

Ara Institute of Canterbury Ltd
Department of Computing

Documentation for the Programme of Study

leading to the awards of:

CH3866

Bachelor of Information and Communication Technologies

Level 7, 360 credits

July 2018



Summary of Changes

Date of change	Description of change	Effective from	Approved by
9/9/19	BCCS283 – minor updates to learning outcome and indicative curriculum BCCS355 – reduce to two assessments BCIS370 – swap weightings for assignment 1 and 2	Sem 1, 2020	EC/NC
18/11/19	BCDE213 – prerequisite changes to BCDE102 for BICT and None for GradDipICT students.	Sem 1, 2020	MA/NC
23/1/20	BCCS283 – Update to learning outcome 2.	Sem 1, 2020	MA/NC
27/1/20	Assessment Regulations and grade scales updated to align with policy updates following TANZ Harmonisation	Sem 1, 2019	Academic Board
13/2/20	BCIS212 – Changes to outcomes assessed on assessments 1 & 2.	Sem 1, 2020	PR/NC
20/4/20	New course BCCS295 replaces BCCS293 and BCCS294 due to updates with Cisco CCNA course content	Sem 2, 2020	EC/MA/NC
25/5/20	BCCS350 – Prerequisite updated to BCCS295	Sem 2, 2020	EC/NC
23/07/20	BCCS191 – Prerequisite (BCCS153) removed.	Sem 1, 2021	EC/NC
21/08/20	BCCS355 – Learning outcomes and Indicative Curriculum updated	Sem 1, 2021	EC/NC
16/09/20	BCCS153 Computer Systems Architecture replaced with new course BCCS183 Cloud Technologies and the Internet of Things	Sem 1, 2021	EC/NC
18/09/20	BCDE213 – Correction to assessment type. Assessment map corrected and course descriptor aligned to this.	Sem 2, 2021	MA/NC
1/10/20	BCIS208 – Change to prerequisite	Sem 1, 2021	MA/NC
16/10/20	BCCS283 – Change to outcomes assessed in assessment 2	Sem 1, 2021	MA/NC
19/02/21	BCIS309 – Corrections to co-requisite and outcomes assessed.	Sem 1, 2021	MA/NC

Contents

1	Executive Summary	1
2	Programme Overview.....	2
3	Programme Design	11
4	Programme Structure	14
5	Learning, Teaching and Assessment Approaches.....	16
5.1	Active Learning.....	16
5.2	Practical Skill Development and Technology.....	17
5.3	Academic Literacy Development.....	18
5.4	Research Development.....	18
5.5	Programme Delivery	19
5.6	Teaching Facilities and Physical Resources	19
6	Work integrated Learning (WIL).....	21
7	Academic Regulations	23
7.1	Entry and Selection	23
7.2	Programme Regulations	24
7.3	Credit Recognition and Articulation	25
7.4	Programme Structure	27
7.5	Assessment Regulations.....	33
8	Quality Assurance.....	37
9	Staff.....	40
10	Course Descriptors	44
11	Programme Data.....	45
11.1	Programme of Study Summary	45
11.2	Programme Information for Submission to TEC	48
	Appendices	49

Appendix 1

- 1.1 Graduate Profile Map
- 1.2 Assessment Map

Appendix 2 (Refer Separate Appendix)

- 2.1 Ara Work Integrated Learning Checklist
- 2.2 WIL Industry Projects Handbook
- 2.3 WIL Contracts
- 2.4 Letter to WIL Provider
- 2.5 Project Brief/Proposal Checklist
- 2.6 Student Confidentiality Agreement
- 2.7 Industry Supervisor Halfway Assessment
- 2.8 Academic Supervisor Halfway Assessment

Appendix 3 (Refer Separate Appendix)

- 3.1 Consultation Table
- 3.2 Mapping of Skills
- 3.3 Transition Plan
- 3.4 Skills Framework for the Information Age (SFIA)
- 3.5 Staff Research Outputs
- 3.6 Local Advisory Committee Terms of Reference
- 3.7 External Moderation Plan
- 3.8 External Moderation Reports and Action Plans 2017/2018
- 3.9 Advanced Standing Criteria
- 3.10 CAPL Course List

1 Executive Summary

The Bachelor of Information and Communication Technologies (BICT) is a 360 credit three year full-time equivalent programme of study. It has been delivered at Ara Institute of Canterbury Ltd (Ara) (formerly CPIT) since 2001.

Given that all industry sectors rely on the use of Information Communication Technology (ICT) solutions, there is an ongoing need for suitably skilled IT professionals. The BICT is designed to develop skilled, work-ready IT professionals to assist organisations to identify needs, plan, deploy, and operate IT solutions. Graduates seek employment in local industries, are suitably qualified to play a role in IT organisations internationally, and can apply for study at a postgraduate level.

Since initial approval, the programme has been regularly evaluated and reviewed to ensure ongoing relevance and currency. This process has ensured that the programme continues to offer the knowledge, skills and attributes required of those in a fast changing technology industry where development and the importance of networked solutions are critical.

This latest 2018 iteration is part of the on-going self-evaluation and review process at Ara. This review was planned to address the impact of the post Mandatory Review of Qualifications (MRoQ) portfolio of qualifications, and align the Information Systems pathway within the programme with international developments.

The BICT offers three pathways: Information Systems, Networking and Infrastructure, and Software Development. The changes to the programme significantly enhance the Information Systems pathway which offers a broader range of opportunities in the job market aligned with recent trends in the skills need of the ICT sector. The Networking and Infrastructure, and Software Development pathways have been revised to take into consideration a broader knowledge of infrastructure for software engineers, and to enhance knowledge of software engineering and solution development. The programme continues to offer Work Integrated Learning (WIL) opportunities throughout years two and three, including a final 45 credit work integrated learning project.

This application to NZQA is for a Type 2 change to the existing programme. There are no changes to the overall philosophy, delivery mode, direction, duration or intent of the programme. The changes proposed by this review are informed by consultation with all stakeholders. They refine the existing programme to ensure its currency and the optimisation of the student experience.

2 Programme Overview

2.1 Context and Rationale for Change

ICT is the key driver of productivity growth in the 21st Century. ICT services are an integral part of operations within both communities and businesses, and there is high demand for skilled IT professionals. The Ministry of Business, Innovation and Employment's Information and Communications Technology Report (2017)¹ highlights that IT occupations increased by more than 24,000 between 2006 and 2016. Applicants with professional, technical and computer skills were cited by employers as the hardest to recruit. There is a higher number of vacancies in this sector than in any other.

In November of 1995, CPIT was approved to offer the Bachelor of Business Computing (BBComp) with two elective streams (Programming and Data Communications and Networking). The first group of students commenced the degree in 1996. In 2001 the degree was re-documented, restructured and renamed the Bachelor of Information and Communication Technologies (BICT) and two additional elective streams added in Commerce and Multimedia.

The underpinning philosophy of the BICT continues to be assisting learners to develop information technology knowledge and expertise coupled with strong employability skills to meet the industry demand within the Canterbury region and beyond. To achieve this the BICT integrates theory and practice to provide students with learning opportunities that guide them through graduated levels of attainment in ICT.

The BICT curriculum includes all aspects of the information systems cycle including the governance, planning, design, development or deployment, and the operation of information technology solutions. Students will continue to be equipped with the skills to analyse, design, develop, implement and maintain information systems across a variety of industries and business types.

The current framework of the BICT ensures students participate in active and experiential learning opportunities. This mode of delivery has proven to be successful at embedding a strong understanding of key concepts and will continue to be integral in the revised programme. Practical activities within the BICT provide students with knowledge, skills, and the confidence to apply them to resolve complex ICT problems. Students are challenged with problems, which are increasingly diverse, distributed and demanding, and require timely resolution.

This iteration of the BICT continues to emphasise human and organisational functions that relate to the use of technology including: organisational management, project management and technical communication. Integral to the ICT profession, and this degree are communication skills, problem solving, critical thinking and professional and ethical practice. Skills and knowledge linked to these facets are scaffolded through the three years of the degree (Refer Appendix 3.2 Mapping of Skills).

Changes to degree and rationale for these changes

This application is for a Type 2 change. There are no changes to the overall philosophy, delivery mode, direction, duration or intent of the programme. Consultation for this review has included input from stakeholders, the IT Advisory Committee, graduates and students of the programme, and staff in Computing and other departments at Ara. Evidence of consultation, stakeholder support and how stakeholder advice has been incorporated into the programme is in Appendix 3.1 Consultation Table. Below is a summary of changes proposed for this iteration.

¹ <http://www.mbie.govt.nz/info-services/business/business-growth-agenda/sectors-reports-series/pdf-image-library/information-and-communications-technology-report/2017-ict-report.pdf>

Summary of Changes to the Bachelor of Information and Communication Technologies

	Current programme	Proposed programme	Rationale for change
Programme Aim	<p>The BICT is an applied qualification that focuses on all aspects of the information systems cycle. Students will be equipped with the skills to analyse, design, develop, implement and maintain information systems across a variety of industries and business types.</p> <p>Through a commitment to “hands-on” learning students will gain a strong grounding in the analytical, technical and theoretical concepts of computer-based information systems. The BICT also emphasises the human and organisational aspects that relate to the use of such technology including organizational management, project management and technical communication.</p> <p>By covering these interrelated topics, the BICT provides a practical link between the latest computer technology and its application to today’s business environment ensuring that students are well equipped to take their place in this exciting and constantly changing industry.</p> <p>Although the core focus of the BICT is information systems, students may also choose an elective stream in one of four areas Programming, Multimedia, eCommerce, Data Communications and Networking.</p>	<p>The BICT is an applied programme targeted at school leavers, career changers or unqualified IT professionals seeking a qualification in ICT. The programme aims to produce work-ready graduates who meet the needs of the IT industry in New Zealand, as well as globally.</p> <p>The programme enables students to: Apply knowledge, skills and capabilities to analyse, design, develop, implement and maintain information systems across a variety of industries, business environments, and community organisations; and interact with clients, formulate technology projects, manage projects, and communicate developments effectively throughout the design and development of solutions.</p>	<p>The revised aim aligns with recent developments in the ICT sector. It more clearly emphasises the skills, knowledge and attributes required in the sector.</p>
Graduate Profile	<p>Graduates of the Bachelor of Information and Communication Technologies will be able to:</p> <ul style="list-style-type: none"> • Operate at an academic level that demonstrates the ability to synthesise, think critically, reason, problem solve, self-manage and work both independently and in a team environment appropriate to IT industry culture • Demonstrate professional behaviours and attitudes appropriate to the constantly changing information and communication technologies industry, and business community • Apply best practice industry standards to analyse significant industry challenges/situations and design and report innovative solutions 	<p>Graduates of this programme will be able to:</p> <ol style="list-style-type: none"> 1. Apply specialist technical Information Communication Technology (ICT) knowledge and skills to provide business solutions. 2. Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment. 	<p>The intent of all graduate outcomes remains unchanged. Some refinement of the graduate profile outcomes was required to make the qualities required of the graduate clear and measurable. The importance of cultural context has been included.</p> <p>The changes to the graduate profile outcomes respond to recent trends within the ICT sector, and aligns the graduate profile with the Skills Framework</p>

	<ul style="list-style-type: none"> • Demonstrate a wide range of practical computing and information technology skills • Demonstrate a wide range of business and communication skills • Demonstrate a major understanding of Information Systems with an additional specialist understanding in at least one specific elective stream. • Complete industry based project work of an applied nature, whether from a business perspective or a technical perspective. <p>Graduates completing the Programming Elective Stream will also be able to:</p> <ul style="list-style-type: none"> • Programme in at least two languages • Apply best practice industry standard practices in programming in one or more languages • Adopt and apply new programming languages quickly • Apply sound software engineering processes • Apply the PSP (Personal Software Process). <p>Graduates completing the Data Communications and Networking elective stream will also be able to:</p> <ul style="list-style-type: none"> • Use, install and configure at least two standalone operating systems that are in wide commercial use • Use, install and configure network operating systems • Analyse the data communications, networking and operating system needs of an organisation • Plan for the introduction of networks in organisations. <p>Graduates completing the Information Systems and Strategies elective stream will also be able to:</p> <ul style="list-style-type: none"> • Assist organisations in developing plans for introducing Information Technology solutions. • Assess the use of IT solutions in helping businesses and organisations to function efficiently and effectively. • Analyse the need for technology solutions in business functions (IT business analysis) and communicate it to technical teams who develop and deliver applications and solutions. • Assist organisations in managing projects associated with introducing Information Technology. • Plan and develop quality assurance and test plans. 	<ol style="list-style-type: none"> 3. Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice. 4. Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts. 5. Apply self-directed learning and research to maintain currency and lead future development. 6. Communicate effectively in a professional manner with stakeholders, colleagues, and clients. 7. Work effectively, both independently and across teams, in diverse cultural contexts. 8. Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations. 	<p>for Information Age (SFIA), and the Seoul Accord Graduate Profile. This alignment will facilitate a planned application for accreditation (by the Seoul Accord Accreditation Board).</p>
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	<p>Graduates completing the Multimedia elective stream will also be able to:</p> <ul style="list-style-type: none"> • Use a wide range of multimedia application development tools • Develop significant multimedia applications to support industry-based requirements • Manage the development of multimedia applications • Evaluate the suitability of multimedia application development tools for particular tasks. <p>Graduates completing the eCommerce elective stream will also be able to:</p> <ul style="list-style-type: none"> • Demonstrate an awareness of, and apply the practical skills in the disciplines making up eCommerce • Develop viable and sustainable eBusiness plans to meet specific client needs • Design and implement websites for business use • Demonstrate specialist skills, in at least one of Electronic and Internet Based Marketing, Legal Issues Related to eCommerce or =Web Programming. 																																																																										
Programme Structure	<p>The current programme structure has five elective streams (pathways):</p> <ul style="list-style-type: none"> • Programming • Data Communications • Information Systems and Strategies • Multimedia • eCommerce <p>The current programme comprises 225 core course credits, a minimum of 60 elective stream credits, and 75 other elective credits.</p> <p>Core Courses:</p> <p>Year One</p> <table> <thead> <tr> <th>Code</th><th>Course</th><th>Level</th><th>Credits</th></tr> </thead> <tbody> <tr> <td>BCCS153</td><td>Computer Systems Architecture</td><td>5</td><td>15</td></tr> <tr> <td>BCCS191</td><td>Introduction to Networks</td><td>5</td><td>15</td></tr> <tr> <td>BCCS199</td><td>Operating Systems</td><td>5</td><td>15</td></tr> <tr> <td>BCIT141</td><td>Website Development</td><td>5</td><td>15</td></tr> <tr> <td>BCIT181</td><td>IT – Concepts and Tools</td><td>5</td><td>15</td></tr> <tr> <td>BCPR109</td><td>Programming Precepts</td><td>5</td><td>15</td></tr> <tr> <td>BCSE101</td><td>Software Engineering 1A</td><td>5</td><td>15</td></tr> <tr> <td>BCSE102</td><td>Software Engineering 1B</td><td>5</td><td>15</td></tr> </tbody> </table>	Code	Course	Level	Credits	BCCS153	Computer Systems Architecture	5	15	BCCS191	Introduction to Networks	5	15	BCCS199	Operating Systems	5	15	BCIT141	Website Development	5	15	BCIT181	IT – Concepts and Tools	5	15	BCPR109	Programming Precepts	5	15	BCSE101	Software Engineering 1A	5	15	BCSE102	Software Engineering 1B	5	15	<p>The proposed programme will offer three pathways:</p> <ul style="list-style-type: none"> • Information Systems • Networking and Infrastructure • Software Development <p>The proposed programme remains at 225 core course credits, with 75 compulsory course credits and 60 elective credits included.</p> <p>Core Courses:</p> <p>Year One</p> <table> <thead> <tr> <th>Code</th><th>Course</th><th>Level</th><th>Credits</th></tr> </thead> <tbody> <tr> <td>BCCS153</td><td>No Change</td><td></td><td></td></tr> <tr> <td>BCCS191</td><td>No Change</td><td>5</td><td>15</td></tr> <tr> <td>BCCS199</td><td>No Change</td><td>5</td><td>15</td></tr> <tr> <td>BCIS105</td><td>IT Practitioner Fundamentals</td><td>5</td><td>15</td></tr> <tr> <td>BCDE101</td><td>Introduction to Programming</td><td>5</td><td>15</td></tr> <tr> <td>BCIS106</td><td>Computational Methods</td><td>5</td><td>15</td></tr> <tr> <td>BCDE102</td><td>Introduction to Software Engineering</td><td>5</td><td>15</td></tr> <tr> <td>BCDE103</td><td>Database Design</td><td>5</td><td>15</td></tr> </tbody> </table>	Code	Course	Level	Credits	BCCS153	No Change			BCCS191	No Change	5	15	BCCS199	No Change	5	15	BCIS105	IT Practitioner Fundamentals	5	15	BCDE101	Introduction to Programming	5	15	BCIS106	Computational Methods	5	15	BCDE102	Introduction to Software Engineering	5	15	BCDE103	Database Design	5	15	<p>Core Courses:</p> <p>The core courses have been updated (including titles and learning outcomes) to reflect industry requirements for high-level analytical skills, business awareness, technology deployment governance and risk management within complex technological settings.</p> <p>The Level 6 Database Management Systems course has moved to a Level 5 Database Design course. A new Managing</p>
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DNET603	Unified Communication	6	15																																																																																																																																
DSYS601	Systems Deployment	6	15																																																																																																																																
Course Descriptors	<p>Course Descriptors aligned to existing Graduate Profile.</p> <p>Example:</p> <p>BCCS199 Network Operating Systems <i>Aim:</i> Configure and administer systems and applications to meet typical organisational IT support requirements.</p> <ol style="list-style-type: none"> Describe and discuss key concepts related to operating systems, applications and system architecture. Manage resource, memory, I/O, file, process and network-related operations. Install and manage system software and services. Control and manage the boot process. Configure system settings using commonly-used tools. <p>No indicative curriculum</p>	<p>Aims, learning outcomes and indicative curriculum have all been updated.</p> <p>BCCS199 Operating Systems <i>Aim:</i> To enable students to configure and administer systems and applications to meet typical organisational IT support requirements.</p> <ol style="list-style-type: none"> Discuss key concepts related to operating systems, applications and system architecture. Demonstrate the ability to install and manage system software and services. Utilise common tools to configure and administer systems. <p>Indicative Curriculum</p> <ul style="list-style-type: none"> Hardware resources, network connectivity, systems and application software Graphical (GUI) and command line interfaces (CLI) Performance, capacity and business continuity Application types, such as standalone, client server, peer to peer, web service, mobile 	<p>Updates have been made to align with the new graduate profile and the SFIA profile, and to ensure learning and assessment activities will be collaborative, authentic and learner-centred.</p>																																																																																																																																

2.2 Consultation

BICT staff have developed and maintained strong professional relationships with a range of IT industry representatives and professional bodies. These partnerships have been key to ongoing enhancements to the programme content, ensuring Ara BICT graduates are in demand when they complete their studies.

