MODULE SUMMARY

Module Code	Existing Module Yes/No	Mandatory Module	Stage / Year	Module Title	Web Enabled Code	Owner School	Teaching School	Level	Directed Hours	Self-Directed Hours	Total Student Learning Hours	Wintec Credit Value	EFTS Factor	Principle Programme Code No.	Grade Method Code	Funding Category	Classification	Proposed NZSCED Classification	Enrolment Type	Subject Code	Unit Standard + Version
COMP501	No	Y	1	Information Technology Operations	WS	BI	BI	5	64	86	150	15	0.125	BI1606	GM1	B2	06	020199	DI	COMP	
COMP502	No	Y	1	Fundamentals of Programming and Problem Solving	WS	BI	BI	5	64	86	150	15	0.125	BI1606	GM1	B2	06	020103	DI	COMP	
INFO501	No	Y	1	Professional Practice	WS	BI	BI	5	64	86	150	15	0.125	BI1606	GM1	B2	06	020199	DI	INFO	
INFO502	No	Y	1	Business Systems Analysis and Design	WS	BI	BI	5	64	86	150	15	0.125	BI1606	GM1	B2	06	020305	DI	INFO	
COMP503	No	Y	1	Introduction to Networks	WS	BI	BI	5	64	86	150	15	0.125	BI1607	GM1	B2	06	020113	DI	COMP	
COMP504	No	Y	1	Operating Systems and Systems Support	WS	BI	BI	5	64	86	150	15	0.125	BI1607	GM1	B2	06	020117	DI	COMP	
INFO503	No	Y	1	Database Principles	WS	BI	BI	5	64	86	150	15	0.125	BI1607	GM1	B2	06	020303	DI	INFO	
INFO504	No	Y	1	Technical Support	WS	BI	BI	5	64	86	150	15	0.125	BI1607	GM1	B2	06	020307	DI	INFO	
COMP601	No	Y	2	Object Oriented Programming	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020103	DI	COMP	
INFO601	No	Y	2	Database Modelling and SQL	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
MATH601	No	Y	2	Mathematics for Information Technology	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020105	DI	MATH	

Module Code	Existing Module Yes/No	Mandatory Module	Stage / Year	Module Title	Web Enabled Code	Owner School	Teaching School	Level	Directed Hours	Self-Directed Hours	Total Student Learning Hours	Wintec Credit Value	EFTS Factor	Principle Programme Code No.	Grade Method Code	Funding Category	Classification	Proposed NZSCED Classification	Enrolment Type	Subject Code	Unit Standard + Version
COMP602	No	Y	2	Web Development	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020399	DI	COMP	
INFO602	No	Y	2	Business, Interpersonal Communications and Technical Writing	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020399	DI	INFO	
INFO603	No	N	2	Systems Administration	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020399	DI	INFO	
COMP604	No	N	2	Routing and Switching Essentials	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
COMP605	No	N	2	Data Structures and Algorithms	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020109	DI	COMP	
COMP609	NO	N	2	Application Development	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020109	DI	COMP	
MATH602	No	N	2	Mathematics for Programming	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020105	DI	MATH	
COMP606	No	N	2	Web Programming	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020103	DI	COMP	
INFO604	No	N	2	Database Systems	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
INFO605	No	N	2	Human Computer Interaction	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020199	DI	INFO	
COMP615	No	N	2	Data Centre Infrastructure	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020111	DI	COMP	
INFO701	No	Y	3	Project Management	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020399	DI	INFO	
BIZM701	No	Y	3	Business Essentials for IT Professionals	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020399	DI	BIZM	

Module Code	Existing Module Yes/No	Mandatory Module	Stage / Year	Module Title	Web Enabled Code	Owner School	Teaching School	Level	Directed Hours	Self-Directed Hours	Total Student Learning Hours	Wintec Credit Value	EFTS Factor	Principle Programme Code No.	Grade Method Code	Funding Category	Classification	Proposed NZSCED Classification	Enrolment Type	Subject Code	Unit Standard + Version
COMP701	No	N	3	Advanced Networking	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
COMP702	No	N	3	Scaling Networks	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
COMP703	No	N	3	Network Engineering Project	WS	BI	BI	7	16	134	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
INFO702	No	N	3	Cyber Security	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	029901	DI	INFO	
COMP704	No	N	3	Network Security	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	029901	DI	COMP	
COMP705	No	N	3	Connecting Networks	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
INFO703	No	N	3	Big Data and Analytics	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
COMP706	No	N	3	Game Development	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020103	DI	COMP	
COMP707	No	N	3	Principles of Software Testing	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020399	DI	COMP	
COMP708	No	N	3	Software Engineering Project	WS	BI	BI	7	16	134	150	15	0.125	BI1601	GM1	B2	06	020399	DI	COMP	
COMP709	No	N	3	Mobile Applications Development	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020103	DI	COMP	
INFO704	No	N	3	Data-Warehousing and Business Intelligence	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
COMP710	No	N	3	Web Applications Development	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020103	DI	COMP	
INFO705	No	N	3	Database Architecture Project	WS	BI	BI	7	16	134	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	

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INFO706	No	N	3	Database Front-End Applications	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
INFO707	No	N	3	Cloud Server Databases	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
INFO708	No	N	3	Data Visualisation	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020303	DI	INFO	
INFO710	No	N	3	Industry Placement/Internship	WS	BI	BI	7	15	284	300	30	0.2500	BI1601	GM1	B2	06	020199	DI	INFO	
COMP711	No	N	3	Web Development Project	WS	BI	BI	7	16	134	150	15	0.125	BI1601	GM1	B2	06	020103	DI	INFO	
INFO712	No	N	3	Database Architecture Project	WS	BI	BI	7	16	284	300	30	0.2500	BI1601	GM1	B2	06	020303	DI	INFO	
COMP713	No	N	3	Web Application Project	WS	BI	BI	7	16	284	300	30	0.2500	BI1601	GM1	B2	06	020103	DI	COMP	
COMP714	No	N	3	Network Engineering Project	WS	BI	BI	7	16	284	300	30	0.2500	BI1601	GM1	B2	06	020113	DI	COMP	
COMP715	No	N	3	Software Engineering Project	WS	BI	BI	7	16	284	300	30	0.2500	BI1601	GM1	B2	06	020399	DI	COMP	
COMP716	N	N	3	Virtualisation Essentials	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020113	DI	COMP	
COMP717	N	N	3	Advanced Web Technologies	WS	BI	BI	7	48	102	150	15	0.125	BI1601	GM1	B2	06	020199	DI	COMP	
DFNZ701				Design Factory 1	WE	BM	BM	7	300	0	300	30	0.2500	BM1801	GM3	J2	04	089999	DI	MGMT	
COMP616	N	Y	2	Front-End Web Development	WS	BI	BI	6	64	86	150	15	0.125	BI1601	GM1	B2	06	020399	DI	COMP	

2.6 MODULE DESCRIPTORS

BIZM701 – Business Essentials for IT Professionals

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO602: Business, Interpersonal Communications and Technical Writing
Co-Requisites:	None

Aim:

To enable students to develop an understanding of the common principles of business practice whilst focussing on the theoretical and practical concepts of accounting, economics, marketing and management in order to understand the business context within which Information Technology solutions are developed.

Learning Outcomes:

1.	Analyse the principal elements of management in a business environment focussing on the contexts within which IT plays a part
2.	Analyse the principal elements of marketing in a business environment focussing on the contexts within which IT plays a part
3.	Analyse the principal elements of economics in a business environment focussing on the contexts within which IT plays a part
4.	Analyse the principal elements of accounting in a business environment focussing on the contexts within which IT plays a part

Content:

Management and the IT industry

- Understanding the management tasks (or functions)
- Management theories
- Aspects of organisational behaviour in the contemporary workplace
- Activities in the design, production and improvement of services and goods
- Organisational issues – culture, design, influences
- Introduction to the operations function
- Human resource development
- The management of culturally diverse teams in a global environment

Marketing and the IT industry

- The marketing function
- The purpose of marketing management and marketing plans

- Market segmentation and research
- Consumer behaviour
- Marketing tools used in different business situations
- Issues in e-marketing

Economics and the IT industry

- What economics is all about
- Basic economic problems
- Economic theory and methodology
- Demand, supply and price determination
- Economic models to examine current economic issues
- Policy options and issues related to government interventions
- International trade

Accounting and the IT industry

- The practice of accountancy in business
- The role and purpose of accounting elements and financial statements
- The financial statements of a business

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Evidence Portfolio	100%	1, 2, 3, 4.

Criteria to Pass this Module:

Students must achieve a minimum 40% average over all supervised tests. Additionally, students must achieve 50% overall for the module, in order to receive a passing grade.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP501 – Information Technology Operations

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To introduce the student to computer hardware and software, as well as operating systems, networking concepts, mobile devices, IT security, and troubleshooting

Learning Outcomes:

1.	Configure Windows operating system on a PC
2.	Explain computer operating systems, configuration, security and software
3.	Dissassemble and reassemble a PC to working order with an operating system and network services
4.	Explain computer hardware, virtualisation, cloud computing and troubleshooting

Content:

Note:

The content incorporates the Cisco IT Essentials curriculum and is intended to prepare students for the CompTIA A+ Certification exams.

