

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

**Programme of Study:  
New Zealand Diploma in Applied Science (Level 5)**

**Leading to the award of:  
2552 New Zealand Diploma in Applied Science (Level 5)**



**Te Pūkenga**

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## Ngā Ihirangi | Contents

1.1	New Zealand Diploma in Applied Science (Level 5) .....	1
1.2	Te Huanui Whakawhanake i te Hōtaka   Development Approach .....	2
1.3	Te Whakawhitinga ki te Tūhono Kawenga Hōtaka   Transition to the Unified Programme .....	3
<b>Appendix 1: Te Hono o te Kahurangi   Qualification Details .....</b>		<b>4</b>
<b>Appendix 2: Waeture ā-Hōtaka   Programme Regulations .....</b>		<b>6</b>
<b>Appendix 3: Ngā Hua o te Ako me te hāngai ki Ngā Putanga Ako a te Taura   Learning Outcomes and Assessment Mapped to Graduate Profile Outcomes .....</b>		<b>9</b>
<b>Appendix 4: Akoranga   Courses .....</b>		<b>13</b>

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## 1.1 New Zealand Diploma in Applied Science (Level 5)

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 ākonga 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 ākonga, [Te Rito Report Part Three](#) indicated the need for Te Pūkenga to provide appropriate impairment-related learning support for Disabled ākonga 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 ākonga, and training. The plan provides a unified national strategy across Te Pūkenga and was developed with ākonga and kaimahi (staff). The plan provides a comprehensive road map towards a vocational system that hears the voices of Disabled ākonga 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 ākonga, 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 ākonga.

## 1.2 Te Huanui Whakawhanake i te Hōtaka | Development Approach

The New Zealand Diploma in Applied Science (Level 5) 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 Natural and Physical Sciences; 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) ākonga)
- 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:

- Version changes or accreditation/regulatory body changes have already been made.

- 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
<b>New Zealand Diploma in Applied Science</b>	XXXXXX	2	120	5

which leads to the award of the following qualification

<b>New Zealand Diploma in Applied Science</b>		2552	2	120	5
NZSCED	019999 Natural and Physical Sciences>Other Natural and Physical Sciences>Natural and Physical Sciences not elsewhere classified				
Qualification developer	Ara Institute of Canterbury Ltd				
Quality assurance body	New Zealand Qualifications Authority				
Next review	31/05/2026				
Next planned consistency review	2023				

### Strategic purpose

The purpose of this qualification is to provide individuals with broad theoretical and technical knowledge within a range of natural and physical sciences for employment or education.

The qualification will also identify for the science-related sectors of Aotearoa New Zealand those employees who are able to self-manage, be responsible, and support leadership in the manufacturing and regulatory industries, field work, research, and development.

### Graduate profile

Graduates of this qualification will be able to:

1. Select and apply scientific principles to carry out routine tasks in an operational or research context.
2. Collect, process, evaluate and report scientific data in an operational or research context.
3. Identify common problems with scientific processes and recommend solutions.
4. Contribute to, and have responsibility for, team outcomes in a scientific workplace.
5. Apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.

### Qualification education pathway

This qualification builds on the New Zealand Certificate in Applied Science (Level 4) [Ref: 2551].

This qualification may lead to the New Zealand Diploma in Applied Science (Level 6) [Ref: 2553] or higher-level study in a wide range of science-related disciplines.

### Employment/cultural/community pathway

Graduates of this qualification can work in routine operational positions in science-related fields of work including manufacturing and regulatory industries, field work, research, and development.

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**Professional recognition/accreditation****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 candidates hold a Level 4 qualification in science 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](mailto: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

<b>General admission</b>	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 A foundation qualification at level 4 that includes science OR New Zealand Certificate in Applied Science (Level 4) or equivalent.
<b>Special admission</b>	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.
<b>Discretionary admission</b>	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.
<b>Additional requirements</b>	For the Pre-Analytical Technician pathway: students are required to be concurrently employed in a Patient Services or Phlebotomy trainee role.
<b>English language requirements</b>	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 5.5 (general or academic) with no individual band lower than 5 from one test taken in the preceding two years, or an equivalent described in <a href="#">NZQA Rules</a> .

### 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 with [Te Kawa Maiooro | Educational Regulatory Framework](#).

## Tohu o te Hōtaka | Award of Qualification

<b>Credit requirements</b>	To be awarded the <b>New Zealand Diploma in Applied Science (Level 5)</b> 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.			
	<b>Table 1: Credit Requirements</b>			
	<b>Level</b>	<b>Compulsory credits</b>	<b>Elective credits</b>	<b>Total credits</b>
	5	45	75	120
	<b>Total credits</b>			<b>120</b>
	<b>Table 2: Schedule of Courses</b>			
	<b>Course code</b>	<b>Course title</b>	<b>Credits</b>	<b>Pre-requisites</b>
	<b>Level 5</b>			
	NSCI5101	Professional Skills in Science	15	
	NSCI5103	Practical Laboratory Skills	15	
NSCI5104	Quality Assurance	15		
<b>Total compulsory credits @ Level 5</b>			<b>45</b>	
<i>Plus five electives from the following courses (may include an approved course from another programme)</i>				
<b>Level 5</b>				
NSCI5105	Chemistry for Applied Science	15		
NSCI5106	Statistical Analysis	15		
NSCI5107	Microbiology in Industry	15		
NSCI5108	Biochemistry for Applied Science	15		
NSCI5109	Anatomy and Physiology	15		
NSCI5114	Biology for Applied Science	15		
NSCI5115	Organic Chemistry for Applied Science	15		
NSCI5116	Wine Making	15		
NSCI5117	Wine Chemistry and Analysis	15		
NSCI5118	Physics for Applied Science	15		
NSCI5119	Environmental Issues	15		
NSCI5120	Food and Nutrition	15		
<b>Level 6</b>				
NSCI6121	Project Design and Analysis	15		
<b>Total elective credits Level 5 or 6</b>			<b>75</b>	
<b>Level 5 Pre-Analytical Technician Pathway</b>				
NSCI5101	Professional Skills	15		
NSCI5102	Practical Skills for Pre-analytical Technicians	15		
NSCI5104	Quality Assurance	15		
NSCI5109	Anatomy and Physiology	15		
NSCI5111	Health, Safety and Infection Control	15		
NSCI5112	Laboratory Specimens	15		
NSCI5113	Introduction to Pre-Analytical Medical Laboratory Science	10		
NSCI5110	Capstone Project	20		
<b>Total compulsory credits Level 5</b>			<b>120</b>	

