialisation
Document**

**Programme of Study:
New Zealand Diploma in Applied Science
(Level 6)**

**Leading to the award of:
2553 New Zealand Diploma in Applied Science
(Level 6)**



Te Pūkenga

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1 New Zealand Diploma in Applied Science (Level 6)

1.1 Te Tūhono Kawenga Hōtaka | A Unified Portfolio of Programmes

Te Pūkenga aims to develop a unified, sustainable, public network of regionally accessible vocational education programmes that have our ākonga (students) at the centre. This application for programme approval and accreditation forms part of the development of a national network of provision requiring partnerships and cooperation with co-responsibilities for programme delivery. This is consistent with Te Pūkenga academic delivery innovation strategic direction, which is aimed at establishing a coherent portfolio of programmes that will support ākonga, employers and industry to make informed decisions about future study and employment and achieve a sustainable network of ongoing delivery.

In order to develop a coherent portfolio of programmes that supports the above strategic direction, a unification process has been established that is aimed at achieving a future state of (in the main) one programme per qualification that supports and allows for a range of delivery modes, namely blended, distance and work-based learning. Currently, Te Pūkenga needs to work within the parameters of Programmes of Industry Training reporting via the ITR and Programmes of Study reporting via the SDR (as integrated NZ Programmes / Skills Standards and an integrated TEC reporting system are not yet available). The unified programme of study presented here unifies on-campus, blended and distance approaches, reported through the current SDR.

The unification process has been designed to employ a collaborative approach to redevelopment that will ensure that programme design meets the criteria set by [Te Pūkenga Charter](#) and our commitments under [Te Pae Tawhiti](#), our Te Tiriti o Waitangi Excellence Framework, and [Te Rito](#), our Ākonga at the Centre research project and reports. This approach also fulfills the expectations of the emerging Whiria Te Pūkenga (Mātauranga Māori Framework) and Te Pūkenga Ako Framework (Learning and Teaching Framework).

One of Te Pūkenga educational priorities is a relentless focus on equity and ensuring participation. Therefore, equity is integrated and embedded into Te Pūkenga operating model blueprint and business case. Te Pūkenga is also committed to putting ākonga at the centre of all we do, and working towards equity and success for ākonga of all genders, ethnicities, cultures and abilities, as outlined in our [Equity and Ākonga Success Strategy](#).

In 2020, Te Pūkenga commissioned the Ākonga at the Centre research project to gain insights from ākonga (and those that supported them) on the barriers and enablers to their success across the current learner journey. The project applied Te Tiriti o Waitangi inspired principles of excellence and used Critical Bicultural and Human Centred Design methodologies as a new and innovative approach for the public sector. The research led to three [Te Rito reports](#), focusing on Māori, Pacific and Disabled ākonga, respectively. [Te Rito](#) framework builds towards our Equity Outcomes framework, its purpose being to guide Te Pūkenga in its response to the unique needs of all ākonga, with a priority focus on Māori, Pacific and Disabled ākonga.

In accordance with Te Tiriti o Waitangi, Te Pūkenga is focused on ensuring our services work well and respond with excellence to the needs of Māori ākonga and their whānau, and to the aspirations of iwi and Māori communities throughout Aotearoa New Zealand. This objective comes from our Charter, our legislative mandate, and from the will of our Council, and is supported by the opportunities outlined in [Te Rito Report Part One](#). In working to achieve this objective, we know it is not Māori ākonga or communities that need to change to fit with us; rather it is our responsibility to ensure our services improve for the betterment of Māori.

In terms of the needs of Pacific ākonga, [Te Rito Report Part Two](#) indicated a range of opportunities to be taken up by Te Pūkenga. These range from targeted support for the wellbeing of Pacific

learners to empowering and bringing effect to Pacific hopes and dreams for intergenerational development and prosperity. Te Pūkenga is committed to ensuring all Pacific ākongā and kaimahi feel that they belong, that their voices are heard, that the use of Pacific languages is normalised and that their cultures are valued.

In terms of the needs of Disabled ākongā, [Te Rito Report Part Three](#) indicated the need for Te Pūkenga to provide appropriate impairment-related learning support for Disabled ākongā to achieve their academic potential and to resolve barriers to learning. The research also indicated the need for mental wellbeing support, the reduction of financial barriers, a focus on the development of digital literacy skills and ensuring access to the physical learning environment. Te Pūkenga has developed a national strategic disability action plan, which incorporates the Enabling Good Lives principles. The National Strategic Disability Action Plan implements the Accessibility Charter across Aotearoa New Zealand and supports consistent data collection on Disabled ākongā, and training. The plan provides a unified national strategy across Te Pūkenga and was developed with ākongā and kaimahi (staff). The plan provides a comprehensive road map towards a vocational system that hears the voices of Disabled ākongā and what they need to succeed.

The unified programme presented here contributes to the ability of Te Pūkenga to offer a coherent portfolio of programmes that responds to the needs of ākongā, industries, iwi, hapū, hapori, Māori communities and Pacific communities. This also begins to take us towards addressing some of the inequities that exist for priority ākongā.

1.2 Te Huanui Whakawhanake i te Hōtaka | Development Approach

The New Zealand Diploma in Applied Science (Level 6) qualification was updated with Version 2 published in May 2021. The last date for assessments to take place for Version 1 of this qualification is 30 June 2023. Therefore, rather than each network partner dedicating time and resource to develop programmes of study for the new version individually, one programme of study was selected and revised to become the unified programme of study.

