Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Course Title:	NETWORKING AND SECURITY
Course ID:	ITECH1102
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(GPSIT1102)
ASCED:	020113

Description of the Course:

In this course, 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 course 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 course 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: Student is not undertaking work experience in industry.

Does Recognition of Prior Learning apply to this course?   No

Placement Component:	No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	**6**	**7**	**8**	**9**	**10**
Introductory			✔			
Intermediate						
Advanced						

Learning Outcomes:

After successfully completing this course, students should be able to:

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.   Explain the protocols and interactions that implement network communications.

K5.   Explain 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.   Use a variety of network 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.   Plan and implement operational assurance programs from a security perspective.

A4.   Analyse cryptographic techniques for data security.

Course Content:

Topics may include:

- 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 course, and all must be directly assessed in each program.*

| FEDTASK attribute and descriptor | Development and acquisition of FEDTASKS in the course | |
	Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, interact and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating 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 professional skills and behaviours in leading others. Students will be required to display skills in: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving	S2, S3, A1	AT1, AT2
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities	S3	AT1
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life.	A3	AT1

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, K4, K5, S1, S2, S3, A1, A2, A3, A4	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.	Assignments and laboratory tasks	50% - 60%
K1, K2, K3, K4, K5, S1, S2, S3, A2	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, A1, A2, A4	Students will provide theoretical answers and work out solutions to a range of networking and security questions.	Final Examination	20% - 30%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a program level. Although courses must undertake MiCS mapping, there is NO expectation that courses will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS program level reporting highlights how each program embraces the principals and practices associated with the Co-Operative Model. Evidence of program alignment with the MiCS, can be captured in the Program Modification Form.

MICS Mapping has been undertaken for this course   No

Date:

Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)