	<b>TOTAL CREDITS</b>	<b>120</b>
<b>Programme completion</b>	<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

<b>Grading</b>	<p>Assessment in this programme is achievement-based.</p> <p>Grading follows the guidelines in <a href="#">Te Kawa Maiorooro   Educational Regulatory Framework</a>.</p> <p>Specific assessment and/or course pass requirements are detailed in programme delivery documentation.</p>
<b>Assessment submission and additional opportunities</b>	<p>Requirements and processes for</p> <ul style="list-style-type: none"> <li>• assessment submission,</li> <li>• resit and/or resubmission opportunities for failed assessments,</li> <li>• reassessment opportunities for failed courses,</li> <li>• late submission of assessments, and</li> <li>• extension of assessment deadlines</li> </ul> <p>are outlined in programme delivery documentation provided to ākonga at the start of their course.</p>

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	Select and apply scientific principles to carry out routine tasks in an operational or research context.	Collect, process, evaluate and report scientific data in an operational or research context.	Identify common problems with scientific processes and recommend solutions.	Contribute to, and have responsibility for, team outcomes in a scientific workplace.	Apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.
					GPO 1	GPO 2	GPO 3	GPO 4	GPO 5
NSCI5501	Professional Skills in Science	Aim	The aim of this course is to develop the knowledge, skills and attributes to work effectively in an applied science setting, with an understanding of workplace legislative requirements.						
		LO1	Take responsibility for compliance requirements of health and safety legislation in a STEM team.	All LOs: Assessment portfolio (100%)			✓	✓	✓
		LO2	Communicate in oral and written contexts in an applied science setting.					✓	✓
		LO3	Contribute to a STEM team to apply hazard recognition and management principles.				✓	✓	
		LO4	Use current computing technology to analyse data within a scientific context.			✓			
NSCI5502	Practical skills for Pre-analytical Technicians	Aim	The aim of this course is to develop knowledge and skills for pre-analytical technicians to safely carry out a range of generic laboratory or workplace tasks appropriately and, where applicable, accurately.						
		LO1	Perform correct protocols and procedures for specimen transport, handling, and sampling.	All LOs: Assessment portfolio (100%)	✓	✓	✓	✓	
		LO2	Perform safe use and routine maintenance of laboratory equipment.		✓	✓		✓	
		LO3	Complete basic laboratory calculations accurately.		✓	✓		✓	
		LO4	Outline how information systems are used in the workplace.			✓		✓	
NSCI5503	Practical Laboratory Skills	Aim	The aim of this course is to develop knowledge and skills to safely carry out a range of generic laboratory or workplace tasks.						
		LO1	Make and interpret measurements from a range of instruments and equipment.	All LOs: Assessment portfolio (100%)	✓	✓			
		LO2	Demonstrate good practice related to safety, and sample handling and tracking in an operational or research context.				✓		✓
		LO3	Apply academic, information and digital literacy skills to a range of professional communications.			✓			✓
		LO4	Carry out scientific calculations in an operational or research context.		✓	✓			
NSCI5504	Quality Assurance	Aim	The aim of this course is to develop knowledge, skills and attributes in organisational techniques for establishing, maintaining and improving quality assurance in a laboratory or other organisational unit.						
		LO1	Work collaboratively to apply industry-specific quality standards and approaches to product quality.	All LOs: Assessment portfolio (100%)		✓		✓	✓
		LO2	Identify the elements that govern quality assurance in the laboratory or other organisations.		✓			✓	✓
NSCI5505	Chemistry for Applied Science	Aim	The aim of this course is to develop knowledge, skills and attributes to explore and apply theoretical knowledge and practical skills relevant to further study in chemistry and the applied sciences.						
		LO1	Describe the properties of chemical elements and compounds in terms of redox behaviour, acid-base properties, bonding, and reactivity.	All LOs: Assessment portfolio (100%)	✓	✓			
		LO2	Describe the chemistry of organic functional groups relevant to biological and analytical chemistry.		✓	✓			
		LO3	Apply practical chemistry skills in a STEM related environment.		✓	✓	✓		
NSCI5506	Statistical Analysis	Aim	The aim of this course is to develop knowledge, skills and attributes to analyse and report statistical concepts in a science context.						
		LO1	Use a statistical package to display, analyse and report on scientific data in a STEM context.	All LOs: Assessment portfolio (100%)		✓		✓	✓
		LO2	Use probability distributions in a research or operational context.		✓	✓			
		LO3	Use introductory statistical inference processes in a research or operational context.		✓	✓			

