



Programme Document

Bachelor of Computing Systems [BCS]

Level 7, 360 Credits

Programme Reference and Version Number: [102337-1]

This programme leads to the award of the following qualification(s)

Bachelor of Computing Systems [BCS]

Level 7, 360 Credits

Qualification Reference and Version Number: (CA2209)

Prospectus Code: (CA2209)

School of Computing

Version 1: Programme and Accreditation approved by NZQA [02 October 1996]

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PROGRAMME FACTUAL SUMMARY



Mōhiohio pono Hōtaka | Programme Factual Summary

TERTIARY EDUCATION ORGANISATION (TEO) DETAILS

NZQA Reference No.

[Issued at time of application]

Name of TEO

Unitec Institute of Technology

Ministry of Education No.

6004

QUALIFICATION DETAILS

Qualification(s) Title

Bachelor of Computing Systems

Qualification(s)
Number/Version

CA2209

Qualification Short Title

BCS

NZSCED Name and No.

020199 > Information Technology > Computer Science > Computer Science not elsewhere classified

Qualification Level

7

Qualification(s) Credit
value/range

360

Qualification Type

Bachelors (including intermediate)

Strategic Purpose Statement

The purpose of this Programme is to provide students with a thorough theoretical and applied knowledge of areas vital to the computing industry, which will enable them to be work ready on graduation, and to maintain their currency and develop their discipline by on-going professional development within their established conceptual framework.

This programme is designed to build professional adaptive skills that will prepare graduates for the inevitable technical disruption and changes they will encounter in the IT industry, as well as progressively honing their technical skills and developing smart interpersonal skills to prepare them for the working environment.

Graduates from this programme will have gained theoretical and practical knowledge of the computing industry, with a solid grounding in technical and theoretical concepts, systems development and technical computing. They will have experience of practical application by regular real-world assignments and case study scenarios.

Graduate profile

The Graduate will have:

- The ability to apply technical and conceptual thinking;
- Self-reliance and motivation for continued learning and professional development;
- The capabilities to be effective communicators and team members;
- An educational base that will enable them to relate to the wider context of society;
- Enquiring, flexible, creative and critical attitudes towards contemporary issues and underlying theoretical concepts;
- An appreciation of management and the ability to apply management processes in the IT environment;
- The knowledge of IT required to solve problems within their area of specialisation;

	<ul style="list-style-type: none"> An awareness of bicultural issues and an ability to function positively in a multicultural society; An awareness of social, ethical and environmental issues.
Education pathway	Graduates of this programme may progress to computer science qualifications at post-graduate level, or other relevant industry or professional qualifications at Level 7 or above.
Employment and/or community pathway	Graduates of this qualification will have the skills and knowledge to be employed in a variety of Computer and Information Systems entities within their chosen fields, including technical computing and systems development knowledge and skills to inform strategic decisions, and to work as a manager/leader in a range of strategic roles.
Next review:	Semester 1, 2024
Approval date:	1996
Qualification developer:	Unitec Institute of Technology
PROGRAMME DETAILS	
Programme Name	Bachelor of Computing Systems
Programme Level	7
Programme Credit Value	360
Programme Code	102337-1
Professional Recognition	N/A
Programme review:	Last: Sem 1, 2019. Next: Sem 1, 2024
OUTCOME STATEMENTS	
Programme Aim	The purpose of this Programme is to provide students with a thorough theoretical and applied knowledge of areas vital to the computing industry, which will enable them to be work ready on graduation, and to maintain their currency and develop their discipline by on-going professional development within their established conceptual framework.
Programme Outcome Statement (Graduate Profile)	<p>The Graduate will have:</p> <ul style="list-style-type: none"> The ability to apply technical and conceptual thinking; Self-reliance and motivation for continued learning and professional development; The capabilities to be effective communicators and team members; An educational base that will enable them to relate to the wider context of society; Enquiring, flexible, creative and critical attitudes towards contemporary issues and underlying theoretical concepts; An appreciation of management and the ability to apply management processes in the IT environment; The knowledge of IT required to solve problems within their area of specialisation; An awareness of bicultural issues and an ability to function positively in a multicultural society; An awareness of social, ethical and environmental issues.
Endorsement Grades (e.g. with Distinction)	Achievement 11-point Grading System. The award of Senior Scholar is available for this programme.
Content Statement	The Bachelor of Computing Systems (BCS) is a three-year 360 credit degree. The degree spans Unitec Levels 5 to 7 courses. Credit values of the component courses range from 15 to 45. The degree allows for optional courses to be taken at each level from other degrees, but retains essential IT elements by specifying a minimum of 90 credits from Level 7 computing courses.
Entry Requirements	Candidates must meet the general, special or discretionary admission requirements, and meet the English Language entry requirements. Applicants must have sufficient competence in the English language to undertake this programme, which is taught and assessed in English. Student must also meet programme specific requirements for Mathematics. Go to www.unitec.ac.nz for details.

Entry requirements - Key Information for Students (KIS) website	Candidates must meet the general, special or discretionary admission requirements, and meet the English Language entry requirements. Student must also meet programme specific requirements for Mathematics. Go to www.unitec.ac.nz for details.		
ACCREDITATION DETAILS			
Type of Approval	<input checked="" type="checkbox"/> Approval and Accreditation		
Proposed Start Date:	Semester 1, 2022		
New programme or existing programme amended:	<input checked="" type="checkbox"/> Existing programme amended		
Brief summary of changes made			
DAS (unit or achievement standards) credits	N/A		
Unitec credits	360		
Total Programme Credit Value	360		
Delivery Mode	<input checked="" type="checkbox"/> Face to Face only (Intramural)		
Delivery Methods	Lectures, computer simulations, tutorials, online learning, work on computers, small group work, case studies.		
To be run: (Click appropriate box/boxes)	<input checked="" type="checkbox"/> Full time <input checked="" type="checkbox"/> Part time <input type="checkbox"/> Block <input type="checkbox"/> Weekend <input type="checkbox"/> Summer School		
Assessment Methods	Practical tests, theory tests, assignments, essays, group assignments, presentations.		
Assessment standards included (if any)	N/A		
Delivery sites	Unitec Mt Albert Campus		
Student Type	<input type="checkbox"/> Domestic <input type="checkbox"/> International <input checked="" type="checkbox"/> Domestic and international		
Nature of funding sought	<input checked="" type="checkbox"/> SAC		
Sub-contracting	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROGRAMME DURATION DETAILS			
Duration of the Programme		Minimum	Maximum
	Full time:	3 Years	8 Years
	Part time:	6 Years	8 Years
Number of Years	3		
Duration: Total Weeks		Incl. Holidays weeks	Excl. Holidays weeks
	Full time:	117	96
	Per year:	39	32
Average Hours Per Week	Directed Hours	Work Experience Hours	Self-Directed Hours
	12		25.5
Total Learning Hours Per Week	37.5		
Total Study Hours	3600		
Programme Learning Hours Per Year	1200		
Work Experience Type & Expected Location	N/A		
TEC DATA REQUIREMENTS			
Provider Code	6004		

Qualification Award Codes	20
Student Destination	<input type="checkbox"/> more academically oriented - designed to lead to entry into advanced research programmes and professions with high skill requirements <input checked="" type="checkbox"/> more occupationally oriented - designed to lead to direct labour market access <input type="checkbox"/> designed to lead directly to the labour market
Status	Active
Funding Source	M
EFTS Value	3
Expected student intake	200
EFTS Eligibility	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
To be Approved for Student Loans and Allowances?	<input checked="" type="checkbox"/> Loans and Allowances
CONTACT DETAILS	
Contacts	<p> Contact 1 Susan Bennett Academic Programme Manager: Computing, Unitec Institute of Technology Private Bag 92025 Victoria St West Auckland (09) 849 7475 sbennett2@unitec.ac.nz </p> <p> Contact 2 Jackie Tims Lead, Programme Development and Management Te Korowai Kahurangi Unitec Institute of Technology Private Bag 92025 Victoria St West Auckland (09) 849 4321 jtims@unitec.ac.nz </p>

Programme Version Control

Version 1: Programme and Accreditation approved by NZQA [02 October 1996]

Version 1.1: 15 Credit alignment approved by Undergraduate Board of Studies [October, 2008]

Summary of Changes

Table 1: Summary of programme improvement and changes

Version No.	Date of Change	Approved by	Effective from	Description of change
1.1.1	6/04/2013	Faculty Academic Committee (FAC)	Sem 2, 2013	ISCG6410 Information Gathering changed from Compulsory to an Elective in the DipITS and BCS
1.1.2	25/09/2013	FAC	Sem 1, 2014	ISCG5410 Info System in Bus removed from the BCS and DipITS
	25/09/2013	FAC		ISCG5424 Information Systems Concepts added as a NEW compulsory course to BCS and DipITS and an elective in the GDCMP
	10/17/2013	Programme Committee (PC)		ISCG6425 Data Warehousing added as a new elective to BCS and GDCMP
	10/17/2013	PC		ISCG6441 Visual Game Design added as a new elective to BCS and GDCMP
1.1.3	7/8/2014	PC	Sem 2, 2014	ISCG5430 Professional Skills for IT Practitioners – final exam removed and nature and weighting of assessments changed

1.1.4	9/30/2014	FAC	Sem 1, 2015	ISCG7431 Capstone Project is the new 60 credit Level 7 compulsory course added to the BCS; this will replace 45 credit Level 7 BCS compulsory course ISCG7430, with a transition arrangement valid till December 2016 - 60 credit course is also offered over two semesters for part time students.
1.1.5	4/30/2015	PC	Sem 2, 2015	ISCG5421 replaced ISCG5420 as a pre-requisite for ISCG6423; Exam weighting reduced to 40% from 50% and Assignment weighting raised from 30% to 40%.
1.1.6	10/7/2015	PC	Sem 1, 2016	ISCG7400 Comp Systems Security - Weighting for Final Exam brought down to 40% from 60% and a 3rd item - Quiz Test for 20% is added ISCG5421 Programming Principles & Practice - Final Exam brought down to 30% from 40%; weighting for Programming assignment raised from 30% to 50% and weighting for Practical Tests down to 20% from 30%
1.1.7	20/04/2016	PC	Sem 2, 2016	ISCG7440 Advanced Game Design added as a new elective course to the BCS and GDCMP
1.1.8	11/10/2016	Programme Improvement Committee (PIC)	Sem 1, 2017	ISCG7430 Project be reactivated and offered as an alternative compulsory project course for the BCS with Academic Leader approval. Changes to assessment for ISCG6412.
1.1.9	15/06/2018	PIC	Sem 2, 2018	ISCG6414 - Expansion of course topics with inclusion of some Extended Los. Changes to assessment weighting. ISCG6423 – Changes to Assessment
	05/10/2018	PIC		Add HTCS5700 Cyber Security Principles (Level 5, 15credits) as an elective course to the Bachelor of Computing Systems
1.1.10	10/05/2018	PIC	Summer School 2018-19	HTCS5700 Cyber Security Principles – new elective added to BCS
1.1.11	10/06/2019	PIC	Sem 2, 2019	ISCG5420 Programming Fundamentals - 1. Minor changes in Course Topics; 2. Removal of Expanded Learning Outcomes; 3. Minor changes in the Nature of Assessments and alignment to Learning Outcomes
1.1.12	June 2020	PIC	Sem 2, 2020	ISCG6402 Network Admin & Support - 1. Delete Assessment 3 (Report) with 15% weighting. 2. Increase Assessment 2 (Test) weighting from 45% to 60%
1.2	AACSC	09/08/2021	2022-Sem1	<ul style="list-style-type: none"> Reformat regulations to remove reference to discontinued Bachelors Generic Regulations. Inactivate electives that are no longer offered and delete them from the programme - ISCG5422, HTCS5700, ISCG6400, ISCG6410, ISCG6412, ISCG6413, ISCG6432, ISCG6433, ISCG6434, ISCG6436, ISCG7409, ISCG7422, ISCG7423, ISCG7436, ISCG7443, ISCG7445, ISCG7446. Add GDCMP course ISCG7142 Information Systems and Analysis as an elective. This is already allowed under the regulations and formally adding it simply streamlines student enrolment in this elective. Modify requisites to accommodate above changes, to remove obsolete inactive course references, and to simplify re-enrolment for students. Courses: ISCG6404, ISCG6414, ISCG6420, ISCG6421, ISCG6422, ISCG6423, ISCG6424, ISCG6435, ISCG7400, ISCG7401, ISCG7402, ISCG7407, ISCG7413, ISCG7420, ISCG7421, ISCG7424. Modify requisites for ISCG7430 Project to match ISCG7431 Capstone Project to remove confusion for students.

1. INTRODUCTION TO THE QUALIFICATION

This document outlines Unitec's capability and delivery arrangements for the Bachelor of Computing Systems [BCS] programme, which leads to the Bachelor of Computing Systems (Level 7) qualification, (360 Credits) [CA2209], with the aim of maintaining external accreditation.

The programme meets the definition as listed in the New Zealand Qualifications Framework (NZQF) Listing and Operational Rules. The level and credit value of the qualification to which the programme leads, meets the requirements in the qualification type definitions published in the NZQF.

The Bachelor of Computing Systems [BCS] was formally approved and accredited by NZQA on 02 October 1996.

1.1 Background

Computing educates people for work in that it targets entry level jobs in the I.T. industry. Unitec is committed to teaching and learning of the highest possible quality and relevance. One of the means by which Unitec aims to achieve this outcome is through a commitment to teaching, informed by research and practice whilst retaining a professional and vocational focus.

The Unitec School of Computing, Electrical and Applied Technology has a portfolio of stair-casing programmes ranging from level 4 to a Master of Computing programme. Students can enter at level 5 or start at lower levels and chose their pathway to their chosen goal. The Bachelor of Computing Systems (BCS) educates people for work in that it targets entry level jobs in the I.T. industry. This empowers students from school leavers through to those already in the work force but wishing to change their careers. The BCS programme is an excellent example of a programme that reflects this dual characteristic. Staff participation in research is demonstrated by their research outputs and a clear professional and vocational focus is maintained, for example, through attending professional and vocational oriented conferences and close involvement with industry on programme advisory boards.

The field of applied computing continues to experience strong growth and heavy demands. Four sources of demand are, users seeking effective data management solutions, software development, network support and cybersecurity companies seeking acceptable entry level candidates. The Bachelor of Computing Systems (BCS) is designed to meet these demands. It gives grounding in technical and theoretical concepts at Level 5, concentrating on systems development and technical computing at later levels. An emphasis on the practical nature of these subjects is embodied in the design. Theory is introduced within the context of practical application, and supports and clarifies practice as well as providing an integrative conceptual framework.

The rapid pace of change in computing technology mandates that both theoretical and practical components are required in the learning process in the computing domain. Educational principles also recognise that learning is accomplished more effectively and efficiently if the student plays an active part in the learning process. The process of student-centred learning epitomises this approach. The theoretical background to subjects will be developed using practical applications by way of illustration.

Student learning progresses from immediately applicable skills and knowledge at the lower levels, through more generic capabilities and theoretical constructs at intermediate levels, to a broad and integrated conceptual framework at the highest level. This provides graduates with the ability to integrate new technological developments and techniques into their learning, and thus to be at the leading edge in the development and application of advances in their field.

The BCS provides the opportunity for students to take elective courses at each level of the degree, to allow for diversification into user support and management roles, and to allow graduates to broaden the base of their education.

1.2 The programme

The philosophy of the BCS programme embodies a well-founded, flexible and diverse approach to computing, which will increase and enhance student options in both professional and educational areas. It has also been designed to provide a flexible and adaptable degree qualification upon which to base further graduate study.

In designing the programme, the following aspects were considered crucial:

- preparing graduates to be effective in a variety of professional roles with expertise in the technical components of the discipline;
- a well-defined, relevant, foundational curriculum with scope for rapid and flexible adaptation as technology advances - this will provide for the immediate and long term needs of graduates;
- professionalism and promotion of independence in learning as essential educational goals;
- flexible study modes and the capacity to develop individual study initiatives and directions;
- programme components which incorporate problem solving, analysis and research.

The initial Level 5 courses are designed to provide the student with a solid foundation of knowledge, practical skills and basic concepts. These courses are firmly grounded in industry practice and standards and have been reviewed to ensure that they continue to reflect the current situation.

As students' progress through the Level 6 courses, they are required to take more initiative in the selection of suitable techniques for specific situations, and to integrate learning from a range of courses to develop problem solving capability and deal with challenges presented.

The Level 7 courses require students to evaluate new techniques and technology in a range of unfamiliar situations. This may include the development of criteria for this evaluation. Students will need to integrate ranges of techniques and technology in novel ways, and to deal with complex, realistic problems.

At all times, the context of the courses is the useful application of concepts, techniques and technology to the solution of realistic problems. At Level 5 this will generally involve the application of established methods, while at Level 7, students will be expected to investigate new developments and integrate these with their understanding of current best practice. Their ability to assimilate new developments is one of the key characteristics of successful professionals in the field of computing.

The degree is based upon the philosophy of combining theory and application. Practical work in the form of projects will give the students the opportunity to demonstrate the effective linking of theory with practice in realistic situations. Smaller projects are part of most courses at Levels 6 and 7 and every student is required to undertake a major project at Level 7.

The degree emphasises problem solving, critical thinking, adaptability and creative response to change. These include an ability to transfer capabilities and concepts into a variety of issues and contexts. This process will remain relevant and applicable when content and knowledge components change and/or evolve.

As students move from Level 5 to Levels 6 and 7, the weekly lecture component reduces (typically from two hours to one) and the non-timetabled student-directed component increases. In addition, the timetabled sessions become more and more student-directed as the student moves up the levels. Most will be a blend of lecture, demonstration, tutorial and self-directed activities (such as library research, group work or practical).

The variety of learning approaches taken in the BCS programme will cater for the diverse needs of the students, by allowing for differences in cultural background and preferred learning styles. These learning experiences will also prepare students for the wide range of activities and situations they can expect to be involved in as computer professionals.

1.3 Te Noho Kotahitanga

Unitec is committed to creating an education environment that aligns with its obligations to *Te Tiriti o Waitangi/the Treaty of Waitangi*. The foundation of this commitment at Unitec is *Te Noho Kotahitanga* - a partnership document built on five principles, which are demonstrated in the BCS in a number of ways.

- **Rangatiratanga (authority and responsibility):** Māori have authority over, and responsibility for, all teaching and learning relating to Māori dimensions of knowledge.
- **Wakaritenga (legitimacy):** all stakeholders have a legitimate right to be present, to speak freely in their own language, and to put their resources to use for the benefit of all.
- **Kaitiakitanga (guardianship):** Unitec accepts responsibility as a critical guardian of knowledge.
- **Mahi kotahitanga (co-operation):** all actions are guided by a spirit of generosity and co-operation.
- **Ngākau mahaki (respect):** the heritage and customs, current needs, and future aspirations of Māori and Pākehā are respected and valued.

The principles of *Te Noho Kotahitanga* also underpin the mātauranga Māori expression of our Learning and Teaching Strategy and our strategies for Māori Success (see [Section 3](#)). These two elements have an important role in programme development at Unitec, most significantly in the determination of content, pedagogy, and assessment.

2. TITLE, AIMS, LEARNING OUTCOMES AND COHERENCE

This section addresses programme approval Criterion 1 which presents evidence that demonstrates how the programme meets the definition published in the NZQF Listing and Operational Rules.

It also addresses programme approval Criterion 2 by describing the title, aims, stated learning outcomes and coherence of the whole programme to demonstrate that they are adequate and appropriate and that they meet the graduate profile and specification of the qualification as listed on the [New Zealand Qualifications Framework](#).

2.1 Title

The title of this programme is the Bachelor of Computing Systems [BCS]. This is a level 7, 360 credit programme.

This programme leads to the award of the Bachelor of Computing Systems (Level 7) qualification, (360 Credits) [CA2209].

2.2 Strategic purpose statement

The purpose of this Programme is to provide students with a thorough theoretical and applied knowledge of areas vital to the computing industry, which will enable them to be work ready on graduation, and to maintain their currency and develop their discipline by on-going professional development within their established conceptual framework.

This programme is designed to build professional adaptive skills that will prepare graduates for the inevitable technical disruption and changes they will encounter in the IT industry, as well as progressively honing their technical skills and developing smart interpersonal skills to prepare them for the working environment.

Graduates from this programme will have gained theoretical and practical knowledge of the computing industry, with a solid grounding in technical and theoretical concepts, systems development and technical computing. They will have experience of practical application by regular real-world assignments and case study scenarios.

2.3 Graduate profile

Graduates of this qualification will have:

1. The ability to apply technical and conceptual thinking;
2. Self-reliance and motivation for continued learning and professional development;
3. The capabilities to be effective communicators and team members;
4. An educational base that will enable them to relate to the wider context of society;
5. Enquiring, flexible, creative and critical attitudes towards contemporary issues and underlying theoretical concepts;
6. An appreciation of management and the ability to apply management processes in the IT environment;
7. The knowledge of IT required to solve problems within their area of specialisation;
8. An awareness of bicultural issues and an ability to function positively in a multicultural society;
9. An awareness of social, ethical and environmental issues.

2.3.1 Pathways

Education pathway

Graduates of this programme may progress to computer science qualifications at post-graduate level, or other relevant industry or professional qualifications at Level 7 or above.

Employment pathway

Graduates of this qualification will have the skills and knowledge to be employed in a variety of Computer and Information Systems entities within their chosen fields, including technical computing and systems development knowledge and skills to inform strategic decisions, and to work as a manager/leader in a range of strategic roles.

2.4 Programme structure

This Programme is structured to achieve the qualification outcomes. Its approaches to learning, teaching and assessment are embedded in components (courses) which are designed to form a coherent programme that demonstrates progression and integration of learning and assessment throughout, to meet the strategic purpose statement, outcome statement, and the level and credit value of the qualification.

The Bachelor of Computing Systems (BCS) is a three-year 360 credit degree. The degree spans Unitec Levels 5 to 7 courses. The degree allows for elective courses to be taken at each level from within, and also from other degrees, but retains essential computing elements by specifying a minimum number of computing courses across the levels.

The programme comprises a number of compulsory courses at level 5 and level 7 and elective courses at each level. Each course has its own aims, learning outcomes and assessment structure, which contribute to the overall degree. The programme is offered on a semester basis. Currently a semester is 16 weeks in duration, made up of 16 teaching weeks at level 5 and 13 teaching weeks, one week for study and two examination weeks at level 6 and 7.

All courses are assigned a credit rating and students who pass a course are awarded these credits towards completion of the degree requirements. For the purposes of the degree programme one credit is generated by approximately ten hours of student learning.

Computing Professionals in Practice

Historically, there is a dynamic relationship between the content and scope of education programmes, the practical relevance of the qualifications, the number of students completing educational programmes and the number of employment positions available. The computer industry training environment is serviced by an array of educational providers with an equally varied array of philosophies and approaches to programme delivery.

Many professional groups maintain that professional needs are not being met by the tertiary education system and that computing education programmes have often produced graduates who know the theoretical side but have had little chance to apply the theory in a practical setting.

The structure of this programme is designed to:

- ensure the development of capabilities so that graduates are competent and adaptable in the general computing sector, as well as having specific competency in their chosen speciality;
- develop understanding of management practice, quality assurance analysis, and administrative systems as well as computing disciplines;
- foster independent professionalism;
- maintain close integration of academic disciplines with practical application.

2.4.1 Programme objectives

This programme aims to produce graduates who will:

- apply a knowledge of computing to solve Technical and/or System Development problems;
- be effective and adaptable in encompassing technological change;
- demonstrate self-directed problem solving and research abilities;

- be able to apply management processes in the computing environment;
- demonstrate personal and professional integrity.

These objectives will be achieved by:

- Specific learning outcomes which are supported by learning experiences which educate and prepare the students for professional practice. Integration of theoretical learning and practical demonstration will be reinforced by directed and self-directed learning.
- Courses which develop group and interpersonal communication and awareness. There are two compulsory courses at Level 5 which will aid the development of these qualities and promote the ability to work within groups. These are Professional Skills for Computing, and Information Systems Analysis and Design
- The opportunity to work on special topics and project work in conjunction with industry. This will allow students to develop specialised knowledge and gain practical experience in a particular field and will foster the ability to synthesise their learning from different courses to solve a problem.
- The provision for students to participate in activities which promote self-esteem, self-awareness and the perception of learning as a life span activity. There are opportunities for students to be involved in peer tutoring and support, and as student representatives.

Study Area Objectives

There are four main elements in the programme. These are:

- discipline base;
- professional study area;
- practical application area;
- integration area

The objective of the discipline base is to develop foundation knowledge.

The objective of the professional study area is to generate attitudes, values and behaviour that will lead to conduct which demonstrates assimilation of accepted professional practice and ethics.

The objective of the practical application area is to fully prepare students for a professional role in the computing field, with particular skills in technical computing and systems development. A further aim is to provide the workforce with graduates who can demonstrate technical expertise and who also possess management, planning, communication and quality assurance capabilities.

The objective of the integration area is to enable the student to combine the three associated areas of study into a coherent expression of professional practice. As a higher cognitive function, integration can be observed in the outcomes of the programme at various levels. Integration is particularly apparent at project and special topic level.

The following strategies will be used to achieve these objectives:

1. Discipline base: student learning within the specified range of disciplines. The range of disciplines can be broadly classified as:
 - core computing;
 - communications and general business;
 - course content relating to professional and ethical practice.
2. Professional study area: involvement and participation in the learning activities and special project work required in the relevant course prescriptions.
3. Practical application area: student involvement in practical application of study areas particularly in Levels 6 and 7 of the degree with system projects in all streams.
4. Integration area: through a wide range of activities and assessment components drawing from all three associated areas of the curriculum.

2.5 Programme courses

Programme courses have been designed using a constructive alignment approach with clear links between learning outcomes and activities and the graduate profile outcomes of the qualification. Course descriptors for each course are in Appendix 2. Course details are provided through an overview mapping of courses to the Graduate Profile in the table below and a more detailed mapping which clearly demonstrates how the learning outcomes from each of the courses link to the Graduate Profile in the appendix of this document.

Course learning outcomes in this programme:

- are consistent with the programme aims;
- demonstrate how learners will achieve the graduate profile;
- are clear and specified for each component of the programme;
- are measurable and achievable;
- are integrated to provide a balanced and logical programme;
- are presented in a logical, progressive way that demonstrates learners' development of knowledge, skills, and attitudes.

2.6 Mapping course outcomes to the graduate profile

Table 2: Programme Overview - Courses mapped to Graduate Profile

		GPO 1	GPO 2	GPO 3	GPO 4	GPO 5	GPO 6	GPO 7	GPO 8	GPO 9
		The ability to apply technical and conceptual thinking	The self reliance and motivation for continued learning and professional development	The capabilities to be effective communicators and team members	An educational base that will enable them to relate to the wider context of society	Enquiring, flexible, creative and critical attitudes towards contemporary issues and underlying theoretical concepts	An appreciation of management and the ability to apply management processes in the IT environment	The knowledge of IT required to solve problems within their area of specialisation	An awareness of bicultural issues and an ability to function positively in a multicultural society	An awareness of social, ethical and environmental issues
Course Code	Course Name									
ISCG5400	Hardware Fundamentals	√						√		
ISCG5401	Operating System Fundamentals	√						√		
ISCG5420	Programming Fundamentals	√						√		
ISCG5423	Introduction to Databases	√						√		
ISCG5424	Information Systems Concepts	√		√			√	√		
ISCG5430	Professional Skills for IT Practitioners	√	√	√	√	√			√	√
ISCG6411	Project Planning and Control	√	√	√			√			√
ISCG7430	Project	√	√	√	√	√	√	√	√	√
ISCG7431	Capstone Project									
Key Elective Courses										
ISCG5403	Networking Fundamentals	√				√		√		
ISCG5421	Programming Principles and Practice	√		√		√		√		
ISCG6401	Data Communications and Networks	√						√		
ISCG6402	Network Administration and Support	√						√		√
ISCG6403	Network Operating Systems Management	√						√		√
ISCG6404	Web Server Management	√					√	√		
ISCG6407	Fundamental Concepts in Cyber Security	√						√		√
ISCG6414	Systems Analysis and Design	√		√	√	√	√	√		
ISCG6420	Internet and Website Development	√		√				√		
ISCG6421	GUI Programming	√						√		
ISCG6423	Database Design and Development	√						√		√
ISCG6424	User Interface Design	√				√		√	√	√

ISCG6425	Data Warehousing	√						√		
ISCG6426	Data Structures and Algorithms	√						√		√
ISCG6435	Special Topic	√	√		√			√		
ISCG6441	Visual Game Design	√						√		√
ISCG6442	Game Programming	√						√		√
ISCG6488	Negotiated Study	√	√		√	√		√	√	
ISCG7400	Computer Systems Security	√						√		√
ISCG7401	Advanced Data Communications	√						√		
ISCG7402	Network Design and Implementation	√						√		√
ISCG7404	Computer Forensic Investigations	√						√		
ISCG7407	Advanced Cyber Security	√						√		√
ISCG7408	Malware Analysis	√						√		√
ISCG7410	Information Systems Management	√		√			√	√		√
ISCG7411	Project Management Methodologies	√	√		√		√	√	√	
ISCG7412	Risk Management	√	√				√	√		
ISCG7413	Testing and Quality Assurance Management	√	√	√			√	√		
ISCG7414	Business Systems Analysis	√	√		√		√	√	√	√
ISCG7420	Web Application Development	√						√		
ISCG7421	Advanced Program Development	√						√		
ISCG7424	Mobile Software Development	√						√		√
ISCG7425	Java Enterprise Programming	√						√		
ISCG7426	Data Mining	√						√		
ISCG7427	Agile and Lean Software Delivery	√		√				√		
ISCG7435	Special Topic 1	√	√					√		
ISCG7440	Advanced Game Design	√						√		√
ISCG7441	Advance Game Programming	√						√		√
ISCG7444	Cloud Application Design & Development	√		√				√		
ISCG7488	Negotiated Study	√	√			√		√	√	

Note: Courses listed above are core compulsory courses and key elective courses for the Programme Only. Full mapping of individual Learning Outcomes for core compulsory courses to Graduate Profile Statements are located in Appendix 3.

3. PROGRAMME DELIVERY

This section addresses programme approval Criterion 3 by describing the how the delivery methods are adequate and appropriate, given the stated learning outcomes for the programme.

Information in this section demonstrates:

- the appropriateness of the programme's delivery modes (e.g. face-to-face, online/distance, blended);
- the appropriateness of the programme's delivery methods; and
- how academic integrity will be maintained through delivery.

It is important delivery methods do not place learners, staff, or the public at risk. The programme must identify any potential risks, and demonstrate how they will be addressed. Delivery methods also need to include consideration of cultural safety and ethical practice.

3.1 Delivery modes

This programme employs the following modes of delivery:

Face to Face only (Intramural)

The delivery mode has been chosen to meet the needs of students' learning in a context that is most appropriate for the discipline and subject matter of the Programme. The aim is to use delivery methods that successfully achieve the programme aims, graduate profile and learning outcomes of individual courses whilst reflecting the characteristics of a Living Curriculum.

The BCS has been designed to reflect principles of adult learning, and more specifically how these may be applied to professionals. The approach includes:

- identifying and challenging assumptions
- imagining and exploring alternatives
- openness to the perspectives of others
- participation in critical reflective discourse
- awareness of context
- experiential learning
- problem definition and solution
- acquiring new knowledge and techniques
- the differentiation between implicit and explicit knowledge
- the relationship between professional knowledge and practice

3.1.1 Delivery Sites

Unitec ensures that all delivery sites (including all off-site learning) remain safe and adequate for the programme of study provided, its staff, the number of students enrolled, and for meeting students' specific needs.

The BCS is delivered at the following permanent site(s):

- Mt Albert Campus

3.2 Delivery methods

Case-studies/scenario-based learning

Case-studies and/or scenario-based learning approaches are used to reinforce students' application of theory to practice. These methods are used in face-to-face (for example, lectures), practical (for example, laboratories), and online (for example, online forums) contexts. These methods are used to support development of evaluation, analysis, problem-solving, and critical-thinking skills. Their application also provides opportunities for developing 'soft skills' related to practice.

Flipped-classroom/learning

Using our Learning Management System (Moodle™), students will be able to access resources that allow them to start to become familiar with, and understand, discipline-specific knowledge and content material. In accordance with this approach, there is an expectation that students will engage with this material before a related classroom session. In this way, classroom sessions will maximise face-to-face opportunities for discursive and interactive learning activities.

Interactive lectures/Large-group teaching

Lectures are used to present course- and/or topic-specific principles, theories, and concepts. These sessions include a high-level of class interaction and participation; this supports the flipped-learning approach, while promoting independence, communication skills, and attributes related to life-long learning skills. Interactive lectures provide a forum for supporting practice-based learning, via the use of case-studies. The use of guest lecturers from industry offers further opportunities to make theoretical content more meaningful for students.

Laboratory sessions/practical learning

Laboratory sessions and other practical learning opportunities provide students the chance to apply learning to practice in a supported environment. This approach teaches relevant practical skills, while facilitating development of communication, leadership, and team skills and competencies. Practical learning opportunities may involve: handling skills; equipment manipulation; experimentation; observation; problem-solving; measurement and monitoring; and analysis and evaluation.

Project-based learning

Project-based learning is used to highlight theory-to-practice, and to develop students' problem-solving, research, independent study, leadership, team, and communication skills.

Where used, projects give students the opportunity to explore relevant areas of practice that may be of special interest to them, further strengthening their engagement with course material, while fostering an appreciation for life-long learning.

Online learning

Online or e-learning tools are an important resource, particularly in terms of supporting other modes of praxis. Moodle™ gives students access to relevant readings, multi-media resources, simulations (where appropriate), and supporting materials, such as assessment and course information. These resources are a key component of the flipped-learning approach, as students are expected to access and use these before face-to-face learning experiences. Online forums facilitate students' (online) engagement with peers and staff, offering the opportunity to develop teamwork, communication, and independent study skills.

Self-directed learning | mahi-ā-ipurangi

Primarily, students engage in self-directed learning via review of course readings and other resources, research as preparation for assessments, projects, flipped-learning contexts, and participation in peer discussions. This learning fosters students' research skills, as well as

competencies needed for life-long learning, critical-thinking and analysis, and communication/ collaboration skills.

Team/peer-based learning

This involves a structured approach to small-group work that goes much further than tutorials (see below), wherein students prepare in advance of face-to-face interactions (for example, by reading). In a typical class session, students may complete a test individually, then repeat the same test in their groups where collaborative discussion among group members promotes a consensus answer. Team-based learning promotes reflection and team-work, and taps into group strengths as well as motivating team members to learn in competition with other groups.