Particularly strong relationships exist with Canterbury IT companies who partner with BICT students on their third year industry project. Regular feedback is sought and received from these partners, and utilised to enhance the outcomes for students and employers.

Ara BICT staff are in regular contact with academic staff from ICT tertiary education providers across the globe. These relationships enable information sharing around trends and developments in the ICT sector worldwide.

Feedback is constantly sought and responded to from students through course evaluations, programme evaluation, and other formal and informal feedback methods.

Since March 2017, feedback and guidance specific to the BICT redevelopment has been sought from Ara staff and students from the Computing and Business departments, Ara Kaiārahi and local Māori businesses and iwi, industry Advisory Groups for the BICT and Business Information Systems programmes, as well as representatives from IT Professionals NZ, and key contacts from universities in Hong Kong, Japan, Australia and Singapore.

Changes proposed in this document have been developed in close consultation with the ICT sector stakeholders.

A summary of consultation is included in Appendix 3.1 Consultation Table.

2.3 Coherence with the Ara Institute of Canterbury Ltd Portfolio

The BICT sits within the Department of Computing at Ara and is supported by a departmental approach to research and enquiry.

Ara has approval and accreditation for the New Zealand qualifications in Information Technology at Levels 4, 5 and 6. The BICT has been developed to align with these programmes, ensuring Ara continues to provide pathways for a range of students' intent on gaining qualifications and employment in the ICT sector (Refer to Figure 1 below).

The Department of Computing also delivers the following BICT courses within the Bachelor of Applied Management (Business Information Systems specialisation) for the Department of Business:

- Introduction to Enterprise Solutions Architecture (BCIS212)
- Enterprise Solutions Deployment (BCIS207)
- IT Service Management (BCIS208)
- Introduction to Enterprise Intelligence and Analytics (BCIS213)
- Enterprise Solutions Architecture (BCIS312)
- Enterprise Intelligence and Analytics (BCIS313)
- Enterprise Solutions Architecture (BCIS312)
- Information Technology Governance (BCIS303)

Pathways

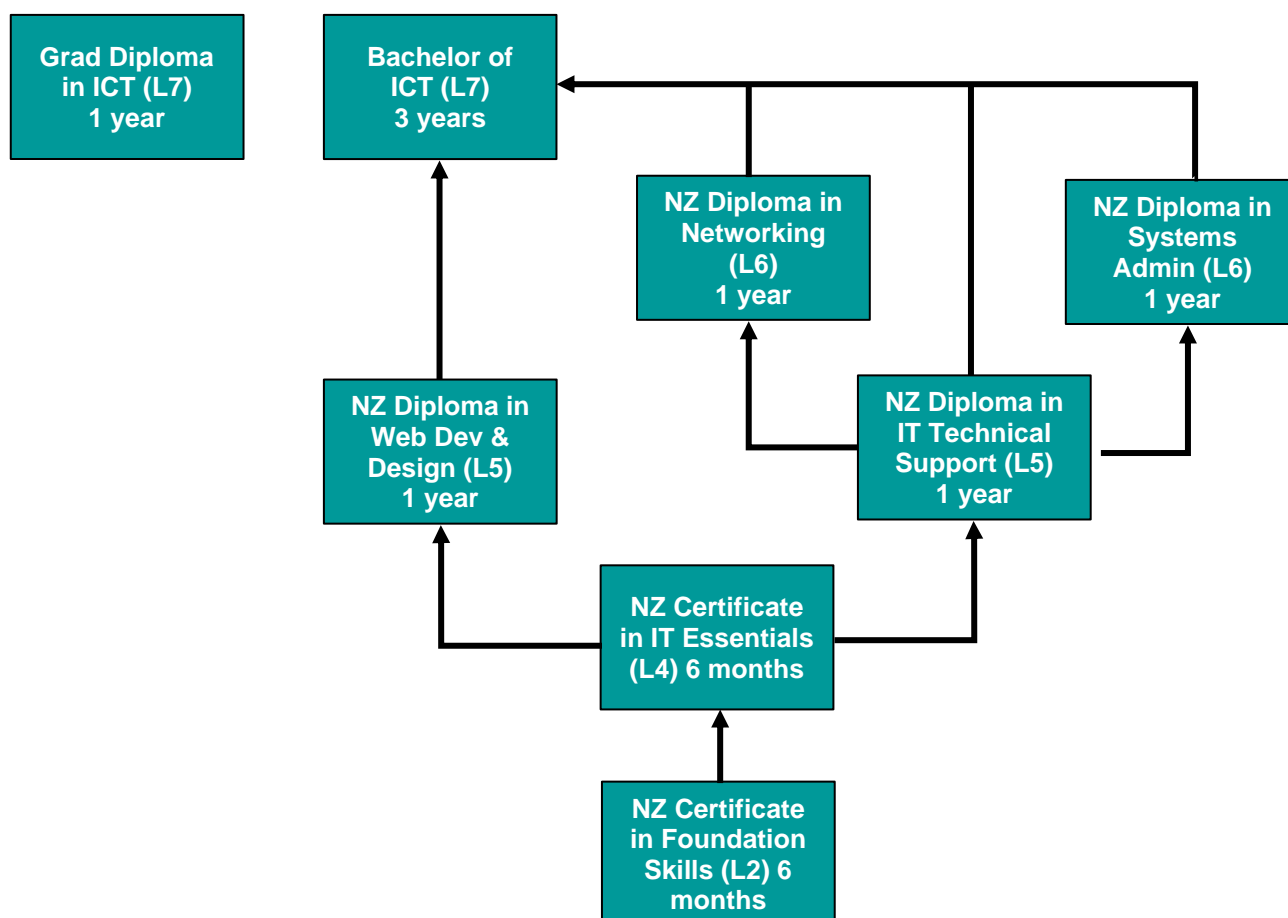


Figure 1. BICT aligned with other Ara pathways

2.3 Programme Aim

The BICT is an applied programme targeted at school leavers, career changers or unqualified IT professionals seeking a qualification in ICT. The programme aims to produce work-ready graduates who meet the needs of the IT industry in New Zealand, as well as globally.

The programme enables students to: apply knowledge, skills and capabilities to analyse, design, develop, implement and maintain information systems across a variety of industries, business environments, and community organisations; and interact with clients, formulate technology projects, manage projects, and communicate developments effectively throughout the design and development of solutions.

2.4 Graduate Profile

Graduates of this programme will be able to:

- 1) Apply specialist technical Information Communication Technology (ICT) knowledge and skills to provide business solutions.
- 2) Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.
- 3) Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice.
- 4) Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts.
- 5) Apply self-directed learning and research to maintain currency and lead future development.
- 6) Communicate effectively in a professional manner with stakeholders, colleagues, and clients.
- 7) Work effectively, both independently and across teams, in diverse cultural contexts.
- 8) Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations.

Employment pathways

Graduates of the Information Systems pathway will be able to seek employment in roles which require solution deployment for enterprises - such as enterprise solutions analyst, information system quality and security manager and IT business analyst, and can engage in work relating to prototyping and 'proof of concept' initiatives.

Graduates of the Networking and Infrastructure pathway are able to seek employment opportunities in infrastructure management. They could be involved in network operations roles, network design roles, network management positions, or roles that involve performance monitoring and management of networks.

Graduates of the Software Development pathway will be able to seek employment in roles that relate to solution building - such as test analysts, systems analysts, application developer, and other roles that require solution and application building skills.

Education pathways

Graduates of the BICT may seek entry into postgraduate level programmes of study in the field of ICT.

3 Programme Design

The BICT is designed to be consistent with Ara strategic intent, values, desired graduate outcomes, and core academic policies and procedures, and to be compliant with approval and accreditation rules and criteria.

The Ara values of Kia Hihiri (Inspire), Kia Tūhono (Connect) and Kia Pono (Trust) inform and contribute to the culture of the degree and are integrated throughout the programme.

Below is a summary of the principles that inform the degree.

Vocational Applied Learning

This remains an applied degree. Student capability continues to be developed through participation in activities that provide opportunities to learn in authentic contexts. Students are required to think critically, work with a range of individuals and teams, and to develop the skills to be future leaders in the industry. The teaching and learning approaches deployed remain founded on the deep and successful history of Ara in providing vocational and applied learning in ICT with outstanding results for students.

The underpinning philosophy of the BICT is to develop 'work-ready' graduates. Throughout the programme, students apply theoretical knowledge to real-life scenarios. Project orientated approaches and problem-based learning will continue to be employed across the programme to develop employability skills, analytical thinking, effective communication, and problem solving techniques within an IT industry context.

A major industry-based work integrated learning project (45 credits) remains a core component of the BICT programme. This 450 hour project requires third year students (regardless of their pathway) to work collaboratively with an industry partner, negotiating a problem they can help to solve. Ara staff assess and approve the project to ensure it meets the learning outcomes of this course before confirmation of the project. Students produce outcomes including a proposal, reports, poster and panel discussion. They will also produce a product, report or process and any training required or their industry partner to utilise the products or processes. Industry provides the student with feedback on their project, including the student's employability skills.

Cultural Understanding in both a New Zealand and global context

Graduates of this degree take their place in a global community of IT professionals. This community is responsible for designing, building, implementing and supporting technology-centric solutions that touch and enable nearly every aspect of human life. The demand is for Ara students to be creative, innovative, solution-focused and client-centric, and to respectively collaborate with others and the world around them to produce outcomes of genuine value. There is no better training ground for these qualities and skills than in Aotearoa New Zealand where global needs meet local indigenous Māori perspectives and values, to form the unique identity of IT professionals.

Students in the degree come to understand the unique history of IT in New Zealand and how the profession has been shaped and influenced by the constitutional and legislative foundation of Te Tiriti o Waitangi (the Treaty of Waitangi). They are exposed, and given opportunities, to gain expertise in using the principles of the Treaty in the field of ICT. The principles are: partnership (working together), participation (where everyone is involved) and protection (addressing any power imbalances that exist between people). These principles are infused with both the degree content and the way the content is delivered by the staff in the Department of Computing. From

a global context these principles align with current thinking on using diverse teams to achieve quality outcomes (Gardenswartz & Rowe, 2003)².

Refer to Appendix 3.2 Mapping of Skills (Global Context and NZ Cultural Context columns)

Socio-Cultural Learning

Ara values the social context of quality learning experiences. Students are successful when they are in a positive, supportive learning environment and their fellow learners contribute to their learning. The degree programme design acknowledges that learning is influenced by cultural background and is a social experience. The Department of Computing has built a culture wherein students develop a sense of belonging to a broad community of learners. Creating this sense of belonging is achieved through the integration of cultural experiences and team-based learning activities. Various strategies are employed to achieve the objectives that are outlined above. For example, students are required to perform tasks within teams of students from various cultural backgrounds. Industry projects are selected from a range of industries and organisations.

Sustainability in the ICT Industry

The Ara goal is that every student will graduate with the skills and knowledge to be aware of, and take into consideration, sustainable practices (Ara Sustainability Charter). Students are made aware of sustainable practices with regards to three specific contexts; economic, social, and environmental.

From the economic and social perspective, students develop knowledge of connecting technology deployment to business needs. They develop awareness of the role of IT in both social and economic development. The concepts of sustainable practice are addressed in courses on professionalism and information systems deployment and application. Department research on Information Technology Governance (ITG) covers sustainability as one of the domains of ITG.

Students are encouraged to utilise digital tools sustainably. Recycling and sustainability issues with regards to hardware are discussed throughout the programme and students learn to implement virtualisation and minimise power usage on systems.

In the Networking and Infrastructure pathway, sustainability is embedded in the way students are taught to manage computing resources effectively to minimise energy consumption. Focus areas include the following:

- Configuring load balancers to manage spikes in the number of users to a website.
- Multi-tenancy – having multiple clients on a cloud provided infrastructure which reduces their overall energy use and carbon emissions.
- The concept of server utilisation – using cloud computing to drive energy savings by using fewer servers to perform tasks.

The above concepts are taught in Cisco and Cloud Services courses.

In the Information Systems pathway, sustainability is embedded in the way students are taught to write and understand policies regarding Service Level Agreements in dealing with suppliers, procurement and disposing of computers.

In the Software Development pathway, sustainability is embedded in the way students are taught to write reusable code, and write applications with more efficient processing, memory

² Rowe, A. (2003). *Diverse teams at work: Capitalizing on the power of diversity*. Alexandria: VA Society for Human Resource.

utilisation and data fetches which ultimately results in additional savings of physical consumption of the central processing unit (CPU), storage, memory, and network.

Refer to Appendix 3.2 Mapping of Skills (Sustainability column).

Industry Specific Capabilities

The graduate profile for the revised BICT is aligned with the Skills Framework for the Information Age (SFIA)³ and the Seoul Accord Graduate Profile⁴. SFIA has been adopted by organisations worldwide, including IT Professionals NZ, to help define skills and competencies required by professionals working with digital technologies (Refer to Appendix 3.4 - SFIA).

It is expected that a graduate of the BICT will be able to demonstrate workplace performance capabilities in four areas (autonomy, influence, complexity, and business-related skills) as is required by industry.

Refer to Appendix 3.2 Mapping of Skills (Global Context column).

Constructive Alignment

Ara programmes and learning design are informed by John Biggs' Constructive Alignment model⁵. Constructive alignment provides a clear line-of-sight between the graduate profile, course learning outcomes, learning, and teaching and assessment activities. Using this approach, students in the BICT will engage with a scaffolded approach to learning and assessment activities that enable them to develop and demonstrate the requirements of the graduate profile at the end of the degree. Constructive alignment in this programme is evidenced through matching the course learning outcomes to graduate profiles in the Graduate Profile Map (refer Appendix 1.1). Learning outcomes are also matched to assessment and evidenced in the Assessment Map (refer Appendix 1.2).

Research Skills

The degree is research informed and will be taught predominantly by staff engaged and experienced in research. Throughout the degree, students will engage in research-led learning. The programme design encourages learners to seek and discover new knowledge through integrating theory and practice to create their theory of praxis (Kemmis & Smith 2008)⁶ and to develop their understanding of principles and trends within the ICT sector. The programme ensures that students will have the critical thinking and strategic skills to keep developing their career and pursue higher-level qualifications. The strategic driver for research within the Department of Computing is to inform industry of technology development trends and apply research outcomes. Research outcomes are disseminated within industry forums as well as both academic and industry-connected publications. Research informed teaching enables effective teaching and learning, and staff and students to actively participate in both local and international academic research.

Across all the three years of the programme, students are required to research areas such as technology changes, applications, roles within the industry, and trends in technology development, use of ICT in communities, and effectiveness and value of solutions.

(Refer to Section 9 Staff for details of staff research activity).

³ The Skills Framework for the Information Age – SFI. <https://www.sfia-online.org/en>

⁴ Seoul Accord Secretariat- Institute of Engineering Education Taiwan. <https://www.seoulaccord.org>

⁵ Biggs, J. & Tang, C. (2007). *Teaching for Quality Learning at University: Third Edition*.

⁶ Kemmis, S. & Smith, T. J. (2008). *Enabling praxis: Challenges for education*, Sense Publishers.

4 Programme Structure

The structure scaffolds students' learning of fundamental skills, knowledge, attributes and competencies for the industry, together with academic literacies. As students' progress through the BICT, they will demonstrate a sophisticated application of theory to practice across IT industry sectors.

Students are required to cover a core foundation of ICT knowledge – regardless of the pathway they choose. In addition to gaining core IT skills, they are offered three pathways to develop skills focused on specific ICT roles. The pathways are aligned with the main categories of ICT roles within the industry and international frameworks that define IT skills. The pathways are Information Systems, Networking and Infrastructure, and Software Development.

