Course Outline (Higher Education)

Institute / School:	Global Professional School
Course Title:	NETWORKING AND SECURITY
Course ID:	GPSIT1102
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	020113

Description of the Course:

This course will introduce 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. The role of personnel and encryption to secure Internet communications will also be studied. This course will incorporate additional learning hours to support the development of students' academic and study skills.

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

Work Experience:

No work experience: Student is not undertaking work experience in industry.

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

K2. Describe and explain the principles of communication in networks.

K3. Explain 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. Describe and explain the role of information security in securing communication systems.

K6. Detail fundamental aspects of cloud computing.

Skills:

S1. Proficiently use a variety of network services and tools.

S2. Interpret security needs of information systems.

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

S4. Develop the appropriate English language and academic skills to successfully study at an undergraduate level

Application of knowledge and skills:

A1. Apply networking architecture knowledge to analyze the networking needs for business.

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.

- Planning and Implementing a Corporate Security Policy.

- 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 industry; Career pathways.

Values:

V1. Appreciate the responsibilities that network administrators have to design, maintain and expand enterprise and backbone communication networks.

V2. Appreciate the privacy issues relating to information systems.

V3. Recognise the importance of research to the development and progress of the IT industry.

V4. Value IT as an underlying transformative technology to all of society in the information and immersive ages.

V5. Appreciate your career possibilities and how they can be achieved.

V6. Appreciate the range of problems faced by industry practitioners and how problem-solving skills learnt may be applied in the industry context.

V7. Appreciate how theory and practice learnt is applied in industry.

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1, K2, S2, S3, A1 and A4	1 and 2
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K5, K6, S2, S3, A1 and A3	1 and 2
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K5, S2, S3 and A4	1 and 2
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K3, K4, S1, S2, S4 & A3	1 and 2
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, K4, K5, K6, S1, S2, S3, S4, 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/laboratory tasks/presentations/quizzes.	30-50%
K1, K2, K3, K4, K5, K6, S1, S2, S3, S4, A1, A2, A3, A4.	Students will provide theoretical answers and work out solutions to a range of questions and problems designed to test their understanding on networking concepts and protocols and security techniques.	Examination/Tests.	50-70%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool