



# COIT20260 *Cloud Computing and Internet of Things for Smarter Applications*

## Term 1 - 2021

Profile information current as at 27/04/2024 06:56 am

All details in this unit profile for COIT20260 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

Emerging technologies, such as cloud computing and the Internet of Things (IoT), enable you to rapidly design, develop and deploy smart applications. In this unit, you are introduced to the software, devices, and techniques supporting these technologies. You will learn the fundamentals of cloud computing as well as various cloud environments and services, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). You will use a Platform as a Service (PaaS) cloud environment, gaining practical experience in designing, developing and deploying smarter cloud-based applications.

### 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 units: COIT20245 Introduction to Programming and COIT20246 ICT Services Management

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 - 2021

- 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 Teacher's reflection

**Feedback**

Given the limited duration and the high weighting of assignment three, it creates excessive pressure to deliver the best outcome.

**Recommendation**

Revise assessment requirements to introduce group activity.

## Unit Learning Outcomes

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

1. Evaluate cloud computing concepts and IoT components for smart applications/systems development
2. Analyse the application of cloud computing and IoT technologies in different scenarios
3. Design and develop cloud based smart applications for business solutions
4. Deploy a smart application using cloud computing and 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)

- Systems design (DESN)
- Systems integration and build (SINT)
- Programming/software development (PROG)
- Testing (TEST)
- Release and deployment (RELM)
- 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
1 - Written Assessment - 20%	•	•		
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

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#### Supplementary

##### **Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS)**

1st Edition (2014)

Authors: Kavis, MJ

Wiley US

Hoboken , NJ , USA

ISBN: 9781118617618

Binding: Paperback

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#### Supplementary

##### **Cloud Computing: Concepts, Technology & Architecture**

1st edition (2013)

Authors: Erl, T., Mahmood, Z., and Puttini R.

Prentice Hall

USA

Binding: Hardcover

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#### Supplementary

##### **CompTIA Cloud+ Guide to Cloud Computing**

Edition: 1st edn (2021)

Authors: West, J

Cengage Learning

Boston , MA , USA

ISBN: 9780357541395

Binding: Hardcover

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#### Supplementary

##### **Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud**

(2015)

Authors: Stallings, W

Pearson USA

Upper Saddle River , NJ , USA

ISBN: 9780134175393

Binding: Paperback

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#### Supplementary

##### **The Internet of Things**

1st Edition (2015)

Authors: Miller, M

Pearson

Upper Saddle River , NJ , USA

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
- IBM Cloud CLI
- Cloud Foundry Command Line Interface(CLI)
- Eclipse Oxygen with IBM Cloud Tool

## Referencing Style

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

## Teaching Contacts

**Biplob Ray** Unit Coordinator  
[b.ray@cqu.edu.au](mailto:b.ray@cqu.edu.au)

## Schedule

### Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Cloud computing and modern networking	Chapter 1 and 2 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud 1st Edition, by William Stallings'	

### Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Smart applications and modern networking	Chapter 1 and 2 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud 1st Edition, by William Stallings'	

### Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Understanding cloud computing and enabling technologies	Chapter 5 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	

### Week 4 - 29 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Cloud infrastructure mechanisms	Chapter 7,8 and 9 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	

### Week 5 - 05 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Cloud computing and virtualization	Chapter 7,8 and 9 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud 1st Edition, by William Stallings'	<b>CloudIoT Assignment 1</b> Due: Week 5 Friday (9 Apr 2021) 11:59 pm AEST

### Vacation Week - 12 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
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### Week 6 - 19 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Cloud security mechanisms	Chapter 6 and 10 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	

### Week 7 - 26 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
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Cloud architectures  
Chapter 11 and 12 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'

#### **Week 8 - 03 May 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Cloud delivery model, cost metrics and pricing models	Chapter 14 and 15 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	<b>CloudIoT Assignment 2</b> Due: Week 8 Friday (7 May 2021) 11:59 pm AEST

#### **Week 9 - 10 May 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Understanding the Internet of Things(IoT) and smart application	Chapter 14 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud 1st Edition, by William Stallings'	

#### **Week 10 - 17 May 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
The IoT: architecture and implementation for cloud	Chapter 15 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud 1st Edition, by William Stallings'	

#### **Week 11 - 24 May 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
A convergence of Cloud, IoT, and Bigdata	Chapter 1 and 4 from 'The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World by Miller, Michael'	

#### **Week 12 - 31 May 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Smart problems and Smart businesses	Chapter 12, 14 and 15 from 'The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World by Miller, Michael'	<b>CloudIoT Assignment 3</b> Due: Week 12 Friday (4 June 2021) 11:59 pm AEST

#### **Review/Exam Week - 07 Jun 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
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#### **Exam Week - 14 Jun 2021**

<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
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## Term Specific Information

Welcome to Term 1 2021! Unit Contact details are found on the unit page on Moodle ("Information" box, top left corner). Feel free to contact me if you have any questions which are not suitable to be asked through the unit forums.

Have an enjoyable term!

Unit Coordinator - (T1, 2021 COIT20260 - Cloud Computing and Internet of Things for Smart Applications)

Dr. Biplob Ray

CQUniversity Australia, Melbourne Campus, Lvl 6 (6.10) 120 Spencer St, Melbourne VIC 3000

P 03 9616 0695 | X 50695 | E [b.ray@cqu.edu.au](mailto:b.ray@cqu.edu.au)

## Assessment Tasks

### 1 CloudIoT Assignment 1

#### Assessment Type

Written Assessment

#### Task Description

In this assignment, you will write a report that will let you compare and contrast between two Platform as a Service (PaaS) cloud providers and their services. You are also required to create a simple application in each of the cloud services as part of your comparative exercise. The assessment requires you to:

1. identify a PaaS and IaaS cloud provider and investigate all the services it provides;
2. create a simple application in both of the cloud providers;
3. compare and contrast your chosen cloud provider and services with IBM Cloud services;
4. prepare a report based on the given criteria in the assignment.

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

#### Assessment Due Date

Week 5 Friday (9 Apr 2021) 11:59 pm AEST

Online via Moodle

#### Return Date to Students

Week 6 Friday (23 Apr 2021)

Online via Moodle

#### Weighting

20%

#### Assessment Criteria

The students are assessed mainly against their:

1. knowledge about existing cloud providers;
2. ability to identify and evaluate available services of a cloud provider;
3. analytical capability to compare and contrast between services of different service providers.

More detailed marking criteria can be accessed from Moodle.

#### Referencing Style

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

#### Submission

Online

#### Submission Instructions

Assignments must be submitted online in .doc or .docx format.



## Learning Outcomes Assessed

- Evaluate cloud computing concepts and IoT components for smart applications/systems development
- Analyse the application of cloud computing and IoT technologies in different scenarios

## Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills

# 2 CloudIoT Assignment 2

## Assessment Type

Group Work

## Task Description

The assessment requires you to select the topic(s) from a given list and research about the topic(s). You should find scholarly articles (e.g. published journals, books, conference articles) and report current scientific developments relevant to the topic(s). The investigation will be in a team environment which requires you to:

1. choose the topic(s) from the given list based on given instructions in the assignment;
2. research multiple scholarly resources to report the scientific developments relevant to the topic(s);
3. prepare a report according to the given guidelines in the assignment.

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

## Assessment Due Date

Week 8 Friday (7 May 2021) 11:59 pm AEST

Online via Moodle

## Return Date to Students

Week 10 Friday (21 May 2021)

Online via Moodle

## 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(s);
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

Group submission

## Learning Outcomes Assessed

- Evaluate cloud computing concepts and IoT components for smart applications/systems development
- Analyse the application of cloud computing and IoT technologies in different scenarios
- Design and develop cloud based smart applications for business solutions

## Graduate Attributes

- Knowledge
- Communication
- Research
- Leadership

## 3 CloudIoT Assignment 3

### Assessment Type

Project (applied)

### Task Description

In this assignment, you need to analyse a given business case and issues within it, to come up with a smart application that will address the business problem(s). You also need to write a report to show the process you followed to create the smart application. The assessment requires you to:

1. analyse the given case study and identify issues associated with the business;
2. design a smart application based solution to address identified issues;
3. develop and deploy the application in IBM Cloud;
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 (4 June 2021) 11:59 pm AEST

Online via Moodle

### Return Date to Students

Exam Week Monday (14 June 2021)

Certification of grades

### Weighting

50%

### Assessment Criteria

The students are assessed mainly against:

1. depth of the analysis to identify current and upcoming issues;
2. level of appropriateness of the solution and its justification;
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

Online via Moodle

### Learning Outcomes Assessed

- Design and develop cloud based smart applications for business solutions
- Deploy a smart application using cloud computing and IoT technologies.

### Graduate Attributes

- Knowledge
- Cognitive, technical and creative skills
- Self-management
- Ethical and Professional Responsibility

## 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