After students complete their first year of study, they are required to select a pathway for the next two years. Students can consult with Department staff if they are unsure which pathway to follow. A student can also change pathways, if they meet the requirements of the pathway they are moving to. The transition between pathways is managed on a case-by-case basis.

Year One

Year one of the BICT is common for all students. In this year they learn the fundamental knowledge of IT and students are introduced to each pathway. In addition to ICT knowledge and skills, students' academic skills, including introduction to research, are developed to enable them to thrive in degree level study (refer to Appendix 3.2 Mapping of Skills). Year one consists of 120 credits (eight 15 credit compulsory courses). These core courses are IT Practitioner Fundamentals, Introduction to Programming, Computer Systems Architecture, Operating Systems, Computational Methods, Introduction to Software Engineering, Database Design and Introduction to Networks.

Year Two

Building on year one, students learn the specific technical knowledge and skills required for their chosen pathway. Year two comprises 120 credits (eight 15 credit courses). The courses are a combination of two core courses (30 credits) undertaken by all students, four compulsory courses (from one of the pathways) and two elective courses.

During year two, students' problem solving, communication and research knowledge and skills are developed as they work individually and in groups on real-world projects. Students' employability skills are strengthened by embedding in-depth technical and problem solving skills in learning activities.

Year two students continue to engage with work integrated learning through opportunities to develop solutions for real scenarios and real organisations.

Year Three

Year three enables students to solidify their expertise in their chosen pathway. The focus is to strengthen students' confidence and independent research, problem analysis and problem solving. Students are also encouraged to continue to develop self-directed learning skills to complement classroom learning practices.

Year three involves significant work integrated learning practices with a major component being the industry project. All students undertake a 45-credit industry project. This focuses on the students' research skills, giving them an opportunity to work directly with a client. Year three consists of 120 credits. There are two core courses (30 credits) undertaken by all students, one compulsory course (from the selected pathway), two elective courses, and the 45 credit industry project.

Table 1: Bachelor of Information and Communication Technologies Matrix

Year 1	IT Practitioner Fundamentals <i>15 credits</i>	Introduction to Programming <i>15 credits</i>	Computer Systems Architecture <i>15 credits</i>	Operating Systems <i>15 credits</i>
	Computational Methods <i>15 credits</i>	Introduction to Software Engineering <i>15 credits</i>	Database Design <i>15 credits</i>	Introduction to Networks <i>15 credits</i>
Year 2	Enterprise Solutions Deployment <i>15 credits</i>	Pathway Compulsory <i>15 credits</i>	Pathway Compulsory <i>15 credits</i>	Elective <i>15 credits</i>
	IT Service Management <i>15 credits</i>	Pathway Compulsory <i>15 credits</i>	Pathway Compulsory <i>15 credits</i>	Elective <i>15 credits</i>
Year 3	Information Technology Governance <i>15 credits</i>	Pathway Compulsory <i>15 credits</i>	Elective <i>15 credits</i>	Elective <i>15 credits</i>
	Managing Information and Cybersecurity <i>15 credits</i>	Work Integrated Learning Project (Industry Project) <i>45 credits</i>		

Key:

<i>Core (across all pathways)</i>	<i>Compulsory within pathway</i>	<i>Elective within pathway</i>
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Students are introduced to ethics, professional practice, sustainability, and research as follows:

- **Year one:** basic concepts are presented in the two Information System courses, BCIS105 and BCIS106.
- **Years two and three:** embedded in courses for example: BSIS211 and BSIS206
- **Year three:** via Information System courses and the 45 credit WIL project, and BSIS302, BSIS303, BSIS309, and BCIS370.

Refer to Appendix 3.2 Mapping of Skills for details on how various academic, cultural context, research, professional practice and critical thinking are integrated into courses.

5 Learning, Teaching and Assessment Approaches

Learning experiences in the BICT develop discipline knowledge as well as generic employability skills, in particular, teamwork, problem solving, planning, organising, initiative, enterprise, adaptability, academic literacy and the effective use of technologies in context.

5.1 Active Learning

Active, holistic learning and assessment approaches throughout the programme empower students to take a participative role in the learning process by synthesising information and establishing deep learning of concepts.

Academic staff use a range of strategies to explain concepts and maximise student engagement in the learning process. Across all years of the degree, curriculum development is informed by an experiential pedagogical approach. Experiential learning is facilitated through the use of lab work, projects and scenarios. These activities take place in computer suites on campus as well remotely through the internet. They enable students to learn by doing. Students apply learning from demonstrations and presentations to complete practical tasks or present content. This enables students to consolidate their knowledge of concepts and practice key technical and communication skills.

Exercises scaffold from less complex tasks designed to help learners gain confidence, to tasks that extend and challenge students' capabilities. Staff provide feedback to students either in person or through mechanisms such as quizzes accessed through Moodle. Students are then able to act on the feedback to continue learning and improve knowledge and skills. Throughout the programme, students are encouraged to reflect on their learning process and achievements through self, peer and lecturer feedback. At Ara assessment is for learning as well as of learning. Assessment processes include formative peer and tutor feedback as described by David Boud⁷.

Teaching strategies and approaches support collaborative, team-based learning activities that simulate real-life work practices. Project-based learning ensures students learn skills through their involvement in a body of work. This may form part of a course or span across a number of courses.

The curriculum acknowledges the specialised and technical nature of IT. To learn many aspects of IT requires on-going and sometimes repetitive practice to attain procedural skills before critical reflection, synthesis and application. The learning of logic and problem solving scaffold through the degree to ensure learners become confident, enabling them to work in current and future IT environments. Aspects underpinning the development of 'computational thinking' as a foundation for problem solving and critical analysis underpin the programme.

⁷ Boud, D. and Associated (2010) *Assessment 2020: Seven propositions for assessment reform in higher education*. Sydney: Australian Learning and Teaching Council

5.2 Practical Skill Development and Technology

Many areas of ICT require the learning and refining of theoretical knowledge as well as a range of practice-based skills.

Repetition ensures the skills are firmly entrenched in students practice as IT professionals. Authentic learning is key to learning specialised knowledge, skills and attributes required for the profession. Teaching material supporting learning activities in year one and year two courses are based on real-world scenarios, technologies and environments, and require students to work in an organised, systematic way.

All courses within the programme make use of online digital technologies and pedagogy through the Ara Learning Management System (Moodle) as well as the Institute's extensive lab infrastructure. This infrastructure includes switches, routers, servers, as well as virtual systems which are accessible from anywhere on and off campus. Students also use standard computer suites at Ara for industry-specific software development tools. Mobile technologies, including phones and tablets are utilised and there is an increasing reliance on cloud platforms, principally AWS and Microsoft Azure. In all cases, the emphasis is on current practice in the industry and the development of appropriate practical skills, knowledge and attributes that assist graduates to be work ready.

Information Systems students develop strong analytical skills to determine suitable approaches to technology solutions deployment. They practice problem solving skills using real-life case studies. Students in year three work on developing technology governance or solution deployment plans for small to medium size enterprises.

In **Networking and Infrastructure**, students start working with physical networks and systems and then progress to a range of virtual technologies. Students are supported to resolve problems of increasing complexity and require less assistance from their teachers as the programme progresses.

In **Software Development**, students also work with industry-based specifications and develop skills through the use of a defined iterative process. Students are required to develop competencies in the use of various development platforms to be able to build real applications and solutions to address business problems.

Students are provided with opportunities to be engaged in various practical skill learning activities, participate in group discussions, and be involved in portfolio work through both synchronous and asynchronous modes of learning.

The programme has an emphasis on interaction with people in organisations to be able to assess technology needs and provide technology solutions. Developing sound technical skills occur alongside students' interpersonal and communication skills are strengthened throughout the programme.

Refer to the indicative curriculum section in the various Course Descriptors (Section 10) and Mapping of Skills (Appendix 3.2) for details on inquiry and research, and critical thinking/problem solving.

5.3 Academic Literacy Development

Learning and assessment activities utilised in the degree align with the Ara Academic Literacies Framework. Through the learning of relevant IT knowledge and skills, students will develop academic literacy using contextualised learning opportunities. At the beginning of the programme, there is a strong focus on the development of academic literacy skills such as reading academic articles, writing literature reviews and referencing. These skills are reinforced, practised and extended in second and third year.

Students receive extensive guidance and support in their academic skills development throughout the programme. The programme contains increasing levels of complexity and depth enabling students to understand their learning processes and become independent learners.

Set learning activities and tasks require students to respond to increasingly complex questions or problems through locating, identifying, comprehending, evaluating and organising industry-specific information including industry-based standards, protocols and frameworks such as COBIT (Control Objectives for Information and Related Technologies), ITIL (IT Infrastructure Library) and RISKIT (Risk IT Framework). To be successful, students need to apply the necessary academic literacies.

Students are also required to develop industry-specific literacies to support the preparation of their portfolios and reports. In year three, students prepare a project proposal and carry out the industry-based project. This involves both evaluating relevant literature and applying knowledge to a specific body of work.

Refer to Appendix 3.2 Mapping of Skills (Academic and Information literacies, and Numeracy columns).

5.4 Research Development

As an undergraduate programme, research in the context of BICT refers to the practice of systematic data and evidence gathering, analysis of data, and formation of knowledge to respond to ICT related problem resolution. In the first year of the programme, foundational research skills are covered in the information systems course, BCIS106 Computational Methods. Students are introduced to the literature framing ICT practice and management, and are expected to apply academic skills to the commenting on, and discussion of current research.

A feature of the first year is the explicit teaching of how to read, describe and apply knowledge from academic articles to learning. Students learn academic, information and digital literacy skills allowing them to access research-based information, which they apply to learning activities and assessment tasks.

In year two, research is embedded in most assessments of the level 6 courses – mainly in the core courses. Students' ability to use research increases as task and content complexity increase. This progression accompanies an increase in expectations in academic ability and application of information and digital literacies. The emphasis shifts to 'research orientated' discipline knowledge. All students have opportunities to learn about the research process through developing a proposal in a specialist area. This learning assists the students to develop discipline specific and generalisable problem solving and critical thinking skills; essential knowledge and skills necessary to complete the Work Integrated Learning Project in year three.

In year three, research is a key element of BCIS303 Information Technology Governance and BCIS309 Work Integrated Learning Project. The focus in year three is the shift towards independence in learning. Learning activities and assessments are designed to demonstrate complexity and depth of thinking. Students are taught progressively to demonstrate increased ability to read and critically review research, and to execute investigation in collaboration with an organisation. The Work Integrated Learning Project advances students' knowledge of research skills through the application of the research process to an authentic business

environment. Across the three years, the students' research skills are scaffolded to enable students to move from being 'participants' in research-based inquiry, to participation with the research process and contribution to problem solving.

Refer to Appendix 3.2 Mapping of Skills (Inquiry and research, Interpersonal/teamwork skills /professional practice and critical thinking, and problem solving columns).

5.5 Programme Delivery

The degree uses a blended delivery model incorporating face-to-face teaching and online learning. Students have remote access to resources including Microsoft labs and Cisco networking infrastructure resources. This ensures students are able to utilise equipment to complete practical labs. There is a focus on the use of collaborative and co-operative learning activities such as discussion, peer feedback, reflection, reviewing and critiquing, and co-operative and experiential learning tasks. Delivery includes the use of a range of software tools and technologies.

Academic staff support learning through quality pedagogical decision making in the selection and application of appropriate technologies to achieve desired learning outcomes. Ara supports a range of e-learning technologies; the use of a Learning Management System (namely Moodle), relevant digital resources (e.g. Lynda.com), and other learning technologies (e.g., Microsoft Office 365 suite of tools; Panopto programmes). These are utilised for the purposes of blended learning and offer pedagogically appropriate ways of facilitating quality-learning experiences. The e-learning platform provides students with the opportunity to progress and access their learning in their own time. Flipped classroom activities are used to facilitate class preparation and enable a greater depth of learning in face-to-face environments.

All courses are semester based to align with Ara design principles and to increase the opportunities for students who wish to study part-time.

5.6 Teaching Facilities and Physical Resources

Equipment is refreshed on a regular basis and forms a critical part of programme delivery. This includes lab infrastructure containing switches, routers, access points, firewalls and virtual machines, all of which are accessible through a secure internet connection. The Department has adopted a number of industry-based IT academy programmes, including Cisco, Microsoft, VMware and AWS. Ara has been designated by Cisco to be its leading academy in New Zealand, with other Cisco Academies (e.g. Massey University) reporting to us.

Academic staff control, configure and support the lab network infrastructure, which is physically separate from Ara's corporate network with a separate firewall and internet connection. The Department makes extensive use of VMware for virtualisation. This includes some virtual local area networks (VLANs) that are reserved specifically for virtual machines and have dedicated access to the internet.

Other standard provisions at Ara apply to the BICT. All teaching rooms have built in AV technology, wireless broadband, and access to WiFi. Ara has an on-going commitment to web-based learning. All resources delivering such learning are managed via a set of IT standards aligned with AS/NZS ISO/IEC 27001: 2006, for Information Security Management and are audited annually by Audit New Zealand.

These standards include

- access control,
- operations management,
- information systems management and maintenance,
- physical and environmental security.

Student Support Services

Ara has an established process for the support of students that assists in leading them to success.

It has been recognised that key relationships are established between a student and a course facilitator, and the Ara support model leverages this relationship. It is articulated through the institution that academic staff are the primary provider of support for students. This will often see staff providing the necessary technical and discipline support students require when challenged by course work.

At times however, Ara teaching teams are unable to provide the more specialised support that students may require. The Ara Student Services Division is responsible for providing a connected and supported infrastructure that delivers a broad range of services to support student needs. This service can be accessed through referral from academic staff or directly by a student.

Based on a model known as Cornerstone, the Student Services Division facilitates a range of support activities, on a graduated scale covering academic and pastoral care, career and transition to work advice, and wellbeing services including a health centre, recreation centre, early learning centre and student accommodation.

Level 0 or self-help resources are tools that are in place and to which students can be directed where they are able to solve their own issue. Often these resources are in an electronic format that allow ease of access through the organisation and its various sites, at a place and time where students may be located. These resources are likely to be the first point of access for postgraduate students who will have achieved academic success prior to these programmes.

Level 1 or triage support is a person orientated interaction through a Student Engagement Advisor. This team has a breadth of knowledge and will often be able to solve low level needs, or in the case of many issues direct students to Level 0 self-help resources.

Level 2 includes the provision of well-advertised workshops and seminars as well as a range of short engagement drop-in support services delivered by specialist advisors. These seminars are offered in a timely way such as 'how to get set up for success at Ara' in the early weeks of programme delivery. Across a range of academic and pastoral care areas, and career and transition to work advice, advisors provide targeted support for all students and for key target groups including Youth, Māori and Pasifika students, and International students. At times these are provided in response to student feedback or a pro-active department request about a specific development – ie Digital Boost to assist students with newer technology use such as Microsoft OneNote, or for a specific cohort such as postgraduate students.

Level 3 Through engagement at earlier points it may be identified that a student needs 1:1 support and this is provided by appointment to those students by specialised advisors.

Sometimes Ara is unable to provide the direct support a student may require due to the highly specialised nature of the student issue. When this is the case, a network of providers link Ara to key external agencies that students can be referred to.

The deployment of the Cornerstone model at Ara has seen Student Engagement Advisors located at each of our main campuses including the Christchurch City and Woolston Campuses, as well as campuses in Ashburton, Timaru and Oamaru. Staff can also provide support on the phone or through on-line and skype activities. This ensures all students can access triaged support functions and if necessary be directed to self-help or specialised support functions.

6 Work Integrated Learning (WIL)

The focus of the programme is to develop work-ready graduates. Students are required to practice the application of theory to real-life business environments through the use of work integrated learning (WIL).

Authentic learning occurs through students' access to various tools used within the industry, including a range of hardware, software and technologies, such as virtualisation. Moreover, students use the tools to investigate problems and build solutions that are addressing real-life workplace scenarios. Across years one, two and three, teaching and learning, and assessments contain real-life analysis, problem solving, and attention to process; elements critical to industry practice e.g. they learn to apply specific industry frameworks such as ITIL, COBIT, and RiskIT to gather, synthesise and analyse data, determine and evaluate potential solutions, make a decision to recommend one, and in most cases implement the recommended solution.

In addition to smaller projects completed in other courses, such as IT planning for small to medium organisations or building IT applications for moderately complex real-life scenarios, the programme includes substantial WIL through a compulsory 45 credit industry project in the final year. The industry project involves placement within an organisation to work alongside IT teams to perform as an IT worker. Students are required to solve real business and technical problems for the sponsoring organisation. The process of placement involves identifying a project either by a student or offered by an industry partner. Students are encouraged to engage with industry and seek opportunities for industry projects. The department also has industry partners who regularly provide projects.

Organisation and set up

WIL industry projects follow a standard formal process.

- (a) Students prepare a project brief, outlining the purpose, expected outcomes, agreed upon timelines, resource requirements, supporting roles (supervisors), stakeholders, communication and reporting mechanisms, and a project plan.
- (b) After the student discusses the project with the industry supervisor, the project brief is presented to the Department for endorsement to ensure that the project satisfies academic and course requirements.
- (c) Once the project brief is endorsed, it is formalised by the sponsoring organisation signing off that they agree for the project to progress.
- (d) Students are required to report progress verbally and in writing to supervisors and other key stakeholders. Students have a regular weekly timetabled meeting with their course co-ordinator and meet their academic supervisor weekly.
- (e) The sponsoring organisation is responsible for providing workspace, relevant technologies and mentoring.
- (f) Academic and administrative issues that arise while a student is in a work placement are handled according to the Ara Academic Policies and Procedures.

