COIT11238 *Networked Infrastructure Foundations*
Term 1 - 2024

Profile information current as at 05/09/2024 02:25 pm

All details in this unit profile for COIT11238 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student).The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

This unit will provide you with the foundation knowledge of computer and network infrastructure that underpins Information and Communication Technologies (ICT) in modern organisations. You will study networking essentials including virtualisation, wireless networks, cloud computing, cyber security, and risk management. By the end of this unit, you will be able to build and manage basic computer networks. You will conduct hands-on practical activities with industrial-grade networking equipment and cyber security tools to enhance the security of built networks.

Details

Career Level: *Undergraduate*
Unit Level: *Level 1*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Anti-requisite: If students have undertaken COIT11233 Information and Communication Technology Foundations, then this unit should not be taken.
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2024

- Brisbane
- Cairns
- Melbourne
- Online
- Rockhampton
- Sydney

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Portfolio**
Weighting: 40%
2. **Online Quiz(zes)**
Weighting: 30%
3. **Written Assessment**
Weighting: 30%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Discipline Lead and Head of Course feedback

Feedback

At the introductory level, the unit should enhance the cybersecurity content to align with ACS accreditation requirements.

Recommendation

Enhance the introduction of cybersecurity with reference standards and practical exercises linking to core networking infrastructure and applications.

Feedback from Student and the teaching team feedback

Feedback

The virtual machines available on the CyberIoT lab computers for on-campus students, intended for lab exercises starting from Week 03, should undergo pretesting to verify their proper functionality.

Recommendation

Pretest the virtual machines and check the provided network devices in the CyberIoT lab prior to Week 03.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Explain the role of hardware and software components in computer networks
2. Recognise the importance of protocols, standards, and layered architectures in building computer networks
3. Explain the selection of network components, topologies, and technologies to meet business requirements
4. Describe challenges and solutions in securing computer networks and infrastructure
5. Interpret the use of forwarding and encapsulation to deliver data securely in computer networks
6. Discuss techniques for managing cyber security, documenting, and troubleshooting computer networks.

The Australian Computer Society (ACS), the professional association for Australia's ICT sector, recognises the Skills Framework for the Information Age (SFIA). SFIA is adopted by organisations, governments, and individuals in many countries and provides a widely used and consistent definition of ICT skills. SFIA is increasingly being used when developing job descriptions and role profiles. ACS members can use the tool MySFIA to build a skills profile.
This unit contributes to the following workplace skills as defined by SFIA 8 (the SFIA code is included):

- Network Support (NTAS)
- IT Infrastructure (ITOP)
- Security Administration (SCAD)
- Systems Installation/Decommissioning (HSIN)
- Problem Management (PBMG)
- Information Security (SCTY).

The National Initiative for Cybersecurity Education (NICE) Framework defines knowledge, skills and tasks needed to perform various cyber security roles. Developed by the National Institute of Standards and Technology (NIST), the NICE Framework is used by organisations to plan their workforce, including recruit into cyber security positions.
This unit helps prepare you for roles such as Systems Security Analyst, Network Operations Specialist and Systems Administrator, contributing to the following knowledge and skills:

- K0001 Knowledge of computer networking concepts and protocols, and network security methodologies.
- K0010 Knowledge of communication methods, principles, and concepts that support the network infrastructure.
- K0011 Knowledge of capabilities and applications of network equipment including routers, switches, bridges, servers, transmission media, and related hardware.
- K0029 Knowledge of organization's Local and Wide Area Network connections.
- K0050 Knowledge of local area and wide area networking principles and concepts including bandwidth management.
- K0053 Knowledge of measures or indicators of system performance and availability.
- K0060 Knowledge of operating systems.

