



# COIT29226 *Introduction to the Internet of Things*

## Term 1 - 2024

Profile information current as at 05/09/2024 02:28 pm

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 - 2024

- Brisbane
- Melbourne
- Online
- 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 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 Unit Coordinator's reflection, and feedback from students during class

##### Feedback

Some students struggled to access and visualise the sensor data from NodeRED installed in the lab computers.

##### Recommendation

The newly deployed scalable IoT network needs to be further fine-tuned and Node-RED needs to be updated in the lab computers to ensure better accessibility of sensor data.

## 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



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
<b>1 - Written Assessment - 20%</b>	•	•		•
<b>2 - Group Work - 30%</b>		•	•	•
<b>3 - Project (applied) - 50%</b>	•		•	

## 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

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#### 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](mailto:n.islam@cqu.edu.au)

## Schedule

### Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Introduction to IoT- definition, applications, architecture	Multiple resources as mentioned in the lecture slides.	
<b>Week 2 - 11 Mar 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Communication technologies for IoT	Multiple resources as mentioned in the lecture slides.	
<b>Week 3 - 18 Mar 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Energy harvesting IoT (EH-IoT)	Multiple resources as mentioned in the lecture slides.	
<b>Week 4 - 25 Mar 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Drone assisted IoT (Drones serving IoT: Mobile data collector)	Multiple resources as mentioned in the lecture slides.	
<b>Week 5 - 01 Apr 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Internet of Drones (IoD)	Multiple resources as mentioned in the lecture slides.	<b>Assignment-1 Individual work</b> Due: Week 5 Friday (5 Apr 2024) 11:50 pm AEST
<b>Vacation Week - 08 Apr 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
<b>Week 6 - 15 Apr 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Framework of IoT	Multiple resources as mentioned in the lecture slides.	
<b>Week 7 - 22 Apr 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
IoT gateway and edge computing	Multiple resources as mentioned in the lecture slides.	
<b>Week 8 - 29 Apr 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Edge computing to cloud	Multiple resources as mentioned in the lecture slides.	<b>Assignment-2</b> Due: Week 8 Friday (3 May 2024) 11:50 pm AEST
<b>Week 9 - 06 May 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Convergence of traditional network and IoT	Multiple resources as mentioned in the lecture slides.	
<b>Week 10 - 13 May 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Use cases of IoT	Multiple resources as mentioned in the lecture slides.	
<b>Week 11 - 20 May 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
IoT security and data privacy	Multiple resources as mentioned in the lecture slides.	
<b>Week 12 - 27 May 2024</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>

Artificial Intelligence (AI) assisted IoT

Multiple resources as mentioned in the lecture slides.

**Assignment-3 (Group work)** Due: Week 12 Friday (31 May 2024) 11:45 pm AEST

### Review/Exam Week - 03 Jun 2024

Module/Topic

Chapter

Events and Submissions/Topic

### Exam Week - 10 Jun 2024

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 Individual work

#### Assessment Type

Written Assessment

#### Task Description

In this assignment, you will work individually and reflect on your weekly tutorial activities from weeks 1 to 5. Your reflection will specifically focus on the outcomes and findings of each tutorial during this time frame.

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

#### Assessment Due Date

Week 5 Friday (5 Apr 2024) 11:50 pm AEST

Submit online via Moodle link

#### Return Date to Students

Week 7 Friday (26 Apr 2024)

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

#### Graduate Attributes

- Knowledge
- Communication
- Research

#### 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.

## 2 Assignment-2

### Assessment Type

Group Work

### Task Description

In this assignment, you will receive a research topic related to the Internet of Things (IoT). Your task is to locate scholarly articles such as published journals, books, and conference articles to report on current scientific developments relevant to the given topic. This investigation will be conducted in a team (group) environment, and it will require 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 8 Friday (3 May 2024) 11:50 pm AEST

Submit via Moodle Link

### Return Date to Students

Week 10 Friday (17 May 2024)

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

### Graduate Attributes

- Knowledge
- Communication
- Research
- Leadership

### 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.

## 3 Assignment-3 (Group work)

### Assessment Type

Project (applied)

### Task Description

In this assignment, you will be tasked with designing and developing an Internet of Things (IoT) application utilizing IoT devices and tools. Additionally, you will need to compose a report that outlines the process you followed during the project's development. This is a Group activity. 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).
5. Participate in an oral presentation where you need to demonstrate your understanding and findings about the project. This part of the assignment will be marked individually based on each student's performance during the presentation.

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

**Assessment Due Date**

Week 12 Friday (31 May 2024) 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 Group

**Submission Instructions**

submit via Moodle link

**Graduate Attributes**

- Knowledge
- Communication
- Cognitive, technical and creative skills

**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

## 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