The Department of Computing requires that students access the support of two suitably qualified supervisors, one from Ara and one from the industry. The industry supervisor represents the sponsoring organisation and provides support that relates to some of the technical aspects and organisational requirements. The academic supervisor is responsible for providing support so that students meet the course requirements (learning outcomes). Academic staff are also responsible for engaging with the sponsoring organisation and coordinating activities, such as assessments.

The final assessment is in the form of a panel. A panel must include both academic and industry supervisors as well as the course co-ordinator.

Sponsoring organisations are not required to pay students for their work, however some organisations may choose to do so.

Organisations must be suitable for WIL. Some of the factors that are considered in assessing organisations' suitability can include:

- The organisational capability of the workplace to provide on the job learning opportunities and mentoring for the students relevant to the learning outcomes and competencies to be covered in the placement.
- The organisation's equipment, facilities and workplace health and safety standards.
- The extent to which students will be supervised, supported or instructed while working with the organisation.

Refer to Appendix 2 the Work Integrated Learning documents.

7 Academic Regulations

7.1 Entry and Selection

Entry Requirements

Academic Requirements

New Zealand University Entrance - NCEA Level 3 (60 credits at level 3 and 20 credits at level 2 or higher) which must include:

- 14 credits at Level 3 in each of:
 - Mathematics or physics or statistics or accounting
 - English or history or art history or classics or geography or economics
 - one other subject from the list of approved subjects* **and**
- Literacy* - 10 credits at level 2 or above, made up of 5 credits in reading, 5 credits in writing **and**
- Numeracy* - 10 credits at level 1 or above (specified achievement standards, or unit standards 26623, 26626, 26627)

Or one of the following:

- New Zealand Diploma in Information Technology Technical Support Level 5
- New Zealand Diploma in Web Development and Design Level 5
- New Zealand Diploma in Networking Level 6
- New Zealand Diploma in Systems Administration Level 6
- New Zealand Certificate in Study and Career Preparation (Level 4) Ara Business and ICT Pathway or equivalent

If you have undertaken examinations other than NCEA (e.g. International Baccalaureate, Cambridge Examination), Ara will assess your qualification for academic entry equivalency.

* NZQA approved subjects: see <http://www.nzqa.govt.nz/qualifications-standards/awards/university-entrance/>

Alternative Requirements

Applicants who are unable to evidence that they meet Academic Requirements, but who can demonstrate acquired skills for tertiary study gained through study, work and/or life experience, may be approved for alternative entry. This may include Recognition of Prior Learning. Contact Ara for advice.

English Requirements

If English is not the applicant's first language, applicants will need to provide a result from a test or qualification on the acceptable alternatives English Proficiency Outcomes Chart. Applicants who do not have evidence of English language skills and are a New Zealand citizen or permanent resident, may contact Ara for an assessment.

- IELTS 6.0 Academic (no lower than 5.5 in any subtest)

Note:

IELTS scores used must be taken from a single IELTS Test Report Form and are valid for two years from the date of the test.

Students who have achieved NCEA Level 3 University Entrance requirements are not required to provide evidence of English language skills.

Selection

Applicants who meet the requirements for admission are accepted into the programme in the order their applications are received.

Key Information for Students
University Entrance (specific subjects apply); NESB IELTS 6.0 Academic (no lower than 5.5 in any subtest).

7.2 Programme Regulations

- a) The Bachelor of Information and Communication Technologies is a three year full-time equivalent programme of study requiring the successful completion of 360 course credits.
- b) Applications for entry to the programme are evaluated against the stated entry, published annually on the Ara website and in programme brochures.
- c) The maximum period of time to complete the programme is five years. Any extension to this period would require a written application from the Head of Department or delegate to the Computing Board of Studies for consideration.
- d) The programme comprises 225 core course credits, 75 compulsory pathway credits and 60 elective credits, with a minimum of 75 credits at Level 7.
- e) A minimum of 450 work integrated learning hours is required.
- f) All relevant credits from other approved programmes will be considered for credit recognition (cross credits, credit transfers and recognition of prior learning) according to Ara standard policy and procedure. Refer Section 7.3 below for a summary.
- g) A student showing insufficient academic progress will be advised in writing of the student support services available, and their academic performance (including class attendance) will be monitored by the Programme Leader. Should performance not improve, the Programme Leader will discuss with the Head of Department the benefit of placing the student on a Formal Academic Contract according to Ara standard policy and procedures.
- h) The Bachelor of Information and Communication Technologies will be awarded to all students who successfully complete all the requirements laid down by the Department of Computing and approved by the Academic Board.
- i) A maximum of 30 credits can be selected as unspecified credits completed as part of other Ara qualifications or qualifications at other institutions, subject to approval by the Academic Manager to ensure alignment of the graduate profile outcomes and that content is not replicated in courses.
- j) Students will be eligible to graduate with "Distinction" if they have attained a weighted grade average of A- (A minus) with no grades less than B+ (B plus) across a minimum of 90 credits at level 7. The 90 credits must include the following:
 - BCIS309 (45 credits), BCIS302 (15 credits), BCIS303 (15 credits) and the 15 credit Level 7 course required in the student's pathway.
 Students must have also completed the requirements for Distinction within two years.

Transition Arrangements

- All new students enrolling from Semester One 2019 will enrol in the new version of the programme.
- Current students will complete the programme according to the regulations that existed at the time of enrolment (last date for completion of previous version is the end of 2021). Students who will be unable to complete prior to the end of 2021 will, as soon as this becomes apparent, have individual learning plans developed where the learning and assessment will be in the context of the new courses.

Plan of Delivery 2018 to 2021						
	Current Year 1	Current Year 2	Current Year 3	New Year 1	New Year 2	New Year 3
2018						
2019						
2020						
2021						

Key

	Courses being offered
	Courses not being offered

- Current students will be advised of the transition plan during classes in Semester Two 2018. All previously enrolled students yet to complete the current programme will be contacted and advised of their options.

7.3 Credit Recognition and Articulation

Credit Recognition opportunities that may apply to this programme are listed in the table below.

Type of credit recognition	From other qualifications/experiences	To other qualifications from this one
Cross credit (similar outcome)	<p>Students can request to cross credit courses from prior study where there are similar student outcomes. Where possible applicants will be advised prior to enrolment of their eligibility for cross credit for particular courses.</p> <p>Where an equivalency does not exist, the Academic Manager will utilise a subject matter expert to examine the course. An 80% learning content match is required for a new equivalency; with consideration to the currency of the completed course. In general credit will not be given for a course older than 5 years</p>	Dependent on regulations and policies of the particular institution.

Credit Transfer (identical outcome)	<p>Where prior learning outcomes are identical to those in the degree, students can apply for a credit transfer. Where possible applicants will be advised prior to enrolment of their eligibility for credit transfer for particular units/courses.</p> <p>For students who have studied the NZ2596 New Zealand Diploma in Information Technology Technical Support (Level 5), NZ2598 New Zealand Diploma in Web Development and Design (Level 5), NZ2600 New Zealand Diploma in Networking (Level 6), or NZ2601 New Zealand Diploma in Systems Administration (Level 6) at Ara there are some courses eligible for credit transfer. These students will be awarded an equivalent grade based on their final course result awarded in the New Zealand Diplomas.</p> <p>Refer Appendix 3.3 Transition Plan.</p> <p>Students who qualify for a credit transfer from other institutions will receive a grade of CT, for credit transfer.</p>	Dependent on regulations and policies of the particular institution.
Recognition of, or Assessment of, Prior Learning (equivalent outcome and commonly achieved outside formal education)	<p>Where students have met some or all of the graduate profile they may request an assessment of prior learning.</p> <p>Assessment against an individual course</p> <p>Prior Learning will be considered against learning outcomes for a course and may include a combination of attestation, portfolio, professional conversation, challenge test, academic transcript.</p> <p>Assessment against the graduate profile</p> <p>CAPL Candidates will be enrolled on facilitated courses that assist them to prepare a written and oral presentation supported by a portfolio of evidence, which demonstrates and documents their integrated knowledge and understanding. A rationale will be presented stating how their work has been developed and informed by their knowledge base.</p> <p>CAPL candidate enrolments:</p> <ul style="list-style-type: none"> • Full degree candidates will enrol in CBCIS309 and CBCIS206. • Advanced standing candidates will enrol in CBCIS206. <p>Refer to Appendix 3.10, CAPL Course List, for detailed list of CAPL courses and assessments.</p>	Dependent on regulations and policies of the particular institution.
Advanced Standing	Applicants may be granted Advanced Standing as a consequence of Credit Recognition (either cross credit, credit transfer or RPL) according to the Advanced Standing criteria (refer Appendix 3.9).	Dependent on regulations and policies of the particular institution.
Articulation/pathways	New Zealand Diploma in Information Technology Technical Support, New Zealand Diploma in Web Development and Design, New Zealand Diploma in Networking and New Zealand Diploma in Systems Administration.	Graduates of the BICT may seek entry into postgraduate level programmes of study in the field of ICT.

7.4 Programme Structure

List of Approved Courses

CH3866 Bachelor of Information and Communication Technologies Level 7

Course Code	Course Title	Level	Credits	Work Integrated Learning	Notional Learning Hours	Course Factor	Classif & Funding	NZSCED
Core Courses								
BCIS105	IT Practitioner Fundamentals	5	15	0	150	0.1250	B2 06	029999
BCDE101	Introduction to Programming	5	15	0	150	0.1250	B2 06	020103
BCCS183	Cloud Technologies and the Internet of Things	5	15	0	150	0.1250	B2 06	020113
BCCS199	Operating Systems	5	15	0	150	0.1250	B2 06	020117
BCIS106	Computational Methods	5	15	0	150	0.1250	B2 06	020103
BCDE102	Introduction to Software Engineering	5	15	0	150	0.1250	B2 06	020103
BCDE103	Database Design	5	15	0	150	0.1250	B2 06	020303
BCCS191	Introduction to Networks	5	15	0	150	0.1250	B2 06	020113
BCIS207	Enterprise Solutions Deployment	6	15	20	150	0.1250	B2 06	020301
BCIS208	IT Service Management	6	15	20	150	0.1250	B2 06	020305
BCIS302	Managing Information and Cybersecurity	7	15	20	150	0.1250	B2 06	020399
BCIS303	Information Technology Governance	7	15	20	150	0.1250	B2 06	020399
BCIS309	Work Integrated Learning Project	7	45	450	450	0.3750	B2 06	020199
Compulsory Courses								
<i>The courses below are delivered as compulsory courses in pathways and are also available as electives in other pathways.</i>								
Information Systems Pathway								
BCIS211	Research for Information Solutions	6	15	0	150	0.1250	B2 06	020399
BCIS212	Introduction to Enterprise Solutions Architecture	6	15	30	150	0.1250	B2 06	020399

BCIS213	Introduction to Enterprise Intelligence and Analytics	6	15	20	150	0.1250	B2 06	020399
BCIS312	Enterprise Solutions Architecture	7	15	20	150	0.1250	B2 06	020399
BCIS313	Enterprise Intelligence and Analytics	7	15	30	150	0.1250	B2 06	020399
Networking and Infrastructure Pathway								
BCCS254	System Infrastructure	6	15	30	150	0.1250	B2 06	020113
BCCS283	Network Infrastructure	6	15	20	150	0.1250	B2 06	020113
BCCS292	Routing and Switching Essentials	6	15	20	150	0.1250	B2 06	020113
BCCS295	Enterprise Networking, Security, and Automation	6	15	20	150	0.1250	B2 06	020113
BCCS355	Cloud Services	7	15	30	150	0.1250	B2 06	020113
Software Development Pathway								
BCDE211	Best Programming Practices (Web and Mobile Development)	6	15	30	150	0.1250	B2 06	020103
BCDE213	Interactive Media Development	6	15	10	150	0.1250	B2 06	020115
BCDE214	Database Administration	6	15	30	150	0.1250	B2 06	020303
BCDE215	Web Development	6	15	30	150	0.1250	B2 06	020305
BCDE311	Software Development Project	7	15	50	150	0.1250	B2 06	020103
Elective Courses								
<i>Electives can be selected from the courses above that are not completed as compulsories in a pathway or selected from the courses below.</i>								
BCCS253	Directory Services	6	15	0	150	0.1250	B2 06	020117
BCCS350	Advanced Networking	7	15	0	150	0.1250	B2 06	020113
BCCS381	Special Topic – Networking Infrastructure	7	15	50	150	0.1250	B2 06	020113
BCDE221	Software Engineering	6	15	0	150	0.1250	B2 06	020103
BCDE222	Best Programming Practices (C# .NET)	6	15	0	150	0.1250	B2 06	020103
BCDE223	Best Programming Practices (Java)	6	15	0	150	0.1250	B2 06	020103
BCDE224	Best Programming Practices (Server Side Programming - PHP)	6	15	0	150	0.1250	B2 06	020103

BCDE321	Advanced Programming	7	15	0	150	0.1250	B2 06	020103
BCIS206	Professional Practice	6	15	0	150	0.1250	B2 06	020399
BCIS321	Special Topic in Information Systems	7	15	50	150	0.1250	B2 06	020399
BCIT388	Mobile Technology	7	15	0	150	0.1250	B2 06	020305
DNET601	Wireless Local Area Networks	6	15	0	150	0.1250	B1 06	020113
DNET602	Network Security	6	15	0	150	0.1250	B1 06	020113
DNET603	Unified Communication	6	15	0	150	0.1250	B1 06	020113
DSYS601	Systems Deployment	6	15	0	150	0.1250	B1 06	020305
A maximum of 30 credits can be selected as unspecified credits completed as part of other Ara qualifications or qualifications at other institutions, subject to approval by the Academic Manager to ensure alignment of the graduate profile outcomes and that content is not replicated in courses.								

CH3866 Bachelor of Information and Communication Technologies Level 7**Example Structure – Information Systems Pathway**

Course Code	Course Title	Level	Credits	Work Integrated Learning	Notional Learning Hours	EFTS
Year One						
Core:						
BCIS105	IT Practitioner Fundamentals	5	15	0	150	0.1250
BCDE101	Introduction to Programming	5	15	0	150	0.1250
BCCS183	Cloud Technologies and the Internet of Things	5	15	0	150	0.1250
BCCS199	Operating Systems	5	15	0	150	0.1250
BCIS106	Computational Methods	5	15	0	150	0.1250
BCDE102	Introduction to Software Engineering	5	15	0	150	0.1250
BCDE103	Database Design	5	15	0	150	0.1250
BCCS191	Introduction to Networks	5	15	0	150	0.1250
Total Year One:			120	0	1200	1.0000
Year Two						
Core:						
BCIS207	Enterprise Solutions Deployment	6	15	20	150	0.1250
BCIS208	IT Service Management	6	15	20	150	0.1250
Compulsory for Information Systems Pathway:						
BCIS211	Research for Information Solutions	6	15	0	150	0.1250
BCIS212	Introduction to Enterprise Solutions Architecture	6	15	30	150	0.1250
BCIS213	Introduction to Enterprise Intelligence and Analytics	6	15	20	150	0.1250
BCIS312	Enterprise Solutions Architecture	7	15	30	150	0.1250
Electives: Two courses from the list of Electives		6	30	0	300	0.2500
Total Year Two:			120	120	1200	1.0000
Year Three						
Core:						
BCIS302	Managing Information and Cybersecurity	7	15	20	150	0.1250
BCIS303	Information Technology Governance	7	15	20	150	0.1250
BCIS309	Work Integrated Learning Project	7	45	450	450	0.3750
Compulsory for Information Systems Pathway:						
BCIS313	Enterprise Intelligence and Analytics	7	15	20	150	0.1250
Electives: Two courses from the list of Electives		7	30	0	300	0.2500
Total Year Three:			120	510	1200	1.0000
Totals for Years One, Two and Three:			360	630	3600	3.0000

Example Structure – Networking and Infrastructure Pathway

Course Code	Course Title	Level	Credits	Work Integrated Learning	Notional Learning Hours	EFTS
Year One						
Core:						
BCIS105	IT Practitioner Fundamentals	5	15	0	150	0.1250
BCDE101	Introduction to Programming	5	15	0	150	0.1250
BCCS183	Cloud Technologies and the Internet of Things	5	15	0	150	0.1250
BCCS199	Operating Systems	5	15	0	150	0.1250
BCIS106	Computational Methods	5	15	0	150	0.1250
BCDE102	Introduction to Software Engineering	5	15	0	150	0.1250
BCDE103	Database Design	5	15	0	150	0.1250
BCCS191	Introduction to Networks	5	15	0	150	0.1250
Total Year One:			120	0	1200	1.0000
Year Two						
Core:						
BCIS207	Enterprise Solutions Deployment	6	15	20	150	0.1250
BCIS208	IT Service Management	6	15	20	150	0.1250
Compulsory for Networking and Infrastructure Pathway:						
BCCS254	System Infrastructure	6	15	30	150	0.1250
BCCS283	Network Infrastructure	6	15	20	150	0.1250
BCCS292	Routing and Switching Essentials	6	15	20	150	0.1250
BCCS295	Enterprise Networking, Security, and Automation	6	15	20	150	0.1250
Electives: Two courses from the list of Electives		6	30	0	300	0.2500
Total Year Two:			120	130	1200	1.0000
Year Three						
Core:						
BCIS302	Managing Information and Cybersecurity	7	15	20	150	0.1250
BCIS303	Information Technology Governance	7	15	20	150	0.1250
BCIS309	Work Integrated Learning Project	7	45	450	450	0.3750
Compulsory for Networking and Infrastructure Pathway:						
BCCS355	Cloud Services	7	15	30	150	0.1250
Electives: Two courses from the list of Electives		7	30	0	300	0.2500
Total Year Three:			120	510	1200	1.0000
Totals for Years One, Two and Three:			360	640	3600	3.0000

Example Structure – Software Development Pathway

Course Code	Course Title	Level	Credits	Work Integrated Learning	Notional Learning Hours	EFTS
Year One						
Core:						
BCIS105	IT Practitioner Fundamentals	5	15	0	150	0.1250
BCDE101	Introduction to Programming	5	15	0	150	0.1250
BCCS183	Cloud Technologies and the Internet of Things	5	15	0	150	0.1250
BCCS199	Operating Systems	5	15	0	150	0.1250
BCIS106	Computational Methods	5	15	0	150	0.1250
BCDE102	Introduction to Software Engineering	5	15	0	150	0.1250
BCDE103	Database Design	5	15	0	150	0.1250
BCCS191	Introduction to Networks	5	15	0	150	0.1250
Total Year One:			120	0	1200	1.0000
Year Two						
Core:						
BCIS207	Enterprise Solutions Deployment	6	15	20	150	0.1250
BCIS208	IT Service Management	6	15	20	150	0.1250
Compulsory for Software Development Pathway:						
BCDE211	Best Programming Practices (Web and Mobile Development)	6	15	30	150	0.1250
BCDE213	Interactive Media Development	6	15	10	150	0.1250
BCDE214	Database Administration	6	15	30	150	0.1250
BCDE215	Web Development	6	15	30	150	0.1250
Electives: Two courses from the list of Electives		6	30	0	300	0.2500
Total Year Two:			120	140	1200	1.0000
Year Three						
Core:						
BCIS302	Managing Information and Cybersecurity	7	15	20	150	0.1250
BCIS303	Information Technology Governance	7	15	20	150	0.1250
BCIS309	Work Integrated Learning Project	7	45	450	450	0.3750
Compulsory for Software Development Pathway:						
BCDE311	Software Development Project	7	15	50	150	0.1250
Electives: Two courses from the list of Electives		7	30	0	300	0.2500
Total Year Three:			120	540	1200	1.0000
Totals for Years One, Two and Three:			360	680	3600	3.0000

7.5 Assessment Regulations

The following assessment regulations apply to this programme. Please also refer to Ara Assessment Policy APP505.

	Yes/No	Details (e.g. provisions, rationale, procedures, restrictions, penalties)
Resits and Resubmissions	Yes	By exception only and at the discretion of the Academic Manager or delegate, resits and resubmissions may apply to this programme when the final course result indicates a narrow failure. The maximum mark for passing a resit or resubmission is the minimum mark to pass the assessment. Requests for resubmissions must be made to the relevant staff member, no later than 5 working days after the assessment has been marked and returned to the student.
Extensions	Yes	Extensions are initiated by the student affected and timeframes must be agreed to prior to the assessment due date. Extensions awarded must be completed by the course end date. It is recommended that extensions be limited to 6 weeks after the assessment due date to ensure timely outcomes. Extensions awarded outside the course end date require the approval of the HOD or delegate.
Second Results	Yes	A student who gains a fail grade in a course with a mark of 40% or more will be provided with one opportunity to undertake a reassessment of the course on the recommendation of the HOD or delegate. The re-assessment must be taken within one month of the end date of the course. No extra tuition is available, although they can opt to re-enrol in the entire course instead, receive tuition, and complete the assessment in the normal way. A student passing the reassessment will gain the minimum grade available as a pass in the course. The student's original result remains on the transcript, along with the updated (second) result.
Alternative Assessment Arrangements	Yes	Alternative assessment arrangements may be provided in cases where a student is unable to sit a test or examination or complete an assessment on the scheduled date for reasons the Department considers acceptable. Alternative arrangements include allowing students to sit a test before or after the scheduled date.
Aegrotat Pass	Yes	Aegrotats will be granted only when a student's performance was seriously impaired at the time of the assessment and where there has been sufficient prior assessment to indicate successful completion of the learning outcomes and when no alternative assessment opportunity is available. In all cases, the initial notification must be prior to the assessment event. For tests and examinations, this means the start time of the assessment. For assignments, this means the deadline for submission.

Conceded Pass	Yes	<p>A conceded pass may be awarded at the discretion of the Department Programme Group if a student has fulfilled the minimum course requirements but failed marginally (45-49%) to achieve the standard over all assessments, or completed most but not all of the required work at an acceptable level. The Department Programme Group must be satisfied that the student has worked conscientiously and is worthy of special consideration.</p> <p>The Department Programme Group will decide whether the conceded pass is advancing or non-advancing and whether the student must complete any additional work within a specified timeframe.</p> <p>A student is eligible to receive only one conceded pass in any one year in the same programme, unless an exception is approved by Academic Board.</p>
Reconsiderations	Yes	<p>If a student considers a mark/result/course outcome of an assessment allocated to them is incorrect or unfair they must first discuss the result with the relevant academic staff member who may consult their Programme Manager or Head of Department. The request for a discussion must be lodged within five working days of the mark/result/course outcome being communicated.</p> <p>For further details on process if the discussion does not bring a satisfactory outcome to the student or for Clinical/Work place reconsiderations refer to the Assessment Policy and/or the Reconsideration/Appeals flow chart for more details.</p>
Marks Carried Forward	Yes	<p>A student may apply to carry marks forward for completed assessments to the next occurrence of the course and not redo those assessments. The Head of Department or delegate is responsible for counselling the student about the potential impact on their overall workload, and the possible impacts on student visa or StudyLink eligibility.</p> <p>The following provisions apply:</p> <ul style="list-style-type: none"> a) The student must enrol in the next available occurrence of the course. b) A pro rata enrolment will apply. c) Marks Carried Forward can only occur for one re-enrolment of the same course.
Assessment in Te Reo Māori	Yes	<p>Any student wishing to be assessed or present work for assessment in Māori must inform the Head of Department, preferably at the time of enrolment, but no later than the start of the course(s).</p>
Late Submissions	Yes	<p>Other than approved extensions, late submissions will have 10% of the mark deducted per day per assessment, up to a maximum of 50%. If an assessment is more than five days after the due date, it will not be marked unless special circumstances are approved by Head of Department or delegate.</p>

Authenticity of student work/Academic integrity

Academic integrity is a commitment from staff and learners to apply the fundamental values of honesty, trust, fairness, respect, and responsibility to all academic matters.

Students are held accountable through the policies and procedures relating to authenticity of student work through policies on academic misconduct (including plagiarism, cheating and misrepresenting identity for purposes of assessment), and assessment policies. Refer to Ara Policies APP301 Student Rights and Responsibilities, APP304 Academic Misconduct, APP506 Probation, APP511 Academic Progression, and APP512 Exclusion.

Results Notification

Results of assessments are expected to be returned to students within ten working days of the assessment due date. Where possible, students receive and are given an opportunity to discuss model answers and/or marking guides and to query their grades/marks.

All assessment results are expected to be entered into Student Management System, ready for publishing, no later than 15 working days after the assessment due date.

Course and programme results are due for publication (provided to the student) within 15 working days after the end date of the course or programme.

Grade Scale

The G29aa grade scale will be used for all courses.

Grade Scale G29aa		
Mark	Grade	Result
90 -100	A+	Pass
85 - 89	A	Pass
80 - 84	A-	Pass
75 - 79	B+	Pass
70 - 74	B	Pass
65 - 69	B-	Pass
60 - 64	C+	Pass
55 - 59	C	Pass
50 - 54	C-	Pass
40 - 49	D	Fail
0 - 39	E	Fail

G29AA may also be reported as:		
Code	Result	Definition
Pass	Pass	Awarded pass and no appropriate grade can be awarded
CC	Pass	Course credit awarded by Cross Credit
CT	Pass	Course credit awarded by Credit Transfer
RPL	Pass	Course credit awarded by Recognition of Prior Learning
ADV	Pass	Course credit awarded by Advanced Standing
CON	Pass	Conceded Pass
RP	Pass	Restricted Pass - Conceded Pass Non-Advancing
CP	Pass	Conditional Pass - Pass on Second Result
AEG	Pass	Aegrotat Pass
FF	Fail	Forced Fail due to not attaining mandatory minimums
Fail	Fail	Not passed and no appropriate grade can be awarded
DNC	Incomplete	Did not complete course requirements
W	Withdrawn	Formal withdrawal within the non-academic penalty period

8 Quality Assurance

The Quality Management System is based on the Quality Assurance Framework established by NZQA and gazetted under the Education Act 1989. This framework uses the theory and practice of evaluation to focus on the quality of educational outcomes and key contributing processes, and comprises four components:

- Course accreditation and approval to deliver courses/programmes
- Continuous self-assessment
- Periodic external evaluation and review
- Managing the consequences of poor performance

a. Self-Assessment

Self-assessment in this framework is the on-going process used to gain evidence of effectiveness in providing quality education, including identifying best practice and determining actions to improve and develop. Responsibility for self-assessment is organisation-wide, its purpose is for organisation improvement and accountability. The Key Evaluation Questions are used as a foundation for evidenced based self-assessment (using both qualitative and quantitative data). The primary tool for self-assessment is the Programme Evaluation process. Identified strategies for improvement and progress reports are reported to the Board of Studies periodically. Institution-wide themes are identified and improvement strategies are monitored by Academic Board.

b. External Evaluation and Review (EER)

Through EER, Ara is held accountable to our students, employers, funding bodies, quality assurance body and other interested parties.

An evaluation and review team external to the Institution uses evaluation processes and tools to reach reliable and valid judgements about Ara Institute of Canterbury Ltd's educational performance and capability in self-assessment.

Educational performance relates to the way in which the educational outcomes achieved by Ara represent quality and value for learners and the wider community. An evaluation of educational performance involves answering questions focused primarily on the quality of learning and teaching, and the achievements of learners.

Capability in self-assessment indicates how effectively Ara uses self-assessment information to understand performance and bring about improvements.

Following NZQA's External Evaluation and Review in October 2016, Ara maintained its Category 1 provider status with an outcome of highly confident in both educational performance and self-assessment capability.

Stakeholder Engagement

All programmes are supported by an appropriate consultation network, established to provide input at various stages of programme development, delivery and evaluation and review.

A consultation network may include formally constituted Programme Advisory Committees or other processes/activities such as focus groups brought together for a specific purpose; "virtual committee" based on electronic or other communication that can be recorded; formal, documented industry links; membership on relevant external bodies if agenda items include ones related specifically to the delivery and outcomes of the Ara programme.

This degree is supported by the Local Advisory Committee which meet according to their Terms of Reference (Appendix 3.6), a minimum of four times a year.

Moderation

Internal and external moderation of assessment will be undertaken to ensure valid, reliable and consistent standards of assessment are maintained throughout the programme. Moderation will ensure that assessment decisions are fair and reflect the marking guides, learning outcomes and graduate profile. Moderation is a negotiated process of agreement between designer and moderator (pre) and between moderator and marker (post). Moderation's main purpose is for continuous improvement with outcomes reported in a constructive and informative way. How moderation results are used for improvement will be described in the Programme Evaluation process.

Quality moderation processes assure:

- All relevant information relating to the assessment process is provided to students.
- Assessment documentation is complete and the instructions to the student are clear.
- Assessments and learning activities are mapped to the learning outcomes and graduate profile and are at the appropriate level.
- Marking criteria/guides, marks available and model answers are correct and clearly stated.
- Assessment processes are valid, authentic, consistent and easily understood.
- Changes recommended by moderators to improve assessments are incorporated where appropriate.
- Assessors/markers are consistent in their judgements.

Moderation		
Type of moderation	Pre-assessment moderation	Post-assessment moderation
Internal	<p>All new assessments and significant changes to assessments will be pre-assessment peer-moderated to ensure the assessment is clear, accurate and appropriate for the level and the outcomes assessed.</p> <p>All assessments developed by new academic staff are peer-moderated prior to assessment.</p>	<p>Post-assessment moderation is undertaken according to an annual plan. The purpose of this type of moderation is to check the consistency of the assessors' marking decisions and to recommend any changes to the assessment that may improve validity, authenticity, consistency, and ease of understanding.</p> <p>All assessments marked by new academic staff are peer-moderated after assessment is completed and before it is returned to students.</p> <p>All assessments with a weighting higher than 75% will be internally moderated before assessment results are made available to students.</p>
External	<p>All courses will be reviewed once over a five-year period. Refer external moderation plan in Appendix 3.7.</p> <p>The external moderator will be supplied with the following:</p> <ul style="list-style-type: none"> - A course outline, including a course schedule, which identifies all summative assessment items and the weightings for individual assessment items. - Copies of all summative assessment materials and accompanying marking schedules. - Three samples of assessed student work for each assessment item. <p>The external moderator will prepare a report for the department management team and any requirements will be reported through the Programme Evaluation process.</p>	

**Refer External Moderation Plan in Appendix 3.7, External Moderation Reports and Action Plans in Appendix 3.8*

Self-Assessment and Evaluation				
Evaluation type		Feedback sought and what frequency	Collection / analysis	Feedback and action loops
Department Initiated	Course Evaluations	Informal feedback undertaken within each course.	Undertaken by academic staff member to ensure continuous improvement.	Responses discussed in class between lecturer and students, and modifications implemented as necessary.
	Programme Evaluation	A series of self-assessment steps involving staff reflection, feedback from key stakeholders, including academic and administrative staff, management, services, students and industry representatives, culminating in an evaluative conversation.	Individual programme data prepopulated. Facilitated evaluative conversation. Reports compiled by Department.	Summary of reports including improvement plans, progress on strategies and best practice, reported at intervals to the Board of Studies. The Board of Studies reports twice a year to Academic Board on progress.
	Course Evaluation Survey	Approximately 20% of courses within a programme will be evaluated each year.	Process administered online by Academic Quality team in Academic Services Division, with raw data reported to HOD within two weeks of survey close.	Responses to any issues in evaluations prepared by HOD and/or Academic Manager and provided to students as appropriate.
Initiated Centrally	Formal Teacher Observation	Regularly over an 18 month cycle.	Observations are conducted by trained observers and feedback reported to staff member and manager.	Data and strengths and improvement themes are used for informing individual, team and Department capability planning.
	Student Experience Survey	Applied before the end of each year or end of programme.	Online, analysed by Academic Services Division and reported in the Programme Evaluation and to Boards of Studies.	Opportunities for improvement are documented in the Programme Evaluation report. Where common themes are identified feedback will be provided to students through Academic Services Division and Departments.
	Graduate Outcomes Survey	From graduates at the time of graduation.	Online, analysed by Academic Services Division and reported to HODs for analysis in Programme Evaluations and then reported to Boards of Studies.	Results are reported annually and incorporated into the Programme Evaluation process. During evaluative conversations the employment and satisfaction levels of the graduate are considered.
	Graduate Employers Survey	Conducted every second year.		
	Degree Monitoring (NZQA or Ara appointed)	Annual visit to meet with staff, students and other stakeholders.	NZQA or Ara Report.*	Department Action Plan and Report tabled at the Board of Studies before forwarding to the Academic Board.

**Note the monitor visited December 2017. The subsequent report has factual errors and canvass issues which are out of scope for a monitor of a programme of study. Feedback is being provided to the monitor on these matters. Once the report is completed and accepted by Academic Board a copy will be forwarded to NZQA.*

9 Staff

The Department of Computing has a commitment to employing staff who are expert in their discipline with most of them experienced in both industry and education. Six staff have memberships or are associated with professional bodies as detailed in the table below.

Many existing staff hold post-graduate level qualifications including three staff with Masters and eight staff holding a Doctoral or double Masters qualifications. Two staff members are in the process of completing a Masters qualification.

Staff who will be involved with teaching this programme are employed according to Ara employment policies and are appropriately experienced and qualified in their area of expertise.

Staff member	Academic/ Professional Qualifications	Teaching Qualifications	Position	Main Teaching Areas	Current Main Research Areas	Professional Memberships	Time release for research
Acting Head of Department of Computing and Academic Leader Mehdi Asgarkhani							
Lecturers - Department of Computing							
Arifah Addison	Bachelor of Applied Computing (with Animal Science)	Graduate Diploma in Teaching and Learning, Secondary, Diploma in Tertiary Teaching and Learning	Academic Staff Member	Information Management Information Systems Database design User experience (UX) Usability and testing Web design	Human Interface Technology (UC) – UX, Usability testing, Design, Prototyping, Virtual Reality		
Mehdi Asgarkhani	Chartered IT Professional (NZ, UK, AUS) Master of Business Administration, Master of Computer Science with Honours, Bachelor of Computer Engineering with Honours.	Certified IT Professional (ITP NZ)	Academic Leader Acting HoD Principal Academic Staff Member	Information Systems IT Governance IT Management	Information Technology Governance Digital disruption	Full Member – Institute of IT Professionals Editorial Board – Contemporary Management research Editorial Board – Journal of Business, Economics, and Accountancy	250
Dr Christopher Bartlett	PhD	Teaching qualification in progress	Academic Staff Member	Website development, User experience design			
Dr Ed Correia	PhD, MCSE, MCSA, MCITP	HDipEd (PG Sec), Certificate in Adult Teaching	Principal Academic Staff Member	Operating Systems, Networking, Infrastructure (on-premise and cloud services)	Cloud services, virtualisation, technical education		250
Brett Davidson	BICT (Communication and Networking)	Teaching qualification in progress	Academic Staff Member	Networking Stream although will also teach 1 st year programming soon.			

Staff member	Academic/ Professional Qualifications	Teaching Qualifications	Position	Main Teaching Areas	Current Main Research Areas	Professional Memberships	Time release for research
Peter Edge	BICT -NZCE Process Measurement & Control -Cisco Certified Network Associate -Microsoft Certified Systems Administrator		Academic Staff Member	Diploma in Computer networking, Cisco curriculum, BICT	Software Defined Networking (SDN) IoT and Hybrid Cloud.	ACM Cisco Global Network Academy Advisory Board	250
Dr Michael Lance	PhD, Master of Arts (Hons), Bachelor of Arts		Principal Academic Staff Member	Software engineering Application development	Software engineering		
Chris McCarthy	Grad Dip in e-Commerce	Certificate in Adult Teaching	Principal Academic Staff Member	Information Systems, Business communication, Current Issues in IT	Maori studying IT Opportunities for International Students		
Dr Matt Melchert	PhD (Computer Science)	Certificate in Adult Learning and Teaching	Senior Academic Staff Member	Operating Systems, Networking Operating systems, effect of digital technology on mental and physical health	Cloud services IoT		250
Dr Bernard Otinpong	PhD, Master of Science, Bachelor of Science (Hons)	Certificate in Tertiary Learning and Teaching	Senior Academic Staff Member	Information Systems	Information Visualisation	Associate Member, ITP NZ	250
Ian Patterson	Master of Information Technology	Diploma in Tertiary Learning and Teaching	Senior Academic Staff Member	Cisco academy courses		TUANZ	
Phillip Roxborough	Master of Arts with Distinction in Mature Student Tertiary Education Success (Otago)	Certificate in Tertiary Learning and Teaching	ASM	Technical Support, Professional Practice, IT Service Management, Business Analysis – Introduction and Advanced, Project Supervision			
Amitrajit Sarkar	BE (Electrical) First Class, GradDipICT (Distinction), B Info Sys (Hons) (Distinction), M Info Sys (First Class Hons).	Certificate in Tertiary Learning and Teaching	Senior Academic Staff Member	Software Eng. and Database	Data Driven IT Governance, Data Analytics	MIITP, CTech	250
Dr David Weir	PhD, Bachelor of Science (Hons)	Cert TT, CISCO Certified Instructor (IT Essentials) A+ Certification	Principal Academic Staff Member	CE301 Projects, IT352 Projects, Interactive Media Development Operating Systems and Networking Essentials.	IoT AR and Web Enabled Application Development Life Cycles.	AASC, NUANZ, CITRENTZ	100
Dr Luofeng Xu	PhD in Computer Studies	Certificate in Tertiary Learning and Teaching	ASM	Software Engineering/ Development	JavaScript Testing framework, Software Development, Data mining, IoT	Institute of IT Professionals (IITP) Associate Member	300

Research

Ara is committed to delivering quality assured research which underpins the theory of our courses, informs delivery, and is responsive to industry and stakeholders. Liaison with industry and stakeholders is a focus for applied research and currently 64% of our applied research projects are industry aligned in 2017. Most of our research outputs are quality assured (85% in 2017, including conference presentations) and we were a participant in the 2006 and 2011 PBRF rounds. The quality of our research is evident in our PBRF ranking of 2.57 from the 2011 round.

The vision statement from the Ara Functional Research Plan is: 'Creative, applied research and innovation that inspires teaching and learning.'

The key focus areas for research in the current Functional Research Plan are:

1. Develop and nurture a research culture.
2. Develop a coherent portfolio of research and innovation.
3. Develop operational plans including staff capability and capacity.
4. Integrate research and innovation into teaching and learning.
5. Leveraging partnerships.

Research Framework

Ara has a well-developed framework to support research.

- Goals and targets identified in the Ara Strategic and Investment Plan
- Functional, operational and individual research plans
- Research and Ethic Policies
- Higher Qualifications Policy
- Thesis Examination Policy
- Assessment Policy
- Research and Knowledge Transfer Committee that meets six times a year and reports to the Academic Board
- Ethics Subcommittee which meets at least six times a year, if required, or transacts urgent business by email
- Departmental Research Committees which meet four times a year
- Code for The Responsible Conduct of Research, includes supervision of student research
- Forms for funding applications, conference attendance, incentive grants, research project or programme applications, changes to projects,
- Flow diagrams showing the processes for research project applications and spending of grants.

Research Support

Ara encourages staff research by building time allowances into staff workload plans. Research time is allocated to individual staff members negotiated around their contact teaching hours and duty hours and the research activities for the year are identified in an individual research plan for those staff. A competitive sabbatical process is available for research active staff to focus on research activity.

The Research Office assists staff with research project and internal funding applications, review and advise on research proposals, submit and manage external contracts, develop information resources, identify funding opportunities and track spending on internal and external grants with assistance from Finance and report on research activity and progress. Funds are available to support conferences, materials, research assistants and reward staff for publications and gaining external funding. Research information is available to staff on the Infoweb. The Annual Report includes a list of research outputs by Department and staff contribution to the research environment and is reported from a central research database. Research outputs are monitored each semester and reported to the Research and Knowledge Transfer Committee and collated in a central database. Research is showcased annually in “Research Week” through staff research presentations. The Office is staffed by a Research Manager and Research co-ordinator. Ara library staff are involved in assisting staff with resources.

All research projects require approval by the Head of Department, Manager Research, Director Academic and Director Education and Applied Research to ensure the resources are available and the project is strategically aligned. The quality of the project is ensured through a technical review process. The approval process includes assessment of the need for ethics approval and the Ethics Subcommittee assures that research which involves humans is ethically sound. The Research and Knowledge Committee provides a forum for strategic development and support of research.

Research Capability in the Programme

Staff of the BICT are active in dissemination of research, including in published quality assured journals. Over 2015 - 2017 seven staff had quality assured outputs and one staff member is doing his Masters thesis. Curricula vitae are available for the staff teaching in this programme and show their recent research outputs and experience.

Refer to Appendix 3.5 for Staff Research Outputs.

10 Course Descriptors

See separate document

11 Programme Data

11.1 Programme of Study Summary

1 Programme Details

Department Computing		Department Contact Person/s Mehdi Asgarkhani			
Prog Code CH3866	Programme of Study Title Bachelor of Information and Communication Technologies	Abbreviation BICT	Version 2.0	Credits 360	Level 7
Qual Code	Qualification Title <i>(if different from programme of study title)</i>	Version	Credits	Level	
Formal Specialisation/s:					
Embedded Qualification/s:					
Prog Code	Title		Credits	Level	
Exit Qualification/s:					
Prog Code	Title		Credits	Level	
Qualification Outcome (Tick as many as apply) <input type="checkbox"/> New Zealand qualification <input checked="" type="checkbox"/> Ara qualification <input type="checkbox"/> Collaborative programme <input type="checkbox"/> Training Scheme		Unit standards <input checked="" type="checkbox"/> Includes no unit standards <input type="checkbox"/> Consists entirely of unit standards <input type="checkbox"/> Includes some unit standards			
If assessment standards are included, do we hold current accreditation/s to the required level?				n/a	
Are there any external approval/review requirements other than NZQA (eg Nursing Council of NZ, Midwifery Council of NZ, Social Workers Registration Board, IPENZ)? If so, what body and how often?				No	
Is the programme to be assessed by NZQA under Matauranga Māori Evaluative Quality Assurance (MMQA)? Note: applies to Level 1 to Level 6 only.				n/a	

2 Delivery Options

Tick as many as apply: <input checked="" type="checkbox"/> Full time <input checked="" type="checkbox"/> Part time <input checked="" type="checkbox"/> Block	Proposed start date February 2019	Other intakes during year July
---	---	--

3 Programme History

<input type="checkbox"/> Replacement for another programme	<input type="checkbox"/> New programme	<input checked="" type="checkbox"/> Reviewed programme
Details of disestablished programme/s:		
Prog Code	Full Title	Credit Value
Level		
Start date of last intake	Discontinued effective from	Courses end-dated from

4 Change Type

NEW changes proposed for this re-approval

*NZQA/ #TEC approval required

- | | |
|---|---|
| <input type="checkbox"/> title of qualification awarded *
<input type="checkbox"/> credit value of programme *#
<input type="checkbox"/> EFTS value of programme *# (not if unit standard related)
<input type="checkbox"/> level of programme *#
<input type="checkbox"/> number of teaching weeks/gross weeks #
<input type="checkbox"/> content (if funding category/classification alters) #
<input type="checkbox"/> course factors (if funding affected) #
<input checked="" type="checkbox"/> other changes (list): | <input type="checkbox"/> new specialisation/s *#
<input type="checkbox"/> deleted specialisation/s *#
<input type="checkbox"/> new exit point/s *
<input type="checkbox"/> deleted exit point/s *
<input type="checkbox"/> delivery mode (e.g. distance) *# - degrees only
<input type="checkbox"/> entry criteria
<input type="checkbox"/> other changes to a degree (may require approval*#) |
|---|---|

Refer to Summary of Changes Table in Section 2.1 Context and Rationale for Change

Further information related to any of the above:

5 Delivery Details

Are any courses delivered by another Department? If YES:

(a) Which Department?

(b) Which course/s?

No

Is any delivery under contract to or in partnership with other provider/s?

☐ sub-contracted ☐ jointly awarded ☐ jointly delivered ☐ in NZ ☐ off-shore

Name of partner/s:

No

Is any delivery (excluding work integrated components) outside our approved sites?

Location of site:

No

How will delivery be funded?

☒ TEC ☐ ITO ☐ STAR ☐ Self ☐ Other:

Which work integrated components apply? Tick as many as are relevant

☒ work-based projects ☐ on-job assessment ☒ work placement ☐ internship ☐ clinical

What is the delivery mode?

☒ Face-to-face ☒ Distance ☒ Blended

Delivery Methods: classroom, tutorial, workshops, labs, online, practical, group work, self directed, distance.

Assessment Methods: written, practical and portfolio

Any comments/explanations related to the above items:

6A Full time Equivalent Weeks

	Teaching Wks	+	Wks Break	=	Gross Wks
Year One	34	+	7	=	41
Year Two	34	+	7	=	41
Year Three	34	+	7	=	41
(A) TOTAL TEACHING WEEKS (To be used for calculations in #7 below)	102				

6B Part time Delivery Weeks*(Required if delivered on part time basis ONLY)*

	Teaching Wks	+	Wks Break	=	Gross Wks
Year One		+		=	
Year Two		+		=	
Year Three		+		=	
TOTAL TEACHING WEEKS					

Any comments/explanations related to the above:

7 Programme Hours

	Work Integrated Learning	Notional Learning Hrs: <i>Directed + self-directed + assessment</i>	Credit Value	EFTS Value
Year One	0	1200	120	1.0000
Year Two	120-140	1200	120	1.0000
Year Three	510-540	1200	120	1.0000
(B) Totals	630-680	3600	360	3.0000
TOTAL Hrs/Wks [B ÷ A]	6.18-6.67	35.29		

Estimated teaching hours per week:	15.82 (9.15 to 9.68 + 6.18 to 6.67 WIL)
Estimated self-directed study hours per week:	19.47

Any comments/explanations related to the above:

11.2 Programme Information for Submission to TEC

Ara ID: 6006

Note to TEC: The details below and on the attached pages are submitted for approval of a new or modified programme/s for Student Achievement Component (SAC) and Student Loans/Allowances. All details as specified on the TEC standard form are included, although in a different format for ease of use within Ara as well.

Programme Title:	Bachelor of Information and Communication Technologies
------------------	---

1 Programme Details					
EFTS Based Funding	Yes	Student Allowances	Yes	Student Loans	Yes
Qualification Award Category	20	Primary NZSCED Code	020103	NZQF Level	7
Funding Category	06	Course Classification	B2	ISCED Level	5
Anticipated student intake at entry level			50		
ISCED Subsequent Destination	Designed to lead directly to the labour market.				

2 TEC Approval			<i>To be completed by the Academic Advisor</i>		
New Qualifications		Significant Changes		Minor Changes	
Programme Documentation	<input type="checkbox"/>	Changes in total EFTS Value	<input type="checkbox"/>	Change to title (Programme/Course)	<input type="checkbox"/>
Academic Board Minutes	<input type="checkbox"/>	Change in Credit Value, unless result of unit standard revision	<input type="checkbox"/>	Change to total tuition time, but no change to EFTS	<input type="checkbox"/>
NZQA Approval	<input type="checkbox"/>	Change in # of teaching weeks	<input type="checkbox"/>	Change to course EFTS, but not total EFTS	<input type="checkbox"/>
		Change in delivery site or mode	<input type="checkbox"/>		
		Change to length of qualification	<input type="checkbox"/>		

3 Additional Notes

Manager, Registry (TEC Liaison Officer)

Corporate Services Division
Ara Institute of Canterbury Ltd, PO Box 540, Christchurch 8140
Phone: (03) 940 8306 E-mail: millarlj@ara.ac.nz

Signature:

Appendices

Appendix 1

- 1.1 Graduate Profile Map
- 1.2 Assessment Map

Appendix 2 (Refer Separate Appendix)

- 2.1 Ara Work Integrated Learning Checklist
- 2.2 WIL Industry Projects Handbook
- 2.3 WIL Contracts
- 2.4 Letter to WIL Provider
- 2.5 Project Brief/Proposal Checklist
- 2.6 Student Confidentiality Agreement
- 2.7 Industry Supervisor Halfway Assessment
- 2.8 Academic Supervisor Halfway Assessment

Appendix 3 (Refer Separate Appendix)

- 3.1 Consultation Table
- 3.2 Mapping of Skills
- 3.3 Transition Plan
- 3.4 Skills Framework for the Information Age (SFIA)
- 3.5 Staff Research Outputs
- 3.6 Local Advisory Committee Terms of Reference
- 3.7 External Moderation Plan
- 3.8 External Moderation Reports and Action Plans 2017/2018
- 3.9 Advanced Standing Criteria
- 3.10 CAPL Course List

1.1 Graduate Profile Map – Bachelor of Information and Communication Technologies

Core Courses

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
	Learning Outcome		1	2	3	4	5	6	7	8
BCIS105 IT Practitioner Fundamentals	1	Explain how IT solutions are used across a range of organisational environments and cultural contexts.		✓	✓	✓				✓
	2	Identify and discuss factors that impact on the proficiency of IT practitioners.		✓	✓	✓				
	3	Demonstrate effective written, oral and visual communication for different audiences and purposes.		✓		✓		✓		
BCDE101 Introduction to Programming	1	Analyse and explain requirements and design software.	✓							
	2	Demonstrate ability to code and debug software from designs.	✓			✓		✓		
	3	Apply knowledge of standards and tools to build, test and document systems.	✓			✓				
BCCS153 Computer Systems Architecture	1	Describe the system architecture and organisation of personal and enterprise-level computer systems.	✓							
	2	Configure a system with emphasis on network resources.	✓			✓			✓	
	3	Manage services, processes, memory and storage to meet organisational requirements	✓			✓				

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCCS 199 Operating Systems	1	Discuss key concepts related to operating systems, applications and system architecture.	✓							
	2	Demonstrate the ability to install and manage system software and services.	✓			✓				
	3	Utilise common tools to configure and administer systems.	✓			✓				
BCIS106 Computational methods	1	Analyse sets of data to draw insights.	✓	✓	✓					
	2	Formulate a problem and develop a substantiated approach to arrive at a data-driven solution.	✓	✓	✓			✓		
	3	Apply techniques to tackle moderately complex computational problems.	✓	✓	✓			✓		
BCDE102 Introduction to Software Engineering	1	Demonstrate ability to design a software solution using industry standards.	✓	✓	✓	✓		✓	✓	
	2	Demonstrate skills and knowledge required to code a software solution for a given design.	✓							
	3	Apply knowledge of standards and tools to build moderately complex systems.	✓	✓	✓	✓	✓	✓	✓	
BCDE103 Database Design	1	Demonstrate ability to implement physical database structures using project requirements.	✓							
	2	Apply knowledge of database concepts, data modelling techniques and design principles to produce detailed database designs.	✓	✓	✓	✓		✓		
	3	Demonstrate skills in coding, testing, correcting and documenting moderately complex databases and SQL scripts.	✓	✓		✓				

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCCS191 Introduction to Networks	1	Demonstrate ability to create and document a simple Ethernet network using routers and switches.	✓							
	2	Verify small network operations and analyse data traffic.	✓			✓		✓		
BCIS207 Enterprise Solutions Deployment	1	Compare and contrast IT solution development methodologies.	✓	✓	✓	✓	✓	✓	✓	
	2	Evaluate various methods of IT solutions deployment.	✓	✓		✓		✓	✓	
	3	Select relevant tools, metrics, and plan integrated IT solutions.	✓	✓	✓	✓	✓	✓	✓	✓
BCIS208 IT Service Management	1	Apply IT service management and change management processes and procedures to IT service delivery.	✓	✓		✓	✓	✓	✓	
	2	Apply appropriate tools and techniques to solve IT project management problems.	✓	✓		✓	✓	✓	✓	
	3	Recommend solutions to IT service management scenarios.	✓	✓		✓	✓	✓	✓	
BCIS302 Managing Information and Cybersecurity	1	Apply in-depth knowledge of fundamental access control techniques to ensure data security and privacy on various platforms (including mobile platforms and the cloud).	✓	✓	✓	✓	✓	✓	✓	
	2	Critically analyse problems with existing enterprise platforms to find solutions to ensure secure information.	✓	✓	✓	✓	✓	✓	✓	
	3	Critically evaluate suitability of basic industry frameworks/standards to implement effective information and cybersecurity management.	✓	✓		✓	✓	✓	✓	

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCIS303 Information Technology Governance	1	Critically analyse the needs for information technology governance elements and domains for implementation.	✓	✓	✓	✓	✓	✓	✓	✓
	2	Strategically analyse and evaluate IT systems and solutions within organisations.	✓	✓	✓	✓	✓	✓	✓	✓
	3	Examine and employ information technology governance standards and frameworks within small to medium-sized organisations	✓	✓	✓	✓	✓	✓	✓	
	4	Strategically analyse and evaluate options to develop long-term plans for deployment of technology with small to medium size enterprises.	✓	✓	✓	✓	✓	✓	✓	✓
BCIS309 Work Integrated Education Project	1	Evaluate and apply professional practice in terms of ethics, risk, quality assurance, sustainability, communication, compliance and the Treaty of Waitangi.	✓	✓	✓	✓	✓	✓	✓	✓
	2	Evaluate, synthesise, adapt and utilise knowledge to plan, manage and complete a project.	✓	✓	✓	✓	✓	✓	✓	✓

Compulsory Courses – Information Systems Pathway

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCIS211 Research for Information Solutions	1	Explore the application of quantitative and qualitative research methods used in the business environment.	✓	✓	✓		✓	✓	✓	
	2	Apply the principles and methods (both secondary and primary) of research.	✓	✓	✓		✓	✓	✓	
	3	Identify and develop research aims and objectives.		✓	✓		✓	✓	✓	
	4	Demonstrate skills in constructing research plans.		✓	✓		✓	✓	✓	
BCIS212 Introduction to Enterprise Solutions Architecture	1	Investigate and evaluate enterprise objectives to create an effective solution.	✓	✓	✓	✓	✓	✓	✓	
	2	Apply sourcing techniques to facilitate the selection of a suitable solution.	✓	✓		✓	✓		✓	
	3	Apply process-testing techniques to complex initiatives.	✓	✓			✓		✓	
	4	Interpret expectations of stakeholders and evaluate performance of suppliers involved in IT initiatives of moderate complexity.	✓	✓	✓		✓	✓	✓	
BCIS213 Introduction to Enterprise Intelligence and Analytics	1	Formulate a data management strategy to support the secure operation of existing and new information and digital services.	✓	✓	✓	✓	✓	✓	✓	
	2	Devise and implement data management processes, including classification, security, retrieval and retention processes.	✓	✓	✓		✓			
	3	Evaluate the integrity of data from multiple sources.	✓	✓	✓		✓	✓	✓	

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCIS312 Enterprise Solutions Architecture	1	Critically evaluate advanced and emerging technologies and systems for enterprise business solutions.	✓	✓	✓	✓	✓	✓	✓	✓
	2	Analyse business process to substantiate need for enterprise solutions for automation and integration of solutions.	✓	✓	✓	✓	✓	✓	✓	
	3	Apply industry specific tools and standards to real-life solution architecture scenarios.	✓	✓	✓	✓	✓	✓	✓	
	4	Develop moderately complex IT solution strategies for various stakeholders.	✓	✓	✓		✓	✓	✓	
BCIS313 Enterprise Intelligence and Analytics	1	Critically analyse real-world enterprise data to make effective decisions.	✓	✓	✓		✓		✓	
	2	Critically analyse basic data warehousing techniques, and evaluate business intelligence capabilities.	✓	✓	✓	✓	✓	✓	✓	
	3	Create advanced data warehousing software solutions to problem solving in real-world scenarios.	✓	✓	✓		✓		✓	

Compulsory Courses – Networking and Infrastructure Pathway

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations
BCCS254 System Infrastructure	1	Analyse a range of options and implement a solution to meet an organisation's data storage requirements.	✓	✓	✓	✓	✓		✓	
	2	Demonstrate the ability to implement messaging and collaboration, and associated infrastructure.	✓			✓	✓		✓	
	3	Demonstrate the skills and knowledge required to implement a server-based virtualisation infrastructure featuring high availability.	✓			✓	✓		✓	
BCCS283 Network Infrastructure	1	Demonstrate knowledge of a range of network services and infrastructure.	✓			✓	✓		✓	
	2	Plan, implement and configure basic cloud services and solutions.	✓			✓	✓		✓	
BCCS292 Routing and Switching Essentials	1	Evaluate switching concepts and enhanced switching technologies.	✓	✓		✓	✓		✓	
	2	Analyse, troubleshoot and configure routers and switches.	✓	✓		✓	✓		✓	
BCCS295 Enterprise Networking, Security,	1	Design, configure, manage and troubleshoot network topologies using a variety of protocols, and describe best practices for protecting networks.	✓	✓		✓	✓		✓	
	2	Perform tasks such as network virtualisation and automation.	✓	✓		✓	✓		✓	

BCS355 Cloud Services										
	1	Evaluate current issues and solutions pertaining to cloud environments.	✓	✓	✓	✓	✓	✓	✓	
	2	Implement and manage a range of commonly-utilised cloud technologies and solutions.	✓	✓	✓	✓	✓	✓	✓	
	3	Connect networks through VPNs and other techniques.	✓	✓	✓	✓	✓	✓	✓	
			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts.	Demonstrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance throughout the deployment and application of technology solutions in realising New Zealand/Aotearoa cultural aspirations

Compulsory Courses – Software Development Pathway

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts and work environments	Integrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance to deployment and application of technology in New Zealand/Aotearoa.
	Learning Outcome		1	2	3	4	5	6	7	8
BCDE211 Best Programming Practices (Web and Mobile Development)	1	Demonstrate skills and knowledge to code to industry standards.	✓			✓	✓	✓	✓	
	2	Demonstrate ability to implement a prototype system.	✓		✓		✓	✓	✓	
	3	Apply knowledge of standards and tools to build complex systems.	✓	✓	✓	✓	✓	✓	✓	
BCDE213 Interactive Media Development	1	Evaluate, select and utilise techniques and tools used in the development of interactive media titles.	✓	✓	✓		✓	✓	✓	
	2	Evaluate and apply the techniques of interactive media development.	✓	✓	✓		✓	✓	✓	
BCDE214 Database Administration	1	Apply knowledge to install and configure/reconfigure databases and perform reverse and forward engineering.	✓	✓	✓		✓	✓	✓	
	2	Apply knowledge to investigate problems, collect performance statistics, and create reports.	✓	✓	✓		✓	✓	✓	

			Apply specialist technical Information Technology (IT) knowledge and skills to provide business solutions	Employ critical, systematic and strategic thinking and analytical skills to evaluate and solve complex business problems in a changing global environment.	Apply ethical dimensions for decision making to uphold social responsibility and sustainable practice	Advise on technology deployment decision making in a range of organisational, professional, social, and multi-cultural contexts	Apply self-directed learning and research to maintain currency and lead future development	Communicate effectively in a professional manner with stakeholders, colleagues, and clients	Work effectively, both independently and across teams, in diverse cultural contexts and work environments	Integrate knowledge of the Treaty of Waitangi/Te Tiriti o Waitangi and its relevance to deployment and application of technology in New Zealand/Aotearoa.
	3	Apply knowledge of query optimisation techniques to improve database performance.	✓	✓	✓		✓	✓	✓	
BCDE215 Web Development	1	Demonstrate technical responsibility for all stages and/or iterations in a website development project.	✓	✓			✓	✓	✓	
	2	Use agreed standards, tools and specifications to build a website and achieve a well-engineered result.	✓	✓	✓	✓	✓	✓	✓	
BCDE311 Software Development Project	1	Analyse and evaluate the needs of a client, and document the specifications using appropriate methods relevant to both New Zealand and global contexts.		✓	✓	✓	✓	✓	✓	✓
	2	Analyse and adopt an appropriate development lifecycle to design and produce iterative prototypes to meet specifications.	✓	✓	✓	✓	✓	✓	✓	
	3	Evaluate, select and apply appropriate technologies and tools to produce and deploy a fully functioning software application to specifications.	✓	✓	✓	✓	✓	✓	✓	✓

1.2 Assessment Map

Purpose:

- to demonstrate the alignment of assessments with learning outcomes
- to demonstrate variety of assessment types
- to make transparent the assessment workload.

Core courses

BCIS105 IT Practitioner Fundamentals				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Explain how IT solutions are used across a range of organisational environments and cultural contexts	Written Assessment 1	Case study analysis of current ICT roles and solutions within organisations.	30%	1, 2
2. Identify and discuss factors that impact on the proficiency of IT practitioners.	Written Assessment 2	Investigate potential solutions to solve business problems given a real scenario.	35%	2, 3
3. Demonstrate effective written, oral and visual communication for different audiences and purposes.	Written Assessment 3	End of semester test of all learning outcomes including both short answer questions and long analytical answers.	35%	1, 2, 3

BCDE101 Introduction to Programming				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse and explain requirements and design software. 2. Demonstrate ability to code and debug software from designs. 3. Apply knowledge of standards and tools to build, test and document systems.	Practical Assessment 1	Requirement modelling - produce a use case statement of requirements for a given problem domain. Produce design level static and dynamic diagrams of the functionality of a problem domain.	25%	1
	Practical Assessment 2	Coding (and some debugging) - Given a design of a partial system. Add functionality to meet requirements of provided unit tests. CRUD programming. (Creation, Retrieval, Updating, Deleting) Open book. Open directory. Timed.	25%	2
	Portfolio	Design, code and test a program. Plan and document the development process. Make sure the software passes automated code quality inspections. Create test data and import real-world data. Portfolio demonstrates how the work products (code and designs) are fit-for-purpose.	50%	3

BCCS153 Computer Systems Architecture				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Describe the system architecture and organisation of personal and enterprise-level computer systems. 2. Configure a system with emphasis on network resources. 3. Manage services, processes, memory and storage to meet organisational requirements.	Practical Assessment 1	Using virtual machines install and configure operating systems, configure services, features, disks, file systems, raid, monitor the event log and manage the registry.	35%	3
	Practical Assessment 2	Using virtual machines, configure network settings such as local IP address, create network shares, access remote services while maintaining security.	35%	2
	Written Assessment	Explain the role of firmware – Bios and UEFI, virtualisation of both hardware and operating systems, security scenarios, CPU's, core and resource management.	30%	1

BCCS199 Operating Systems				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Discuss key concepts related to operating systems, applications and system architecture.	Portfolio	A combination of integrated on-line quizzes and practical project work documented to a professional standard.	40%	1, 2, 3
2. Demonstrate the ability to install and manage system software and services.	Practical Assessment 1	Using virtual servers, implement and configure a range of services in a Linux environment, such as web services and software installation.	30%	2
3. Utilise common tools to configure and administer systems.	Practical Assessment 2	Using virtual servers, implement and configure messaging in a Linux environment as well as monitor, maintain and secure systems and services, both local and network.	30%	3

BCIS106 Computational Methods				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse sets of data to draw insights.	Written Assessment 1	Data Analysis - Analyse data available about a certain scenario and determine patterns that identify potential trends in the scenario that is studied.	30%	1, 3
2. Formulate a problem and develop a substantiated approach to arrive at a data-driven solution.		Solution Analysis - Having established certain patterns and trends, identify problems in trends observed, and develop solutions to address identified problems.	35%	2, 3
3. Apply techniques to tackle moderately complex computational problems.	Written Assessment 3	A test to assess learners' competency using both short computational questions and longer analytical and data presentation questions.	35%	1, 2, 3

BCDE102 Introduction to Software Engineering				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to design a software solution using industry standards. 2. Demonstrate skills and knowledge required to code a software solution for a given design. 3. Apply knowledge of standards and tools to build moderately complex systems.	Practical Assessment 1	Given a requirements statement, for a given problem domain, plan a first iteration solution. The student must demonstrate that their solution is a Minimal Usable SubseT (MUST) of the requirements.	25%	1
	Practical Assessment 2	Coding (and some debugging) - Given a design of a system, create functionality to meet requirements of provided acceptance tests.	25%	2
	Portfolio	Given a requirements statement, for a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must document the standard of engineering of the final product.	50%	3

BCDE103 Database Design				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to implement physical database structures using project requirements. 2. Apply knowledge of database concepts, data modelling techniques and design principles to produce detailed database designs. 3. Demonstrate skills in coding, testing, correcting, and documenting moderately complex databases and SQL scripts.	Practical Assessment 1	Given short requirements statements, use Entity Relationship (ER) diagrams and SQL to define well-engineered solutions, e.g. normalised databases, SQL to create appropriate tables, fields, constraints and keys. The test will be an 'in-tray' exercise with a background story and series of tasks to complete.	25%	1
	Practical Assessment 2	Given a case study, produce a detailed database design. As well as demonstrating that the system meets the requirements, the student must explain how their solution used appropriate modelling techniques and evaluate how well it meets the given design principles.	25%	2
	Portfolio	Given a requirements statement and a partial solution populated with data, the student must plan, implement, test and document a complete solution system. Data queries will be an important part of the requirements statement. The portfolio must explain and evaluate the process by which the system was refined and tested. The portfolio will document the standard of engineering of the final product.	50%	3

BCCS191 Introduction to Networks				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to create and document a simple Ethernet network using routers and switches. 2. Verify small network operations and analyse data traffic.	Portfolio	A combination of integrated on-line quizzes and a practical project documented to a professional standard.	40%	1, 2
	Practical Assessment	Using real equipment, perform, analyse and troubleshoot basic router and switch configurations in Internet Protocol (IP) environments.	30%	1, 2
	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 2

BCIS207 Enterprise Solutions Deployment				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Compare and contrast IT solution development methodologies.	Written assessment 1	Case study analysis	30%	2
2. Evaluate various methods of IT solutions deployment.	Written assessment 2	Case study analysis	30%	1
3. Select relevant tools, metrics, and plan integrated IT solutions.	Written assessment 3	Written test on all learning outcomes	40%	1, 2, 3

BCIS208 IT Service Management				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Apply IT service management and change management processes and procedures to IT service delivery.	Written assessment 1	Case study analysis	35%	1, 2, 3
2. Apply appropriate tools and techniques to solve IT project management problems.	Written assessment 2	Case study analysis	35%	2, 3
3. Recommend solutions to IT service management scenarios.	Written Assessment 3	Final test over all three learning outcomes	30%	1, 2, 3

BCIS302 Managing Information and Cybersecurity				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Apply in-depth knowledge of fundamental access control techniques to ensure data security and privacy on various platforms (including mobile platforms and the cloud).	Written Assessment 1	Case Study - Investigate potential security concerns with a small or medium organisation.	30%	1
2. Critically analyse problems with existing enterprise platforms to find solutions to ensure secure information.	Written Assessment 2	Solution development - Develop a security plan for a selected organisation.	30%	2
3. Critically evaluate suitability of basic industry frameworks/standards to implement effective information and cybersecurity management.	Practical Assessment	Application of security management practices to various scenarios	40%	1, 2, 3

BCIS303 Information Technology Governance				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Critically analyse the needs for information technology governance elements and domains for implementation.	Written assessment 1	Systems analysis project - Conduct analysis and evaluation of IT systems within a real organisation and evaluate possible options for future IT deployment.	30%	2, 4
2. Strategically analyse and evaluate IT systems and solutions within organisations.	Written assessment 2	Implementation project - Implementation of framework and standards in a small or medium-sized organisation.	30%	1, 3
3. Examine and employ information technology governance standards and frameworks within small to medium-sized organisations				
4. Strategically analyse and evaluate options to develop long-term plans for deployment of technology with small to medium size enterprises.	Written assessment 3	Develop solutions and answers to specific scenarios – small case studies.	40%	1, 2, 3, 4

BCIS309 Work Integrated Learning Project				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate and apply professional practice in terms of ethics, risk, quality assurance, sustainability, communication, compliance and the Treaty of Waitangi. 2. Evaluate, synthesise, adapt and utilise knowledge to plan, manage and complete a project..	Written Assessment	Project proposal	10%	1, 2
	Portfolio	Range of course work culminating in a final report and presentation. Includes mid-way report, methodologies essay, professional practice (including sustainability and ethics).	90%	1, 2

Compulsory courses – Information Systems Pathway

BCIS211 Research for Information Solutions				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Explore the application of quantitative and qualitative research methods used in the business environment. 2. Apply the principles and methods (both secondary and primary) of research. 3. Identify and develop research aims and objectives. 4. Demonstrate skills in constructing research plans.	Written Assessment 1	Individual project. Students will undertake a literature search on a specified topic and use the results to either plan and write interview/survey questions, or plan an observation schedule that could be used for primary data collection. (LO1,2,3) Students will collect secondary data (from an online source such as Statistics NZ), undertake basic statistical analysis and present results. (LO1,2)	40%	1, 2, 3
	Written Assessment 2	Students are presented with a series (4-6) of mini case studies. Each briefly describes a hypothetical research project and a series of questions related to each project follows. Questions cover research design, sampling, ethics and privacy law, literature searching, and general aspects of undertaking research. (LO2,3)	20%	2, 3
	Written Assessment 3	Students individually plan a hypothetical (any students concurrently undertaking their internship may use the real project) research project, based on a real local organisation. (LO4) This plan is written up following a template provided to the student, requiring them to write about: <ol style="list-style-type: none"> The organisation and its industry sector. The problem to be researched and research questions (LO3). Proposed methodology, including sampling and data collection methods (LO2). A literature review on the relevant topic.	40%	2, 3, 4

BCIS212 Introduction to Enterprise Solutions Architecture				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Identify, investigate and evaluate enterprise objectives to create an effective solution.	Written Assessment 1	Case study analysis	30%	1, 4
2. Apply sourcing techniques to facilitate the selection of a suitable solution.	Written Assessment 2	Case study analysis and solution architecture design	30%	1, 4
3. Apply process-testing techniques to complex initiatives.	Written Assessment 3	Written test over all learning outcomes	40%	1, 2, 3, 4
4. Interpret expectations of stakeholders and evaluate performance of suppliers involved in IT initiatives of moderate complexity.				