- K0061 Knowledge of how traffic flows across the network (e.g., Transmission Control Protocol [TCP] and Internet Protocol [IP], Open System Interconnection Model [OSI], Information Technology Infrastructure Library, current version [ITIL]).
- K0071 Knowledge of remote access technology concepts.
- K0077 Knowledge of server and client operating systems.
- K0108 Knowledge of concepts, terminology, and operations of a wide range of communications media (computer and telephone networks, satellite, fiber, wireless).
- K0111 Knowledge of network tools (e.g., ping, traceroute, nslookup)
- K0113 Knowledge of different types of network communication (e.g., LAN, WAN, MAN, WLAN, WWAN).
- K0136 Knowledge of the capabilities of different electronic communication systems and methods (e.g., e-mail, VOIP, IM, web forums, Direct Video Broadcasts).
- K0137 Knowledge of the range of existing networks (e.g., PBX, LANs, WANs, WIFI, SCADA).
- K0138 Knowledge of Wi-Fi.
- K0332 Knowledge of network protocols such as TCP/IP, Dynamic Host Configuration, Domain Name System (DNS), and directory services.
- S0033 Skill in diagnosing connectivity problems.
- S0035 Skill in establishing a routing schema.
- S0041 Skill in installing, configuring, and troubleshooting LAN and WAN components such as routers, hubs, and switches.
- S0073 Skill in using virtual machines. (e.g., Microsoft Hyper-V, VMWare vSphere, Citrix XenDesktop/Server, Amazon Elastic Compute Cloud, etc.).
- S0151 Skill in troubleshooting failed system components (i.e., servers)
- S0154 Skill in installing system and component upgrades. (i.e., servers, appliances, network devices).

Alignment of Learning Outcomes, Assessment and Graduate Attributes

| — | N/A Level | ○ | Introductory Level | ○ | Intermediate Level | ● | Graduate Level | ○ | Professional Level | ○ | Advanced Level |

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Online Quiz(zes) - 30%	●	●	●	●	●	
2 - Written Assessment - 30%		●	●			●
3 - Portfolio - 40%	●			●	●	●

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication	○	○	○	○	○	○
2 - Problem Solving	○	○	○	○	○	○
3 - Critical Thinking			○	○	○	
4 - Information Literacy	○		○		○	
5 - Team Work						
6 - Information Technology Competence	○	○	○	○	○	○
7 - Cross Cultural Competence						
8 - Ethical practice						
9 - Social Innovation						
10 - Aboriginal and Torres Strait Islander Cultures						

Textbooks and Resources

Textbooks
COIT11238

Prescribed

Guide to Networking Essentials 8th (2019)
Edition: 8th (2019)
Authors: Greg Tomsho
Cengage
Boston , MA , USA
ISBN: 978-0-3571-1828-3
Binding: Paperback

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Cisco Packet Tracer
- Wireshark network protocol analyser
- draw.io
- A Virtual Machine (VM) in each Cyber-IoT lab computer

Referencing Style

All submissions for this unit must use the referencing style: Harvard (author-date)
For further information, see the Assessment Tasks.

Teaching Contacts

Yufeng Lin Unit Coordinator
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Schedule

Module 1: Fundamentals of Network Communication - 04 Mar 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Computer Network Overview in Week 01	Chapters 1 & 11	

Module 1: Fundamentals of Network Communication - 11 Mar 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Network Communication Models in Week 02	Chapter 1 & 7	

Lab Exercise 1: To Build a Simple Computer Network - 18 Mar 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Physically connect two computers as a network in Week 03	The lab exercise specification will be provided.	

Module 2: Network Infrastructure - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Network Devices and Media in Week 04	Chapters 2 & 4	

Module 2: Network Infrastructure - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Network Topology and Technology in Week 05	Chapter 3	Portfolio: The first draft (10%) is due this Friday.

Mid-Term Break - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic

Lab Exercise 2: To Build a LAN Network - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Use a switch/wireless router to build a LAN network in Week 06	The lab exercise specification will be provided.	Quiz 1 (15%) is due this Friday.

Module 3: Network Service, Protocol and Addressing - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Network Services in Week 07	Chapter 5	

Module 3: Network Service, Protocol and Addressing - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Internet Protocol Addressing in Week 08	Chapter 6	Portfolio: The second draft (10%) is due this Friday.

Lab Exercise 3: To Build an Internetwork - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
To Build an internetwork with two LAN networks in Week 09	The lab exercise specification will be provided.	

Module 4: Cybersecurity and Network Management - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Enhance Network Communication Security in Week 10	Chapter 9	Quiz 2 (15%) is due this Friday.

Module 4: Cybersecurity and Network Management - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Monitor and Manage Network Performance in Week 11	Chapters 12 and 14	

Lab Exercise 4: To Build a Wireless Network - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Build a Wi-Fi network using an Access Point (AP) in Week 12	The lab exercise specification will be provided.	Portfolio: The final submission (20%) is due this Friday.

Review/Exam Week - 03 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
		The written assignment (30%) is due this Friday.
		Assignment Due: Review/Exam Week Friday (7 June 2024) 11:45 pm AEST

Term Specific Information

Required Lab Equipment
In this unit, you will conduct lab exercises with real networking equipment.
On-campus students will use the provided equipment in the ICT computer lab. On-campus students do not need to prepare any special equipment.
Online students (i.e. studying in Distance mode) will need the following recommended equipment:
2 x PCs with Ethernet
1 x Wi-Fi device
1 x Wireless Router
2 x Ethernet cables
This equipment is defined in further detail below. If you do not have the recommended equipment, you are advised to purchase it. If purchasing the equipment is not possible, there are other options. For advice on whether your existing equipment is suitable, which equipment to purchase, or what other options are available, see the Moodle site or contact the Unit Coordinator.
PC with Ethernet: A desktop computer or laptop computer with a wired Ethernet port (also called LAN port or NIC). Alternatively, a low-cost computer such as a Raspberry Pi could be used if it has a wired Ethernet port. If your laptop computer does not have a wired Ethernet port, you can purchase a USB-to-Ethernet adapter.
Wi-Fi device: a laptop or mobile phone (or any other computing device with Wi-Fi, such as a Raspberry Pi 3 or 4).
Ethernet cable: a LAN cable with RJ45 connectors on both ends.
Wireless Router: A network device that supports Wi-Fi, has an in-built Ethernet switch (e.g. 4 ports) and acts as a router. We highly recommend TP-Link wireless routers, with the suggested models given below. A modem router typically provided by your Internet Service Provider for NBN/DSL home Internet is not suitable. A standalone wireless router (that does not have an in-built NBN/DSL modem) is required to be able to complete all lab activities. You are suggested to purchase one of the following, depending on their availability and your budget:
TP-Link Archer C24 (best; available in many online stores and some physical stores for $50 to $60)
TP-Link Archer C20 (in-store option; available in some physical stores, e.g., Officeworks, Bunnings for $60 to $70; suitable if you cannot purchase online)
TP-Link TL-WR841N (cheapest; available in some online stores for $40 to $50)
These wireless routers are suggested because they: have been tested to work with lab activities; are cheap and are often in stock in Australian online or physical stores. Other, more expensive TP-Link wireless routers may also be suitable.

If you are unclear about the equipment requirements or want advice on whether another wireless router is suitable, see the Moodle site or contact the Unit Coordinator.

Assessment Tasks

1 Portfolio

Assessment Type
Portfolio

Task Description
The Portfolio assessment requires students to maintain a diary/journal for the weekly tutorial activities and the lab exercises conducted during the term. (e.g.: screenshots, testing results, reflections etc.). The Portfolio has two drafts as interim submissions and the final submission for all the tutorial/lab activities. The first draft (10%) is due on Friday of Week 5, the second draft (10%) is due on Friday of Week 8, and the final submission (20%) is due on Friday of Week 12.

Assessment Due Date

The first draft is due on Friday of Week 5, the second draft is due on Friday of Week 8, and the final submission is due on Friday of Week 12.

Return Date to Students

The first two drafts and the final submission of Portfolio assessment will be returned through Moodle in two weeks after their due dates. Late submissions with or without extension approvals may be returned after the above dates.

Weighting
40%

Assessment Criteria

The Portfolio will be assessed based on the clarity, relevance, and quality of the regular contributions recorded in a diary/journal for tutorial questions and/or lab exercises each week.

Lab exercises recorded in the Portfolio will be marked as part of this assessment, with 20% weighting in total. (5% in the first draft, 5% in the second draft, and 10% in the final submission).

More details of the assessment criteria will be provided on the unit Moodle website.

Referencing Style

- [Harvard (author-date)](#)

Submission

Online

Submission Instructions

The Portfolio is an individual assessment item.

Learning Outcomes Assessed

- Explain the role of hardware and software components in computer networks
- Describe challenges and solutions in securing computer networks and infrastructure
- Interpret the use of forwarding and encapsulation to deliver data securely in computer networks
- Discuss techniques for managing cyber security, documenting, and troubleshooting computer networks.

