Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Networking and Security (Masters)
Unit ID:	ITECH5102
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(GPSIT1102 and ITECH1102)
ASCED:	020303

Description of the Unit:

In this unit, we will cover the fundamentals of networking through analysis of the Open System Interconnection (OSI) and Internet networking models. Students will learn the role of each model layer and the technologies used to provide end-to-end connectivity between computer systems and the associated networking protocols. The unit will also introduce cloud computing and investigate the role of cybersecurity in securing information systems and the impacts of threats to individual persons and society as well as ethical and legal considerations. The role of personnel and encryption to secure Internet communications will also be studied. The unit also contains a hurdle task which requires students to get involved with their local IT community through attendance and participation in events, such as seminars, workshops, expos, discussion forums etc. The aim is to provide students with a broad understanding of the IT industry, its research foundations and its place in servicing society.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience

Placement Component:

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment.

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory				✔		
Intermediate						
Advanced						

Learning Outcomes:

Knowledge:

K1. Identify and explain the role and function of network connectivity in current computing.

K2. Describe and explain the principles of communication in networks and the fundamental aspects of cloud computing.

K3. Describe the role and functionality of hardware and software entities that contribute to network communications.

K4. Differentiate the protocols and interactions that implement network communications.

K5. Research and justify the critical role of cyber security in securing communication systems in terms of impacts or threats to society and individuals as well as ethical and legal considerations

Skills:

S1. Experiment with a variety of services and tools to configure network settings on various network devices and operating systems.

S2. Interpret security needs of information systems in various organisational contexts

S3. Examine and configure network settings on various network devices and operating systems.

Application of knowledge and skills:

A1. Analyse the networking architecture needs of a business or an organisation.

A2. Apply knowledge of security policies to reduce security threats

A3. Research, plan and implement operational assurance programs from a security perspective.

A4. Analyse cryptographic techniques for data security.

Unit Content:

Introduction to data communications networks, network models and protocol architecture.
IP addresses, subnet masks and the number systems used to describe them
Fundamentals of architectures at the application layer, common Internet based applications.
Transmission media and their characteristics, guided and wireless media, media selection, digital and analog transmission of digital and analog data.
Functions of data link layer, media access control, data link layer addressing, flow and error control mechanisms, data link protocols.
Network layer protocols: Internet Protocol (IP), assigning IP addresses, address resolution, routing protocols, multicasting.
Transport layer protocols: Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) transport layer functions, reliable and unreliable services, ports, linking to the application layer, segmentation, session management.
Introduction to Local Area Networks (LAN), LAN components, Ethernet and Token Ring, LAN design

consideration, Wireless LAN, Wide Area Networks (WAN).
Cloud computing fundamentals, Cloud security models and the advantages and disadvantages of cloud computing.
Security requirments, including confidentiality, integrity and availability.
Security threats to Enterprise Networks.
Common security countermeasures; cryptography and other network security technologies
Using operating system and Industry standard networking and security tools including Virtualization tools and protocol analysers.
IT and related industry activity and research developments in the local community, and around the globe; ACS's CBOK, SFIA and their relationship with the networking industry; Career pathways.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		**Development and acquisition of FEDTASKS in the Unit**	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 1 Interpersonal	Students will demonstrate high-level skills to effectively communicate, interact and work with others both individually and in groups Students will be required to display (in person and/or online) high-level skills in-person and/or online in: • Effective verbal and non-verbal communication via a range of synchronous and asynchronous methods • Active listening for meaning and influencing • High-level empathy for others • Negotiating and demonstrating extended conflict resolution skills • Working respectfully in cross-cultural and diverse teams	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply leadership skills and behaviours Students will be required to display skills in: • Creating, contributing to, and enabling collegial environments • Showing self-awareness and the ability to self-reflect for personal growth • Inspiring and enabling others • Making informed and evidence-based decisions through consultation with others • Displaying initiative and ability to solve problems	Not applicable	Not applicable

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complex and ambiguous environments, using their imagination to create new ideas Students will be required to display skills in: • Reflecting critically on complex problems • Synthesising, evaluating ideas, concepts and information • Proposing alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts through deep inquiry • Proposing creative solutions in problem solving	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work proficiently across a range of tools, platforms and applications to achieve a range of tasks Students will be required to display high-level skills in: • Finding, accessing, collating, evaluating, managing, curating, organising and appropriately and securely sharing complex digital information at a high-level • Receiving and responding to messages in a range of digital media • Using digital tools appropriately to conduct research • Contributing proficiently to digital teams and working groups • Participating in and utilising digital learning opportunities	Not applicable	Not applicable
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to think ethically and sustainably. Students will be required to display skills in: • The responsible conduct of research • Making informed judgments that consider the impact of devising solutions in multiple global economic environmental and societal contexts • Demonstrating commitment to social responsibility as a professional and a citizen • Generating research solutions which are sustainable,ethical, socially responsible and/or sustainable • Extending lifelong, life-wide and life-deep learning to be open to diverse others • Demonstrate extended actions to foster sustainability in their professional and personal life.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S1, S2, S3, A1	Students will utilise their knowledge of networking protocols and security techniques to answer conceptual questions and apply their understanding to practical networking and security problems, supported by research.	Assignments and laboratory tasks	50% - 60%
S1, S2, S3, A1, A2, A3, A4	Practical problems designed to test their understanding of networking concepts and protocols in the lab.	Practical lab work	10% - 20%
K1, K2, K3, K4, K5	Students will provide theoretical answers and work out solutions to a range of networking and security questions.	Tests & examinations	20% - 30%

Adopted Reference Style:

APA ()

Refer to the library website for more information

Fed Cite - referencing tool