BCIS213 Introduction to Enterprise Intelligence and Analytics				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Formulate a data management strategy to support the secure operation of existing and new information and digital services.	Written Assessment 1	Apply data and intelligence analysis models to assess organisational data and determine how the information can be used in making effective decisions.	30%	1, 2, 3
2. Devise and implement data management processes, including classification, security, retrieval and retention processes.	Written Assessment 2	Assess business intelligence needs within an organisation and develop an enterprise intelligence plan addressing all issues in learning outcomes 2 and 3.	30%	1, 2, 3
3. Evaluate the integrity of data from multiple sources.	Written Assessment 3	End of semester test to cover competencies expected in all three learning outcomes.	40%	1, 2, 3

BCIS312 Enterprise Solutions Architecture				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Critically evaluate advanced and emerging technologies and systems for enterprise business solutions.	Written Assessment 1	Analyse processes within a given organisation and determine the gaps in the application of IT solutions.	30%	1, 2
2. Analyse business process to substantiate need for enterprise solutions for automation and integration of solutions.	Written Assessment 2	Develop a solution architecture scenario using process modelling and other techniques outlined in learning outcome 3.	30%	3, 4
3. Apply industry specific tools and standards to real-life solution architecture scenarios.				
4. Develop moderately complex IT solution strategies for various stakeholders.	Written Assessment 3	Case study analysis and solution implementation test	40%	1, 2, 3, 4

BCIS313 Enterprise Intelligence and Analytics				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Critically analyse real-world enterprise data to make effective decisions.	Written Assessment 1	Determine data mining and data warehousing needs for a given organisation.	30%	1, 2
2. Critically analyse basic data warehousing techniques, and evaluate business intelligence capabilities.	Written Assessment 2	Develop a business intelligence framework and system for a given organisation.	30%	2, 3
3. Create advanced data warehousing software solutions to problem solving in real-world scenarios.	Written Assessment 3	Apply data mining and data warehousing methods to scenarios provided.	40%	1, 2, 3

Compulsory courses – Networking and Infrastructure Pathway

BCCS254 System Infrastructure				
Learning Outcomes	Assessment Type	Assessment Description	Weighting	Outcomes Assessed
1. Analyse a range of options and implement a solution to meet an organisation's data storage requirements.	Practical Assessment	Using virtual servers, implement and configure at least two data storage solutions.	40%	1
2. Demonstrate the ability to implement messaging and collaboration, and associated infrastructure.	Portfolio	Using virtual servers, implement and configure a highly available virtualisation infrastructure as well as messaging and collaboration and its associated infrastructure.	60%	2, 3
3. Demonstrate the skills and knowledge required to implement a server-based virtualisation infrastructure featuring high availability.				

BCCS283 Network Infrastructure				
Learning Outcomes	Assessment Type	Assessment Description	Weighting	Outcomes Assessed
1. Demonstrate knowledge of a range of network services and infrastructure.	Practical Assessment	Using virtual servers, implement and configure network infrastructure, such as Dynamic Host Configuration Protocol (DHCP), routing and remote access.	40%	1
2. Plan, implement and configure basic cloud services and solutions.	Portfolio	Using virtual servers, implement and configure domain name system (DNS), certificate services and a commonly used current type 1 hypervisor (e.g. Microsoft Hyper-V).	60%	1, 2

BCCS292 Routing and Switching Essentials				
Learning Outcomes	Assessment Type	Assessment Description	Weighting	Outcomes Assessed
1. Evaluate switching concepts and enhanced switching technologies.	Portfolio	A combination of integrated on-line quizzes and a practical project documented to a professional standard.	40%	1, 2
2. Analyse, troubleshoot and configure routers and switches.	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 2
	Practical Assessment	Using real equipment, construct a topology consisting of network devices that demonstrates sound understanding of routing, switching, filtering and address translation techniques.	30%	2

BCCS295 Enterprise Networking, Security, and Automation				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Design, configure, manage and troubleshoot network topologies using a variety of protocols, and describe best practices for protecting networks. 2. Perform tasks such as network virtualisation and automation.	Portfolio	A combination of integrated on-line quizzes and a practical project documented to a professional standard.	40%	1, 2
	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 2
	Practical Assessment	Using real equipment, construct a scaled network topology consisting of devices that demonstrates sound understanding of <u>advanced</u> routing and switching techniques.	30%	1, 2

BCCS355 Cloud Services				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate current issues and solutions pertaining to cloud environments. 2. Implement and manage a range of commonly-utilised cloud technologies and solutions. 3. Connect networks through VPNs and other techniques.	Practical Assessment	Implement a new ("green fields") cloud infrastructure on the AWS platform.	40%	2
	Portfolio	Migrate an existing on-premise infrastructure to the cloud	60%	1, 2, 3

Compulsory courses – Software Development Pathway

BCDE211 Best Programming Practices (Web and Mobile Development)				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate skills and knowledge required to code to industry standards. 2. Demonstrate ability to implement a prototype system. 3. Apply knowledge of standards and tools to build complex systems.	Practical Assessment 1	Exercises to ensure that the student can code to basic certification standard* and can use all standard language features. * e.g. Microsoft Exam 70-480 Programming in HTML with JavaScript and CSS3.	25%	1
	Practical Assessment 2	Plan, design, code, and write tests for the first iteration of a solution (a proof of concept) for a specified problem domain. The implementation of the solution will be assessed by peer review.	25%	2
	Portfolio	For a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCDE213 Interactive Media Development				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate, select and utilise techniques and tools used in the development of interactive media titles	Portfolio	Document the evaluation of selected techniques and media standards and create appropriate examples to support the evaluation.	40%	1, 2
2. Evaluate and apply the techniques of interactive media development	Portfolio	Apply selected techniques and tools to produce an IM product together with project documentation to a professional standard.	60%	1, 2

BCDE214 Database Administration				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Apply knowledge to install and configure/reconfigure databases and perform reverse and forward engineering. 2. Apply knowledge to investigate problems, collect performance statistics, and create reports. 3. Apply knowledge of query optimisation techniques to improve database performance.	Practical Assessment 1	Practical test	25%	1
	Practical Assessment 2	Create and analyse a database to address a specific business need.	25%	2
	Portfolio	Given a requirement statement and a partial solution populated with data, the student must plan, implement, test, optimise and document a complete database management solution system.	50%	3

BCDE215 Web Development				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate technical responsibility for all stages and/or iterations in a website development project. 2. Use agreed standards, tools and specifications to build a website and achieve a well-engineered result.	Practical assessment	Create a web page to meet a design brief, following specified development standards.	25%	2
	Portfolio	Plan and carry out the development, installation and documentation of a website to meet stated requirements.	75%	1, 2

BCDE311 Software Development Project				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse and evaluate the needs of a client, and document the specifications using appropriate methods relevant to both New Zealand and global contexts.	Written Assessment 1	Project Specification - Preparing a project brief to solve a problem in a real-world context	25%	1
2. Analyse and adopt an appropriate development lifecycle to design and produce iterative prototypes to meet specifications.	Written Assessment 2	Project Design - Design the application based on project specification	35%	2
3. Evaluate, select and apply appropriate technologies and tools to produce and deploy a fully functioning software application to specifications.	Portfolio	Project implementation - Build and implement the designed application	40%	3

Elective courses

BCCS253 Directory Services				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Implement directory services in a distributed environment.	Practical Assessment	Using virtual servers, implement and configure directory services in a distributed environment, including multiple domain controllers and sites.	40%	1
2. Implement security and management policies.	Portfolio	Using virtual servers, implement and configure security and management policies.	60%	1, 2

BCCS294 Connecting Networks				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate WAN technologies, virtual private networks (VPNs) and tunnelling.	Portfolio	A combination of integrated on-line quizzes and a practical capstone project documented to a professional standard.	40%	1, 2, 3
2. Demonstrate ability to configure serial and broadband connections, tunnelling, and network operations.	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 3
3. Design and develop network architectures.	Practical Assessment	Using real equipment, construct a wide area network topology consisting of devices that demonstrates sound understanding of broadband, tunnelling, and monitoring techniques.	30%	2, 3

BCCS350 Advanced Networking				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate, plan and implement a secure and scalable LAN and WAN network design.	Portfolio	Online Tests - A combination of integrated on-line quizzes and tests covering all aspects of the course work.	40%	1, 2
2. Demonstrate competence and knowledge in implementing IPv4 and IPv6 based route redistribution and path control.	Portfolio	Portfolio - Using physical and virtual network devices design and build production standard networks to include IP routing, redistribution and L2 and L3 traffic segregation using multiple protocols.		
	Practical Assessment	Configure multiple routing protocols with address families to create an integrated network for testing IP connectivity with scripts and show commands to verify routing and path selection.	30%	1, 2
	Written Assessment	Summative assessment on all material covered through the course.	30%	1, 2

BCCS381 Special Topic in Networking and Infrastructure				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse relevant information to prepare a project plan for an approved topic in networking and infrastructure.	Written Assessment	A project plan for the topic selected that includes a literature review based on a range of academic and industry sources.	30%	1
2. Apply theoretical knowledge to implement a range of related technologies.	Portfolio	Practical project work in a single, unified area of networking and infrastructure, involving a range of technologies and tools.	70%	2

BCDE221 Software Engineering				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to code to industry standards.	Practical Assignment 1	Exercises to ensure that the student can code to basic certification standard and can use all standard language features.	25%	1
2. Demonstrate ability to implement a prototype system.		Plan, design, code, and write tests for the first iteration of a solution (a proof of concept) for a specified problem domain. The implementation of the solution will be assessed by peer review.	25%	2
3. Apply knowledge of standards and tools to build complex systems.	Portfolio	For a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCDE222 Best Programming Practices (C# .NET)				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to code to industry standards. 2. Demonstrate ability to implement a prototype system. 3. Apply knowledge of standards and tools to build complex systems.	Practical Assessment 1	Exercises to ensure that the student can code to basic certification standard* and can use all standard language features. * e.g. Microsoft Exam 70-483 0 Programming in C#	25%	1
	Practical Assessment 2	Plan, design, code, and write tests for the first iteration of a solution (a proof of concept) for a specified problem domain. The implementation of the solution will be assessed by peer review.	25%	2
	Portfolio	For a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCDE223 Best Programming Practices (Java)				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to code to industry standards. 2. Demonstrate ability to implement a prototype system. 3. Apply knowledge of standards and tools to build complex systems.	Practical Assessment 1	Exercises to ensure that the student can code to basic certification standard* and can use all standard language features. * e.g. Oracle Java Tutorial Trail: Learning The Java Language	25%	1
	Practical Assessment 2	Plan, design, code, and write tests for the first iteration of a solution (a proof of concept) for a specified problem domain. The implementation of the solution will be assessed by peer review.	25%	2
	Portfolio	For a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCDE224 Best Programming Practices (Server Side Programming - PHP)				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to code to industry standards. 2. Demonstrate ability to implement a prototype system. 3. Apply knowledge of standards and tools to build complex systems.	Practical Assessment 1	Exercises to ensure that the student can code to basic certification standard* and can use all standard language features. * e.g. Zend PHP certification or the coding style, language Highlights, Coding Practices, and Errors and Exception components of 'PHP: The Right Way.'	25%	1
	Practical Assessment 2	Plan, design, code, and write tests for the first iteration of a solution (a proof of concept) for a specified problem domain. The implementation of the solution will be assessed by peer review.	25%	2
	Portfolio	For a given problem domain, plan and produce subsequent iterations that refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCDE321 Advanced Programming				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Demonstrate ability to implement appropriate design patterns. 2. Demonstrate ability to integrate software components and frameworks. 3. Apply knowledge of design patterns to evaluate the effectiveness of software implementation.	Practical Assessment 1	Exercises to ensure that the student can refactor existing code to design patterns in order to solve design problems.	25%	1
	Practical Assessment 2	Plan, design, code, and write tests of the integration of software components and frameworks into a software solution. The implementation of the solution will be assessed by peer review.	25%	2
	Portfolio	For a given problem domain, choose and apply design patterns to refine a solution system. The portfolio must explain and evaluate the process by which the system was refined. The portfolio must demonstrate that the system functionality and performance meets requirements.	50%	3

BCIS206 Professional Practice				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate professional and ethical practice in Information Technology (IT) including security, sustainability, equity, and social and cultural issues. 2. Apply communication, information design, personal, and interpersonal skills, clearly and professionally.	Portfolio	Seminar	20%	1
	Written Assessment	Reflective blog, project plan and project report	40%	1, 2
	Practical Assessment	Present project	40%	1, 2

BCIS321 Special Topic in Information Systems

<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse relevant information to prepare a project plan for an approved topic in information systems.	Written Assessment	A project plan for the topic selected that includes a literature review based on a range of academic and industry sources.	30%	1
2. Apply theoretical knowledge to recommend or implement a range of information solutions.	Portfolio	Project work in a single, unified area of information systems and solutions.	70%	2

BCIT388 Mobile Technology

<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse emerging and current mobile technologies and their role in delivering outcomes of value.	Practical Assessment	Design, develop and test a mobile application	30%	3, 4
2. Demonstrate a feasibility analysis of a proposed solution.	Portfolio	Short paper, poster reporting background research, oral presentation	30%	1, 2
3. Investigate specific design issues pertaining to mobile applications and develop a conceptual framework and architecture for solutions.	Written Assessment	Summative assessment on all material covered through the course.	40%	1, 2, 3, 4
4. Design, develop and test prototype applications for mobile devices.				

DNET601 Wireless Local Area Networks

<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate wireless fundamentals, topologies, technologies, and regulatory bodies, standards and certifications.	Portfolio	A combination of integrated quizzes and a practical project documented to a professional standard.	30%	1, 2
	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 2
2. Apply skills and knowledge to implement, manage and troubleshoot wireless networks.	Practical Assessment	Using real equipment, construct a network topology consisting of devices used in class that demonstrates a sound understanding of wireless principles.	40%	1, 2

DNET602 – Network Security				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Evaluate security threats facing modern network infrastructures in the context of layers in data communications. 2. Secure the management, control and data planes using a variety of technologies, configuration and best practice techniques. 3. Implement and secure switches, routers and dedicated security appliances.	Portfolio	A combination of integrated on-line quizzes and a practical project documented to a professional standard.	40%	1,2,3
	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1,3
	Practical Assessment	Using real equipment, construct a network topology consisting of devices that demonstrates sound understanding of security and best practice techniques.	30%	2,3

DNET603 Unified Communication				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Analyse and discuss the characteristics of a Unified Communications (UC) solution. 2. Discuss and implement and support end user accounts and associated devices, voice messaging, unified instant messaging (IM) and presence.	Portfolio	Case Study: An integrated project requiring candidates to implement a UC solution and document the network to a professional standard.	30%	1, 2
	Written Assessment	Summative assessment on all material covered throughout the course.	30%	1, 2
	Practical Assessment	Using real equipment, construct a UC solution that demonstrates aptitude in skills and techniques learned throughout the course.	40%	2

DSYS601 Systems Deployment				
<i>Learning Outcomes</i>	<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Weighting</i>	<i>Outcomes Assessed</i>
1. Deploy client operating systems and application software 2. Deploy server class operating systems.	Practical Assessment 1	Using virtual machines, deploy client operating systems and application software.	40%	1
	Practical Assessment 2	Using virtual machines, deploy server class operating systems.	60%	2

Refer to Separate Document for

Appendix 2

- 2.1 Ara Work Integrated Learning Checklist
- 2.2 WIL Industry Projects Handbook
- 2.3 WIL Contracts
- 2.4 Letter to WIL Provider
- 2.5 Project Brief/Proposal Checklist
- 2.6 Student Confidentiality Agreement
- 2.7 Industry Supervisor Halfway Assessment
- 2.8 Academic Supervisor Halfway Assessment

Appendix 3

- 3.1 Consultation Table
- 3.2 Mapping of Skills
- 3.3 Transition Plan
- 3.4 Skills Framework for the Information Age (SFIA)
- 3.5 Staff Research Outputs
- 3.6 Local Advisory Committee Terms of Reference
- 3.7 External Moderation Plan
- 3.8 External Moderation Reports and Action Plans 2017/2018
- 3.9 Advanced Standing Criteria
- 3.10 CAPL Course List