- Hardware
  - Identifying, using and connecting hardware components and devices
  - Configure BIOS
  - Components of PCs, laptops, mobile devices and peripherals
  - Troublehsoot hardware errors
- Windows operating system
  - Install and configure Windows on a PC including disk management, file systems, users, security, firewall, backup and recovery, scheduled tasks, remote access, CLI, configure printing and installing 3rd party software
- Networking
  - Explain types of networks and connections
  - Configure networking and troublehsoot network errors
- Mobile devices and other operating systems
  - Install and configure other operating systems
  - Understand mobile, Mac and Linux operating systems
- Software troubleshooting
  - Troublshoot PC and mobile device issues including application security support
- Security

    - Identify and protect against security vulnerabilities for devices and their network connections
- Operational procedures
    - Follow best practices for safety, environmental impacts, and communication and professionalism
    - Explain IT Industry professional best practice
- Virtualisation and cloud computing
    - Explain virtualisation and cloud computing

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Portfolio	Theory and Practical	100%	1, 2, 3, 4

Criteria to Pass this Module:

In order to receive a passing grade, students much achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Learning Management System

Computer Network Laboratory

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP502 – Fundamentals of Programming and Problem Solving

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	None
Co-Requisites:	None

Aim:

To enable students to apply the principles of software development to create simple working applications and use problem-solving and decision-making techniques to provide innovative and timely Information Technology outcomes.

Learning Outcomes:

1.	Apply programming concepts and tools
2.	Differentiate between procedural and object oriented programming
3.	Apply the Principles of Implementation to the development of simple applications
4.	Use problem-solving and decision making techniques which include logic and mathematical concepts, problem solving methods, critical thinking, abstract reasoning, and systems.

Content:

- Introduction to programming and programming development environment
- Programming basics
- Object oriented and procedural programming
- Simple input and output commands
- Variables types and operations
- Coding standards and indentation
- Conditions, selections and iterations (loops)
- Methods and parameters
- Modular programming
- Files and I/O
- Arrays
- Simple algorithms and problem solving
- Debugging and Testing
- Graphical User Interface

- Software implementation methods
- Technical documentation

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP503 – Introduction to Networks

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	None
Co-Requisites:	None

Aim:

To enable students to apply a broad operational knowledge of networking, and associated services and technologies to meet typical organisational requirements.

Learning Outcomes:

1.	Apply knowledge of networking, including reference models, addressing, cabling, wireless, protocols, topologies, security, industry networking standards, LAN and WAN devices
2.	Apply knowledge of network services including DNS, ARP, application layer protocols, printing, and authentication.

Content:

- Exploring networks:
  - LAN and WAN topologies
  - The changing network environment
- Network models:
  - The Seven layer OSI model
  - TCP/IP model
- Network protocols and communication includes:
  - Rules of communication
  - Network protocols
- Ethernet technologies:
  - Fast Ethernet, Gigabit Ethernet and Fibre technologies
- Router and Switch networking configuration:
  - Physically cabling a network
  - Basic router and switch command line interface configuration
  - Network troubleshooting tools
- IP Addressing and subnetting:
  - IPv4 and IPv6 network addressing
  - Fixed length subnetting

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Netspace Learning Management System

Computer Network lab with Cisco routers and switches

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP504 – Operating Systems and Systems Support

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to select, install, and configure IT hardware and systems software and use graphical (GUI) and command line interfaces (CLI) to meet organisational requirements.

Learning Outcomes:

1.	Recognise common computer architecture from personal to enterprise
2.	Use graphical (GUI) and command line interfaces (CLI)
3.	Demonstrate an understanding of operating system internals, and the relationship between hardware and operating system
4.	Select, install and configure general purpose and specialist operating systems in current use, both proprietary and open source

Content:

- Networking and connectivity
- Basic hardware and software architecture
- Administration of software installation and configuration
- Graphical user interface and command line interface
- Resources requirements
- Architecture of different type of computers
- Operating systems internals
- Special purpose operating systems
- Proprietary operating systems
- Open source operating systems
- Security and authorised access
- Auditing and logging in operating systems
- Automation and shell scripting

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

MODULE DESCRIPTOR FOR: COMP504

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP601 – Object Oriented Programming

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP502: Fundamentals of Programming and Problem Solving
Co-Requisites:	None

Aim:

To enable students to gain the skills to develop software applications using Object Oriented Programming techniques. Students will enrich their programming and problem solving skills by applying classes, objects, constructors, methods and properties, inheritance and polymorphism to develop programming applications.

Learning Outcomes:

1.	Write and demonstrate programs that solve problems using arrays, input, output, methods, classes, objects, abstract classes, static classes, derived classes and polymorphism
2.	Demonstrate effective use of object oriented concepts
3.	Demonstrate effective use of integrated development environment features

Content:

- Introduction to high level programming languages and programming environment
- Basic input and output operations
- The use of methods and parameters in solving problems
- Coding standards, debugging and testing
- Solving problems using recursion
- Arrays and algorithms
- Design and Implementation of classes and objects
  - Public and private variables
  - Constructors, public and private methods
  - Modular programming
  - Examples of problem solving using classes and objects
- Static classes: examples and its advantages
- Debugging and testing: advanced features of the integrated development environment
- Derived classes and protected variables and methods: examples and problem solving
- Polymorphism and its advantages in software development : examples and problem solving
- Abstract and interface classes
- Using object oriented programming to develop applications
- Object oriented programming and code reuse

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

MODULE DESCRIPTOR FOR: COMP601

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP602 – Web Development

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP502: Fundamentals of Programming and Problem Solving INFO502: Business Systems Analysis and Design
Co-Requisites:	None

Aim:

This module provides an introduction to website design and development, and will enable students to gain the knowledge and skills required to plan, design and develop professional web sites.

Learning Outcomes:

1.	Demonstrate an understanding of the principles, planning, design and application of a website
2.	Examine and apply web development programming languages in the development of a website
3.	Create and apply multimedia solutions in website development
4.	Examine current web practices used in industry and apply this to the development of a website

Content:

- Principles of website planning and design
  - Principles of website planning and design
  - Design concepts
  - Storyboarding principles to web development
  - Principles of user interaction within website development
- Website languages
  - HTML programming language
  - HTML5 and website form development
  - CSS techniques and website development
  - Create web site form interaction using JavaScript
  - Using a CMS tool
- Multimedia concepts to web development
  - Website graphics
  - Website animation using various methods
- Current web practices
  - Mobile development concepts and design
  - Responsive design in website development
  - Other new web practices

MODULE DESCRIPTOR FOR: COMP602

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

MODULE DESCRIPTOR FOR: COMP605

COMP604 – Routing and Switching Essentials

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites: COMP503: Introduction to Networks
Co-Requisites: None

Aim:

To enable students to **apply a broad operational knowledge of networking, and associated services and technologies to meet typical organisational requirements**.

Learning Outcomes:

1.	Demonstrate an understanding of the operation and features of network devices required for setup and maintenance of a local area network.
2.	Configure and troubleshoot switches and routers to support a scalable and secure LAN (Local Area Network) for a small to medium network.
3.	Design, build, troubleshoot, and document a secure network solution using advanced LAN technologies .

Content:

- Switch concepts:
  - Switch operation and security
  - VLANs
  - STP (Spanning Tree Protocol)
  - Ether Channel
- Routing concepts:
  - Types of Routing
  - IPv4 and IPv6 static and default routes
  - Inter-VLAN Routing
  - FHRP (First Hop Redundancy Protocols)
  - DHCPv4 and DHCPv6
- WLAN concepts:
  - WLAN configuration
  - WLAN security

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, guest lectures, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

MODULE DESCRIPTOR FOR: COMP605

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Netspace Learning Management System
Computer network lab with Cisco Routers and Switches

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.
An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP605 – *Data Structures and Algorithms*

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP601: Object Oriented Programming MATH601: Mathematics for Information Technology
Co-Requisites:	None

Aim:

To enable students to apply programming and analytical skills to implement and analyze common data structures for computer programs. Students will cover a wide range of computer programming algorithms.

Learning Outcomes:

1.	Analyse and implement arrays, lists, binary search trees, balanced trees and hash table
2.	Write and analyse common algorithms including sorting and searching
3.	Apply data structures and algorithms to software applications

Content:

- Big O analysis
- Arrays and simple algorithms
- Singly and doubly linked lists
  - Basic operations
  - Advanced functions
- Stack and Queues abstract data types
  - Implementation using arrays
  - Implementation using linked lists
  - Examples of using stack and queues in solving problems
- The use of data structures in modular programming
- Binary search trees
  - Standard operations: create, insert, delete and search operations
  - Useful applications of binary search trees
  - Traversing and advanced functions
- Sorting and searching algorithms e.g. binary search, bubble sort, quick sort or heap sort
- Hash tables
  - Insert, delete and search operations
  - The use and rationale of hash tables in ubiquitous applications
- Examples of exponential algorithms

- Balanced trees (e.g. 2-3 trees, B-trees and AVL trees)

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP606 – Web Programming

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP602: Web Development
Co-Requisites:	None

Aim:

To enable students to gain the in depth knowledge and skills required to be able to write programs in web programming languages that solve various web programming tasks.

Learning Outcomes:

1.	Set up and configure a web programming development environment
2.	Apply tested solutions to relevant web programming tasks using procedural and object oriented approaches
3.	Create and dynamically manipulate mark-up documents written in a variety of mark-up languages
4.	Discuss the typical features of server side and client side web programming languages and apply software libraries in the development of program solutions

Content:

- Server and Client side web programming languages such as (but not limited to):
  - PHP
  - Javascript (Unobtrusive)
- Procedural and Object Oriented Programming Approaches
- Dynamic generation of various content types such as HTML, Graphics,
- Markup languages such as (but not limited to):
  - HTML5
  - CSS3
  - XML
  - XSL
  - XSD
- Setup and configuration of web programming development environment
- Methods and Tools for debugging server side and client side programs
- Dynamic manipulation of web pages using the Document Object Model
- Client Side Libraries such as (but not limited to):
  - JQuery
  - Prototype
  - Dojo
- Server Side Programming Extensions such as (but not limited to):
  - Database functions
  - Cryptographic functions
  - Mail extensions
  - XML extensions

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text: None

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP609 – Application development

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP601; MATH601
Co-Requisites:	None.

Aim:

Students will gain in-depth programming and problem solving skills. They will be able to use a modern development environment and a programming language to implement a working solution. This includes rigorous programming and effective use of built-in data structures and other useful features of the development environment.

Learning Outcomes:

1.	Implement an appropriate graphical user interface
2.	Extract and update data from databases
3.	Effective use of built-in data structures and features of a modern development environment
4.	Implement a working solution

Content:

- Graphical user interface
- Connecting and manipulating databases
- Modular programming techniques
- Quality and maintenance
- Effective use of features of a modern development environment
- Use efficient algorithms and data structures
- Analysis of performance and efficiency
- Trade off analysis: features, quality, cost of development, time of development, maintenance and cost of resources

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.[1]

COMP615 – Data Centre Infrastructure

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	None
Co-Requisites:	None

Aim:

To enable students to apply a broad operational knowledge of data centres and associated technologies to meet typical organisational requirements.

Learning Outcomes:

1.	Describe the infrastructure of a Data Centre and the services it provides to support the common functions of an organisation
22.	Apply knowledge of data centre technologies including hardware and software, to meet typical organisational requirements of a medium sized business
3.	Given an unfamiliar scenario, analyse, design and document a data centre solution for a medium sized business using common solutions

Content:

- Common organisational requirements
  - The common functions of an organisation
  - The data centre services that support the common functions of an organisation
  - Continuity planning for infrastructure services
- Data centre models
  - Local, Cloud, Hybrid
- Cloud systems
  - Compare the features, advantages and disadvantages of common cloud systems
- Data centre infrastructure
  - Hardware
  - Applications
  - Management processes including resource monitoring
- Business application delivery
  - Thin client delivery technology
  - Cloud delivery services
- Designing a data centre model for a business
  - Selecting a model and designing a solution for a small to medium sized business

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes, which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Computer Network lab and data centre applications

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP616 – Front-End Web Development

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	none
Co-Requisites:	none

Aim:

To enable students to understand and apply theories and principles of front-end web development. Learners will investigate applications in front-end web technologies. The core focus will be on the knowledge and skills required to implementing current front-end web technologies and practices.

Learning Outcomes:

1.	Examine and configure web practices used in industry
2.	Create web programming front-end solutions
3.	Examine and apply web testing techniques to a web solution
4.	Investigate and implement a digital marketing solution for a web application

Content:

- Web environment configuration, including (but not limited to):
  - Web configuration setting
  - Local web programming environments
  - Error handling
  - Database administration
  - Back-end tools and concepts
- Front-end web technologies and practices currently used in industry
- Web Languages currently used in industry, including (but not limited to):
  - JavaScript
  - Web programming frameworks
  - CSS frameworks
- Web testing including (but not limited to):
  - Mobile first testing
  - Optimising and performance testing

- Digital marketing including (but not limited to):
    - Search Engine Optimisation (SEO)
    - Web marketing such as social media, blogs and content marketing
    - Social media analytics

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, guest speakers, field trips, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text: None

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP701 – Advanced Networking

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO603: Systems Administration
Co-Requisites:	None

Aim:

To enable students to investigate and configure advanced system administration tools, advanced network virtualisation and wireless networking technologies. Students will also research emerging networking technologies.

Learning Outcomes:

1.	Demonstrate an understanding of Network virtualisation, advanced system and administration and Mobile Wireless Technologies.
2.	Investigate, implement, configure and troubleshoot advanced systems administration and network virtualisation technologies.
3.	Research and critically analyse new networking technologies

Content:

- Advanced systems administration
  - Server imaging and backup
  - Linux networking services
  - Computer Network scripting
  - Server clustering concepts

- Virtualisation concepts
  - Cloud infrastructure platforms
  - Virtual machines
  - Container Networking
  - Mobile IP Virtual Private Networks

- Mobile wireless technologies
  - 2G, 3G and 4G cellular networks
  - Advanced WLAN configurations
  - Bluetooth
  - Global Positioning System (GPS)

- Research new networking technologies
  - Emerging networking technologies

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management System

Computer Lab: Local Area Network with administrator rights

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP702 – Scaling Networks

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: COMP503: Introduction to Networks
COMP604: Routing and Switching Essentials

Co-Requisites: None

Aim:

To enable students to gain an understanding of the architecture, components, security, troubleshooting and operation of large-scale networks.

Learning Outcomes:

1.	Demonstrate an understanding of Wide Area Network technologies and secure network design principles through software-defined networking, virtualisation, and automation concepts which support digitalisation of large networks.
2.	Configure and troubleshoot large scale networks using network management tools including controller-based architecture and application programming interface enabled network automation tools.
3.	Analyse, design, build, troubleshoot and document a network solution using secure network design principles for a large organisation.

Content:

- Single Area OSPFv2
  - Point to point networks
  - Broadcast multiaccess networks
- Network Security Concepts
  - Threats and exploits mitigation
  - ACLs
  - NAT services
  - VPNs and IPsec
- WAN technology and concepts
  - WAN access technologies
  - Quality of Service (QoS) implementation
- Network Management and Design
  - Tools for monitoring of network.
  - Characteristics of scalable network architectures.
  - Network virtualization.
- Network Troubleshooting
  - Troubleshooting enterprise networks

- Network Automation
  - RESTful APIs
- Configuration management tools.

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Netspace Learning Management System

Computer network lab with Cisco Routers and Switches

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP703 – Network Engineering Project

Credit Value:	15	Directed Hours:	16
EFTS Factor:	0.125	Self-Directed Hours:	134
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO603: Systems Administration INFO701: Project Management COMP702: Scaling Networks
Co-Requisites:	COMP701: Advanced Networking

Aim:

To enable students to develop a networking solution from a set of requirements documents. This module is the Network Engineering Capstone Project.

Learning Outcomes:

1.	Investigate and design an inter-network to specific client requirements
2.	Implement, configure and troubleshoot an inter-network to specific client requirements

Content:

- IP addressing design
- Network users and groups
- Network and computer group policy
- File sharing and security
- Intranet websites
- Server virtualisation
- Server configuration
- Dynamic Host Configuration Protocol (DHCP)
- Virtual Private Network (VPN)
- Network Address translation (NAT)
- Firewalls
- Switch configuration
- Network printing
- Virtual LANs
- Project management processes applied to networking projects

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management System

Computer Lab: Local Area Network with administrator rights

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP704 – Network Security

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: COMP604 Routing and Switching Essentials
Co-Requisites: None

Aim:
To enable students to gain core security knowledge and skills needed for installation, troubleshooting, and monitoring of networks to maintain the integrity, confidentiality, and availability of data and devices.

Learning Outcomes:
Students will:

1.	Analyse and demonstrate an in-depth understanding of network security, within the context of data communications, systems, networks, and the associated technologies.
2.	Configure, secure and troubleshoot network technologies and data communications, and justify the implementations.

Content:
Network Security

- Secure networks and devices
- Network operating systems, command line interface (CLI) and graphical user Interface (GUI)
- Firewalls, routers, switches, computers and other relevant technologies
- Authentication, authorisation and accounting (AAA)
- Intrusion prevention systems (IPS)
- Cryptographic systems and securing data communications
- Confidentiality, integrity and authentication
- Virtual private networks
- Threats and mitigation
- Policies and network management
- LAN and WAN security
- Testing

Teaching Learning Methods:
Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-2

Criteria to Pass this Module:
In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:
Cisco Learning Management System

Computer network lab with Cisco routers and switches

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP705 – Connecting Networks

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP702: Scaling Networks
Co-Requisites:	None

Aim:

To enable students to gain an understanding of Wide Area Network (WAN) technologies and network services required by converged applications in a complex network.

