COIT29226 *Introduction to the Internet of Things*
Term 1 - 2023

All details in this unit profile for COIT29226 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

The Internet of Things (IoT) is a collection of networked sensors that feed information to applications to make smart decisions. In this unit, you will learn the fundamentals of the IoT as well as the opportunities IoT brings to the connected smart world. This unit will develop your understanding of the hardware and software components of IoT systems, including sensors, gateways, and applications, as well as the network protocols used to communicate between devices. You will learn to store and present IoT data using a dashboard, and learn of the challenges associated with the proliferation of IoT, such as standardisation of communication protocols, reliability, and sustainability, and identify how they impact future IoT deployments. Finally, the unit will cover privacy, security and ethical issues raised by the connected smart world of IoT.

Details

Career Level: *Postgraduate*
Unit Level: *Level 9*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Pre-requisite: COIT20245 Introduction to Programming
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 - 2023

* Online

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 Postgraduate 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. **Written Assessment**
Weighting: 20%
2. **Group Work**
Weighting: 30%
3. **Project (applied)**
Weighting: 50%

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 SUTE unit comments.

Feedback
Students found the practical implementation parts of the unit fascinating and engaging.

Recommendation
Maintain the current focus on the practical implementation based activities/assessments in the unit.

Feedback from Unit Coordinator's reflection.

Feedback
The IoT infrastructure used in the unit for the practical parts can only cater for a smaller cohort, and will not be sufficient when enrolments grow.

Recommendation
Consider scaling up the IoT infrastructure used in the unit.

Unit Learning Outcomes

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

1. Evaluate the concepts and the technologies of IoT
2. Analyse IoT devices, sensor types, protocols and standards appropriate in different scenarios
3. Design and develop an IoT network dashboard for presenting live data for social and business solutions
4. Evaluate the ethical and security concerns related to IoT technologies.

The Australian Computer Society (ACS) 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 7 (the SFIA code is included):

- Network Design(NTDS)
- Systems Design (DESN)
- System Integration and Build (SINT)
- Application Support (ASUP)
- Solution architecture (ARCH)
- IT Infrastructure (ITOP)

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**
1 - Written Assessment - 20%	●	●		●

Assessment Tasks	Learning Outcomes			
	1	2	3	4
2 - Group Work - 30%		•	•	•
3 - Project (applied) - 50%	•		•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	○	○	○	○
2 - Communication	○	○		
3 - Cognitive, technical and creative skills	○	○	○	
4 - Research	○			
5 - Self-management				
6 - Ethical and Professional Responsibility			○	○
7 - Leadership				
8 - Aboriginal and Torres Strait Islander Cultures				

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Written Assessment - 20%	○	○		○				
2 - Group Work - 30%	○	○		○			○	
3 - Project (applied) - 50%	○	○	○					

Textbooks and Resources

Textbooks
COIT29226

Supplementary

IoT security- Advances in Authentication
1st edition (2020)
Authors: Madhusanka Liyanage, An Braeken, Pradeep Kumar, Mika Ylianttila
Wiley
ISBN: 9781119527923
Binding: eBook
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Supplementary

The Internet of Things- Foundation for smart cities, eHealth and Ubiquitous computing
1st edition (2018)
Authors: Ricardo Armentana, Robin Singh Bhadoria, Parag Chatterjee, Ganesh Chandra Deka
Taylor and Francis
ISBN: 978-1-4987-8902-8
Binding: eBook
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Supplementary

The Internet of Things- from Data to insight
1st edition (2020)
Authors: John Davies and Carolina Fortuna
Wiley
ISBN: 9781119545262
Binding: eBook

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Node.js and NODE-RED
- Grafana
- InfluxDB

Referencing Style

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

Teaching Contacts

Nahina Islam Unit Coordinator
n.islam@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to IoT- definition, applications, architecture	Multiple resources as mentioned in the lecture slides.	

Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Communication technologies for IoT	Multiple resources as mentioned in the lecture slides.	

Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Energy harvesting IoT (EH-IoT)	Multiple resources as mentioned in the lecture slides.	

Week 4 - 27 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Drone assisted IoT (Drones serving IoT: Mobile data collector)	Multiple resources as mentioned in the lecture slides.	

Week 5 - 03 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Internet of Drones (IoD)	Multiple resources as mentioned in the lecture slides.	**Assignment-1** Due: Week 5 Friday (7 Apr 2023) 11:45 pm AEST

Vacation Week - 10 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 17 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Framework of IoT	Multiple resources as mentioned in the lecture slides.	

Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
IoT gateway and edge computing	Multiple resources as mentioned in the lecture slides.	**Assignment-2** Due: Week 7 Friday (28 Apr 2023) 11:45 pm AEST

Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Edge computing to cloud	Multiple resources as mentioned in the lecture slides.	

Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Convergence of traditional network and IoT	Multiple resources as mentioned in the lecture slides.	

Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Use cases of IoT	Multiple resources as mentioned in the lecture slides.	

Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
IoT security and data privacy	Multiple resources as mentioned in the lecture slides.	

Week 12 - 29 May 2023

Module/Topic	Chapter	Events and Submissions/Topic

Artificial Intelligence (AI) assisted IoT	Multiple resources as mentioned in the lecture slides.	**Assignment-3 (Applied project)** Due: Week 12 Friday (2 June 2023) 11:45 pm AEST
Review/Exam Week - 05 Jun 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Exam Week - 12 Jun 2023		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Term Specific Information

Unit Coordinator: Dr. Nahina Islam
email: n.islam@cqu.edu.au

Assessment Tasks

1 Assignment-1

Assessment Type
Written Assessment

Task Description
In this assignment, you will reflect on your weekly tutorial activities from week 1- 5. Your reflection will specifically focus on the outcome and findings of each tutorial from week 1-5.
Detailed information about this assignment can be accessed from the unit website in Moodle.

Assessment Due Date
Week 5 Friday (7 Apr 2023) 11:45 pm AEST
submit via Moodle link

Return Date to Students
Week 7 Friday (28 Apr 2023)
Online

Weighting
20%

Assessment Criteria
The students will be marked based on their:
1. Knowledge about existing IoT applications and services;
2. Ability to learn and use different IoT platforms;
3. Ability to self reflect on what they have learnt.
More detailed marking criteria can be accessed from Moodle.

Referencing Style

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

Submission
Online

Learning Outcomes Assessed

- Evaluate the concepts and the technologies of IoT
- Analyse IoT devices, sensor types, protocols and standards appropriate in different scenarios
- Evaluate the ethical and security concerns related to IoT technologies.

Graduate Attributes

- Knowledge
- Communication
- Research

2 Assignment-2

Assessment Type
Group Work

Task Description
In this assignment, you will be given a research topic related to the Internet of Things (IoT). You need to find scholarly articles (e.g. published journals, books, conference articles) to report current scientific developments relevant to the topic. The investigation will be in a team environment which requires you to:

1. Find and research multiple scholarly resources to report the scientific developments relevant to the topic;
2. prepare a report according to the given guidelines in the assignment.
3. provide feedback on your peer's work.

Detailed information about this assignment can be accessed from the unit website in Moodle.

Assessment Due Date
Week 7 Friday (28 Apr 2023) 11:45 pm AEST
Submit via Moodle Link

Return Date to Students
Week 9 Friday (12 May 2023)
Online

Weighting
30%

Assessment Criteria
The students are assessed mainly against their:
1. research skills to locate and use quality scholarly articles relevant to their topic;
2. capability to understand and analyse scientific articles in depth;
3. quality and level of detail in the report;
4. effective teamwork skills.
More detailed marking criteria can be accessed from Moodle.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Submission Instructions
One submission per group.

Learning Outcomes Assessed

- Analyse IoT devices, sensor types, protocols and standards appropriate in different scenarios
- Design and develop an IoT network dashboard for presenting live data for social and business solutions
- Evaluate the ethical and security concerns related to IoT technologies.

Graduate Attributes

- Knowledge
- Communication
- Research
- Leadership

3 Assignment-3 (Applied project)

Assessment Type
Project (applied)

Task Description
In this assignment, you will design and develop an IoT application using IoT devices and tools. You also need to write a report to show the process you followed to develop the project. The assessment requires you to:

1. analyse and find an effective application of IoT;
2. design the IoT application based project;
3. develop and deploy the project using given tools;
4. prepare a document to report (as per given instructions in the assignment) your activities using text and multimedia (for example screenshots, videos).

Detailed information about this assignment can be accessed from the unit website in Moodle.

Assessment Due Date
Week 12 Friday (2 June 2023) 11:45 pm AEST
Submit via Moodle Link

Return Date to Students

Online On Certification day

Weighting
50%

Assessment Criteria
The students are assessed based on:
1. their ability to analyse and develop the project idea;
2. feasibility and level of appropriateness of the proposed project (IoT application);
3. completeness of the development and deployment of the solution;
4. quality and level of detail in the report.
More detailed marking criteria can be accessed from Moodle.

Referencing Style

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

Submission
Online

Submission Instructions
submit via Moodle link

Learning Outcomes Assessed

- Evaluate the concepts and the technologies of IoT
- Design and develop an IoT network dashboard for presenting live data for social and business solutions

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills

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