Tutorials/small-group learning

Tutorials and/or small-group sessions allow students to engage in activities designed to support learning completed in other modes (for example, interactive lectures). These groups may be peer- or staff-led/initiated; they provide a forum for in-depth discussion and exploration of theories, principles, and concepts introduced in other sessions. Tutorials and small-group learning provide a platform for development of skills around collaboration, leadership, and communication, as well as further opportunities for applying theory to practice, and critical-thinking and analysis. Tutorials may take place in a face-to-face setting, or online.

3.3 Practical or work-based components

Practical learning opportunities provide students the chance to apply learning to practice in a supported environment. In the BCS, there are a number of opportunities for practical and / work-based components. These include a Level 7 capstone project, which is considered to provide a platform to demonstrate the integration of the student's knowledge, skills and understanding. This must be taken in the student's last semester of the BCS and the student will be able to graduate on completion of this course. The work associated with this capstone project may include activities undertaken in the work-place under an agreement with a professional organisation.

3.4 Academic Integrity

Academic integrity relates to meeting moral or ethical principles in educational settings. Commitment to these academic principles creates a foundation for successful personal and professional participation and enables citizens to contribute to the broader community, work and society.

Unitec is committed to the highest standards of integrity, respect, and professional conduct. This commitment informs every aspect of our working life, from respectful interactions with colleagues to integrity in all our academic and professional endeavours. We hold our students to the same high standards, and we are committed to providing the policies and resources necessary to support their success as learners and citizens.

Academic integrity practices apply the principle of Whakaritenga – Legitimacy, which requires that academic decision-making processes legitimise the contributions of others and ensure that ethics and integrity inform subsequent actions.

The following are some of the initiatives which are employed to ensure academic integrity in this programme:






- Academic Integrity Policy and Student Disciplinary Statute are discussed with students at the beginning of the programme
- Moodle sites for each course contains the Academic Integrity Statement and a link to Unitec's Academic Integrity Policy and Student Disciplinary Statute

- Assessment design includes authentic tasks including situated and personal experience rather than generic assessment tasks and close integration of assessment tasks with course materials and activities
- Inclusion of formative activities with the added purpose of giving teachers an indication of student's competency
- Questions are employed that require students to demonstrate how they use information rather than simply reiterate what they have learned.

3.5 Te Noho Kohatitanga

Unitec is committed to creating an education environment that aligns with its obligations to the *Treaty of Waitangi*. The foundation of this commitment at Unitec is *Te Noho Kotahitanga* - a partnership document built on five principles, which are demonstrated in this programme in a number of ways.

- **Rangatiratanga (authority and responsibility):** Māori have authority over, and responsibility for, all teaching and learning relating to Māori dimensions of knowledge.
- **Wakatitenga (legitimacy):** all stakeholders have a legitimate right to be present, to speak freely in their own language, and to put their resources to use for the benefit of all.
- **Kaitiakitanga (guardianship):** Unitec accepts responsibility as a critical guardian of knowledge.
- **Mahi kotahitanga (co-operation):** all actions are guided by a spirit of generosity and co-operation.
- **Ngākau mahaki (respect):** the heritage and customs, current needs, and future aspirations of Māori and Pākehā are respected and valued.

 <p>RANGATIRATANGA AUTHORITY AND RESPONSIBILITY</p>	 <p>WAKATITENGA LEGITIMACY</p>	 <p>KAITIAKITANGA GUARDIANSHIP</p>	 <p>MAHI KOTAHITANGA CO-OPERATION</p>	 <p>NGĀKAU MĀHAKI RESPECT</p>
<p><i>E whakarite ana te Whare Wānanga o Wairaka ki te pūtake ake o te rangatiratanga o te Māori me ngā mātauranga Māori.</i></p> <p>Unitec accepts the principle that Māori have authority over and responsibility for all teaching and learning relating to the Māori dimensions of knowledge.</p>	<p><i>E whakarite ana te Whare Wānanga o Wairaka ki te mana o tena, o tena, ki te noho kotahi, ki te puaki i tona ake reo, ki te whakamahi i ngā rawa mo ngā iwi katoa.</i></p> <p>Unitec believes that each partner has a legitimate right to be here, to speak freely in either language, and to put its resources to use for the benefit of all.</p>	<p><i>E whakarite ana te Whare Wānanga o Wairaka ki te kaitiakitanga o ngā taonga mātauranga.</i></p> <p>Unitec accepts responsibility as a critical guardian of knowledge.</p>	<p><i>E whakarite ana te Whare Wānanga o Wairaka kia tau he ngākau māhaki i roto i ngā mahi katoa.</i></p> <p>Unitec affirms that a spirit of generosity and co-operation will guide all its actions.</p>	<p><i>E whakarite ana te Whare Wānanga o Wairaka ki te whakanui i ngā taonga tuku iho o ngā ao e rua, a hikoi ki mua. Ko te Māori me te Pākehā e mahi tahi ana mo Te Whare Wānanga o Wairaka.</i></p> <p>Unitec values each partner's heritage and customs, current needs and future aspirations. Māori and Pākehā working together within Unitec.</p>

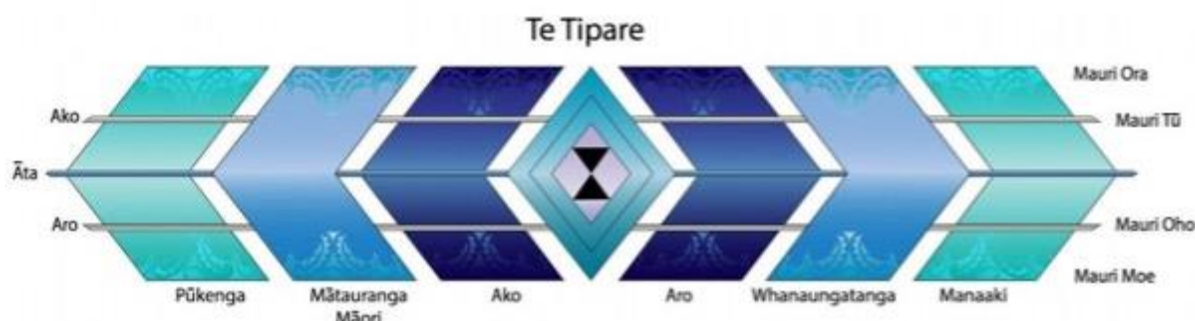
The principles of Te Noho Kotahitanga also underpin Te Tipare Framework, which is the mātauranga Māori expression of the Learning & Teaching Strategy, and our strategy for Māori Success. These two strategies have an important role in programme development at Unitec, most significantly in the determination of content, pedagogy, and assessment (see [Appendix 1](#)).

3.6 Te Tipare Framework for embedding Mātauranga Māori

The Te Tipare framework has been designed to support staff in the embedding of mātauranga Māori in their professional role at Unitec. This framework highlights the key values of ako (teaching and learning), aro (reflective practice) and whanaungatanga (relationships). The concepts of ako, aro and whanaungatanga underpin the design of this programme and the courses contained within it, including classroom delivery, teaching practices and assessment.

In te ao Māori, the concept of ako means both to teach and to learn. It recognises the knowledge that both teachers and learners bring to learning interactions, and it acknowledges the way that new knowledge and understandings can grow out of shared learning experiences. Aro, on the other hand, encourages thinking and reflection on past, present and future events or experiences and supports growth and transformation. In the Te Tipare framework aro encourages staff to adopt reflective practices and to design assessment approaches and tools that apply Māori knowledge, concepts and methodologies plus enable student preferred pedagogies.

Lastly, whanaungatanga is about relationships and whānau working together to make decisions and act in ways that support the betterment of the whānau. In the Te Tipare framework whanaungatanga supports teachers and programmes to engage with Māori whānau, stakeholders and communities and provide culturally safe learning environments.



To ensure student success, it is also important that staff can critically reflect on their professional practice using the Te Tipare framework. The 6 pou of the framework are focus areas where staff can impact and influence the success and holistic wellbeing of all Unitec students, especially Māori. Staff can use Te Tipare as an individual, and as part of their team. In the Applied Business Programmes:

- all courses will be reviewed annually using the framework, and action plans will be drawn up to deliver course improvements. These action plans are included in Programme Evaluation Plans reviewed at the Programme Action and Quality Committee (PAQC).
- staff work with the Ako Ahimura: Mātauranga Māori team to review mātauranga Māori outcomes, content, pedagogy, relationships, and delivery.

3.6.1 Embedding mātauranga Māori

The programme focus on strengthening students' understanding of mātauranga Māori in a number of ways in the programme delivery, including:

- Basic understanding of tikanga Māori, Te Reo Māori, and the Treaty of Waitangi /Te Tiriti o Waitangi is embedded within courses.
- Students participate in a pōwhiri and wānanga. The wānanga will comprise discussions about Te Ngākau Mahaki, a tour of culturally significant sites at Mt Albert Campus including the campus wharehau and whakawhanaungatanga-based activities to strengthen relationships between lecturers and students. This is to ensure that all students are connected to space, face and place at Unitec.
- Students' confidence in using Te Reo Māori is developed:

- by introducing discipline-specific Māori words and concepts to students learning, the classroom and their environment. Unitec celebrates annually both Matariki and Te Wiki o Te Reo Māori which provides further opportunities to engage with Te Reo Māori, tikanga Māori, kaupapa Māori and mātauranga Māori;
- through the use of specific content – pepeha (talking about your place of origin), mihi (acknowledging others through formal speechmaking), karakia (prayer) and waiata (songs).
- Students' confidence in applying Te Noho Kotahitanga (TNK) is developed via:
 - Providing Living Te Noho Kotahitanga workshops for students. Here they will have the opportunity to explore and apply the values of TNK within their learning and practice. It is also envisaged that students will continue to apply the values of TNK in their work and career;
 - The use of class-based (akomanga) and self-directed (mahi-ā-ipurangi) delivery methods.
- Programme teaching staff are supported by 'Priority Group Success Champions' within the School, as well as by Kaihautu and Priority Group Academic Development Lecturers. Support from external Māori stakeholders is available if needed.

In addition:

- Specific content is provided by expert guest speakers and external mātauranga Māori experts;
- Unitec's Te Noho Kotahitanga marae is used as a teaching space;
- Concepts and methods such as leveraging tuākana-tēina relationships, mahi kotahitanga (group work) and āta (peer-review) are widely used in the programme; and
- The concept of ako (a reciprocal relationship between teaching and learning) is key to programme delivery

3.6.2 Tuākana/Tēina mentoring to support success of Māori and Pacific students

Literally translated, tuākana is a concept that refers to older siblings, or more senior in genealogical terms. Tēina refers to the younger siblings or less senior lines in genealogical terms. Tuākana and Tēina in an educational context provides a supportive framework for students, where tuākana are more expert in a particular area and provide help and guidance for the tēina who has less expertise. Tēina can become tuākana as their skill level increases.

The tuākana / tēina mentoring system is a new initiative for priority group success. The initiative will operate within the Peer Assisted Study Support (PASS) framework and includes weekly classes, controlled ratios of tuākana to tēina, and delivery methods to suit the need of the learners involved (individual lessons, small groups or workshops).

In this programme courses have been identified where the installation of Tuākana / Tēina mentoring will support Māori and Pacific students to succeed in their chosen programme of study. Teaching staff will identify students suitable for appointment as tuākana (note: tuākana are not necessarily Māori but must have performed well in the course as a first-year student). Student Success teams will train and support tuākana, and at later stages, evaluate and report on success of the programme.

3.7 Learning and Teaching Strategy

This programme applies the principles of Unitec's Learning and Teaching Strategy to improve the success of all learners. Unitec's approach to learning and teaching is to manaaki the success of our learners and communities, led by Te Noho Kotahitanga. This principles-based approach aims to provide high quality learning, teaching and applied research that develops work-ready lifelong learners.

The objectives of the Learning and Teaching Strategy seek to provide an opportunity for students to develop capabilities to deal with the complexity and uncertainty that is a feature of modern workplaces. These objectives are expressed as learning and teaching goals:

***Kura ako*¹**

Ensures the design of contemporary programmes, courses and assessment to develop work-ready life-long learners resulting in programmes and courses that:

- are based on industry and community needs and designed to meet the Graduate Profile
- are research informed;
- support parity targets and Priority Group Success Strategies by embedding authentic Māori and Pacific worldview, content and pedagogy;
- employ the most appropriate mix of learning modes (blended, online, face-to-face, work based) for the targeted group of learners;
- factor the wellbeing of learners into learning hours and scheduling;
- plan for the use of pedagogically appropriate digital learning technologies across the programme;
- explicitly connect learning outcomes, pedagogy and assessment (constructive alignment);
- seek opportunities for innovative approaches to design, delivery and recognition, including collaboration across the sector.

And assessment that:

- provides valid evidence of achievement of learning outcomes;
- is quality assured;
- promotes learner engagement and enhances learning;
- is authentic/real-world where possible, contributing to positive learning and development of capabilities for the workplace.

***Ako*²**

Continues to enhance the quality of learner-centred teaching and learning, by ensuring that learning and teaching:

- builds and maintains respectful and reciprocal learning relationships (whanaungatanga) to enhance learning;
- uses a range of teaching techniques and activities to support chosen delivery modes;
- is based on ako and requires the active engagement of learners;
- uses a range of appropriate strategies to enhance the success and confidence of diverse learners;
- engages learners in regular feedback to support their learning;
- uses pedagogically appropriate digital technologies;
- applies learning to real world contexts, environments and expectations;
- considers the full range of learner needs, partnering with other support services where appropriate, to ensure all aspects of learning support is provided.

¹ **Kura Ako** – School of Learning

² **Ako** – actively promotes the reciprocal relationship between the learner and teacher. It is premised in the sharing of knowledge, experiences and skills. Ako recognises a joint responsibility and obligation to teaching and learning

Arotake³

Engages in ongoing reflection and evaluation seeking ever greater success in learning & teaching, and learner outcomes by:

- continuing to review and enhance our academic quality systems and practices, including governance oversight;
- continuing to develop and implement robust evaluative practices at programme and course levels, leading to informed change and improved outcomes;
- continuing to support our kaiako (teachers) to be reflective practitioners who use a range of evidence to reflect and evaluate their own teaching practice, making adjustments where appropriate.

Kaiako⁴

Kaiako (teachers) continue to be engaged and inspired. They are supported to design and facilitate great learning/teaching by:

- continuously improving our Teacher Capability Development systems to meet teachers', learners' and institutional needs;
- supporting our kaiako to continuously develop capability in all aspects of our teaching competency and Te Tipare frameworks;
- encouraging and supporting our Kaiako to engage with industry and community, and to continue to develop discipline/industry expertise;
- providing opportunities for our kaiako to share good practice and support them to gain acknowledgement through promotion and through teaching awards.

³ **Arotake** - a continuous and ongoing process of reflection and evaluation, seeking ever greater success in the way we design, facilitate, assess learning, and provide support for our learners

⁴ **Kaiako** – our teachers

4. ASSESSMENT AND MODERATION

This section addresses Programme Approval Criterion 6 by presenting evidence that assessment methodology is fair, valid, consistent and appropriate, given the stated learning outcomes, and there is an effective system for moderation of assessment materials and decisions.

It also addresses Accreditation Criterion 1 by demonstrating how the institution has the capability and capacity to ensure assessment materials and decisions are fair, valid, consistent and appropriate, given the stated learning outcomes.

This section includes an explanation of:

- the programme's assessment rationale;
- what the programme places value on;
- how standards of achievement will be maintained;
- how assessment schemes/schedules have been developed and how they are appropriate for the programme;
- how assessment planning will occur; and
- how, in particular, Objectives 3 and 5 of Unitec's Māori Success Strategy have been realised in developing assessment strategies for this programme.

4.1 Assessment

Assessment practices adhere to Unitec's *Assessment, Moderation and Grades Policy*. This policy mandates that:

- all Unitec programmes employ appropriate assessment and feedback practices that enhance the quality of student learning and evaluate achievement;
- assessments will be consistent with the requirements of the *Academic Development and Approval Policy*;
- will be fair, valid and consistent; and
- utilise transparent processes.

Over time, it is anticipated that programme feedback and course/student evaluations will result in refinements to assessment methods and events.

In addition to this policy, a network of policies and procedures attached to Unitec's *Academic Statute* (including the *Programme Regulations*) is used to guide and address issues of:

- appeals;
- assessment criteria;
- content;
- estimation;
- extra time;
- information;
- marking turn-around;
- scheduling; and
- supervision.

Working within the statute and relevant policies, procedures and regulations allows teachers to assess students' progress in a way that is fair for students and that can adequately measure learning.

Assessment approaches and tools are designed to be diverse and responsive to students' preferred learning and teaching styles⁵.

The assessment process is designed to:

- evaluate the achievement of the programme aims and objectives;
- assess students' capabilities in a fair, valid, and reliable manner;
- stimulate and enhance learning;
- provide students with feedback regarding their own learning for and developmental purposes; and
- evaluate students' achievement and the demonstration of specified learning outcomes.

4.1.1 Assessment basis

Assessment in this programme uses both formative and summative assessment practices. Summative assessment is achievement based using an 11-point grading scale. Students must obtain at least 50% overall score in any achievement-based course in order to pass that course.

All assessment events in each course are compulsory unless noted otherwise.

4.1.2 Assessment methods

Assessment in the Bachelor of Computing Systems has a dual role: to provide students with feedback that supports their on-going learning and develops their resourcefulness and autonomy, and to provide stakeholders with assurances about the quality of graduates in relation to the programme aims and philosophy.

The Bachelor of Computing Systems aims to produce accomplished graduates with the knowledge, skills and capabilities to add value to organisations and the IT industry in New Zealand, and internationally. The programme is designed to provide students with discipline knowledge and skills, an appreciation for how a business functions and the ethics of sound IT practices. The programme assessments reflect these aims and are in many cases characterised by the ethical, professional or real-world application of knowledge and skills.

In some instances, a large number of assessments are applied. The philosophy underlying this approach is to replicate the real world of business where multiple outputs can be required. The courses with larger numbers of assessment events are designed to lead students through an industry standard procedure for achieving IT results. It is part of the living curriculum of this programme and these assessment events are integrated allowing fluid development of both the learning and assessment items. The level of achievement is moulded to fit the personal learning requirements of students, without constricting to a universal piece of work for content, and therefore not stifling individual creativity. Our philosophy is that all assessments should in themselves be learning events that confirm learning and capability to both the teaching staff and individual student.

Assessments are designed to assess not just knowledge, but also skill and attitude. The assessment philosophy of the Bachelor of Computing Systems is that assessments form part of student learning and where possible are integrated and embedded in learning. In all cases, feedback on summative assessments is provided to students to show where improvement could be achieved. The Bachelor of Computing Systems provides many class opportunities for formative assessment to occur. Formative assessments occur in verbal, practical and written formats to suit various subjects. Class group activities are also common practices that allow for formative feedback. The online learning environment provides additional opportunities for formative assessment, for example, through the

⁵ Unitec Institute of Technology (2016). *Learning and Teaching at Unitec Institute of Technology, New Zealand*.

use of online quizzes. The range of assessment methods utilised in the Bachelor of Computing Systems are summarised in the following section.

The following assessment methods may be used as formative and/or summative tools. Each method identified may be utilised to assess theory and/or practical/clinical applications. The table below show the matrix of methods that are used across the BCS.

Portfolios

Portfolios are used as an assessment item in a number of courses in the programme and refer to instances where a series of assessment items from the list below, are used to assess student learning of the theory and application of concepts, models and principles in a variety of scenarios and contexts. The method, timing and weighting of each assessment item will be considered within the development of the courses and in collaboration across the programme teaching team. This portfolio will give students the opportunity to demonstrate development of course-specific knowledge, skills, and learning achievements.

The Capstone Project includes a summary of the knowledge and/or skills developed (for example, research reviews), and examples of summative reflective exercises (for example, written self- and peer-reflections on practice).

Assignments

Assignments (including essays, reports, presentations) are used across the programme to give students the opportunity to hone their research, critical analysis and evaluation, and communication skills. Generally, students are given different topic-options to choose from, allowing them to learn about specific areas of interest in-depth.

Case-studies

This assessment approach is used to provide a real-world context for student learning, in which students demonstrate their ability to apply theory to practice. Typically, students are required to investigate, analyse, and report on a specific real-world scenario. Case-studies may be used as individual assessment items or may also be included as part of a larger assessment (for example, learning portfolios).

Examinations

Examinations are used as a method for assessing students' breadth of knowledge in specific curriculum areas. Students will be required to demonstrate an ability to evaluate and apply their knowledge in increasingly-complex scenarios. Examinations are, typically, written, although support resources are available for students with disabilities, and completed under supervised conditions.

Group/collaborative assessments

This method gives students the opportunity to demonstrate evidence of development of 'soft skills', such as teaming and leadership skills, while also providing the opportunity to work with peers to demonstrate understanding of a specific area of practice. For example, group presentation work requires students to work together to research and present a chosen topic.

Practical demonstrations

These assessments give students the opportunity to demonstrate their ability to complete a range of practical/clinical tasks. Students demonstrate work-based practical skills, for example, lab-work, which is then assessed by teaching staff.

Presentations

Presentations give students an opportunity to demonstrate depth of understanding of specific material, and their ability to respond to peer- and/or supervisor-review. Presentations may also assess communication or writing skills, and a range of research skills. These may be: formal verbal

presentations; poster presentations; or multi-media presentations. Presentations may be aligned with other assessments, such as field reports, case-studies, or group projects.

Projects

Projects are used to explore concepts and/or topics in detail, giving students an opportunity to demonstrate a range of skills. This assessment approach may involve students undertaking a research project, investigating a topic related to an area of interest and/or practice.

Tests/quizzes

Tests are used to assess students' development of specific areas of knowledge; consequently, they are designed to motivate students to engage with theoretical material. While tests are typically summative in nature, they may also act as formative assessments as part of students' progress towards a larger piece of assessment. Tests may be in a short-answer, multiple-choice, or short essay form; they may be delivered in-class or online.

4.1.3 Assessment of work-based learning

Work-based learning only features in this programme in a limited way, and assessment is designed to verify outcomes using the above methods.

4.2 Feedback

Learners are provided with fair and regular feedback on progress and fair reporting on final achievements in accordance with Unitec Policy and Procedure. Teaching staff contributing to the programme strive to provide constructive feedback in a timely fashion. Typically, such feedback is provided in writing with students' individual assessment submissions. However, common errors or themes may be discussed in class or presented via the course Moodle™ site.

4.3 Course workload

Teaching staff are responsible to ensure students' workload is spread evenly across a semester. This is co-ordinated through the use of an assessment planner, completed at the start of the academic year as part of the moderation process. The assessment planner ensures assessments are spaced so that a cohort of student's hand in no more than one summative assessment in a given week. An additional strategy for mitigating work-load risks is the use of assessment events that assess multiple learning outcomes.

To ensure students can plan and prepare appropriately, they are provided with information about the assessment requirements for each individual course at the start of the semester. This information explicitly identifies due dates for assessment events, as well as supporting details (for example, assessment schedules). In addition, students are provided with an overall or larger assessment 'map' that illustrates the timing of assessment events across courses in a given semester.

4.4 Assessment in Te Reo Māori

All students have the right to submit any summative assessment task in Te reo Māori. The process for submission of summative assessment work in Te reo Māori is governed by the Unitec Assessment in Te Reo Māori procedure and detailed in course material.

4.5 Assessment moderation

Unitec's *Moderation of Assessment Procedure* requires internal and external moderation of summative assessments in all Unitec programmes that lead to the award of a formal qualification. Moderation is defined as the review processes used to assure the quality of summative assessments.

The purpose of moderation is to provide the learners and stakeholders assurances that assessment practices have produced credible results.

Moderation is a process of independent peer/stakeholder review of summative assessment material and judgements. It is designed to ensure assessment:

- is consistent, fair, valid, and reliable;
- items assess the appropriate learning outcomes and match information provided to learners at the beginning of the course;
- events are consistent with the teaching, learning, and assessment philosophy of the programme;
- is based on the approved achievement criteria specified in the programme and described in the *Programme Regulations*; and
- procedures are managed effectively and applied fairly.

Furthermore, moderation adds value to qualifications by providing assurances they are credible, while adding value to teaching and learning by providing teachers with feedback on where and how to improve assessment practices.

The outcomes of moderation are reported in the annual *Programme Evaluation Plan* (see section 8.3.1).

Moderation includes:

- a Moderation Plan;
- an External Moderation Report;
- pre- and post-event Internal Moderation Checklists; and
- the programme's response to the *External Moderation Report*.

Moderation is completed in accordance with the *Moderation Plan* which is overseen by the Programme Academic Quality Committee.

4.5.1 Internal moderation processes

Responsibility for internal moderation lies with an internal staff member recognised as having expertise in assessment within the discipline area of the relevant course.

Pre-event moderation

All courses are subject to internal moderation of all summative assessment items.

The Academic Programme Manager, in discussion with the Head of Schools, will include a list of moderators in the programme's *Moderation Plan* at the start of the year. Each course is allocated an internal moderator, who completes the *Internal Moderation Checklists*.

Pre-event moderation activities will ensure assessment items are clear, accurate, appropriate for the course-Level, and meet the course learning outcomes associated with each assessment item.

Post-event moderation

Post-event moderation, which involves completion of a checklist, is performed on all assessments for each course.

Using a sample of assessment scripts, the moderator reviews judgements made about students' work; moderators review assessments with the highest, middle, and lowest marks.

Post-event moderation is used to check the consistency of assessors' marking decisions, and to recommend any changes to an assessment that may improve its validity, authenticity, and consistency.

4.5.2 External moderation processes

Courses are subject to regular external moderation by an independently nominated-peer and/or stakeholder.

Typically, each course will undergo external moderation at least once every three years; selected courses may, however, be moderated annually if internal moderation identified a concern or negative student feedback indicates this step to rectify course issues.

The moderator is supplied with:

- the programme's Graduate Profile;
- course details;
- a range of assessment samples;
- assessment marking schedules; and
- any additional assessment information provided to students.

The external moderator will examine the:

- suitability of tasks;
- extent to which assessment tasks align with the learning outcomes, course content, and the programme's Graduate Profile;
- fairness, consistency, and appropriateness of judgments made about students' work;
- value of feedback for learners; and
- the extent to which feedback enhances and promotes learning.

External moderation for the BCS is undertaken by a range of qualified teachers from a range of appropriate Tertiary Teaching Organisations (TTO).

Table 3: Moderation planning

Course	Pre-moderation	Internal Post-moderation	External moderation	Moderator
All Courses	Prior to each delivery	Prior to grades approval following each delivery	End of first delivery of each course or following any change to assessment Then each course on a three-year cycle	Qualified teachers from a range of appropriate TTO's. – NZIST Computing School connections to be further developed to ensure robust, reliable moderation systems.

Specific detail of moderation will be outlined in the Annual Moderation Plan developed and approved by the Programme Academic Quality Committee.

Each Programme Academic Quality Committee maintains a three year schedule of moderation for each Programme that it is responsible for. The ongoing moderation plan for this programme is available on request.

4.6 Assessment of Prior Learning (APL)

In accordance with Unitec's *Assessment of Prior Learning Procedure*, current and/or prospective students may apply to complete the programme or individual courses under Assessment of Prior Learning (APL); this refers to the process of evaluating informal or non-formal learning or evaluating evidence of formal **and** informal learning.

Students seeking to apply for APL may contact the Academic Programme Manager, who leads the APL process, for general or specific enquiries.

Upon enquiry, prospective students will be provided information around the:

- costs associated with the process;
- methods used during APL, including the type of evidence required; and
- process timelines.

As described in the *Assessment of Prior Learning: Student Guidelines*, students are encouraged to discuss the course(s) they are intending to apply for under APL, to ascertain whether or not the process will be suitable for them.

Students seeking to apply for courses under APL will be required to provide evidence that demonstrates prior learning of skills and/or knowledge specified in individual course learning outcomes.

Once received, evidence submitted by students is assessed by the Delegated Academic Authority against the programme's Graduate Profile Outcomes and the learning outcomes of the specific course(s) students are applying for under APL.

5. PROGRAMME REGULATIONS

This section addresses Programme Approval Criterion 5 by demonstrating that the institution has clear, relevant, and appropriate regulations that specify requirements for:

- admission
- credit recognition and transfer
- recognition of prior learning
- programme length and structure
- integration of practical and work-based components
- assessment procedures, including authenticity of student work
- normal progression within the programme

Programme Regulations are the legally binding contractual obligations of staff and enrolled students. They are used by academic staff to guide delivery of the programme and its courses; and provide guidance on the relevant approaches to learning and teaching, and on assessment (against specified learning outcomes).

In cases where collaborative arrangements are in place, externally prescribed regulations may apply.

Programme Regulations for this Programme are located in Appendix 4 of this document.

6. PROGRAMME RESOURCES

This section addresses Accreditation Criterion 2 by demonstrating that the institution has the capability and capacity to support sustained delivery of the programme through appropriate academic staffing, teaching facilities, educational and physical resources, and support services.

This section:

- provides information on the resources needed for programme delivery;
- presents information about institutional resources in reference to how they impact on programme delivery and students' experience within this programme;
- illustrates how resources are comprehensive and sufficient for the programme Level;
- illustrates how resources are appropriate to the methods of delivery; and
- includes information on teaching staff (via a table outlining staffing), teaching and learning facilities, support services, and, where relevant, arrangements for work-based training.

6.1 Programme staffing

The Bachelor of Computing Systems is delivered by *eighteen* FTE academic staff. In addition, students are supported by support staff comprised of work-place supervisors, tutors, and administrative/support personnel.

Table 4: Programme Staff

Name	Qualifications	Major	Teaching responsibilities
Iman Ardekani	2012 PHD Doctor of Philosophy 2003 MAS Masters 2000 BR3 Bachelors 3 years	Electrical and Electronic Engineering Electrical Engineering - Power Engineering Electrical Engineering - Control Engineering	Programming Fundamentals
John Allan Casey (0.2FTE)	2008 DOC Doctorate 2002 BCS Bach Computing Systems	Cache & Replica Look up, index Applied Computing	Mobile Software Development
Simon George Dacey	1996 MAS Masters 1980 DIP Diploma	Applied Remote Sensing Computer Studies	Capstone Project Systems Analysis and Design
Andrew David	2015 BCS Bachelors 3 years	Bachelor of Computing Systems	Hardware Fundamentals, Network Administration and Support, Network Operating Systems Management and Computer Systems Security
Maryam Erfanian	2009 MAS Master of Information Technology advanced 1992 BSc Associate degree in Computer Science	Database and web programming	Database Design and Development, Capstone Project
Carol Ann Home	1988 BRH Bachelors with honours	Bachelor of Arts with Honours (Second Class, Division 2)	Project Management Methodologies and Risk Management
Eltahir Kabbar	2017 PHD Doctor of Philosophy	Doctor of Philosophy - Information Systems	Introduction to Databases and Network Design and Implementation

Samad Kolahi	2008	PHD	Doctor of Philosophy	Electrical and Electronic Engineering	Data Communications and Networks and Advanced Data Communications
	1986	MAS	Masters	Chemical and Process Engineering	
Natalia Nehring	2008	MAS	Masters	Master of Information Sciences in Information Systems with First Class Honours	Systems Analysis and Design, Internet and Website Development, Testing and Quality Assurance Management and Agile and Lean Software Delivery
	2001	BCS	Bach Computing Systems	Bachelor of Computing Systems	
Natt Nuntalid	2013	PHD	Doctor of Philosophy	Ph.D. in Computer and Information Science	Data Warehousing, Data Mining, Capstone Project
	2008	MS	Master of Science	M.Sc. in Computer Science	
	2005	BS	Bachelor of Science	B.Sc in Computer Science	
	2005	GCE	Graduate Certificate	Graduate Certificate in Teaching Profession	
Kris Pritchard	2012	BSc	Bachelor of Science	Computer Science and Mathematics (with Physics minor)	Programming Principles and Practice Data Structures and Algorithms, Web Application Development
Shiu Ram	1988	DIP	Diploma	Business Studies- Info Systems	Information Systems Concepts, Project Planning and Control, Information Systems Analysis
	1982	PGCERT	Post Graduate Certificate	Teaching	
	1978	BR3	Bachelors 3 years	Science	
Guillermo Ramirez-Prado	2010	PhD	Doctor of Philosophy	Electrical Engineering	Cloud Application Design and Development
	2001	MSc	Master of Science	Electrical Engineering	
	1998	BSc	Bachelor of Science	Computer Science	
Bahman Sarrafpour	2003	CEEE	Cert Electrical Electronic Eng	Advanced Studies in Electrical Engineering	Fundamentals Concepts of Cybersecurity, Advanced Cyber Security
	2003	MAS	Masters	Master of Science (Electrical Engineering)	
	1994	BR3	Bachelors 3 years	Bachelor of Science	
Jesse Schollitt	2018	BSc	Bachelors 3 years	Bachelor of Computing Systems	GUI Programming and Cloud Application Design and Development
Hamid Sharifzadeh	2012	PHD	Doctor of Philosophy	Doctor of Philosophy	Operating Systems Fundamentals
Jung Son	2012	MAS	Masters	Master of Forensic Information Technology with Honours (First Class)	Computer Forensic Investigations
	2008	PGDCG	PGDip Computing	Postgraduate Diploma in Computing	
	2006	DIP	Diplomas	Diploma in Information Technology with Distinction	
	2003	CER	Certificates	Certificate in Introductory Computing with Distinction	
Soheil Varastehpour	2020	PHD	Doctor of Philosophy	Doctor of Computing	Operating Systems Fundamentals, Networking Fundamentals, Programming Fundamentals

Poh Kim 'Teresa' Yap	2009	PGDIP	Post Graduate Diploma	Postgraduate Diploma in International Communication	Professional Skills
	2004	GDHE	GDip Higher Education	Graduate Diploma in Higher Education	
	1995	CER	Certificates	CAT - Adult Teaching	
	1994	DIP	Diplomas	Word Processing	

In addition to the academic staff there is a strong team of technical staff supporting the School as a whole.

Staff development

In accordance with Unitec's policies, all teaching staff are required to develop professional development plans that provide an opportunity for staff involved with the programme to build their skills and knowledge.

6.2 Teaching facilities and physical resources

Teaching facilities and physical resources are designed to support the implementation and sustained-delivery of the programme, in all modes of delivery.

The BCS has put in place the necessary teaching facilities and physical resources. Specific resources include dedicated computer labs.

6.3 Library Services

Students have access to Unitec's physical and online libraries, which support the teaching, learning and research needs of the Unitec community, through its collection and resources, and its librarians, including dedicated postgraduate librarians.

Full details about Unitec Library Services are available via this link – [Unitec Library Services](#)

The [Unitec Library Website](#) describes the collection available for students.

6.4 Information Management Systems

A wide range of information technology services are employed to support delivery of this programme. Information Technology (IT) offers a range of technology services and support to all staff and students of Unitec. Full details about IT Services are available via this link – [IT Support](#)

The delivery of the course content is via the Unitec Moodle Learning Management System - [Moodle](#)

This will be augmented with moderated online meetings and breakout rooms using Zoom, and other online platforms such as Peerwise.

6.5 Student Guidance and Support

Unitec provides a large number of guidance, support systems, and facilities for students.

Full details about **Unitec Student Support Services** are available via the following links:

- [Student Services](#)
- [Support for Māori Learners](#)
- [Support for Pacific Learners](#)
- [Support for International Student Learners](#)
- [Support for Learners with Disabilities](#)

The teaching and support team for this programme are a signatory to the [Code of Practice of Pastoral Care for International Learners](#).

7. PROGRAMME ACCEPTABILITY AND CONSULTATION

This section addresses Approval Criterion 4 by presenting the acceptability of the programme and consultation.

The consultation associated with the original accreditation of this Programme may be found in the Programme Definitive Document. The consultation undertaken in support of this updated programme document included consultation between Enrolments and Programme Staff to streamline the enrolment process for students to remove confusion by deleting references to course that are no longer offered.

The elective courses removed have been considered by School Programme Committee and teaching staff who have close contacts with industry over time. Courses were agreed over time to be no longer relevant. This action is seen to be an administrative tidy-up.

8. SELF-ASSESSMENT, EVALUATION AND REVIEW

This section addresses Programme Approval Criterion 7 by providing information about how the institution assesses the currency and content of the programme; has adequate and effective processes for the on-going review of the programme, taking account of the results of any review of the qualification; has adequate and effective processes for monitoring the quality of outcomes for learners and other stakeholders, and for reviewing programme regulation and content; and updates the programme accordingly.

It also addresses Accreditation Criterion 4 by presenting processes for the adequate and effective review of programme performance and the institution's capability to support the programme.

8.1 Academic and programme quality management

Unitec's Schools are overseen by a number of major decision-making bodies, including:

- the Te Pūkenga Council and its Academic Board;
- the Unitec Board of Directors, Chief Executive and the Leadership Team; and
- the Unitec Academic Committee and its sub-committees.

Unitec's academic committee structure utilises the principle of wakaritenga (legitimacy); academic decision-making processes legitimise others' contributions and ensure that ethics and integrity inform subsequent actions.

The Bachelor of Computing Systems sits within the School of Computing, Electrical and Applied Technology which is led by a Head of School.

The BCS is governed by the Programme Academic Quality Committee (PAQC), which reports to a Quality Alignment Board (QAB) and Unitec's Ako Ahimura Learning and Teaching Committee; these latter groups are established sub-committees of Unitec's Academic Committee.

Together, these committees are responsible for:

- maintaining educational performance;
- supporting continuous improvement in learning, teaching, and research through inter-disciplinary collaboration; and
- student outcomes including success, retention, and academic progress.

8.1.1 Financial and administrative infrastructure

In addition to Academic Quality and Governance, Unitec also provides effective financial infrastructure, administrative systems, and resource management practices to support implementation and sustained delivery of the programme.

8.2 Programme changes

Programme changes and improvements are governed by Unitec Programme Change and Improvement Procedure. Approval for any change is based on:

- stakeholder support for change;
- considerations of the impact on:
 - other programmes;
 - broader Unitec practices; and on
 - Unitec's responsibilities to external agencies.

Institutional support areas such as, Te Puna Ako, Te Korowai Kahurangi, Kaihautū, and other relevant external stakeholders feed into the programme improvements or change process.

8.3 Evaluation and review

All Unitec programmes are subject to ongoing evaluation of individual courses as well as the programme as a whole. Evaluations involve major programme stakeholders: learners, appropriate external professions and organisations, and members of the academic community.

8.3.1 Programme Evaluation

Course Evaluation and Planning (CEP)

Written Course Evaluation and Planning (CEP) reports are completed by individual teachers each semester, to highlight and analyse any issues which occurred and to provide suggestions for improvements as required. They provide Teachers an opportunity to reflect on course outcomes and to plan improvements to their courses and to their own development as teachers.

All teachers who are responsible for courses and outcomes are involved in Course Evaluation and Planning. Evidence is gathered from a wide range of internal and external inputs, and evaluated by the Teacher as the course progresses. CEP reports provide Academic Programme Managers with rich information about the component parts (courses) which form part of their programmes.

Programme Evaluation and Planning (PEP)

Annual *Programme Evaluation Plans* (PEPs) are completed to manage and record the evaluative and improvement process. PEPs are structured around six *Key Evaluative Questions*, which emphasise the core activities of performance, evaluation, planning, execution, and review. It also focuses on Māori and Pacific Success, progress towards 2022 parity goals and, embedding and including the I See Me initiatives and the Te Tipare framework.

Programme plans are assessed as evidence of capability in self-assessment. Evaluations are discussed both locally in the Programme Academic Quality Committee (PAQC) and in various other fora including the QAB, which has responsibility for having a close scrutiny of programmes where the standard of performance is at risk or unacceptable. A single evaluation report is collated for the Academic Board.

Periodically, the institution conducts surveys of learners, graduates, employers, and staff; these provide feedback on specific issues. Findings are reported to the Executive Leadership Team and Academic Board, and tailored presentations are provided to each School. Programme-related findings are evaluated and used to determine improvement actions, which are recorded and tracked through the PEP.

The first PEP for any new Programme is due immediately following the first semester of delivery, and for each semester thereafter. This includes data and information regarding student success, evaluation of the programme, and input from relevant stakeholders, including the Industry Advisory Group.

8.3.2 Degree monitoring

All Unitec degrees and postgraduate programmes are subject to annual, external, independent monitoring. Monitors have credentials and currencies that enable them to relate the needs and expectations of external academic and employer stakeholders to individual, or groups of, degree programmes and their delivery.

Monitoring is aligned with NZQA requirements for monitoring of degree and related qualifications.

Monitoring enables the views and interests of participating stakeholders to be considered; it is also a process for determining the extent to which the needs of all stakeholders are being met.

Individual monitors:

- Are demonstrably independent of Unitec and of programme staff;

- Have current discipline/practice knowledge, strategy/management capability, and proven research/ investigation skills;
- Understand the roles and expectations of the ITP sector; and
- Are familiar with cutting-edge global trends in tertiary education and in business/community development.

Monitors engage with programmes and provide feedback on:

- Implementation of the Unitec strategy in the context of specific programmes;
- Consistency of the programme and its delivery with approved arrangements; and
- Achievement of the quality outcomes specified in the Unitec Academic Statute.

Programme monitoring is carried out annually by a qualified academic from another Institution as approved by Unitec and advised and agreed with NZQA. A schedule of yearly degree monitoring is maintained by Te Korowai Kahurangi, Unitec's Academic Service Centre.

8.3.3 Programme review

All programmes at Unitec are subject to an independent review every three to five years or when directed by the Academic Board. New programmes, including the proposed programme described herein, undergo an initial review following the graduation of the first cohort.

Reviews are designed to be collaborative and aim to:

- identify areas for development;
- identify areas for improvement; and
- ensure the programme maintains relevance for stakeholders.

In doing so, reviews add value to Unitec's on-going stakeholder interactions by fostering new, and strengthening existing, relationships.

Reviews are governed by Unitec's *Academic Evaluation, Review and Improvements Policy*, and focus on two KEQs:

- KEQ2: What is the value of the outcomes for key stakeholders, including learners?
- KEQ3: How well do programme design and delivery, including learning and assessment activities, match the needs of students and other relevant stakeholders?

Programme review is an important component of the self-assessment, evaluation, and improvement process and recognises that stakeholders are critical to the success of Unitec graduates and programmes.

This Programme is subject to programme review on a cycle designed to meet Unitec's and the NZQA's requirements.

8.4 Student evaluation

Student evaluation is a critical component of learners' coherent educational experience, and is a part of Unitec's repertoire of evaluative questioning processes.

Student evaluation aims to naturally integrate evaluation within the context of study so that staff and learners engage in dialogic practices to enhance teaching and learning.

The purpose of student evaluation is to gather feedback on:

- how well a course/programme is meeting learners' learning needs and expectations;
- learners' experiences of courses;
- learners' views on areas of strength;
- learners' views of where improvements can be made;

- learners' assessments of teaching staff and, consequently, teaching staff's professional development needs.

At the start of the course, learners are told which courses will be evaluated; how evaluation will be carried out; evaluation time frames; and reporting back process.

In this programme student evaluation is gathered using Unitec's standardised process.

Once evaluation has occurred, student evaluations are analysed, potential response actions are identified, and this data is communicated back to learners within an agreed timeframe. Evaluation results and proposed actions are incorporated in the annual PEP.

8.5 Stakeholder engagement and feedback

Periodically, Unitec conducts surveys of students, graduates, employers, and staff. Providing feedback on specific issues, surveys adopt a "Net Promoter Score" methodology based on the question 'How likely are you to recommend Unitec to your friends and family'.

Findings are reported to the Executive Leadership Team and the Academic Board, and tailored presentations are given to each School. Programme-related findings are evaluated and used to determine improvement actions, which are recorded and tracked through the PEP.

Institutional support for improvement, as well as ideas for programme development, come from a number of institutional services. These services are also stakeholders in that they help ensure institutional commitments are honoured. For example, Te Puna Ako supports the development of teacher practice, Kaihautū support the embedding of matauranga Māori, and Te Korowai Kahurangi provides advice on quality and other process matters.

Programme-specific engagement with external stakeholders will be supported by ensuring learning experiences are embedded in contemporary work-based practice.

8.5.1 Industry Advisory Group

Each School and or major discipline group has an Industry Advisory Group which supports consultation processes. This group, comprised of a number of stakeholder representatives, has a key role in ensuring this programme continues to meet the needs of all stakeholder groups.

This group meets regularly to discuss and provide input into programme development and improvement. Each Industry Advisory Group focusses on the following key tasks:

- ensuring the programmes meet the current and future needs of employers;
- giving a stakeholder perspective on programme developments and reviews;
- providing an opportunity for teaching staff and stakeholders to share best practice and research findings.

The Industry Advisory Group includes a number of key stakeholders; the membership of this group is listed on the table below.

Table 5: Computing Advisory Group

Name	Title/Organisation	Stakeholder Representation
Rachel James	Head of Business Delivery, Fisher and Paykel, Rachel.James@fisherpaykel.com	
David Eaton	Associate Director, Datacom DavidE@datacom.co.nz	
Priyanka Giri	Mobile Strategist, Datacom PriyankaG@datacom.co.nz	
Craig Shipman	Business Innovation Advisor, Callaghan Innovation	

	craig.shipman@callaghaninnovation.govt.nz
Christophe Spencer	CTO, PHD Media Christophe.Spencer@phdmedia.com
Ivan Pitton	Senior Threat Analyst/Team Lead,Cyber Research (our alumni) ivanpitton@hotmail.com

9. RESEARCH

9.1 Research Strategy

Research at Unitec refers to a wide variety of activities conducted by both staff and students. This activity involves the:

- generation of new knowledge;
- application of existing knowledge in novel or useful ways; and
- the integration of knowledge through inter-disciplinary work. Research activity may be undertaken as:
 - researcher-driven academic research;
 - research funded by external stakeholders in the form of grants or projects;
 - postgraduate or undergraduate student research projects; and
 - other research where the outcome is either quality assured publication, performance or exhibition.

During the 2015 – 2019 Research Strategy period, three Strategic Research Foci were developed at Unitec: the Cybersecurity Focus, the Applied Molecular Solutions Focus and the Kaupapa Māori Focus. Through mechanisms such as the Research Voucher Scheme, the strategy successfully drove institutional change toward higher levels of industry-partnered research resulting in many funded projects. Coupled with an emphasis on building staff capability and research leadership, Unitec has experienced growth in its research, with externally funded research increasing by 450%, increased external partnering with 184% more industry-funded projects, improvement in excellence with a 97% success rate through the PBRF Quality Evaluation and increased NZQA compliance with 91% of degree programmes research compliant. The Kaupapa Māori Focus led to the appointment of two highly respected Māori professors, and the establishment of Ngā Wai a te Tūi Māori and Indigenous Research Centre, which is now leading numerous externally funded projects, including an Endeavour Fund Research Programme and a National Science Challenge project.

This next strategic period will see Unitec continue investing in our Strategic Research Foci with an emphasis on rangatiratanga, embedding a flourishing, diverse and sustainable research culture and weaving strong, enduring industry/community partnerships.

The Unitec Research Strategy 2020 – 2024 has three key priorities which underpin our goals, our actions and the way we measure success:

Priority One: Research that is aligned with Te Tiriti o Waitangi

Priority Two: A flourishing, collaborative research culture

Priority Three: Partnered research and innovation

Unitec's research strategy has been developed in the context of the New Zealand Government's *Tertiary Education Strategy*, which places a particular emphasis on partnership with industry and producing research outputs that have greater "relevance...to industry and wider society."

As outlined in the [Unitec Research and Enterprise Strategy 2020-2024](#), the strategy focuses on three main goals, which are informed and guided by key actions for each goal listed in the strategy.

9.1.1 Tūāpapa Rangahau / Research and Enterprise Office

Unitec's Tūāpapa Rangahau/Research and Enterprise Office (REO) combines the management and administration of staff and student research at Unitec, under the leadership of the Dean: Research and Enterprise.

The activities of the unit focus on the main areas of:

- commercialisation, technology transfer and the management of intellectual property;
- external grants and funding;
- professional research development;
- research ethics;
- research management and promotion;
- special research events; and
- student research.

9.2 Research policies

See Appendix 1 for link to policies

9.3 Staff research

Staff teaching on this programme conduct research to an appropriate level within their area of experience that advances knowledge and understanding and supports their function as teachers.

The quantity and quality of staff research outputs are monitored and the collective output is consistent with the development and maintenance of an on-going research culture in support of the programme.

Organisational systems and facilities provide appropriate support to staff involved in research, including access to an appropriate ethics committee. For further information, see Unitec Policy and Procedure in the Appendix.

The majority of staff teaching in BCS are research active with overall 2020 Research Productivity Traffic Light (2019 RPTL) status for this programme is sitting at 73% (i.e. 73% of staff teaching in BCS have at least two quality-assured research outputs in the past two years). The numbers of quality assured output published by the BCS staff in the past four years are: 57 (2016), 65 (2017), 52 (2018), 30 (2019). Furthermore, staff in this programme were successful in establishing five industry-funded projects (including public sector services) in 2019. The research active staff were also successful in securing \$187K external research income (ERI) for the School in 2019. Most of these industry-funded projects and ERI funding involve high levels of students' engagement in addition to the expertise and capabilities provided by the staff.

As part of School Research Plan devised in 2020, seven research groups have been identified across various programmes offered by the School. Closely aligned with the teaching specialisations and pathways in the BCS programme, BCS staff form four of these research groups based on their expertise. These four research groups are as follows: a) Intelligent Systems and Data Science; b) Cyber Security and Computer Networks; c) Software Engineering; d) IoT and Sensor Networks. By encouraging collaborations and working together culture (mahi Kotahitanga), these research groups make the research efforts to be more focused on achieving research goals and finding efficiencies in further embedding research into teaching and learning activities. Such approach is more likely to result in impactful research for our students, industries and communities as well (rather than individual research trajectories).

Each research group comes with its own statement of purpose and covers full spectrum of diverse research areas of staff forming that group. For example, research in the area of Software Engineering is directed towards design and development of mobile apps, web applications, computer games, web programming, human computer interactions and user interfaces whereas research in the area of Intelligent Systems and Data Science is focused on developing smart technologies using artificial intelligence and machine learning, developing smart systems based on data science and big data analysis, and exploring wide range of artificial intelligence applications in various areas from healthcare to industry, education, business, security, etc.

Details of research expertise for staff teaching in the BCS programme along with their 2020 RPTL status and number of research outputs have been listed in the following table.

Staff Name	2020 RPTL Status	Research outputs (2016-2019)	Expertise
Bahman Sarrafpour	Green lit	7-Conference Contributions- Paper in published Proceedings	Cyber security, AI, Computer Architecture, IoT
Bashar Barmada	Green lit	2-Conference Contributions- Oral Presentation, 6-Conference Contributions- Paper in published Proceedings, 5-Conference Contributions- Poster Presentation, 2-Journal Articles	Networking, Security and IoT applications
Eltahir Kabbar	Joined in 2020		Smart government, qualitative research, Structured Equation Modelling (SEM)
Gerard Lovell	Amber lit	1-Conference Contribution- Oral Presentation, 1-Conference Contribution- Paper in published Proceedings	Educational practices and innovative teaching
Guillermo Ramirez-Prado	Green lit	1-Book Chapter, 2-Conference Contribution- Oral Presentation, 1-Conference Contribution- Paper in published Proceedings, 2-Conference Contributions- Poster Presentation	Networking and security, Smart homes, Control systems
Hamid Sharifzadeh	Green lit	1-Conference Contribution- Oral Presentation, 11-Conference Contributions- Paper in published Proceedings, 5-Journal Articles	Machine Learning, Digital Signal Processing (Speech and Image Processing), Embedded Operating Systems
Iman Ardekani	Green lit	1-Conference Contribution- Oral Presentation, 14-Conference Contributions- Paper in published Proceedings, 1-Conference Contribution- Poster Presentation, 6-Journal Articles	Digital Signal Processing, Statistical Optimisation, Adaptive Systems
John Casey	Green lit	3-Conference Contributions- Paper in published Proceedings, 2-Journal Articles, 1-Other	Java, Microservices, AWS
Lei Song	Red lit		Fatigue driving detection, Internet of Things, Wireless Sensor Networks
Maryam Erfanian	Green lit	2-Conference Contributions- Paper in published Proceedings	Acoustic Measurements, Databases and Data Mining, Human Computer Interactions

Natalia Nehring	Green lit	1-Conference Contribution- Abstract, 2-Conference Contributions- Paper in published Proceedings, 1-Conference Contribution- Poster Presentation	Utilising Moodle to improve student achievements, Challenges of distance learning
Nuttapod (Natt) Nuntalid	Joined in 2020		Spiking Neural Networks, Health informatics, Business Intelligence
Samad Kolahi	Green lit	4-Conference Contributions- Paper in published Proceedings, 3-Journal Articles	Performance evaluation of networks Wireless networks Cyberattack and defences
Shiu Ram	Red lit	1-Conference Contribution- Abstract	Ergonomics, Moderation, Information Systems
Simon Dacey	Red lit	1-Awarded Doctoral Thesis, 1-Conference Contribution- Oral Presentation, 4-Conference Contributions- Paper in published Proceedings, 2-Journal Article	Assessment development, delivery of programming courses, remote sensing

10. APPENDICES

Appendix 1	Link to Policy and Procedure (OneDrive Folder)
Appendix 2	Learning Outcomes mapped to Graduate Profile Outcomes
Appendix 3	BCS Programme Regulations
Appendix 4	Course Descriptors

10.1 Appendix 1: Link to Policy and Procedure (OneDrive Folder)

Use the following link to view [Unitec Policy and Procedure](#)

10.2 Appendix 2: Learning Outcomes Mapped to Graduate Profile Outcomes

Table 6: Learning Outcomes mapped to Graduate Profile Outcomes

			GPO 1	GPO 2	GPO 3	GPO 4	GPO 5	GPO 6	GPO 7	GPO 8	GPO 9
Course Code	Compulsory Course Name	Learning Outcomes	The ability to apply technical and conceptual thinking	The self reliance and motivation for continued learning and professional development	The capabilities to be effective communicators and team members	An educational base that will enable them to relate to the wider context of society	Enquiring, flexible, creative and critical attitudes towards contemporary issues and underlying theoretical concepts	An appreciation of management and the ability to apply management processes in the IT environment	The knowledge of IT required to solve problems within their area of specialisation	An awareness of bicultural issues and an ability to function positively in a multicultural society	An awareness of social, ethical and environmental issues
ISCG5400	Hardware Fundamentals	<ol style="list-style-type: none"> Describe a wide selection of hardware components and explain their functions, including selection issues and managing peripherals; Correctly identify and configure a selection of information technology hardware resources. Demonstrate and describe preventative maintenance of information technology. Explain the current and emerging trends in information technology hardware. 	√						√		
ISCG5401	Operating System Fundamentals	<ol style="list-style-type: none"> Demonstrate knowledge of operating system concepts and structures, and processes and inter-process communications; Demonstrate knowledge of memory management, I/O management, file systems, and user management and security.; Use system commands and programs to monitor and manage processes and system resources; Use system commands and programs to manage files, users, and access controls 	√					√	√		
ISCG5420	Programming Fundamentals	<ol style="list-style-type: none"> Design small computer programmes as solutions to simple problems; Implement designs by writing well-structured Programmes that follow enforced programming language conventions and programming standards; Test, debug and document small computer programs 	√						√		
ISCG5423	Introduction to Databases	<ol style="list-style-type: none"> Describe different types of data, system data objects, and operations on data. Create database designs to solve given business problems; Implement database designs to solve given business problems in a database using an SQL software package. Create SQL queries to solve given business problems. Explain the meaning of the terms used in a database management environment. 	√						√		
ISCG5424	Information Systems Concepts	<ol style="list-style-type: none"> Explain the fundamentals of systems theory; Explain the Systems Development Lifecycle and system requirements; Analyse business situations requiring problem solving; Elicit system requirements using a variety of techniques; Model the requirements using a variety of technique 	√		√			√	√		
ISCG5430	Professional Skills for IT Practitioners	<ol style="list-style-type: none"> The student will be able to participate effectively in a variety of conversations, to make meaning, hear alternative perspectives and relay information both as an individual and as a contributing member of an Information Technology team across technical, gender, age and cultural boundaries. The student will be able to Define a problem, determine, create, seek and retrieve the required information from a variety of sources and utilise this information to effect a solution using information technology to support the outcome. The student will be able to Translate information needs into an information search strategy that is adaptable to the wide variety of information sources available. The student will be able to Communicate effectively by exploring the integration of contemporary audio-visual communication tools and software applications with written and spoken communication to prepare presentations and technical documentation that achieve both technical accuracy and user friendliness. 	√	√	√	√	√			√	√

		5. The student will be able to Develop a strategy for evaluating personal efficacy, as well as that of the team, in achieving a goal.									
ISCG6411	Project Planning and Control	1. The student will be able to apply project planning principles; 2. The student will be able to demonstrate the use of project management tools and techniques. 3. The student will be able to create project management documentation; 4. The student will be able to apply monitoring and control techniques.	√	√	√	√		√	√		√
ISCG7430 ISCG7431	Project Capstone Project	1. Prepare and present a project proposal plan —usually in response to a client or workplace need. 2. Analyse and document user requirements. 3. Research and critically evaluate possible new developments that could impact the project. 4. Select appropriate techniques and technologies to apply to the project. 5. Apply the selected techniques and technologies. 6. Manage the project professionally, addressing ethical issues and project risks in an appropriate manner. 7. Analyse the project solving process followed, and identify possible improvements. 8. Document and present the project process and deliverables in a public forum.	√	√	√	√	√	√	√	√	√

10.3 Appendix 3: BCS Programme Regulations

The Programme Regulations are in a separate document stored in the e-Academic Library

10.4 Appendix 4: Course descriptors

The course descriptors are in a separate document stored in the e-Academic Library