The programme of study presented here is based on a collaborative design process across the following Te Pūkenga network partners:

- Ara Institute of Canterbury Ltd (Ara)
- Nelson Marlborough Institute of Technology Ltd (NMIT)
- Universal College of Learning Ltd (UCOL)
- Waikato Institute of Technology Ltd (Wintec)

The collaborative design process was supported by two groups: (i) a Steering Group with representation from every relevant network partner, i.e., every network partner delivering programmes of study in the broad discipline area of Applied Science; and (ii) a Working Group tasked specifically with the unification of this programme of study. The Workforce Development Council was included in the Steering Group membership, and has thus been engaged in the unification process. The functions of the Steering Group were defined in a mutually agreed Terms of Reference, and included the following:

- oversight of the development of a single unified programme for each qualification Te Pūkenga delivers in the discipline area
- leading engagement with regional internal and external partners (including (i) relevant regional industry, including Māori and Pacific employers; (ii) communities at a local level, including hapū and iwi, and Pacific communities; (iii) Te Pūkenga kaimahi; and (iv) ākongā)
- steering programme unification work and providing advice and support to Working Groups

The Working Group of members from the collaborating Te Pūkenga network partners listed above selected the Ara programme of study (an existing approved programme) for the programme unification process. The programme selection criteria included the following:

- The programme was developed in close partnership with industry, hapū, iwi and Pacific communities.
- The programme was updated within the past three years.
- Minor updates to the programme will allow it to align with Te Pūkenga Charter.
- The programme already enables multiple modes of delivery.
- Te Tiriti o Waitangi is evident across the programme.
- The programme is ākonga-centred and allows a focus on under-served ākonga (Māori, Pacific, Disabled) and adult and second-chance ākonga).
- Minor updates to the programme will enable it to align with industry and community needs and allow regional flexibility.
- The programme addresses identified future needs of ākonga, industry and community.

1.3 Te Whakawhitinga ki te Tūhono Kawenga Hōtaka | Transition to the Unified Programme

As is clear from the above, the unification of this programme of study was achieved by means of *transition* to a single unified programme, developed on the basis of existing approved programme offerings that were informed by regional/local needs. Thus, programme content and delivery are contextualised, and provide relevant pathways to meet the needs of those local communities.

It should be acknowledged that the selection of a current approved programme as the basis for the unified programme means that aspects of the selected programme will be adopted across the network, such as programme structure, course details, and the ways in which Mātauranga Māori is embedded throughout the programme. A Mātauranga Māori snapshot tool will be applied to this unified programme to identify how contextualised Mātauranga Māori content is evident and what next steps are required to enhance or develop this further.

The unified programme presented here contributes to the ability of Te Pūkenga to offer a coherent portfolio of programmes and takes us a step towards addressing some of the inequities that exist for priority ākonga. Transition arrangements may be required for ākonga who fail to successfully complete courses within the existing programme of any given network partner. To this end, each network partner currently delivering this programme will create its own transition plan based on equivalencies between existing and new courses. Transition pathways will be identified on a case-by-case basis, informed by these course equivalencies, logistics and individual ākonga knowledge gaps. All care will be taken to minimise any ākonga disadvantage by their transition to the new programme, while still maintaining the integrity of the new unified programme.

Appendix 1: Te Hono o te Kahurangi | Qualification Details

Details for the programme of study	NZQA Reference No.	Version No.	Credits	Level
New Zealand Diploma in Applied Science	XXXXXX	2	120	6

which leads to the award of the following qualification

New Zealand Diploma in Applied Science		2553	2	120	6
NZSCED	019999 Natural and Physical Sciences>Other Natural and Physical Sciences>Natural and Physical Sciences not elsewhere classified				
Qualification developer	Te Pūkenga trading as Ara				
Quality assurance body					
Next review	31/05/2026				
Next planned consistency review	8/06/2023				

Strategic purpose

The purpose of this qualification is to provide individuals with in-depth theoretical and technical knowledge within a specialised field of science(s) for employment or education. The qualification will also identify for Aotearoa New Zealand those employees who are able to work independently in technical positions and provide leadership in a specialised field of science(s) in the manufacturing and regulatory industries, field work, research, and development.

Graduate profile

Graduates of this qualification will be able to:

1. Research, select, and apply scientific principles to carry out routine and non-routine tasks relating to a specialised scientific discipline.
2. Analyse, report, and respond appropriately to scientific data in an operational or research context.
3. Analyse and solve problems for identified scientific processes.
4. Apply knowledge of scientific concepts to contribute to the direction of a scientific workplace.
5. Critically reflect on and apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.

Qualification education pathway

This qualification builds on the New Zealand Diploma in Applied Science (Level 5) [Ref 2552].

This qualification may lead to the New Zealand Certificate in Laboratory Management Systems (Level 6) [Ref: 2554] or further study in higher-level science-related disciplines.

Employment/cultural/community pathway

Graduates of this qualification can work in technical positions in a specialised field of science in manufacturing and regulatory industries, field work, research, and development.

Other requirements of the qualification (including regulatory body or legislative requirements)

None.

General conditions for programme

Tertiary Education Organisations (TEOs) offering programmes leading to this qualification must deliver content that is current with amendments to, and replacements of relevant legislation, appropriate health and safety procedures, regulations, and Australia/New Zealand Standards (AS/NZS).

Programmes must include a minimum of 100 hours relevant work integrated learning (such as work experience, project work, scenarios, simulations, relevant practical work, and activities that develop professional and reflective practice).

It is recommended that candidates hold a Level 5 qualification in science or equivalent prior to enrolling in a programme leading to this qualification.

Qualification version transition information

Version 2 of this qualification was issued following a scheduled review. Please refer to Qualifications and Assessment Standards Approvals for further information.

The last date for assessments to take place for version 1 of this qualification is the 30 June 2023.

People currently enrolled in version 1 of this qualification may either complete the requirements by 30 June 2023 or transfer to version 2 of this qualification.

It is not intended that anyone be disadvantaged by these transition arrangements. Any person who considers they have been disadvantaged may appeal to the address below:

Ara Institute of Canterbury Ltd

P O Box 540

Christchurch Mail Centre

Christchurch 8140

Telephone: 0800 24 24 76

Email: info@ara.ac.nz

Appendix 2: Waeture ā-Hōtaka | Programme Regulations

In the regulations presented here, unless the context otherwise requires, ‘delegated authority’ refers to an individual or role holder, or in some cases a committee, who has been delegated the authority to make a decision within a specific circumstance. A schedule of the various relevant delegations is maintained by the Programme Committee responsible for the programme. Te Pūkenga aims to enable broad access for ākonga and is committed to providing barrier-free access and participation for Māori, Pacific, Disabled and other equity groups.

Whakatapoko | Admission

General admission	To be admitted to this programme, applicants must hold one of the following: NCEA Level 2, which must include 30 credits in science (including chemistry) and 10 Literacy credits and 10 Numeracy credits. OR New Zealand Diploma in Applied Science (Level 5) or equivalent. OR Equivalent
Special admission	Any ākonga who is 20 years of age or older and has not reached the general admission requirements for their intended programme is eligible for Special Admission. Te Pūkenga works with the ākonga to ensure they are prepared for their intended programme.
Discretionary admission	Any ākonga who is not yet 20 years of age and has not reached the general admission requirements for their intended programme may be eligible for Discretionary Admission. In assessing whether to grant Discretionary Admission, the delegated authority focuses on the applicant’s level of preparedness for their intended programme.
English language requirements	All applicants (international and domestic) for whom English or te reo Māori is not a first language need to provide evidence that they have the necessary English language proficiency required for the programme. International applicants are required to have an IELTS score of 6 (academic) with no individual band lower than 5.5 from one test taken in the preceding two years, or an equivalent described in NZQA Rules .

Tūtukitanga Whakamihi | Credit Recognition

The provisions and procedures for credit recognition through cross credit, credit transfer and recognition of prior learning in this programme are set out in [Te Kawa Maiorooro | Educational Regulatory Framework](#).

Tohu o te Hōtaka | Award of Qualification

Credit requirements	To be awarded the New Zealand Diploma in Applied Science (Level 6) ākonga must achieve a minimum of 120 credits in the pattern set out in Table 1 below from the courses set out in Table 2 below.		
	Table 1: Credit Requirements		
	Level	Compulsory credits	Elective credits
	6	45	75
	Total credits	120	

Table 2: Schedule of Courses			
Course code	Course title	Credits	Pre-requisites
Level 6			
NSCI6101	STEM Workplace Legislation	15	
NSCI6102	Work Placement 1	15	NSCI601
NSCI6103	Project	15	
Total compulsory credits @ Level 6		45	
<i>Plus five electives from the following courses</i>			
NSCI6104	Project Management	15	
NSCI6105	Applied Biochemistry	15	
NSCI6106	Environmental Assessment for Applied Science	15	
NSCI6107	STEM Quality Statistics	15	
NSCI6108	Design and Analysis	15	
NSCI6109	Analytical Chemistry for Applied Science	15	
NSCI6110	Food Microbiology for Applied Science	15	
NSCI6111	Food Chemistry for Applied Science	15	
NSCI6112	Sensory Evaluation for Applied Science	15	
NSCI6113	Molecular Methodologies for Applied Science	15	
NSCI6114	Conservation and Biosecurity for Applied Science	15	
NSCI6115	Process Engineering for Applied Science	15	
NSCI6116	Wine Science	15	NSCI5115 NSCI5116
NSCI6117	Advanced Culture Techniques	15	
NSCI6118	Work Placement 2	15	NSCI6102
Total Elective Credits @Level 6		75	
TOTAL CREDITS		120	
Programme completion	<p>The minimum time to complete this programme is 1 year full-time study) or 2 years (part-time study).</p> <p>The maximum time to complete this programme is 6 years</p> <p>The delegated authority may approve an alternative maximum completion time.</p>		

Waeture Aromatawai | Assessment Regulations

Grading	<p>Assessment in this programme is achievement-based.</p> <p>Grading follows the guidelines in Te Kawa Maiooro Educational Regulatory Framework.</p> <p>Specific assessment and/or course pass requirements are detailed in programme delivery documentation.</p>
Assessment submission and additional opportunities	<p>Requirements and processes for</p> <ul style="list-style-type: none"> assessment submission, resit and/or resubmission opportunities for failed assessments,

	<ul style="list-style-type: none">• reassessment opportunities for failed courses,• late submission of assessments, and• extension of assessment deadlines <p>are outlined in programme delivery documentation provided to ākonga at the start of their course.</p>
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Appendix 3: Ngā Hua o te Ako me te hāngai ki Ngā Putanga Ako a te Taurira | Learning Outcomes and Assessment Mapped to Graduate Profile Outcomes

Course Code & Title				Course Aim & Outcomes		Assessment		Research, select and apply scientific principles to carry out routine and non-routine tasks relating to a specialised scientific discipline.	Analyse, report, and respond to scientific data in an operational or research context.	Analyse and solve problems for identified scientific processes.	Apply knowledge of scientific concepts to contribute to the direction of a scientific workplace.	Critically reflect on and apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.										
								GPO 1	GPO 2	GPO 3	GPO 4	GPO 5										
NSCI6101	STEM Workplace Legislation	Aim	The aim of this course is to develop knowledge and skills to undertake work placement or enter employment with an understanding of the compliance obligations of a typical STEM workplace.			All LOs: Assessment portfolio (100%)																
		LO1	Apply compliance requirements of relevant legislation in a STEM setting.																			
		LO2	Discuss the application of industry-specific quality standards and advanced approaches to product quality.																			
NSCI6102	Work Placement 1	Aim	The aim of this course is to develop knowledge and skills that enable students to actively engage in an applied science workplace, and critically reflect on their experience.			All LOs: Assessment portfolio (100%)																
		LO1	Reflect on working within legislative requirements of an applied science workplace.																			
		LO2	Contribute to the outcomes in an applied science workplace.																			
		LO3	Critically reflect on professional practice in a workplace.																			
NSCI6103	Project	Aim	The aim of this course is to develop knowledge and skills that enable students to undertake an applied science investigation and evaluate the data.			All LOs: Assessment portfolio (100%)																
		LO1	Undertake an applied science investigation, including design and data evaluation																			
		LO2	Communicate results of an investigation using appropriate technology.																			
NSCI6104	Project Management	Aim	The aim of this course is to develop introductory knowledge of tools, techniques and principles of project management.			All LOs: Assessment portfolio (100%)																
		LO1	Evaluate introductory project management principles for simple STEM projects.																			
		LO2	Select appropriate tools and techniques for management of simple STEM projects.																			
NSCI6105	Applied Biochemistry	Aim	The aim of this course is to develop theoretical knowledge and practical skills that students require to practise competently in a laboratory or industry setting.			All LOs: Assessment portfolio (100%)																
		LO1	Discuss the role and the properties of selected biomolecules used in industrial processing and chemical analysis.																			
		LO2	Perform laboratory techniques relevant to a STEM setting and interpret results.																			
		LO3	Apply modern life sciences methods to food and environmental quality.																			
NSCI6106	Environmental Assessment for Applied Science	Aim	The aim of this course is to develop knowledge and skills that enable students to take a process-based approach to environmental quality and its assessment.			All LOs: Assessment portfolio (100%)																
		LO1	Assess environmental quality by collecting and interpreting field samples.																			
		LO2	Measure and interpret the biological, microbial, and chemical properties of environmental samples.																			
		LO3	Discuss environmental and waste management.																			
		LO4	Discuss implications of relevant legislation and Te Tiriti o Waitangi regarding the sustainable use of resources and environmental management in New Zealand.																			
NSCI6107	STEM Quality Statistics	Aim	The aim of this course is to develop knowledge and skills that enable students to use quality assurance data in an operational or research context.			All LOs: Assessment portfolio (100%)																
		LO1	Interpret statistical data collected for quality assurance and research purposes.																			
		LO2	Apply professional statistics software in quality management and research contexts.																			
NSCI6108	Design and Analysis	Aim	The aim of this course is to develop knowledge and skills that enable students to apply the principles of planning and data analysis to research informed applied science projects in laboratory settings, in a manner consistent with legislative and quality management requirements.																			

Course Code & Title				Course Aim & Outcomes		Assessment		Research, select and apply scientific principles to carry out routine and non-routine tasks relating to a specialised scientific discipline.	Analyse, report, and respond to scientific data in an operational or research context.	Analyse and solve problems for identified scientific processes.	Apply knowledge of scientific concepts to contribute to the direction of a scientific workplace.	Critically reflect on and apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.	
								GPO 1	GPO 2	GPO 3	GPO 4	GPO 5	
		LO1	Critically evaluate research informed project design and data analysis.	All LOs: Assessment portfolio (100%)				√	√			√	
		LO2	Apply the principles of experimental design to an applied science project.					√	√	√			
		LO3	Perform preparatory work for a defined applied science project.					√	√	√			√
NSCI6109	Analytical Chemistry for Applied Science	Aim	The aim of this course is for students to develop the knowledge and skills required to operate and trouble-shoot a range of instruments used for chemical analysis.	All LOs: Assessment portfolio (100%)				√	√				
		LO1	Perform analyses using common instrumental techniques.						√	√			
		LO2	Evaluate analytical instrumentation results and account for sources of error.						√	√			
NSCI6110	Food Microbiology for Applied Science	Aim	To enable students to develop knowledge and skills in the applications and implications of microorganisms to food production and industry.	All LOs: Assessment portfolio (100%)				√	√	√			
		LO1	Perform techniques relevant to food spoilage, preservation, food-borne illness and/or environmental samples.					√	√	√	√	√	
		LO2	Evaluate the methods used to reduce contamination, preserve food, and promote food hygiene in the food industry.					√	√	√	√	√	√
		LO3	Analyse the role of microorganisms and microbial processes in the manufacture of products.					√	√	√	√	√	
NSCI6111	Food Chemistry for Applied Science	Aim	To enable students to acquire knowledge of functional properties and roles of carbohydrates, lipids and proteins as food ingredients and gain skills in food composition analysis.	All LOs: Assessment portfolio (100%)				√	√				
		LO1	Discuss the structure, properties and reactions of carbohydrates, proteins and lipids in foods and food processing.					√	√				
		LO2	Analyse the composition of food products.					√	√	√			
		LO3	Analyse the role of enzymes in food processing and spoilage.					√	√	√			
NSCI6112	Sensory Evaluation for Applied Science	Aim	To enable students to acquire knowledge about general principles and techniques for sensory food evaluations and analysis.	All LOs: Assessment portfolio (100%)				√	√	√		√	
		LO1	Apply fundamental requirements and procedures of food sensory evaluation in an operational or research context.					√	√	√			
		LO2	Use practical skills and techniques to analyse the sensory properties of food.					√	√	√			
		LO3	Explain the physiology of the main human senses in relation to food perception and acceptance.					√	√	√			√
		LO4	Report on food sensory evaluation data.				√	√					
NSCI6113	Molecular Methodologies for Applied Science	Aim	The aim of this course is to develop knowledge of the principles and methods of molecular biology and the skills to apply these in an Applied Science context.	All LOs: Assessment portfolio (100%)					√				
		LO1	Describe the structure and physical properties of nucleic acids and proteins.					√	√				
		LO2	Conduct appropriate molecular analyses of organisms in a range of food and environmental samples.					√	√	√	√	√	√
		LO3	Discuss tools used in molecular biology and their application in an applied science context.					√	√	√	√	√	
NSCI6114	Conservation and Biosecurity for Applied Science	Aim	The aim of this course is to develop theoretical knowledge and skills in conservation and biosecurity relevant to environment management and the applied sciences.	All LOs: Assessment portfolio (100%)				√					
		LO1	Describe the origins and unique characteristics of Aotearoa New Zealand flora and fauna.					√		√			√
		LO2	Discuss the conservation management of endangered species and ecosystems in Aotearoa New Zealand and other countries.					√		√		√	

Course Code & Title		Course Aim & Outcomes		Assessment	Research, select and apply scientific principles to carry out routine and non-routine tasks relating to a specialised scientific discipline.	Analyse, report, and respond to scientific data in an operational or research context.	Analyse and solve problems for identified scientific processes.	Apply knowledge of scientific concepts to contribute to the direction of a scientific workplace.	Critically reflect on and apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.
					GPO 1	GPO 2	GPO 3	GPO 4	GPO 5
		LO3	Evaluate how agencies in Aotearoa New Zealand prevent, detect, and manage biosecurity incursions.		√		√	√	√
NSCI6115	Process Engineering for Applied Science	Aim	The aim of this course is to develop knowledge of fundamental process engineering principles, and skills in common food processing unit operations.						
		LO1	Develop process flow diagrams for a range of process operations in a STEM context.	All LOs: Assessment portfolio (100%)	√			√	
		LO2	Discuss the basic principles of fluid properties and associated laws including static and in motion fluids.		√				
		LO3	Discuss a range of heat transfer methods and systems.		√		√	√	
		LO4	Examine a range of food processing unit operations.		√	√	√	√	√
NSCI6116	Wine Science	Aim	The aim of this course is to develop knowledge and skills in advanced wine analysis and laboratory trials used in commercial winemaking.						
		LO1	Assess the qualities of a wine using standard industry tasting descriptors.	All LOs: Assessment portfolio (100%)		√			
		LO2	Identify the impact of microbial activity to all stages of wine production.			√			
		LO3	Diagnose the cause of wine faults and formulate appropriate solutions.				√	√	
		LO4	Discuss the origins and use of different oak types and influence of coopering practices.		√	√		√	
		LO5	Formulate winemaking decisions based on wine analysis and trials. Examine the principles and techniques of fining.					√	√
NSCI6117	Advanced Culture Techniques	Aim	The aim of this course is to develop knowledge and skills to enable students to prepare and perform advanced laboratory techniques and investigate epidemiology.						
		LO1	Use epidemiology principles to investigate infectious diseases.	All LOs: Assessment portfolio (100%)	√	√	√		√
		LO2	Apply specialised techniques to investigate organisms in an applied science context.		√		√	√	√
NSCI6118	Work Placement 2	Aim	The aim of this course is to further develop knowledge and skills enable students to actively engage in an applied science workplace, and critically reflect on their experience.						
		LO1	Apply knowledge, skills, and attributes to practice in an Applied Science environment.	All LOs: Assessment portfolio (100%)	√	√	√	√	√
		LO2	Reflect on individual contribution to routine and non-routine tasks in an applied science workplace.		√		√	√	√
		LO3	Reflect on professional practice and identify opportunities for future learning.		√	√	√	√	√

Appendix 4: Akoranga | Courses

The following Course Descriptors provide an overview of the content and structure of each course in the programme. Learning and teaching, and assessment activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

STEM WORKPLACE LEGISLATION					
Course code	NSCI6101	Level	6	Credits	15
Pre-requisites	CDWQ600	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills to undertake work placement or enter employment with an understanding of the compliance obligations of a typical STEM workplace.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Apply compliance requirements of relevant legislation in a STEM setting.	4, 5
LO2	Discuss the application of industry-specific quality standards and advanced approaches to product quality.	3, 4

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Health and Safety at Work Act Hazardous Substances and New Organisms Act Biosecurity Act Codes of Practice Responsible Persons obligations Ethics guidelines for sample and data handling
LO2	<ul style="list-style-type: none"> Industry-specific quality standards Audit and Review LEAN/six-sigma as a quality framework Reflect on and apply quality stories to their professional practice

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

WORK PLACEMENT 1

Course code	NSCI6102	Level	6	Credits	15
Pre-requisites	NSCI6101	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills that enable students to actively engage in an applied science workplace, and critically reflect on their experience.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcomes
LO1	Reflect on working within legislative requirements of an applied science workplace.	4, 5
LO2	Contribute to the outcomes in an applied science workplace.	3, 4
LO3	Critically reflect on professional practice in a workplace.	4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none">Supervised work experience in an appropriate applied science workplaceDevelopment of reflective skillsReview of relevant legislation
LO2	<ul style="list-style-type: none">Apply theory to practiceSupervised work experience in an appropriate applied science workplace
LO3	<ul style="list-style-type: none">Interpersonal communication skillsEthical, social, and culturally responsive behaviour for professional practiceConfidentialityProfessional expectations

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākongā will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio	100%	All

Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.		
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Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

PROJECT					
Course code	NSCI6103	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills that enable students to undertake an applied science investigation and evaluate the data.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Undertake an applied science investigation, including design and data evaluation.	1, 2, 3, 5
LO2	Communicate results of an investigation using appropriate technology.	2, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> • Characteristics of the applied science literature • Research design • Data collection and analysis • Evaluation and synthesis of information • Ethical and legal requirements
LO2	<ul style="list-style-type: none"> • Use of specialised and generic software • Research presentation processes • Written, visual and oral scientific communication • Reflect on ethical, social and cultural implications of project and how it informs professional practice

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

PROJECT MANAGEMENT					
Course code	NSCI6104	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop introductory knowledge of tools, techniques and principles of project management.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Evaluate introductory project management principles for simple STEM projects.	1, 5
LO2	Select appropriate tools and techniques for management of simple STEM projects.	1

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Nature of projects including the relationship among portfolio, program and project management Scope statement Project goals Roles and responsibilities of the project manager and personnel Value of a project and the dimensions of project success Project Management Knowledge areas Project life cycle, project priority matrix, project process groups. Key stakeholder- communication, relationships and roles Social, ethical, and cultural implications
LO2	<ul style="list-style-type: none"> Work Breakdown Structure (WBS), Responsibility Allocation Matrix (RAM), Network diagram and Gantt chart that includes milestones and cost estimate including charge out rates Qualitative risk management plan Project Management Software Optimise a project for cost, time and workload Generate final project reports

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

APPLIED BIOCHEMISTRY

Course code	NSCI6105	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop theoretical knowledge and practical skills that students require to practise competently in a laboratory or industry setting.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Discuss the role and the properties of selected biomolecules used in industrial processing and chemical analysis.	1, 2
LO2	Perform laboratory techniques relevant to a STEM setting and interpret results.	1, 2
LO3	Apply modern life sciences methods to food and environmental quality.	1, 2, 3, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Manufacturing processes relevant to industrial biomolecules in New Zealand Quality management systems relevant to laboratories.
LO2	<ul style="list-style-type: none"> The principles and applications of selected laboratory methods Biochemical analysis using instruments including HPLC, GC qPCR
LO3	<ul style="list-style-type: none"> Immunological techniques Sampling, isolation, identification and enumeration of selected food-borne pathogens Reflect on social, ethical and cultural implications

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

ENVIRONMENTAL ASSESSMENT FOR APPLIED SCIENCE

Course code	NSCI6106	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills that enable students to take a process-based approach to environmental quality and its assessment.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcomes
LO1	Assess environmental quality by collecting and interpreting field samples.	1, 2
LO2	Measure and interpret the biological, microbial and chemical properties of environmental samples.	1, 2
LO3	Discuss environmental and waste management.	1,2, 3
LO4	Discuss implications of relevant legislation and Te Tiriti o Waitangi regarding the sustainable use of resources and environmental management in New Zealand	3, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Freshwater macro-invertebrate indices Water chemistry sampling and analysis for nutrients and major components Water microbiology sampling and enumeration
LO2	<ul style="list-style-type: none"> Interplay between nutrient status, micro-organisms and chemistry in aquatic systems Aquifer structure and water quality Soil structure/composition and stratification Degraded ecosystems; carbon loss from soil The composition of the atmosphere Topical issues related to the atmosphere; including ozone depletion, greenhouse gases and acid rain The sources and impact of soil, water and air pollution; strategies to prevent or control degradation of soil, water and air quality Micro-organisms in rhizosphere processes (carbon storage; nutrient availability) Soil sampling and analysis for microbiological and chemistry quantities
LO3	<ul style="list-style-type: none"> Use of technologies to restore biodegraded ecosystems Use of technologies in water and waste management The role of monitoring and reporting programmes in environmental management Interpret data from environmental monitoring programmes
LO4	<ul style="list-style-type: none"> Bi-cultural perspectives on environmental quality and degradation The environment and Te Tiriti o Waitangi Relevant legislation such as the RMA

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

STEM QUALITY STATISTICS

Course code	NSCI6107	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills that enable students to use quality assurance data in an operational or research context.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Interpret statistical data collected for quality assurance and research purposes.	1, 2, 3, 5
LO2	Apply professional statistics software in quality management and research contexts.	2, 3

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Data display Control charting Proficiency test analysis and interpretation Ethics and confidentiality
LO2	<ul style="list-style-type: none"> Professional statistics and research software Sampling design Data analysis using parametric and non-parametric ANOVA Data analysis using parametric and non-parametric regression and correlation

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

DESIGN AND ANALYSIS

Course code	NSCI6108	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills that enable students to apply the principles of planning and data analysis to research informed applied science projects in laboratory settings, in a manner consistent with legislative and quality management requirements.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Critically evaluate research informed project design and data analysis.	1, 2, 5
LO2	Apply the principles of experimental design to an applied science project.	1, 2, 3
LO3	Perform preparatory work for a defined applied science project.	1, 2, 3, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Research methodologies Ethical and cultural considerations in relation to project design and data analysis Legislative and quality management requirements
LO2	<ul style="list-style-type: none"> Experimental project design Establishment of project management parameters (aim, timeline, milestones, resources).
LO3	<ul style="list-style-type: none"> Data analysis and display Sourcing and referencing scientific information Practical preparatory work for project including analysis and reflection on project design Reflect on social, ethical and cultural implications of project

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio	100%	All

Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.		
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Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

ANALYTICAL CHEMISTRY FOR APPLIED SCIENCE

Course code	NSCI6109	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is for students to develop the knowledge and skills required to operate and trouble-shoot a range of instruments used for chemical analysis.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Perform analyses using common instrumental techniques.	1, 2
LO2	Evaluate analytical instrumentation results and account for sources of error.	2, 3

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Electrochemical analytical techniques Spectrophotometric analyses including UV/Vis, IR, AE/AA and fluorometry Gas chromatographic analysis High performance liquid chromatography analysis
LO2	<ul style="list-style-type: none"> Identification and evaluation of sources of error from analytical instrumentation

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

FOOD MICROBIOLOGY FOR APPLIED SCIENCE

Course code	NSCI6110	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

To enable students to develop knowledge and skills in the applications and implications of microorganisms to food production and industry.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcomes
LO1	Perform techniques relevant to food spoilage, preservation, food-borne illness and/or environmental samples.	1, 2, 3
LO2	Evaluate the methods used to reduce contamination, preserve food, and promote food hygiene in the food industry.	1, 2, 3, 4, 5
LO3	Analyse the role of microorganisms and microbial processes in the manufacture of products.	1, 2, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Food spoilage, food-borne illness, preservation techniques Hygiene analysis, microbial analysis of food Environmental quality testing
LO2	<ul style="list-style-type: none"> Food shelf life, microbial biofilms food hygiene and sanitation Food safety plans, HACCP, food safety regulations Environmental quality testing Hygiene monitoring of contamination in the environment
LO3	<ul style="list-style-type: none"> Large scale cultivation of microorganisms Recent developments in microbial cultivation and detection Products may include food, chemicals, pharmaceuticals and/or environmental processes Reflect on social, ethical and cultural implications

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākongā will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.	All

Ākongā are required to provide sufficient evidence against all learning outcomes in order to pass the course.

All required and recommended resources are advised to ākongā via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

FOOD CHEMISTRY FOR APPLIED SCIENCE

Course code	NSCI6111	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

To enable students to acquire knowledge of functional properties and roles of carbohydrates, lipids and proteins as food ingredients and gain skills in food composition analysis.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcomes
LO1	Discuss the structure, properties and reactions of carbohydrates, proteins and lipids in foods and food processing.	1, 2
LO2	Analyse the composition of food products.	1, 2
LO3	Analyse the role of enzymes in food processing and spoilage.	1, 2, 3

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Classification, structures and properties of carbohydrates and carbohydrate derivatives Chemical reactions of carbohydrates in foods Classification, structures, physical properties and chemical reactions of fats and oils Amino acid and protein structure Structure and properties of natural food proteins
LO2	<ul style="list-style-type: none"> Carbohydrate composition of major food groups Lipid composition of major food groups methods of carbohydrate determination Extraction and processing of fats and oils – Analysis of fats and oils in foods Protein composition of major food groups Changes to proteins during food processing and storage Methods of protein determination
LO3	<ul style="list-style-type: none"> Action of enzymes Factors affecting enzyme activity including enzyme inhibitors The role of enzymes in food processing and spoilage

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākongā will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

SENSORY EVALUATION FOR APPLIED SCIENCE

Course code	SCIE601	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

To enable students to acquire knowledge about general principles and techniques for sensory food evaluations and analysis.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Apply fundamental requirements and procedures of food sensory evaluation in an operational or research context.	1, 2, 3, 5
LO2	Use practical skills and techniques to analyse the sensory properties of food.	1, 2, 3
LO3	Explain the physiology of the main human senses in relation to food perception and acceptance.	1, 2, 3, 5
LO4	Report on food sensory evaluation data.	1, 2

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Methods for Sensory Evaluation Classification of test methods Discrimination tests: paired-comparison, duo-trio and triangle tests; affective tests: qualitative and quantitative tests (paired preference acceptance tests; descriptive analysis) Reflect on social, ethical and cultural implications
LO2	<ul style="list-style-type: none"> Arrangements for Sensory Evaluation Test controls: environment and test room design Product controls: sample preparation and presentation Panellist controls; factors influencing measurements: psychological and physiological errors
LO3	<ul style="list-style-type: none"> Introduction to Sensory Science: definition, history, the senses, methods, and differences from other research methods Gustation (taste) primary tastes, anatomy, physiology, and chemistry of taste Olfaction (smell) anatomy, physiology and chemistry of smell, transduction, adaptation Tactile (touch) tactile sensations, temperature, mouthfeel, pungency, heat, trigeminal pain Vision (Seeing) eyes: design and anatomy; visual organization including rods, cones Audition (Hearing) mechanisms, anatomy, adaptation Cultural differences in food preferences and perception
LO4	<ul style="list-style-type: none"> Apply statistical analysis, interpretation and communication skills to sensory data Statistical tools used may include mean, mode, median, range, and dispersion, variance and standard deviation; normal distribution; z score, student 's t test; ANOVA, multiple comparisons test; testing hypothesis; level of significance; type I and II errors.

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākongā will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.	100%	All

Ākongā are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākongā via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

MOLECULAR METHODOLOGIES FOR APPLIED SCIENCE

Course code	NSCI6113	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge of the principles and methods of molecular biology and the skills to apply these in an Applied Science context.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Describe the structure and physical properties of nucleic acids and proteins.	2
LO2	Conduct appropriate molecular analyses of organisms in a range of food and environmental samples.	1, 2
LO3	Discuss tools used in molecular biology and their application in an applied science context.	1, 2, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Structure and physical properties of DNA, RNA and proteins Electrophoresis of nucleic acids and proteins (agarose GE, PAGE)
LO2	<ul style="list-style-type: none"> Factors contributing to selection of target molecule for analysis DNA, RNA and protein extraction from a range of sample types Mode of action of restriction enzymes and nucleic acid modifying enzymes Nucleic acid hybridization theory Methodologies using nucleic acid probes: blotting techniques; microarrays Methodologies using nucleic acid primers: PCR; sequencing Range nucleic acid fingerprinting/typing methodologies: including RFLP (PFGE), AFLP, DGGE Protein analyses: including ELISA, 2D-PAGE, Westerns, FISH Use of international nucleic acid and protein databases Reflect on social, ethical, and cultural implications
LO3	<ul style="list-style-type: none"> Overview of Recombinant DNA Technology and its application in Food Technology and Environmental Science Legislation controlling Recombinant DNA Technology in New Zealand Reflect on social, ethical and cultural implications Data privacy Sequence ownership and data breaches

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

CONSERVATION AND BIOSECURITY FOR APPLIED SCIENCE

Course code	NSCI6114	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop theoretical knowledge and skills in conservation and biosecurity relevant to environment management and the applied sciences.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Describe the origins and unique characteristics of Aotearoa New Zealand flora and fauna.	1
LO2	Discuss the conservation management of endangered species and ecosystems in Aotearoa New Zealand and other countries.	1, 3, 5
LO3	Evaluate how agencies in Aotearoa New Zealand prevent, detect, and manage biosecurity incursions.	1, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Gondwanaland separating and evolution of species Gigantism, flightlessness, divaricating plants Vulnerability of New Zealand biota to invasion by exotic pests
LO2	<ul style="list-style-type: none"> Conservation strategies used to protect endangered species and ecosystems in New Zealand and other countries The principles of designing and managing a conservation project Matauranga Māori perspective of biodiversity Importance of and threats to biodiversity in New Zealand and other countries Removal or slowing the spread of invasive species Habitat preservation and restoration Replanting and relocation Breeding management Reflect on social, ethical, and cultural implications
LO3	<ul style="list-style-type: none"> Border control The roles of agencies responsible for conservation and biosecurity in New Zealand Pre-border, border, and post-border biosecurity strategies used in New Zealand Monitoring and surveillance Biological control Reflect on social, ethical, and cultural implications

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

PROCESS ENGINEERING FOR APPLIED SCIENCE

Course code	NSCI6115	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			

Course Specific Requirements: ...

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge of fundamental process engineering principles, and skills in common food processing unit operations.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Develop process flow diagrams for a range of process operations in a STEM context.	1, 4
LO2	Discuss the basic principles of fluid properties and associated laws including static and in motion fluids.	1
LO3	Discuss a range of heat transfer methods and systems.	1, 3, 4
LO4	Examine a range of food processing unit operations.	1, 2, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Process Flow diagrams
LO2	<ul style="list-style-type: none"> Fluids and their properties; i.e., density, viscosity, pressure, Reynolds No. Pressure in static systems: pressure, manometers, atmospheric pressure, barometry Fluids in motion; applications of Bernoulli to flow measurement Viscosity of fluids, viscosity measurement, and various different fluid properties in relation to viscosity Pumps and pump selection
LO3	<ul style="list-style-type: none"> Different types of heat exchangers and their associated calculations
LO4	<ul style="list-style-type: none"> Separation unit operations - Mixing and size reduction unit operations Reflect on social, ethical and cultural implications of food processing

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

WINE SCIENCE					
Course code	BVW602	Level	6	Credits	15
Pre-requisites	NSCI5115 NSCI5116	Co-requisites		Nil	
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills in advanced wine analysis and laboratory trials used in commercial winemaking.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcomes
LO1	Assess the qualities of a wine using standard industry tasting descriptors.	2
LO2	Identify the impact of microbial activity to all stages of wine production.	2
LO3	Diagnose the cause of wine faults and formulate appropriate solutions.	3, 4
LO4	Discuss the origins and use of different oak types and influence of coopering practices.	1, 2, 4
LO5	Formulate winemaking decisions based on wine analysis and trials. Examine the principles and techniques of fining.	4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Wine aroma chemistry
LO2	<ul style="list-style-type: none"> Bacteria and yeasts in grapes, juice, wine and storage
LO3	<ul style="list-style-type: none"> Identify the major faults in wine and understand their origin and solutions Sulphides and finings
LO4	<ul style="list-style-type: none"> Barrels and oak derived aromas Reactions that take place during maturation
LO5	<ul style="list-style-type: none"> Phenolics Additions and adjustments to wine Stabilisation Oxidation and aging reactions

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākongā.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākongā will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All

Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

ADVANCED CULTURE TECHNIQUES

Course code	NSCI6117	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills to enable students to prepare and perform advanced laboratory techniques and investigate epidemiology.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Use epidemiology principles to investigate infectious diseases.	1, 2, 3, 5
LO2	Apply specialised techniques to investigate organisms in an applied science context.	1, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Epidemiology Koch's postulates Reflect on social, ethical and cultural implications
LO2	<ul style="list-style-type: none"> Cultural perspectives on the use of biological tissues Virus enumeration Pathogen detection Tissue culture Specialised media Reflect on social, ethical and cultural implications

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes
Assessment portfolio	100%	All

Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.		
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Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course

WORK PLACEMENT 2

Course code	NSCI6118	Level	6	Credits	15
Pre-requisites	NSCI6102	Co-requisites			
Main Programme	New Zealand Diploma in Applied Science (Level 6)				
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

Course Specific Requirements: Includes a minimum of 130 hours work placement.

Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to further develop knowledge and skills enable students to actively engage in an applied science workplace, and critically reflect on their experience.

Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcomes
LO1	Apply knowledge, skills, and attributes to practice in an Applied Science environment.	1, 2, 3, 4, 5
LO2	Reflect on individual contribution to routine and non-routine tasks in an applied science workplace.	1, 3, 4, 5
LO3	Reflect on professional practice and identify opportunities for future learning.	1, 2, 3, 4, 5

Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> Supervised work experience in an appropriate applied science workplace Development of reflective skills Review of relevant legislation
LO2	<ul style="list-style-type: none"> Apply theory to practice Supervised work experience in an appropriate applied science workplace
LO3	<ul style="list-style-type: none"> Interpersonal communication skills Ethical, social, and culturally responsive behaviour in professional practice Identify and reflect on areas to improve in current and future practice Professional expectations

Ngā Mahi Ako me te Whakaako | Learning & Teaching Activities

Learning and teaching activities will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.

Aromatawai | Assessment

Assessment in this course is achievement-based / competency-based. Ākonga will be advised of all matters relating to summative assessment at the start of the course.

Assessment activity	Weighting	Learning outcomes

Assessment portfolio Will employ a range of elements drawn from approved methods to align with the context of the learning (delivery mode, regional specific requirement, etc.) and any particular needs of the group of ākonga.	100%	All
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Ākonga are required to provide sufficient evidence against all learning outcomes in order to pass the course.

Ngā Rauemi Ako | Learning Resources

All required and recommended resources are advised to ākonga via course outlines.

Version Tracking

Ver No.	Approved by	Approval date	Effective from	Description of change
1	Poari Akoranga		DD-MM-YYYY	New Course