Course Code & Title		Course Aim & Outcomes		Assessment	Select and apply scientific principles to carry out routine tasks in an operational or research context.	Collect, process, evaluate and report scientific data in an operational or research context.	Identify common problems with scientific processes and recommend solutions.	Contribute to, and have responsibility for, team outcomes in a scientific workplace.	Apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.
					GPO 1	GPO 2	GPO 3	GPO 4	GPO 5
NSCI5507	Microbiology in Industry	Aim	The aim of this course is to develop knowledge, skills and attributes to acquire the practical skills and theoretical knowledge in microbiology required to practise safely in a laboratory or industry setting.						
		LO1	Identify and differentiate microorganisms in a STEM context.	All LOs: Assessment portfolio (100%)	√	√	√		
		LO2	Perform bacterial enumeration, identification and reporting in an operational or research context.		√	√		√	
		LO3	Describe bacterial cultivation and growth, and methods used to control microbial growth.		√	√			
NSCI5508	Biochemistry for Applied Science	Aim	The aim of this course is to develop knowledge and skills related to the structures and properties of biomolecules, their extraction and associated product quality requirements.						
		LO1	Describe the structures and properties of biological molecules.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Describe commercial extraction and purification of biological materials, and related product safety considerations.		√	√	√		
		LO3	Perform extraction and purification of biological materials in an operational or research context.		√	√	√		
NSCI5509	Anatomy and Physiology	Aim	The aim of this course is to develop knowledge, skills and attributes to develop a knowledge base of the anatomy and physiology of the human body in relation to collection of medical laboratory specimens.						
		LO1	Apply anatomical terms to describe the human body accurately.	All LOs: Assessment portfolio (100%)	√				
		LO2	Outline the location and function of specified human tissues and physiological processes.		√	√			
		LO3	Describe the structure and function of specified human blood collection sites and the circulatory system.		√	√			
		LO4	Describe disorders commonly associated with a range of human body systems.			√	√		
NSCI5510	Capstone Project	Aim	The aim of this course is to develop knowledge, skills and attributes to actively engage in an applied science workplace, and reflect on their experience.						
		LO1	Work within legislative requirements in an applied science setting.	All LOs: Assessment portfolio (100%)	√			√	√
		LO2	Apply theory to practice in an applied science setting.		√	√	√	√	√
		LO3	Establish and maintain effective workplace relationships in an applied science setting.					√	√
		LO4	Reflect on professional practice in an applied science setting.						√
NSCI5511	Health, Safety and Infection Control	Aim	The aim of this course is to develop knowledge, skills and attributes in infection control in the applied science industry.						
		LO1	Reflect on health and safety policies and procedures as they relate to infection control.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Apply the principles of infection control in the applied science industry.		√		√		
		LO3	Evaluate the implementation of appropriate infection control measures.		√	√	√		
		LO4	Describe adverse health and safety incidents related to infection control and appropriate responses.			√	√		
NSCI5512	Laboratory Specimens	Aim	The aim of this course is to develop knowledge, skills and attributes in biological sample collection, handling and testing required to practise safely in an industry laboratory setting.						
		LO1	Describe common laboratory tests, commonly used clinical details and abbreviations.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Outline aspects of specialised tests and procedures in an operational or research context.		√				
		LO3	Outline disorders and diagnostic tests commonly associated with a range of body systems.			√			
NSCI5513	Introduction To Pre-Analytical Medical Laboratory Science	Aim	The aim of this course is to develop knowledge, skills and attributes to undertake work placement or enter employment with an understanding of the compliance obligations, ethical considerations and sample handling requirements for a healthcare laboratory workplace.						
		LO1	Define the ethical and legislative requirements within the medical laboratory environment.	All LOs:			√		√

Course Code & Title		Course Aim & Outcomes		Assessment	Select and apply scientific principles to carry out routine tasks in an operational or research context.	Collect, process, evaluate and report scientific data in an operational or research context.	Identify common problems with scientific processes and recommend solutions.	Contribute to, and have responsibility for, team outcomes in a scientific workplace.	Apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.
					GPO 1	GPO 2	GPO 3	GPO 4	GPO 5
		LO2	Apply compliance requirements of industry-specific quality standards for the medical laboratory environment.	Assessment portfolio (100%)	√	√			√
		LO3	Describe the principles of collection and handling of laboratory specimens, collection equipment, procedures, and documentation.		√				
NSCI5514	Biology for Applied Science	Aim	The aim of this course is to develop theoretical knowledge and practical skills in biology relevant to the applied sciences.						
		LO1	Describe the characteristics that distinguish the five Kingdoms of living things.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Explain genetic information inheritance and how variation occurs.		√				
		LO3	Explain the processes of evolution and speciation.		√				
		LO4	Analyse the adaptations of plants and animals to overcome the challenges associated with life on land.		√	√			
NSCI5515	Organic Chemistry for Applied Science	Aim	The aim of this course is to develop knowledge and skills in organic chemistry and biochemistry.						
		LO1	Classify organic compounds.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Describe properties and chemical reactions of specific functional groups.		√	√	√		
		LO3	Describe structures, properties and roles of carbohydrates, lipids and proteins.		√		√		
		LO4	Explain the action of enzymes and factors affecting enzyme activity.		√		√		
NSCI5516	Wine Making	Aim	The aim of this course is to develop knowledge of wine production, and the knowledge, skills and attributes required to work in a winery.						
		LO1	Evaluate a range of table wines using sensory skills.	All LOs: Assessment portfolio (100%)	√	√	√		
		LO2	Apply wine making principles to plan and produce a table wine.		√	√	√		
		LO3	Apply fermentation kinetics to the management of a wine making project.		√	√	√		
		LO4	Operate winemaking equipment to carry out winemaking tasks.		√		√	√	
NSCI5517	Wine Chemistry and Analysis	Aim	The aim of this course is to develop knowledge and skills in chemistry and microbiology applicable to wine analysis and wine production.						
		LO1	Apply a range of introductory chemistry principles and concepts to winemaking and analysis.	All LOs: Assessment portfolio (100%)	√	√	√		
		LO2	Describe the basic morphology of microorganisms responsible for primary fermentation, malolactic fermentation and spoilage.		√	√	√		
		LO3	Perform a range of laboratory tasks and interpret results.		√	√			
NSCI5518	Physics for Applied Science	Aim	The aim of this course is to develop knowledge and skills related to fundamental physical principles, how they are described mathematically, and their applications in other sciences.						
		LO1	Describe principles of physics in mechanics, fluids, temperature and heat.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Apply physical concepts and mathematical techniques to solve practical problems.		√	√	√		
		LO3	Explore physical concepts through experiments or simulations.			√	√		
NSCI5519	Environmental Issues	Aim	The aim of this course is to develop knowledge of environmental issues.						
		LO1	Describe the composition of the atmosphere and hydrosphere.	All LOs: Assessment portfolio (100%)	√	√			
		LO2	Discuss the sustainable use of natural and man-made environments.		√	√	√		√
		LO3	Investigate a range of current environmental issues.		√	√	√		√
NSCI5520	Food and Nutrition	Aim	The aim of this course is to develop a basic knowledge of food science and nutrition relevant to the health of New Zealand society.						

Course Code & Title			Course Aim & Outcomes		Assessment	Select and apply scientific principles to carry out routine tasks in an operational or research context.	Collect, process, evaluate and report scientific data in an operational or research context.	Identify common problems with scientific processes and recommend solutions.	Contribute to, and have responsibility for, team outcomes in a scientific workplace.	Apply knowledge of ethical, social, and culturally responsive behaviour to professional practice.
						GPO 1	GPO 2	GPO 3	GPO 4	GPO 5
	LO1	Explain the role of nutrients in the body and dietary sources of nutrients.	All LOs: Assessment portfolio (100%)		√					
	LO2	Explain the role of nutrition in health and chronic disease conditions.			√		√			
	LO3	Describe nutritional requirements for different types of physical activity.			√	√	√			
	LO4	Discuss factors that influence food choice and healthy eating strategies for a range of population sub-groups.			√	√	√			√
NSCI5521 Project Design and Analysis	Aim	The aim of this course is to develop the knowledge and skills 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								
	LO1	Critically evaluate research informed project design and data analysis.	All LOs: Assessment portfolio (100%)		√	√				
	LO2	Apply the principles of experimental design to applied science projects.			√					
	LO3	Perform preparatory work for a defined applied science project.			√		√			√

## 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 ākongā.

PROFESSIONAL SKILLS IN SCIENCE					
Course code	NSCI5501	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

**Course Specific Requirements:** Must include 40 hours relevant work integrated learning (such as work experience, project work, scenarios, simulations, relevant practical work, and activities that develop professional and reflective practice).

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop the knowledge, skills and attributes to work effectively in an applied science setting, with an understanding of workplace legislative requirements.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākongā will be able to...		Graduate outcome alignment
LO1	Take responsibility for compliance requirements of health and safety legislation in a STEM team.	3, 4, 5
LO2	Communicate in oral and written contexts in an applied science setting.	4, 5
LO3	Contribute to a STEM team to apply hazard recognition and management principles.	3, 4
LO4	Use current computing technology to analyse data within a scientific context.	2

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Health and safety legislation</li> <li>Employer and employee obligations under workplace legislation</li> <li>Code of Consumer Rights, confidentiality and privacy</li> <li>Teamwork including communication, negotiation, conflict management, motivation</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Professional communication skills including workplace behaviour, ethics and integrity</li> </ul>



	<ul style="list-style-type: none"> <li>• Oral and written communication skills</li> <li>• Customer communication: active listening, assessing customer needs, expectations, behaviours, problem solving, and conflict management strategies</li> <li>• Culturally appropriate communication and overcoming language barriers</li> <li>• Development of reflective practice for communication improvement</li> <li>• Use of technical manuals</li> <li>• Competence in using software technologies with emphasis on Microsoft Office products e.g. Word, PowerPoint, Excel, Publisher</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Hazardous chemical classification, handling &amp; storage</li> </ul>
LO4	<ul style="list-style-type: none"> <li>• Computerised inventory and reporting systems</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## PRACTICAL SKILLS FOR PRE-ANALYTICAL TECHNICIANS

Course code	NSCI5502	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 for pre-analytical technicians to safely carry out a range of generic laboratory or workplace tasks appropriately and, where applicable, accurately.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Perform correct protocols and procedures for specimen transport, handling, and sampling.	1, 2, 3, 4
LO2	Perform safe use and routine maintenance of laboratory equipment.	1, 2, 4
LO3	Complete basic laboratory calculations accurately.	1, 2, 4
LO4	Outline how information systems are used in the workplace.	2, 4

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Use and accuracy of laboratory glassware</li> <li>Following laboratory procedures and recording data</li> <li>Packaging and transport of specimens from patient to laboratory, and between laboratories</li> <li>Selection, preparation, labelling, and storage of specimens</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Equipment use and routine maintenance including centrifuges, barcode scanners, lab information systems, data loggers, autopipettes, balance, thermometer)</li> <li>Laboratory skills including aliquoting, aseptic technique, basic microscopy, filtration</li> <li>Use and calibration of laboratory equipment including autopipettes, balances, thermometers, pH-meters, spectrophotometers</li> <li>Preparation of standard solutions and dilutions</li> <li>UV-visible techniques including theoretical background and data interpretation</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Practical knowledge of undertaking calculations in the laboratory</li> <li>Use of controls and standards</li> <li>Experimental errors</li> <li>Calibration curves and presentation of data graphically</li> </ul>

LO4	<ul style="list-style-type: none"> <li>Laboratory Information Systems (LIS), Laboratory Information Management Systems (LIMS)</li> </ul>
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### 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
<b>Assessment portfolio</b> 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

## PRACTICAL LABORATORY SKILLS

Course code	NSCI5503	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

**Course Specific Requirements:** Must include 60 hours relevant work integrated learning (such as work experience, project work, scenarios, simulations, relevant practical work, and activities that develop professional and reflective practice).

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge and skills to safely carry out a range of generic laboratory or workplace tasks.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Make and interpret measurements from a range of instruments and equipment.	1, 2
LO2	Demonstrate good practice related to safety, and sample handling and tracking in an operational or research context.	3, 5
LO3	Apply academic, information and digital literacy skills to a range of professional communications.	2, 5
LO4	Carry out scientific calculations in an operational or research context.	1, 2

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Equipment use and routine maintenance including centrifuges, barcode scanners, lab information systems, data loggers, autopipettes, balance, thermometer</li> <li>Laboratory skills including aliquoting, aseptic technique, basic microscopy, filtration</li> <li>Use and calibration of laboratory equipment including autopipettes, balances, thermometers, pH-meters, spectrophotometers</li> <li>Preparation of standard solutions and dilutions</li> <li>UV-visible techniques including theoretical background and data interpretation</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Use and accuracy of laboratory glassware</li> <li>Following laboratory procedures and recording data</li> <li>Selection, preparation, labelling, and storage of specimens</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Perform and report on measurements</li> <li>Analyses and report on data from measurements</li> </ul>

	<ul style="list-style-type: none"> <li>Report quantitative spectrophotometric analysis, produce a standard curve, and interpret spectrophotometric data.</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Practical knowledge of undertaking calculations in the laboratory</li> <li>Use of controls and standards</li> <li>Experimental errors</li> <li>Calibration curves and presentation of data graphically</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## QUALITY ASSURANCE

Course code	NSCI5504	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)		150	

**Course Specific Requirements: Course Specific Requirements:** May include relevant work integrated learning (such as work experience, project work, scenarios, simulations, relevant practical work, and activities that develop professional and reflective practice).

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge, skills and attributes in organisational techniques for establishing, maintaining and improving quality assurance in a laboratory or other organisational unit.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Work collaboratively to apply industry-specific quality standards and approaches to product quality.	2, 4, 5
LO2	Identify the elements that govern quality assurance in the laboratory or other organisations.	1, 4, 5

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Quality terminology</li> <li>Policies and procedures for quality</li> <li>Sources of evidence for quality improvement</li> <li>Leadership for quality</li> <li>Supply chain management</li> <li>Teamwork, collaborative skills</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Quality management systems (including ISO 9001, ISO 17025, ISO 15189, IANZ)</li> <li>Quality management practitioners (such as Shewhart, Deming, Juran, Baldrige) and their contributions to quality management</li> <li>The role of audit and review</li> <li>Linkages between technology and product quality</li> <li>Effects of collection procedures on the quality of laboratory specimens and samples</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## CHEMISTRY FOR APPLIED SCIENCE

Course code	NSCI5505	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes to explore and apply theoretical knowledge and practical skills relevant to further study in chemistry and the applied sciences.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe the properties of chemical elements and compounds in terms of redox behaviour, acid-base properties, bonding, and reactivity.	1, 2
LO2	Describe the chemistry of organic functional groups relevant to biological and analytical chemistry.	1, 2
LO3	Apply practical chemistry skills in a STEM related environment.	1, 2, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"><li>The periodic table, atomic structure and properties of elements</li><li>Structure, properties and bonding of chemical compounds</li><li>Chemical formulae and chemical equations including rates and enthalpy change</li><li>Redox chemistry</li><li>Acid-base equilibria including buffers and pH</li><li>Calculations related to chemical analysis</li></ul>
LO2	<ul style="list-style-type: none"><li>Structure, properties and reactions of organic compounds including isomerism and biological function</li><li>Essential biomolecules</li></ul>
LO3	<ul style="list-style-type: none"><li>Apply practical chemistry skills in an operational or research context</li><li>Analyse and report on samples</li></ul>

### 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
<b>Assessment portfolio</b> 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

**STATISTICAL ANALYSIS**

Course code	NSCI5506	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)			150

**Course Specific Requirements: ...****Whāinga/He Tauākī Akoranga | Aim/Outcome Statement**

The aim of this course is to develop knowledge, skills and attributes to analyse and report statistical concepts in a science context.

**Ngā Hua o te Ako | Learning Outcomes**

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Use a statistical package to display, analyse and report on scientific data in a STEM context.	2, 4, 5
LO2	Use probability distributions in a research or operational context.	1, 2
LO3	Use introductory statistical inference processes in a research or operational context.	1, 2

**Ngā Tūtohu o te Kiko | Indicative Content**

LO1	<ul style="list-style-type: none"> <li>Computer software use</li> <li>Graph, summarise and interpret data</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Sampling</li> <li>Probability distributions</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Calculate, interpret and report using statistical inference</li> <li>Sampling distributions and inference</li> <li>Confidence intervals and hypothesis testing</li> <li>Analysis of qualitative data</li> <li>Introduction to analysis of variance (ANOVA)</li> <li>Correlation and regression analysis</li> </ul>

**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.

<b>Assessment activity</b>	<b>Weighting</b>	<b>Learning outcomes</b>
<b>Assessment portfolio</b> 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

<b>Ver No.</b>	<b>Approved by</b>	<b>Approval date</b>	<b>Effective from</b>	<b>Description of change</b>

## MICROBIOLOGY IN INDUSTRY

Course code	NSCI5507	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)		150	

### Course Specific Requirements: ...

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge, skills and attributes to acquire the practical skills and theoretical knowledge in microbiology required to practise safely 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 outcome alignment
LO1	Identify and differentiate microorganisms in a STEM context.	1, 2, 3
LO2	Perform bacterial enumeration, identification and reporting in an operational or research context.	1, 2, 4
LO3	Describe bacterial cultivation and growth, and methods used to control microbial growth.	1, 2

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>• Identification and differentiation of microorganisms</li> </ul>
LO2	<ul style="list-style-type: none"> <li>• Inoculation of media without contamination or production of aerosols</li> <li>• Enumeration methods for microorganisms</li> <li>• Food, water quality and industrial microbes of interest</li> <li>• Factors affecting bacterial growth</li> <li>• Culturing bacteria under a variety of conditions</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Traditional and molecular microbiology methods</li> <li>• Sterilisation and disinfection</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## BIOCHEMISTRY FOR APPLIED SCIENCE

Course code	NSCI5508	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 related to the structures and properties of biomolecules, their extraction and associated product quality requirements.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe the structures and properties of biological molecules.	1, 2
LO2	Describe commercial extraction and purification of biological materials, including product safety and quality considerations.	1, 2, 3
LO3	Perform extraction and purification of biological materials in an operational or research context.	1, 2, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Structures, properties and roles of carbohydrates, lipids, proteins, nucleic acids</li> <li>Introductory thermodynamic concepts and the thermodynamic laws</li> <li>High energy biomolecules, phosphoric acid anhydrides and ATP as an intermediate shuttle molecule. Energetics involving ATP recycling in the human body</li> <li>Reaction orders, radioactive decay law and reaction rates</li> <li>Fundamentals of enzyme kinetics, Michaelis Menton kinetics</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Industrial applications of organic chemistry including food and non-food products</li> <li>Manufacturing processes including extraction, purification, blending, packaging and safety</li> <li>Action of enzymes and factors affecting enzyme activity</li> <li>The principle and use of chromatography as a laboratory method</li> <li>Isomerism (structural isomers, cis and trans isomers, and optical isomers)</li> <li>Bioreactors</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Describe and apply commonly used chemical separation techniques</li> <li>Extraction and purification of biological materials</li> <li>Thin layer and paper chromatography</li> <li>Column chromatography (Size exclusion, ion exchange etc)</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## ANATOMY AND PHYSIOLOGY

Course code	NSCI5509	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes to develop a knowledge base of the anatomy and physiology of the human body in relation to collection of medical laboratory specimens.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Apply anatomical terms to describe the human body accurately.	1
LO2	Outline the location and function of specified human tissues and physiological processes.	1, 2
LO3	Describe the structure and function of specified human blood collection sites and the circulatory system.	1, 2
LO4	Describe disorders commonly associated with a range of human body systems.	2, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Terminology, functions and organization of body into systems</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Components and main functions of specified organs, and their location within body cavities</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Structure and function of specified blood collection sites and the circulatory system</li> <li>The haemostatic process for:                             <ul style="list-style-type: none"> <li>Major organs</li> <li>Blood collection sites – arm, hand and foot</li> <li>Circulatory System – blood, heart, blood vessels, vascular circulation</li> </ul> </li> <li>Haemostasis – vascular, platelet, coagulation phases and clot retraction and destruction</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Disorders commonly associated with a range of body systems</li> <li>Interventions to reduce the impacts of disease</li> </ul>



### 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
<b>Assessment portfolio</b> 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

## CAPSTONE PROJECT

Course code	NSCI5510	Level	5	Credits	20
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)		200	

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

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

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Work within legislative requirements in an applied science setting.	1, 4, 5
LO2	Apply theory to practice in an applied science setting.	1, 2, 3, 4, 5
LO3	Establish and maintain effective workplace relationships in an applied science setting.	4, 5
LO4	Reflect on professional practice in an applied science setting.	5

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Safe use and maintenance of equipment</li> <li>Perform documentation requirements and use LIS system effectively</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Supervised work experience in an appropriate applied science setting</li> <li>Measure, evaluate and report on performance and improvement against training goals</li> <li>Application of quality assurance skills to work routine</li> <li>Measure, evaluate and report on performance and improvement against training goals</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Interpersonal communication skills and positive workplace relationships</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Development of reflective skills</li> <li>Ethical, social, culturally responsive behaviour</li> <li>Professional expectations</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## HEALTH, SAFETY AND INFECTION CONTROL

Course code	NSCI5511	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes in infection control in the applied science industry.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Reflect on health and safety policies and procedures as they relate to infection control.	1, 2
LO2	Apply the principles of infection control in the applied science industry.	1, 3
LO3	Evaluate the implementation of appropriate infection control measures.	1, 2, 3
LO4	Describe adverse health and safety incidents related to infection control and appropriate responses.	2, 3

### Ngāte Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Best practice health and safety in the workplace</li> <li>Hazard identification and management</li> <li>Planning to ensure a safe work environment: resources, materials, training</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Principles of infection control</li> <li>Personal safety &amp; infection control: standard precautions, barrier precautions, handwashing and sanitising</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Infection control assessment</li> <li>Effectiveness of infection control measures</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Sharps, needlestick injury, and medical waste</li> <li>Blood/body spill kits</li> <li>Emergency treatments including first aid</li> <li>Incident and accident reporting</li> <li>Measure, evaluate and report on performance and improvement against health &amp; safety goals</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## LABORATORY SPECIMENS

Course code	NSCI5512	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes in biological sample collection, handling and testing required to practise safely in an industry laboratory setting.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe common laboratory tests, commonly used clinical details and abbreviations.	1, 2
LO2	Outline aspects of specialised tests and procedures in an operational or research context.	1
LO3	Outline disorders and diagnostic tests commonly associated with a range of human body systems.	2

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Tests, equipment, procedures for collection, specimen integrity and labelling, sterility issues, storage and transportation for specimen types including blood, urine, faeces, sputum, swabs, cytology specimens, aspirates &amp; fluids, CSFs, bone marrow, mycology, tissue, bone, skin scrapings, sweat, saliva, seminal fluid, sterility testing and other fluids.</li> <li>Test profiles: Liver, renal, cardiac markers, iron, thyroid, lipids</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Specialised collection procedures: drug levels, glucose, group matching, tissue typing, platelet function.</li> <li>Blood and specialised tests containers, additives used &amp; rationale for their use, identifying specimen types, timed &amp; fasting specimens, differences between specimens</li> <li>Specialised tests and procedures: principles, site selection &amp; preparation, use of equipment, aftercare, interfering factors, sources of error for: Mantoux test, skin prick and bleeding time</li> </ul>
	<ul style="list-style-type: none"> <li>Biochemistry specimens for routine tests, GTT &amp; polycose, urines and blood gas samples</li> <li>Haematology &amp; coagulation specimens routine tests, PFA, Kleihauer</li> </ul>

	<ul style="list-style-type: none"> <li>• Transfusion Medicine specimens group &amp; hold, cross matching, antenatal, coombs/DAT, tissue typing</li> <li>• Virology &amp; immunology specimens Quantiferon TB Gold, Viral &amp; bacterial serology panels, PCR</li> <li>• Blood cultures volume requirements, frequency of collect, use of anaerobic and aerobic bottles Incident and accident reporting</li> <li>• Laboratory request form documentation before and after collection.</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Disorders and diagnostic tests commonly associated with a range of body systems</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## INTRODUCTION TO PRE-ANALYTICAL MEDICAL LABORATORY SCIENCE

Course code	NSCI5513	Level	5	Credits	10
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
Delivery modes	Provider-based Provider-based (extramural)	Total learning hours (See course delivery document for detailed breakdown.)		100	

### Whāinga/He Tauākī Akoranga | Aim/Outcome Statement

The aim of this course is to develop knowledge, skills and attributes to undertake work placement or enter employment with an understanding of the compliance obligations, ethical considerations and sample handling requirements for a healthcare laboratory workplace.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Define the ethical and legislative requirements within the medical laboratory environment.	3, 5
LO2	Apply compliance requirements of industry-specific quality standards for the medical laboratory environment.	1, 2, 5
LO3	Describe the principles of collection and handling of laboratory specimens, collection equipment, procedures, and documentation.	1

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Ethical and legislative requirements</li> </ul>
LO2	<ul style="list-style-type: none"> <li>IANZ; ISO 9001; ISO 15189 Health &amp; Safety at Work Act Biosecurity Act</li> <li>Codes of Practice</li> <li>Consumer Rights legislation Responsible Persons obligations</li> <li>Industry-specific quality standards</li> <li>Code of Health &amp; Disability Services and Consumer Rights</li> <li>NZIMLS Code of Ethics</li> <li>HPCA Legislation</li> <li>Treaty of Waitangi and Maori Health Model</li> <li>Patient Confidentiality/Privacy</li> <li>Statutory requirements and obligations for body parts &amp; samples</li> <li>Laboratory Policies</li> <li>Duty of Care (Do No harm)</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Blood collection equipment, equipment maintenance &amp; storage, safety devices</li> <li>Venous, capillary, and blood culture collection: patient preparation, collection specifics, collection process, special considerations for neonates post collection process.</li> </ul>



### 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
<b>Assessment portfolio</b> 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

## BIOLOGY FOR APPLIED SCIENCE

Course code	NSCI5514	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes to acquire the theoretical knowledge and practical skills in biology relevant to the applied sciences.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe the characteristics that distinguish the five Kingdoms of living things.	1, 2
LO2	Explain genetic information inheritance and how variation occurs.	2
LO3	Explain the processes of evolution and speciation.	2
LO4	Analyse the adaptations of plants and animals to overcome the challenges associated with life on land.	2, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Distinguishing characteristics of the different groups of plants and animals</li> <li>Use keys to categorise plants and animals</li> <li>Binomial nomenclature</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Mendelian inheritance</li> <li>DNA replication and cell division</li> <li>The structure of prokaryotic and eukaryotic cells</li> <li>Movement of materials into and out of cells</li> <li>The structure and function of nucleic acids</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Darwinian concept of evolution</li> <li>Biogeography and continental drift</li> <li>Progression from unicellularity to multicellularity</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Adaptation of plants and animals for desiccation, reproduction in the absence of water and gaseous exchange in air</li> </ul>

### 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.

<b>Assessment activity</b>	<b>Weighting</b>	<b>Learning outcomes</b>
<b>Assessment portfolio</b> 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

<b>Ver No.</b>	<b>Approved by</b>	<b>Approval date</b>	<b>Effective from</b>	<b>Description of change</b>

## ORGANIC CHEMISTRY FOR APPLIED SCIENCE

Course code	NSCI5515	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills and attributes in organic chemistry and biochemistry.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Classify organic compounds.	1, 2
LO2	Describe properties and chemical reactions of specific functional groups.	1, 2, 3
LO3	Describe structures, properties and roles of carbohydrates, lipids and proteins.	1, 3
LO4	Explain the action of enzymes and factors affecting enzyme activity.	1, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Structures, nomenclature, properties and reactions of hydrocarbons</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Structures, nomenclature, properties, synthesis and reactions of specific functional groups</li> <li>Industrial applications of organic chemistry (fuels, polymers, synthesis of medicines)</li> <li>Laboratory methods for organic synthesis including distillation, reflux and purification</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Structure, properties and roles of carbohydrates, lipids and proteins</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Action of enzymes and factors affecting enzyme activity</li> <li>The principle and use of chromatography as a laboratory method</li> <li>Isomerism (structural isomers, cis and trans isomers, E and Z isomers and optical isomers)</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## WINE MAKING

Course code	NSCI5516	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 wine production, and the knowledge, skills and attributes required to work in a winery.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Evaluate a range of table wines using sensory skills.	1, 2, 3
LO2	Apply wine making principles to plan and produce a table wine.	1, 2, 3
LO3	Apply fermentation kinetics to the management of a wine making project.	1, 2, 3
LO4	Operate winemaking equipment to carry out winemaking tasks.	1, 3, 4

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>Wine evaluation</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Overview of the winemaking process</li> <li>Maturity monitoring and harvest sampling</li> <li>Juice handling and analysis</li> </ul>
LO3	<ul style="list-style-type: none"> <li>The fermentation process</li> <li>Bacteria and yeasts in winemaking</li> <li>Stability and fining</li> <li>Oak and maturation</li> <li>Methods of filtration</li> </ul>
LO4	<ul style="list-style-type: none"> <li>Winery equipment overview</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## WINE CHEMISTRY AND ANALYSIS

Course code	NSCI5517	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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, skills in chemistry and microbiology applicable to wine analysis and wine production.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Apply a range of introductory chemistry principles and concepts to winemaking and analysis.	1, 2, 3
LO2	Describe the basic morphology of microorganisms responsible for primary fermentation, malolactic fermentation and spoilage.	1, 2, 3
LO3	Perform a range of laboratory tasks and interpret results.	1, 2

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>• Chemical compounds</li> <li>• Balancing chemical equations</li> <li>• Dilutions</li> <li>• Acids and bases</li> </ul>
LO2	<ul style="list-style-type: none"> <li>• Yeast and Bacteria morphology</li> <li>• Measuring malo-lactic fermentation</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Laboratory tasks</li> <li>• Measuring sugars and acids in grapes and wine</li> <li>• Sulphur dioxide determination</li> <li>• Alcohol and Volatile acidity determination</li> <li>• Metric units of dilution</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## PHYSICS FOR APPLIED SCIENCE

Course code	NSCI5518	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 related to fundamental physical principles, how they are described mathematically, and their applications in other sciences.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe principles of physics in mechanics, fluids, temperature and heat.	1, 2
LO2	Apply physical concepts and mathematical techniques to solve practical problems.	1, 2, 3
LO3	Explore physical concepts through experiments or simulations.	2, 3

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>• Introduction, Measurement, Estimating</li> <li>• Describing motion: Kinematics in one dimension</li> <li>• Kinematics in two dimensions; vectors</li> <li>• Dynamics: Newton's laws of motion</li> <li>• Work and Energy</li> <li>• Fluids</li> <li>• Temperature and Kinetic Theory</li> <li>• Heat</li> </ul>
LO2	<ul style="list-style-type: none"> <li>• Problem solving</li> <li>• Problems related to applications of technology</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Experiments, simulations</li> </ul>

### 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.

<b>Assessment activity</b>	<b>Weighting</b>	<b>Learning outcomes</b>
<b>Assessment portfolio</b> 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**

<b>Ver No.</b>	<b>Approved by</b>	<b>Approval date</b>	<b>Effective from</b>	<b>Description of change</b>

## ENVIRONMENTAL ISSUES

Course code	NSCI5519	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 environmental issues.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Describe the composition of the atmosphere and hydrosphere.	1, 2
LO2	Discuss the sustainable use of natural and man-made environments.	1, 2, 3, 5
LO3	Investigate a range of current environmental issues.	1, 2, 3, 5

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>The chemistry, microbiology and biology of water, soil, and air</li> </ul>
LO2	<ul style="list-style-type: none"> <li>Natural and man-made environments</li> <li>Sustainable practices</li> <li>Role of the Treaty of Waitangi in regard to the sustainable use of resources and environmental management</li> </ul>
LO3	<ul style="list-style-type: none"> <li>Climate change</li> <li>Ocean acidification</li> <li>Sustainable use of energy</li> <li>Waste and recycling</li> <li>Ecological footprints</li> <li>Kaitiakitanga</li> <li>Other topical environmental issues</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## FOOD AND NUTRITION

Course code	NSCI5520	Level	5	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 a basic knowledge of food science and nutrition relevant to the health of New Zealand society.

### Ngā Hua o te Ako | Learning Outcomes

Upon the successful completion of this course, ākonga will be able to...		Graduate outcome alignment
LO1	Explain the role of nutrients in the body and dietary sources of nutrients.	1
LO2	Explain the role of nutrition in health and chronic disease conditions.	1, 3
LO3	Describe nutritional requirements for different types of physical activity.	1, 2, 3
LO4	Discuss factors that influence food choice and healthy eating strategies for a range of population sub-groups.	1, 2, 3, 5

### Ngā Tūtohu o te Kiko | Indicative Content

LO1	<ul style="list-style-type: none"> <li>• Definition of nutrients and nutrition</li> <li>• Types of nutrients: macro- and micro-nutrients (carbohydrates, fats, proteins, vitamins and minerals)</li> <li>• Physiological roles of nutrients</li> <li>• Dietary sources of nutrients and recommended intake levels</li> <li>• Water and alcohol in the diet</li> </ul>
LO2	<ul style="list-style-type: none"> <li>• Role of diet in chronic diseases - cardiovascular, cancer, diabetes and obesity</li> <li>• Use of food labels in dietary planning</li> <li>• Dietary assessment and analysis</li> </ul>
LO3	<ul style="list-style-type: none"> <li>• Dietary guidelines for different activities (sports and recovery); Energy systems and exercise nutrition</li> </ul>
LO4	<ul style="list-style-type: none"> <li>• Dietary guidelines for different age groups</li> <li>• Nutrition and ethnic groups in New Zealand including Māori, Pacific and new immigrant populations</li> </ul>

### 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
<b>Assessment portfolio</b> 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

## PROJECT DESIGN AND ANALYSIS

Course code	NSCI5521	Level	6	Credits	15
Pre-requisites	Nil	Co-requisites	Nil		
Main programme	New Zealand Diploma in Applied Science (Level 5)	Other programmes			
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 the knowledge and skills 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 outcome alignment
LO1	Critically evaluate research informed project design and data analysis.	1, 2
LO2	Apply the principles of experimental design to applied science projects.	1
LO3	Perform preparatory work for a defined applied science project.	1, 3, 5

### Ngā Tūtohu o te Kiko | Indicative Content

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

### 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
<b>Assessment portfolio</b> 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