Learning Outcomes:

1.	Demonstrate an understanding of WAN technologies, point-to-point connections, branch connections, remote access technologies, access control lists, network security, network monitoring, quality of service, IoT, cloud infrastructure and network troubleshooting techniques
2.	Evaluate and compare different WAN technologies
3.	Configure and troubleshoot point-to-point protocols, VPNS, eBGP, access control lists, SNMP and Cisco Switch Port Analyser

Content:

- WAN technologies
- Point-to-point connections and protocols
- Branch connections
  - Remote Access technologies
  - Virtual Private Networks (VPNs)
  - External Border Gateway Protocol (eBGP)
- Access control lists
- Network security
- Network monitoring
  - Simple Network Management Protocol (SNMP)
- Quality of service
- Network evolution
  - Internet of Things (IoT)
  - Cloud infrastructure
  - Network programming
- Network troubleshooting techniques

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Netspace Learning Management System

Computer network lab with Cisco Routers and Switches

Required Text:

Online Learning material located at www.netacad.com. Students will gain access through enrolment into Cisco Netspace.

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP706 – Game Development

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP601: Object Oriented Programming COMP605: Data Structures and Algorithms MATH602: Mathematics for Programming
Co-Requisites:	None

Aim:

To enable students to understand supporting theories and principles of game design and apply these to the art and science of game design, development and programming.

Learning Outcomes:

1.	Explore the theories and principles as applied to game design, development and programming
2.	Design and develop a game using applied industry practice
3.	Implement a computer game using industry-standard practices
4.	Deploy games for the real-time gaming environment

Content:

- Games design theory e.g. game genres, linear/non-linear, anticipatory/complex systems or gamification
- Theories and principles as applied to game design, development and programming
  - Game design theory such as game genres, linear/non-linear anticipatory/complex systems or gamification
  - Rationalize successful games
  - Game development process
  - Common artificial intelligence programming techniques in gaming such as Game Difficulty Balance/Dynamic, Path Finding, Pathing Trees, Scripted Moves, Collision Detection
  - Existing and emerging developments in gaming
- Designing and developing a game using applied industry practice
  - Character design, storyline, level or world design, heads up display (HUD), cinematic techniques
  - Use appropriate documentation standards as applied to the design process
- Implementing a computer game using industry-standard practices
  - 2D and 3D game implementation
  - Apply game principles and theory
  - Implement AI practices
- Deploying games for the real-time gaming environment
  - Game libraries and game engines to support game implementations

- Testing procedures for game compliancy
- Games implemented on a chosen platform(s) such as PC, platform based, or mobile

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP707 – Principles of Software Testing

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP605: Data Structures and Algorithms
Co-Requisites:	None

Aim:

To enable students to gain comprehensive knowledge of software testing methodologies and software testing tools used in industry and apply fundamental aspects of software testing incorporating system requirements, quality assurance, testing processes, automation, testing types and testing levels. This forms the third part of the Software Engineering Capstone Project.

Learning Outcomes:

1.	Apply software testing methodologies
2.	Discuss, examine and apply testing techniques, testing levels and testing types
3.	Use software testing tools currently used in the IT industry

Content:

- Testing overview
- System requirements and analysis
- Quality assurance
- Testing process, documentation and automation
- Testing methods:
    - Black box
    - Grey box
    - White box
    - Other
- Testing levels:
    - Unit test
    - Smoke test
    - Integration test
    - System test
    - User acceptance test
    - Other
- Testing types:
    - Static and dynamic testing
    - Regression
    - Performance
    - Security

-

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP708 – Software Engineering Project

Credit Value:	15	Directed Hours:	16
EFTS Factor:	0.125	Self-Directed Hours:	134
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP605: Data Structures and Algorithms MATH602: Mathematics for Programming
Co-Requisites:	None

Aim:

To enable students to gain advanced software development skills to be able to provide an in depth analysis of prototyping, performance, correctness, software reusability, scalability, quality and maintenance and versioning. This module is the Software Engineering capstone project.

Learning Outcomes:

1.	Produce a comprehensive design to develop a software solution and to provide comprehensive performance and scalability analysis
2.	Apply prototyping to validate an approach or a design point and to investigate trade off analysis: features, performance, quality and maintenance, version control and the cost of development
3.	Produce appropriate internal and external documentation
4.	Effectively use open source code

Content:

- High level design
- Prototyping and its advantages
- Documentation: external and internal
- Quality and maintenance
- Version control systems
- Selecting efficient algorithms and data structures
- Using and incorporating open source code
- Performance and analysis
- Trade off analysis: features, quality, cost of development, time of development, maintenance and cost of resources

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP709 Mobile Applications Development

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP601: Object Oriented Programming
Co-Requisites:	None

Aim:

To enable students to design, develop and implement mobile applications on a given platform.

Learning Outcomes:

1.	Investigate concepts in mobile applications development
2.	Understand the mobile applications development process and apply it to a given platform
3.	Implement a mobile application using industry-based standards and software for the given platform
4.	Use application language features in the given platform

Content:

- A suggested platform such as Android, iOS, HTC or any leading platform in the current environment
- Concepts in mobile applications development:
  - Design heuristics and user interface designs
  - Design methodologies
  - RAD Tools and Multi-Platform development
  - Existing and emerging developments in mobile devices and mobile applications
- Applying the mobile applications development process to a given platform:
  - Apply a design methodology
  - Design a mobile application
  - Implement a mobile application
  - Test the mobile application for verification
  - Discuss business processes and strategies for marketing and deployment
- Implementing a mobile application using industry based methods and software for the given platform
  - Use GUI components
  - Apply layout structures
  - Include resource files such as but not limited to graphic images, media files or data files
  - Multiple screen implementations or various structural components
  - Serialise preferences or settings
  - Portrait and landscape screen orientations
  - Include platform frameworks such as but not limited to local database, cloud databases or push/pull services

- Application language features
  - Proficiency in the programming language which complies with the chosen platform such as but not limited to Java, XML, XCode, C#, Objective C, .NET or the programming language used in the RAD Tool
  - Standard libraries and features for mobile applications

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Assignment (Practical)	70%	1, 2, 3, 4
Assessment 2	Theory Test	30%	1, 2, 4

Criteria to Pass this Module:

Students must achieve a minimum 40% average over all supervised tests. Additionally, students must achieve 50% overall for the module, in order to receive a passing grade."

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Software for chosen platform

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP710 – Web Application Development

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP602: Web Development COMP606: Web Programming
Co-Requisites:	None

Aim:

To enable students to apply practical knowledge of Model View Controller (MVC) frameworks to plan, design and implement web applications. The core focus will be on architecture design and implementation of a web application that will meet a set of functional requirements and user interface requirements, and address business models.

Learning Outcomes:

1.	Investigate the principles, components and application of the MVC software architecture
2.	Examine and apply MVC software architecture in the development of a web application
3.	Examine current practices used in industry and apply this to Web Applications Development
4.	Examine and develop MVC implementation components in the development of a web application

Content:

- MVC software architecture
  - Operation and responsibility of each MVC Component
  - Implement a design report for a MVC web application
- Web Development Frameworks
  - MVC Models
  - Customising Controllers
  - Customising Views
- MVC implementation components
  - MVC with Bootstrap
  - Integrating JavaScript and MVC
  - Web APIs
  - Emerging web practices
- MVC implementation components
  - Unit tests
  - Web application documentation
  - Security and authentication procedures

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP711 – Web Development Project

Credit Value:	15	Directed Hours:	16
EFTS Factor:	0.125	Self-Directed Hours:	134
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO709 Human Computer Interaction INFO702 Cyber Security INFO708 Data Visualization COMP710 Web Applications Development
Co-Requisites:	None

Aim:

On completion of this course students will be able to build a complete web application following the entire web development process from end to end, using contemporary software development architecture and frameworks. Students will be capable of operating within applicable professional standards and practice, both independently and collaboratively as part of a team

Learning Outcomes:

1.	Investigate a range of current web application frameworks/libraries.
2.	Interact with stakeholders and analyse requirements to determine client needs.
3.	Design, develop, and implement a web application using current tools & techniques.
4.	Test the web application against requirements using a range of testing methods.

Content:

- System development lifecycle.
  - Requirement analysis, design, development, and testing a web application system.
- Agile web development Process.
  - Agile web development components.
  - Benefits of Agile web development.
- Current software development architectures.
  - An overview of current software architecture patterns, e.g., Model View Controller.
- Modern web application frameworks.
  - An overview of current web application frameworks and pre-packaged libraries, e.g., Laravel, Symphony, Zend
- Emerging web application tools & techniques.
  - Including but not limited to Angular JS, AJAX, RESTful APIs
- Web testing & security.
  - Range of methods for web application testing and security

Teaching Learning Methods:

Teaching methods may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities. This course is focused on self-directed learning with assistance from tutor and/or supervisor

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

INFO501 – Professional Practice

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	None
Co-Requisites:	None

Aim:

To enable students to apply professional, legal, and ethical principles and practices in a socially responsible manner as an emerging IT professional, and apply communication, personal and interpersonal skills to enhance effectiveness in an IT role.

Learning Outcomes:

1.	Demonstrate an understanding of and apply professional, sustainable, socially responsible and ethical principles; accessibility and equity principles; and ethical work practice
2.	Demonstrate an understanding of privacy and security responsibilities, relevant legislation, industry codes of practices, and codes of conduct
3.	Explain the application of the Treaty of Waitangi in the context of information technology organisational requirements
4.	Conduct oral and visual presentations, and apply research literacy, referencing, information design skills, report and technical writing skills
5.	Demonstrate personal and interpersonal skills, including self-management, teamwork, customer-service, relationship management, social and multicultural awareness

Content:

- Social and responsible ethical behaviour
- Sustainable practices
- Relevant legislation
- The Treaty of Waitangi
- Characteristics of written communication
- Simple research process
- Effective writing skills
- Fundamentals of research
- Effective presentations
- Customer service and relationship management
- Cultural awareness

- Technical writing
- Utilisation of communication tools
- Time Management

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-5

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO502 – Business Systems Analysis and Design

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	None
Co-Requisites:	None

Aim:

The student will be able to apply the fundamentals of information systems concepts and practice to support and enhance organisational processes and systems; and apply the fundamentals of interaction design concepts and practice to enhance interface design.

Learning Outcomes

1.	Demonstrate an understanding of business concepts including the function and structure of IT organisations and its impact on business
2.	Understand the phases of business system analysis and design and apply them to a business context
3.	Apply basic principles of interaction design and human computer interaction (including accessibility) employing current and emerging technologies for a better User Experience (UX)
4.	Demonstrate an understanding of development methodologies and appreciate their employment in the development of an information system
5.	Introduction to the process of testing and handoff of projects

Content:

(LO1) Demonstrate an understanding of business concepts including the functions, structures and the impact of IT on business

- Discovers the functions and structure of a business
- Discovers how IT impacts business
- Discovers the roles in IT in a business
- Identifies systems types and their use in business

(LO1, LO2) - Demonstrates an understanding of systems or project initiation

- Discovers where system changes and projects come from
- Analyse system scope and feasibility for a project
- Undertake feasibility analysis for a small project
- Understand and read initiation diagrams (e.g. Use Case Diagram, Activity and Flow diagrams)
- Introduction to project planning techniques

(LO2) - Identifies and analyses business requirements

- Identify methods of collecting requirements
- Constructs requirements gathering for a simple project

- Analyses requirements for a simple project
- Produce User Stories for a simple project

(LO2) - Analyse and construct modelling driven software design
- Discover software design modelling techniques for business systems analysis
- Construct and Interpret data modelling diagrams by applying UML
- Analyse and construct modelling for business systems analysis for a simple project

(LO3) - Apply basic principles of interaction design and human computer interaction (including accessibility) employing current and emerging technologies. Apply user experience (Ux) and usability concepts in IT
- Discover the principles of interaction design and human computer interaction (including accessibility) employing on current and emerging technologies.
- List the requirements of good input, output and interface design
- Identify and design effective reports and query screen layouts
- Evaluate interface designs according to predefined design criteria
- Explain and apply input and output control concepts
- Review a website or application for applicability of usability principles
- Produce usability wireframes and stories boards for a simple project
- Conduct simple usability tests

(LO4) Demonstrate an understanding of systems development methodologies
- Examine the characteristics of system architecture
- Discuss the objectives of system design
- Identify system development lifecycles
- Demonstrate Agile scrum to plan project

(LO5) Describes system handover and implementation techniques and constructs user testing
- Discover Implementation techniques including migration, testing and training
- Identify appropriate testing methods for projects
- Discover System transition processes including maintenance and support
- Construct user testing documentation

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-5

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

INFO503 – Database Principles

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to apply a broad operational knowledge of database administration to meet typical organisational data storage and retrieval requirements, and apply conceptual knowledge of cloud services and virtualisation.

Learning Outcomes:

1.	Apply the use of Query languages
2.	Utilise database management system (DBMS) optimisation, security and backups
3.	Apply conceptual knowledge of cloud services and virtualisation.

Content:

- Database management systems (DBMS) and database concepts
  - Purpose of using a database management systems approach to organisational structures and missions
  - Types of database management systems
  - Data integrity, optimisation, security, backups
  - Database schemas, instances and database states
  - Conceptual, external and internal schema levels
  - Relational databases and relational database schemas including
    - Integrity and referential integrity
    - Normalisation including resolving many-to-many and one-to-one relationships
    - Transactions
- Data modelling techniques
  - Entities and attributes
  - Examine relationships between logical data structures
    - Primary keys and foreign keys
    - Mandatory and optional
    - Cardinality
  - Set of logical structures that support the data model
  - Data modelling concepts
  - Create a data model
- Structured Query Language (SQL)
  - Data definition
    - Create database objects (tables and views)
    - Drop database objects
  - Data manipulation

- Insert data
- Update data
- Delete data

– Data integrity constraints
  - Primary key
  - NULL
  - Foreign key
  - Default
– Querying and Reporting
  - Select records from tables
  - Conditional select
  - Simple joins
  - Format output
– Cloud services and virtualisation
  - Cloud service databases
  - Database virtualisation

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO504 – Technical Support

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	5	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to demonstrate an operational knowledge and understanding of IT service management, identify common issues related to IT security, and troubleshoot and resolve a range of common system problems.

Learning Outcomes:

1.	Demonstrate an understanding of the principles of service management frameworks and professional practice.
2.	Follow standard procedures when providing IT services and focus on the delivery of best services to the end user
3.	Identify human behaviour that affects IT security and evaluate mitigation techniques and policies.
4.	Demonstrate knowledge of auditing, logging, authentication, and authorisation
5.	Troubleshoot and resolve a range of common system and user problems using appropriate tools and procedures.

Content:

- Service Management frameworks such as ITIL
- Technical IT knowledge and system tools
- Application types eg standalone, client-server, peer to peer, web service, mobile
- IT Services and User Support Management
- Customer service
- SLA (Service Level Agreements)
- Standard procedures for the provision of IT services
- Best practice of service delivery to end users
- Communication and customer service skills
- Auditing, logging, authentication and authorisation
- Trouble shooting computer problems
- IT Security, threats, mitigation policies and techniques

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-5

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO601 – Database Modelling and SQL

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO503: Database Principles
Co-Requisites:	None

Aim:

To enable students to apply an indepth understanding of database modelling, database design and SQL concepts.

Learning Outcomes:

1.	Apply database design concepts
2.	Apply data modelling techniques
3.	Apply Structured Query Language (SQL) techniques

Content:

- Database modelling and database design concepts:
  - Database design techniques
  - Producing data models
  - Applying data modelling to a given scenario
  - Boolean Algebra
  - Data dictionaries
- Structured Query Language (SQL)
  - Data definition languages (DDL), data manipulation language (DML)
  - Implement integrity constraints including
    - Check constraints
    - Triggers
  - Queries
    - Natural Joins
    - Inner Joins
    - Outer Joins
    - Nested Queries
    - Functions
- Advanced techniques in SQL
  - Explaining procedures, functions and packages for manageability and efficiency
  - PL/SQL or TSQL
  - Programmable logic statements in SQL statements
  - Implement procedures and functions

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, tutorials, computer laboratory work, group activities, face-to-face, online, and assignments.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO602 – Business, Interpersonal Communication and Technical Writing

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to develop an understanding of the principles and processes involved in effective interpersonal communication and technical writing used in managing client relationships.

Learning Outcomes:

1.	Discuss and examine interpersonal communication theory and skills in an information technology environment
2.	Plan, investigate and present information in writing using standard business and technical writing principles appropriate for an information technology environment
3.	Demonstrate effective business presentation skills including planning, researching and teamwork
4.	Analyse and apply communication protocols to effectively manage client relationships

Content:

- Communication process theory
- Effective listening
- Giving and receiving feedback
- Presentation skills
- Team/group work
- Cultural and intercultural communication
- Managing meetings
- Technical writing: range – emails, note-taking, instructional writing, reports, minutes, agendas, personal brief.

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO603 – Systems Administration

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites: none

Co-Requisites: none

Aim:

To enable students to gain the skills and knowledge required to effectively install, configure, troubleshoot and administer a Microsoft Windows Server.

Learning Outcomes:

1.	Demonstrate an understanding of Windows Server versions, Active Directory, account management, resource access, data storage, printing, remote access services, Windows Server security and network services.
2.	Configure the Windows Server environment, Active Directory account management, Resource access, printing, data storage, remote access services and windows server security.
3.	Manage and troubleshoot network services, resource access and system reliability/availability.

Content:

- Window Servers Versions
  - Hardware requirements
  - Features
- Resource access
  - Folder and file security
  - File system
  - Disk quotas
- Printing
  - Network printing operation
  - Print management tools
  - Local and shared printers
  - Print jobs
- Data storage
  - Disk management
  - Fault tolerance
  - Storage spaces
  - Disk backup
- Network Services
  - Dynamic Host Configuration Protocol (DHCP)

  - Domain Name Server (DNS)
  - IIS web server
- Active Directory (AD) and account management
  - AD Containers
  - User account management
  - Security group management
- Windows server security
  - Security features
  - Group policy
  - Security policies
  - AD rights management
  - Drive encryption
  - Windows Firewall
- System reliability and availability
  - Problem solving strategies
  - Boot problems
  - Event Viewer

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Computer network Lab with local administrator rights

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO604 – Database Systems

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO503: Database Principles
Co-Requisites:	INFO601: Database Modelling and SQL

Aim:

To enable students to understand and discuss database systems, concepts, modelling, design and administration, and to apply theoretical and practical administrative tasks in a database administrator's role.

Learning Outcomes:

1.	Analyse database management techniques and database concepts
2.	Apply the fundamentals of basic database administration tasks
3.	Create and administer an operational database application

Content:

- Database management systems and database concepts
  - Hierarchical, Network, Relational, Object-based, Star-Schema, Cube
  - Roles in database systems, such as DA, DBA, DB Architect, or DB Analysts
  - Concurrency control, data integrity, data security, locking and backup
  - Current or emerging database systems such as Dedicated, Client/Server, Distributed, Data Warehouse, or Data Lakes
- Fundamental database administration tasks
  - Installation and configuration
  - Creating, developing and managing storage structures
  - Administering a database
  - User accounts, security, roles, and profiles
  - Backup and recovery
- Administering an operational database application
  - Creating designs to support data entry and data display
  - Creating logical and physical storage structures
  - Implementing the database with an application
  - Producing user documentation to support the operation of an application

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

INFO605 – Human Computer Interaction

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP602: Web Development
Co-Requisites:	None

Aim:

To enable students to understand the supporting theories and principles of user interface design with respect to human computer interaction. They will investigate applications in human computer interaction and apply usability best practices and processes.

Learning Outcomes:

1.	Apply Human Computer Interaction (HCI) theories and principles of design
2.	Design and apply effective interfaces using HCI standards and theories
3.	Develop interactive system prototypes including testing and evaluation
4.	Demonstrate an understanding of and apply emerging technologies

Content:

- HCI theories and principles of design
  - Usability engineering process
  - Principles of interface design and usability
  - Principles of behaviour design and the user experience
  - The design process
- Effective interface design for HCI
  - Formal methodologies for interface design
  - Formal methods of user study and user engagement can include but not limited to User Centred Design, Ethnography, or Qualitative Research
  - Principles of user interaction within interface design
- Interactive system prototype development, testing systems evaluation according to HCI principles
  - Prototyping methods
  - Application of interactive user participation
  - User-based testing
  - Evaluation of user testing and rationalisation of interface design
  - Evaluation of interfaces together with Users
- Emerging technologies
  - Current or recent developments in HCI

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reference list will be supplied by the tutor at commencement of the module which will be updated as required

INFO701 – Project Management

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to understand and apply the theory of project management with particular emphasis on Information Technology projects.

Learning Outcomes:

1.	Critique and analyse different project management methodologies and their components
2.	Analyse common reasons for failures in IT Projects
3.	Apply metrics to analyse project profitability

Content:

Distinguishing features of different project management methodologies

- Project management best practice
- Prominent project failures
- Organisational change management
- Metrics

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1, 2, 3,

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO702 – Cyber-Security

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP504: Operating Systems and Systems Support INFO603: Systems Administration
Co-Requisites:	None

Aim:

To enable students to investigate computer system attacks and vulnerabilities in relation to operating systems (OS), applications, networking and websites, and investigate the security techniques for protecting a computer system from such attacks.

Learning Outcomes:

1.	Investigate OS, application, website and network threats and vulnerabilities
2.	Investigate and implement OS, application, website and network security and testing techniques
3.	Research tools and methods used in the IT industry related to cyber-attacks or cyber-security

Content:

- Application and operating system attacks and security such as (but not limited to):
  - Viruses, Trojans and Worms
  - Cross application scripting
  - Anti-virus applications
- Website attacks and security techniques
  - Web application scanning
  - Web application attacks such as (but not limited to):
    - Cross site scripting
    - Cross site request forgery
    - SQL injections
  - Penetration testing
- Networking threats and security techniques such as (but not limited to):
  - IP and MAC spoofing
  - Password, Encryption and authentication cracking
    - Network scanning (SNAP) and Penetration testing
  - VPNs and Firewalls
  - Authentication systems e.g. Radius / Kerberos / Oauth / etc
  - Tools and methods used for cyber security

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Cisco Learning Management System

Computer network lab with Cisco Routers and Switches

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO703 – Big Data and Analytics

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: COMP605: Data Structures and Algorithms
MATH602: Mathematics for Programming

Co-Requisites: None

Aim:

To enable students to gain the practical knowledge and skills required to store, manage and analyse large amounts of data, using appropriate algorithms.

Learning Outcomes:

1.	Examine application architectures for big data and analytics
2.	Examine and apply data modeling approaches for data mining techniques
3.	Design a solution and extract business value from big data
4.	Demonstrate an understanding of commonly used industry tools

Content:

- Introduction to big data
  - Hardware and software evolution
  - Data knowledge discovery
  - Data mining algorithms
  - Traditional solutions and scalability problems
  - Advantages of big data for business
  - Industry use cases
- Information management
  - Query and parallel processing
  - Distributed computing
  - Distributed storage
- NoSQL databases
- Concurrency , scalability and data processing
- Polyglot persistence conceptual architecture
- Big data warehouse and Enterprise data warehouse
- Data modelling approaches
- Selecting analytical models
- Performance attributes
- Extracting business value from big data
- Data scientist

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO704 – *Data Warehousing and Business Intelligence*

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: INFO601 Database Modelling and SQL

Co-Requisites: None

Aim:

To enable students to examine the main components of data warehousing and apply it to business intelligence applications, enabling them to provide solutions which incorporate extracting data from different sources, storing data in a data warehouse and developing applications for business decision-making.

Learning Outcomes:

1.	Examine and discuss the differences between relational databases and data warehouses concepts
2.	Design and create a data warehouse using the latest technologies to support querying, reporting and analysis tools to support critical business questions
3.	Examine and apply OLAP and multidimensional databases to improve performance
4.	Obtain practical knowledge of Industry based recent tools for data warehouse and business intelligence

Content:

- Introduction to OLTP, Data Warehouse and OLAP
  - The need for data warehouses
  - The need for OLAP
  - Querying and reporting
  - Trade-off: cost of resources and the running time of queries and reporting
- Business requirements for Business Intelligence
  - Goals and strategies
  - Valuation models
  - Analytics
- Data warehouse architectures and processes
  - Retrieving data from various sources
  - Quality of data
  - ETL architecture and processes
  - Dimensional modelling (e.g. Star and snowflakes schemas)
  - Data warehouse challenges
- OLAP architecture
  - Multidimensional OLAP and Relational OLAP

    - Queries and reporting
- Performance and analysis
- Mining data warehouses

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO705 – Database Architecture Project

Credit Value:	15	Directed Hours:	16
EFTS Factor:	0.125	Self-Directed Hours:	134
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO601: Database Modelling and SQL INFO604: Database Systems
Co-Requisites:	None

Aim:

To enable students to further develop their knowledge of Database Architecture by analysing, designing and implementing a database solution. Alternative and new approaches to database systems will be explored and evaluated by using practical-based solutions. This module is the Database Architecture Capstone Project.

Learning Outcomes:

1.	Analyse client operations to design and develop a database solution
2.	Perform database architectural tasks to support the database solution
3.	Provide training and supporting documentation
4.	Troubleshoot and resolve user problems

Content:

- Database architecture role in an organisation
- Analysis of client operations and develop a database solution
  - Database structural requirements
  - Client operations, applications, activities and current systems
  - Architectural plans such as database architecture, data models and data distribution
  - Database solutions development
  - Physical structures and functional capabilities
  - Security, back-up and recovery specifications
  - Logical structures (database models) and supporting application functions
  - Front-end application interfaces
- Database architectural tasks
  - Installing and configuring database systems
  - Installing client software
  - Creating physical structures with scripts
  - Creating users, schemas and privileges to implement security
  - Implementing front-end applications or interfaces
  - Monitoring and optimising performance
  - Troubleshooting database application problems
  - Implementing backup and recovery plans
- Training, supporting, documentation and resolving user problems

- Current or emerging developments in databases can include but not limited to data warehousing, data mining, big data and data lakes, or time series databases

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Dedicated computer laboratory

Database server software and supporting client software

Computer network and internet connection

Wintec Learning Management Systems

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO706 – Database Front-End Applications

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites: INFO601: Database Modelling and SQL
INFO604: Database Systems

Co-Requisites: Nil

Aim:

To enable students to understand and apply front-end applications and their interfaces with supporting databases.

Learning Outcomes:

1.	Discuss, analyse and rationalise the use of front-end applications
2.	Explore and understand different methods for data reporting, retrieval and display
3.	Design front-end applications
4.	Implement front-end applications

Content:

- Front-end applications
  - The importance of data reporting
  - Database architectures
  - Effectiveness of separating database structures from local front-ends
- Methods for reporting, retrieval and display
  - Common applications such as web-based, program-based, cloud-based, mobile-based or application-base
  - Common functionality such as SQL, PL/SQL, TSQL or Programming elements
  - Security, interlaced data, data integrity with interfaces
  - Data filtering and data integrity
  - Dashboards and concepts
  - Visual presentation of data such as graphing, pillars or numeric
- Application front-end design
  - User requirements for the design of a business solution
  - Data entry, data display (visualization) and reporting
  - Dashboard front-ends
- Application front-end implementation
  - Implement front-ends using either of the following applications for web-based, program-based, cloud-based, mobile-based or application based
  - Use of standard libraries, API's, 3rd Party Tools and features for database components and connectivity
  - Use of standard libraries, API's, 3rd Party Tools and features for graphing

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Profile	100%	1, 2, 3, 4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% overall for the module

Specific Teaching and Learning Resources:

Computer lab with access to a server database

Wintec Learning Management Systems

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO707 – Cloud Server Databases

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	INFO601: Database Modelling and SQL INFO604: Database Systems
Co-Requisites:	None

Aim:

To enable students to gain an in-depth knowledge of cloud server database concepts, fundamentals and essentials. They will apply practical skills to install, setup, configure, manage and maintain cloud server databases and deploy cloud database services to support database applications.

Learning Outcomes:

1.	Investigate and analyse cloud characteristics and service levels for database systems
2.	Apply administration tasks to setup and configure a cloud server database
3.	Perform administration tasks to manage cloud server database services to support database application development

Content:

- Cloud characteristics and service levels for database systems
  - Cloud computing concepts
  - Cloud services such as XaaS, DBaaS, SaaS, PaaS and IaaS
  - Investigate service level agreements
  - Investigate database migration to the cloud
  - Rationalize and evaluate reasons for cloud databases to support business operations
  - Current cloud architectures, tools, platforms or technology
- Administration tasks for cloud server databases
  - Analyse and apply best practices
  - Install and configure database server software or middleware software
  - Create and manage storage structures
  - Install and configure 3rd tier software or database tools
  - Backup and recovery
  - Monitor and optimise performance
- Administration tasks to manage cloud database services to support database application development
  - Create physical and logical storage structures
  - Create schemas, users, privileges and implement security
  - Create physical and logical data structures
  - Manage and troubleshoot common problems

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Computer laboratory with administration rights

Networking configuration

Server Software

Wintec Learning Management Systems

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO708 – Data Visualisation

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP606: Web Programming COMP607: Visual Effects and Animation
Co-Requisites:	None

Aim:

To enable students to study and apply visual techniques that transform data into a format efficient for human perception, cognition, and communication, thus allowing for extraction of meaningful information and insight. Students will investigate data visualisation techniques, human visual systems and cognitive perception, and design, construct, and evaluate data visualisations

Learning Outcomes:

1.	Examine human visual systems and cognitive perception to gain a better understanding of their role in data visualisation
2.	Examine and apply data visualisation principles and techniques
3.	Evaluate and select appropriate visualisation techniques for producing a data visualisation for a given context
4.	Construct and evaluate interactive visualisations based on a given context and data set

Content:

- Human perception and cognition
- Data visualisation techniques
  - Visual encoding
  - Spatial representations of data
  - charts, graphs, maps
  - Multivariate data representation
  - Navigation
  - Relationships: Hierarchies and Networks
  - Visualising social patterns
  - Interaction Techniques
- The data visualisation pipeline
  - data analysis
  - data filtering
  - data mapping
  - rendering
- Tools for data visualisation including (but not limited to)
  - D3.js Data Visualisation Library

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text: *An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.*

MATH601 – Mathematics for Information Technology

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites: None

Co-Requisites: None

Aim:

To enable students to gain mathematical skills and acquire in-depth understanding of mathematics as applied to Information Technology.

Learning Outcomes:

1.	Discuss, examine and solve problems in mathematics for computing
2.	Solve mathematical problems using Set Theory, Special Functions, Function and Relations, Propositional and Predicate Logic, Counting Methods and Probability and Statistics

Content:

- Set theory and numbers
  - Basic sets operations
  - Natural, integers, rational and real numbers
  - Venn diagram
- Special functions
  - Absolute, floor and ceiling functions
  - Factorial, exponential and logarithmic functions
  - Polynomial functions
  - Summation and product notation
  - Matrices
- Relations and functions
  - Notations
  - Properties of relations: reflexive, symmetric and transitive
  - Properties of functions
- Logic
  - Propositions and connectives
  - Negation of a proposition
  - Equivalence and truth tables
  - Predicate and quantifiers
- Counting and combinatorics
  - Sum and product rules
  - Inclusion-Exclusion principle
  - Permutations
  - Ordered and unordered selection

- Probability and statistics
  - Introduction to probability
  - The product and the sum rules
  - Conditional probability and independent events
  - Probability distributions: Binomial and finite uniform distributions
  - Cumulative binomial probability tables
  - Statistical distributions: Expectations, variance and standard deviation

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

MATH602 – Mathematics for Programming

Credit Value:	15	Directed Hours:	64
EFTS Factor:	0.125	Self-Directed Hours:	86
Level:	6	Total Student Learning Hours (TSLH):	150

Pre-Requisites: MATH601: Mathematics for Information Technology

Co-Requisites: None

Aim:

To enable students to obtain the mathematical skills to facilitate an in-depth understanding of advanced programming techniques. Students will be able to solve problems in recurrence functions, asymptotic functions, algorithmic puzzles, combinatorics and graph theory and advanced topics in probability and statistics.

Learning Outcomes:

1.	Discuss, examine and apply common recurrence functions and asymptotic functions to analyse common algorithms
2.	Solve algorithmic puzzles with average complexity
3.	Discuss and apply combinatorics, probability and statistics to analyze algorithms and programs
4.	Apply common problems of graph theory used in computer programs

Content:

- Recurrence functions and generating functions
  - Definition and examples.
  - Recurrence functions used in common algorithms.
  - Growth rates and Recursion tree.
- Asymptotic function and big O notation
  - Definition and examples
  - Using Big O notation to analyse common algorithms
  - Growth rates of functions and analysis pf algorithms
- Algorithms and mathematical puzzles
  - *Missing number, Fake coin detection, Max-Min weights, Tower of Hanoi*
  - *Summation formulas*
- Combinatorics
  - Sum and product principles
  - K-elements permutation of a set
  - Counting subsets of a set
- Graph theory.
  - Definitions and representations
  - Depth first search and breadth first search
  - The shortest path problem and Dijkstra's algorithm

  - Minimum spanning tree
  - Trees
- Probability and statistics for advanced programming
- Introduction to NP problems and classic examples

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP713 – Web Application Project

Credit Value:	30	Directed Hours:	16
EFTS Factor:	0.25	Self-Directed Hours:	284
Level:	7	Total Student Learning Hours (TSLH):	300

Pre-Requisites:	COMP606 Web Programming
	COMP710 Web Application Development
Co-Requisites:	None

Aim:

To enable students to further develop their knowledge of Web Applications by analysing, designing and implementing a web solution. This module is the Web Application Capstone Project.

Learning Outcomes:

1.	Evaluate,design and present a web solution specific to requirements
2.	Implement a web solution to requirements

Content:

- Compile a portfolio of evidence of a web application project

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portoflio	100%	1,2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP714 – Network Engineering Project

Credit Value:	30	Directed Hours:	16
EFTS Factor:	0.25	Self-Directed Hours:	284
Level:	7	Total Student Learning Hours (TSLH):	300

Pre-Requisites: COMP701: Advanced Networking
COMP702: Scaling Networks
COMP704: Network Security

Co-Requisites: None

Aim:

To enable students to develop a Computer networking solution from a set of requirements documents. This module is the Network Engineering Capstone Project.

Learning Outcomes:

1.	Evaluate and design a Computer network to specific project requirements
2.	Implement, configure and troubleshoot a Computer-network to specific client requirements

Content:

- Compile a portfolio of evidence of a network engineering project

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1, 2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources

Wintec Learning Management System

Computer Lab: Local Area Network with administrator right

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually

COMP715 – Software Engineering Project

Credit Value:	30	Directed Hours:	16
EFTS Factor:	0.25	Self-Directed Hours:	284
Level:	7	Total Student Learning Hours (TSLH):	300

Pre-Requisites:	COMP707 Principle of software testing
Co-Requisites:	None

Aim:

Students will gain advanced software development skills. They will be able to provide an in depth analysis of prototyping, performance, correctness, software reusability, scalability and quality and maintenance and appropriate documentation. This module is the Software Engineering capstone project.

Learning Outcomes:

1.	Evaluate and design a software application for a specific project requirements
2.	Implement a software application that conforms to project requirements

Content:

- Compile a portfolio of evidence of an software engineering project

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1, 2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required and Suggested Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP716 – Virtualisation Essentials

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP504: Operating Systems and Systems Support INFO603 – Systems Administration
Co-Requisites:	None

Aim:

To enable students to gain an understanding of the architecture, components, and operation of server-based virtualisation infrastructure and meet organisational requirements.

Learning Outcomes:

1.	Demonstrate an understanding of server-based virtualisation infrastructure
2.	Implement, configure and troubleshoot virtualisation infrastructure in a medium size organisation
3.	Analyse, design, implement and troubleshoot a virtual infrastructure plan for a medium size organisation

Content:

- Software-Defined data centre
  - Virtualisation hosts and servers
  - How virtualisation supports business needs
  - Planning infrastructure roll-out
- Virtual machines
  - Clones and templates
  - Snapshots
  - Migration
- Virtual networks and storage
  - Switches
  - iSCI, NFS
  - Virtual disk provisioning
- Resource management and monitoring
  - Resource pools
  - CPU and memory optimisation
  - Alarms
- High availability
  - Fault tolerance
  - Data protection
  - Backup solutions
- Troubleshooting
  - Diagnose and solve problems

- Methodologies

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes, which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face, guest lectures and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-3

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Computer Network lab

Virtualisation software

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

COMP717 – Advanced Web Technologies

Credit Value:	15	Directed Hours:	48
EFTS Factor:	0.125	Self-Directed Hours:	102
Level:	7	Total Student Learning Hours (TSLH):	150

Pre-Requisites:	COMP606: Web Programming
Co-Requisites:	COMP710: Web Application Development

Aim:

To enable students to apply advanced practical knowledge required to create web application solutions that solve various web programming tasks. The core focus will be on implementing current web technologies, advanced web programming and web testing practices.

Learning Outcomes:

5.	Examine advanced web practices used in industry and apply this to Web Application Development
6.	Create advanced web programming solutions
7.	Apply web testing practices to a web development
8.	Investigate and implement advanced web technology in the development of a web application

Content:

- Advanced web practices currently used in the industry
  - Web testing
  - Web development processes
- Advanced web technologies such as (but not limited to):
  - API development
  - Json, Ajax and XML
  - Current web technologies
- Advanced Web Languages such as (but not limited to):
  - .Net, JavaScript, PHP
  - Web Programming Frameworks
  - CSS Frameworks

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, guest speakers, field trips, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1-4

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.

Specific Teaching and Learning Resources:

Wintec Learning Management Systems, Computer Laboratory

Required Text: None

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

INFO710 – Industry Placement/ Internship

Credit Value:	30	Directed Hours:	16
EFTS Factor:	0.25	Self-Directed Hours:	284
Level:	7	Total Student Learning Hours (TSLH):	300

Pre-Requisites: The following is taken into account as selection criteria:

Excellence in academic grades and ethic evaluation

Secure internship position:

- Complete an Expression of Interest
- Produce an online portfolio of evidence supporting internship candidacy
- Create an online CV relevant to internship position supported by a covering letter
- Create a LinkedIn profile supporting application
- Placement Interviews with Industry partner and WINTEC Industry relationship Manager
- Placement contracts
- Initial proposal

Aim:

This module will enable students to demonstrate that they can successfully undertake original work that applies the theoretical and practical knowledge gained in other modules in a workplace environment.

Enable student to gain real world experience and build and Industry portfolio. Making professional contacts to build future industry networks.

Learning Outcomes:

1.	Successfully complete an Industry placement that utilises both technical knowledge and soft skills gained throughout your course of study
2.	Critically reflect, with reference to theoretical principles, on the learning and professional capabilities acquired from working with an organisation.

Content:

- Successfully complete an Industry placement to the satisfaction of both WINTEC and the Industry Partner
- Compile a portfolio of evidence of the industry placement

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Teaching and learning methods will involve regular meetings with an assigned academic supervisor and informal discussions with the Industry Relationship Manager and other internship students, and with staff of the organisation where the internship is based, including a staff member identified as the student's workplace supervisor. Students will normally work in the organisation for the equivalent of 300 hours over 8-10 weeks but this may differ according to the placement.
Help is provided for Completion of online CV's, portfolios and interview preparation.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1, 2

Criteria to Pass this Module:

All components of the portfolio must be completed to pass this module.

Specific Teaching and Learning Resources:

Wintec Learning Management System

Required Text:

There is not required text for this Module. Students should research and source quality material to support their work.

INFO712 – Database Architecture Project

Credit Value:	30	Directed Hours:	16
EFTS Factor:	0.25	Self-Directed Hours:	284
Level:	7	Total Student Learning Hours (TSLH):	300

Pre-Requisites:

INFO707: Cloud Server Databases
INFO704: Data-Warehousing and Business Intelligence
INFO706: Database Front-Data Applications

Co-Requisites: None

Aim:

To enable students to further develop their knowledge of Database Architecture by analysing, designing and implementing a database solution. This module is the Database Architecture Capstone Project.

Learning Outcomes:

5.	Evaluate, design and present a database architectural solution specific to requirements
6.	Implement a database solution to requirements

Content:

- Compile a portfolio of evidence of an applied database project

Teaching Learning Methods:

Teaching methods will involve theoretical and practical classes which may include but not limited to lectures, class discussions, tutorials, case studies, simulations, computer laboratory work, group activities, face-to-face and online activities.

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Assessment 1	Portfolio	100%	1, 2

Criteria to Pass this Module:

In order to receive a passing grade, students must achieve a minimum 40% average over all supervised tests and achieve 50% ***overall*** for the module.Click here to enter text.

Specific Teaching and Learning Resources:

Dedicated computer laboratory

Database server software and supporting client software

Computer network and internet connection

Wintec Learning Management Systems

Required Text:

An extended reading list will be supplied by the tutor at commencement of the module. This will be updated annually.

DFNZ701 Design Factory 1

Module Name: Design Factory 1

Module Code:	DFNZ701	**Credit Value:**	30
Level:	7	**EFTS Factor:**	0.25

Pre-requisites:	90 credits at Level 6
Co-requisites:	Nil

Mode of Delivery:	Face-to face, Online (Web supported)
Teaching Learning Methods:	Blended – including facilitation, coaching, interviewing and observation, interdisciplinary teamwork, co-creation workshops, independent study, prototyping activities, user testing, storytelling and presentations
Learning Hours:	300

Aim:

This module aims to develop students who can use problem solving skills and human centred design to solve real world problems. It aims to cultivate inquiring, self-aware practitioners who can apply problem solving to a variety of situations and develop the necessary future focused skills that will prepare them for professional contexts

Students will experience facilitated learning in interdisciplinary teams in a dedicated holistic learning space. Working in interdisciplinary teams, students will co-create a solution with an Industry Partner and solve a complex real world problem.

Students will be selected for this module by an interview process that looks at the student's suitability for interdisciplinary study

LEARNING OUTCOMES: Upon successful completion of this module students will be able to:

1.	Co-create to solve industry driven problems in teams made up of diverse disciplines
2.	Apply professional communication strategies and actively engage others in your product, process or idea to communicate ideas successfully
3.	Apply human centred design and apply a broad range of problem solving tools to innovate and solve an industry driven problem
4.	Apply efficacy, can-do approach, self-motivation and accountability in both independent and collective situations
5.	Acquire and apply future-focused employment skills to industry and educational contexts
6.	Use empathy to research, investigate and produce reasoned and critical responses

Content:

Human Centred design

- Human Centred Design Frameworks – empathy and analysis, defining the problem, prototyping, user testing
- Research methodologies in Human Centred design and developing understanding of contexts through empathy
- Social, cultural, historical, global and political contexts for a given problem.
- Storytelling in various contexts
- Innovation
- Business Frameworks
- Group processes and teamwork
- Co-creation with Industry Partners
- Networking and communicating in professional contexts

Assessment Details:

Name	Type	Weighting	Learning Outcome(s) met
Reflection	Written- individual	20	1,2,3,4,5,6
Present	Oral and written presentations - group	30	1,2,3,4,5,6
Artefact	Oral and written presentations in public contexts- group	50	1,,2,3,4,5,6

Criteria to Pass this Module:

Students must complete all components and achieve a minimum grade of 50% to pass this module

Specific Teaching and Learning Resources:

Required Text:

An extended reading and resource list will be supplied by the tutor at commencement of the module. This will be updated annually.