2 Online Quizzes

Assessment Type

Online Quiz(zes)

Task Description

This assessment item includes two online quizzes: Quiz 1 and Quiz 2. The quizzes consist of a series of questions (e.g., multiple-choice, short answers). Questions will be drawn from topics in Weeks 1 to 5 (Quiz 1) and Weeks 6 to 9 (Quiz 2). Complete these Moodle online quizzes by the due date. The quizzes automatically close if you have not submitted your attempt at a quiz by the due date/time. The quizzes will be finalised (automatically submitted) at the due date/time. Before the due date. You need to submit each attempt of the quiz to check the results.

You are allowed to attempt the quizzes as many times as you want before the due date. However, your last submission for each quiz will be assessed as the final result.

Please ensure that you record the details of your submission (e.g., the received result, as well as the date and time of your submission by taking a screenshot) in case there are any problems with your submission to the Moodle system. Please note that the questions are selected randomly from a question pool, so you are unlikely to be asked the same questions each time you attempt the quizzes. You will not be able to see your detailed feedback on the results until the quiz has closed. To attempt and submit the quiz your computer must be connected to the Internet, although it is possible to save and resume the quiz at a later point in time.

Extensions are not possible for quizzes because the answers will be released after the due date of the Quiz. If you miss attempting the quizzes, you cannot do them later.

Number of Quizzes

2

Frequency of Quizzes

Other

Assessment Due Date

Quiz 1 (15%) is due on Friday of Week 6; Quiz 2 (15%) is due on Friday of Week 10. Warning: the quizzes close after the due dates, and no further attempts are allowed.

Return Date to Students

Immediately after the quizzes close.

Weighting

30%

Assessment Criteria

The quizzes consist of a set of questions. These questions count towards 30% of the total grade in this unit: 15% for each of Quiz 1 and Quiz 2. Each submitted attempt will be marked.

The quizzes are automatically graded by the system based on the selection of correct or incorrect answers. Detailed results of your submission will be generated after the quiz closes.

Remember- you can **attempt each quiz as many times as you want before the due date**, however, **your last**

successful submission for each quiz will be your final mark of that quiz.

Referencing Style

- [Harvard (author-date)](#)

Submission
Online

Submission Instructions
Quizzes are to be attempted and submitted as individual assessment items.

Learning Outcomes Assessed

- Explain the role of hardware and software components in computer networks
- Recognise the importance of protocols, standards, and layered architectures in building computer networks
- Explain the selection of network components, topologies, and technologies to meet business requirements
- Describe challenges and solutions in securing computer networks and infrastructure
- Interpret the use of forwarding and encapsulation to deliver data securely in computer networks

3 Assignment

Assessment Type
Written Assessment

Task Description
This assignment requires you to design a comprehensive networking solution based on specific case study scenarios. You will need to offer detailed responses that address a series of task-related requirements aligned with the topics covered in this unit.
Note: The late penalties apply. (5% of the total available marks per calendar day late or part thereof). Assignments received 14 days or more after the due date will not be marked and will receive zero marks.
You may apply for extensions but must provide documentary evidence to support your request. See the unit Moodle website for more details.

Assessment Due Date
Review/Exam Week Friday (7 June 2024) 11:45 pm AEST

Your written assignment should be submitted in MS Word doc/docx format. See the unit website for more details.

Return Date to Students

Assessments will be returned through Moodle on the Certification of Grades Day.

Weighting
30%

Assessment Criteria
Marking criteria will be included in the assessment submission template provided for this assessment. Please ensure you read them before attempting the assignment.
You will be assessed on your responses based on the technical details, accuracy, and clarity for the given contexts.

Referencing Style

- [Harvard (author-date)](#)

Submission
Online

Submission Instructions
This assignment must be attempted and submitted individually.

Learning Outcomes Assessed

- Recognise the importance of protocols, standards, and layered architectures in building computer networks
- Explain the selection of network components, topologies, and technologies to meet business requirements
- Discuss techniques for managing cyber security, documenting, and troubleshooting computer networks.

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the **Student Academic Integrity Policy and Procedure**. This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?
A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?
A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?
For academic advice and guidance, the Academic Learning Centre (ALC) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

Be Honest
If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

Seek Help
If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

Produce Original Work
Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem