School of Science, Computing and Emerging Technologies

Unit Outline

COS20019

Cloud Computing Architecture

Semester Sep 2025

Please read this Unit Outline carefully. It includes:

PART A Unit summary

PART B Your Unit in more detail

PART C Further information

"Swinburne University of Technology recognises the historical and cultural significance of Australia's Indigenous history and the role it plays in contemporary education

Each day in Australia, we all walk on traditional Indigenous land

We therefore acknowledge the traditional custodians of the land that our Australian campuses currently occupy, the Wurundjeri people, and pay respect to Elders past and present, including those from other areas who now reside on Wurundjeri land"

PART A: Unit Summary

Unit Code(s)		COS20019
Unit Title		Cloud Computing Architecture
Duration		One semester
Total Contact Hours		48 hours
Requisites:		
	Pre-requisites	50 cp in the degree
	Co-requisites	Nil
	Concurrent pre requisites	Nil
	Anti-requisites	
	Assumed knowledge	Familiarity with PHP, database concepts and SQL
Credit Points		12.5
Campus/Location		Ho Chi Minh campus
Mode of Delivery		Blended, assignments, labs and tests. See details below.
Assessment Summary		HED Graded Mark

Aims

Students will use a cloud platform to create well-architected deployments of distributed applications that are secure, scalable, reliable and cost optimised.

Unit Learning Outcomes

Students who successfully complete this unit can:

1. Describe the features and value of Cloud Computing
2. Create and manage cloud services using a cloud management platform 3. Design and implement a cloud-based web site that is reliable, scalable, secure and cost effective
4. Compare and contrast architectural solutions for common Web applications

Graduate Attributes

The Swinburne Graduate Attributes describe the capability of our graduates to use knowledge, skills and behaviours to contribute to society meaningfully and positively. They include professional, self-directed learning and future-ready skills.

This unit contributes to the development of the following Swinburne Graduate Attributes: ▪ GA1 Communication - Verbal communication

- GA2 Communication - Communicating using different media
- GA3 Teamwork - Collaboration and negotiation
- GA4 Teamwork – Teamwork roles and processes
- GA5 Digital literacies– Information literacy
- GA6 Digital Literacies– Technical literacy

Other graduate attributes may be practised in the unit but are not formally taught as part of the unit content, nor incorporated within formal assessment.

Content

- Cloud Computing features, models of deployment and platforms
- Cloud services for computation, data storage, security and networking ▪ Using a cloud management console to configure cloud services on a distributed cloud platform
- Setting up virtual servers and files systems on a cloud platform
- Creating a secure network of services in a Virtual Private Cloud
- User identity management and access control
- Data storage and database services in the cloud
- Automated monitoring, scaling and load balancing of services
- Infrastructure setup automation
- Web content distribution and caching
- Server-less cloud computing
- Architectures for highly available solutions

AWS Academy

This unit uses materials and infrastructure provided by Amazon Web Services (AWS) and partners. It covers knowledge required for **AWS Cloud Practitioner** and **Solutions Architect (Associate)** certifications. Swinburne is accredited to run this unit as part of the AWS Academy Program.

Passing the Certification exams may require additional knowledge of AWS services for which additional study and exam preparation is recommended.

Students may be eligible for AWS certification discount vouchers. For further details, please refer to provided instructions on Swinburne Canvas page.

PART B: Your Unit in more detail

Unit Improvements

Feedback provided by previous students through the Student Survey has resulted in improvements that have been made to this unit. Recent improvements include: • Updated unit instructions and learning materials

- Additional online live lecture activities
- Higher quality pre-recorded lecture videos
- Detailed assessment criteria

Unit Teaching Staff

Name	Role	Email / Teams	Consultation Times
Mr. Trung PHAM	Unit Convenor	ktpham@swin.edu.au	By email appointment

Learning and Teaching Structure

Category	Activity	Total Hours	Hours per Week	Teaching Period Weeks
In person	Lecture	24 hours	2 hours	Weeks 1 to 12
In person	Tutorials	24 hours	2 hour	Weeks 1 to 12

Week by Week Schedule

Week	Week Beginning	Teaching and Learning Activities (Live Online & Pre-Recorded Lectures)	Student Tasks or Assessments (In-person Tutorial Labs)
1	Sep 3	• Overview of the unit • Introduction to cloud computing o Virtualisation o Cloud providers o SaaS, PaaS, IaaS • Overview of AWS infrastructure and services.	Accessing AWS resources Intro to Linux
2	Sep 8	• Compute services o Virtual machines – EC2 o Serverless computing - Lambda o Other compute services • Container-based/Serverless services	ACF Lab 3: Introduction to EC2 (~45 min)
3	Sep 15	• Network services o Virtual Private Cloud - subnets o Security groups firewalls o Designing your Environment o Content Delivery Networks and caching – Cloud Front Lecture Quiz 1	ACF Lab 2: Build a VPC and launch a Web Server (~45 min) ACA Module 12 Guided Lab - Streaming Dynamic Content using Amazon CloudFront (~30 min)
4	Sep 22	• Storage services o File Storage – EBS, EFS o Object storage – S3, Glacier • *Web accessible content on S3*	Assignment 1a Due ACF Lab 4: Working with EBS (~45 min) *Lab Exercise - Create a publicly accessible S3 web page*

5	Sep 29	• Database services o SQL and NoSQL databases o RDS o DynamoDB o Other databases Lecture Quiz 2	ACF Lab 5: Build your DB Server and interact with your DB using an App (~45 min)
6	Oct 6	• Security o Access Control concepts o AWS IAM o Authorization using Policies o Securing your AWS account o AWS Authentication o Securing Data o Auditing Lecture Quiz 3	Assignment 1b due ACF Lab 1: Intro to AWS IAM (~45 min) . Assignment 2 Q & A.
7	Oct 13	• Scalable Architectures o HA, Scaling and Fault tolerance o Scaling to Demand o Elastic Load Balancing o Cloud Watch o Auto-scaling **### MCQ Test 1 ###**	ACF Lab 6: Scaling and Load Balance your architecture App (~45 min)
8	Oct 20	• Scaling (part 2) and Automation o Fault tolerance o Load balancing o Scaling policies o Lambda • Automating Infrastructure o Cloud Formation Lecture Quiz 4	ACA Lab Mod 9: Creating a Highly Available Environment (~60 min) ACA Lab Mod 10: Automating Infrastructure Deployment with AWS CloudFormation (~20 min)
9	Oct 27	• Decoupling applications o Interaction paradigms • Request-response • Message driven/Event driven Archs • Serverless apps - Lambda	Assignment 2 due ACA Lab Mod 14: Implementing a Serverless Architecture with AWS Lambda (~30 min) ACA Lab Mod 14: Implementing a Serverless Architecture for the Cafe (~45 min)
10	Nov 3	• DNS routing – Route53 • Design Patterns and Sample Architectures Lecture Quiz 5	ACA Lab Mod 9 - Creating a Scalable and Highly Available Environment for the Cafe
11	Nov 10	• Architecture Evaluation o Reliability o Security o Performance o Cost	Assignment 3 discussion
12	Nov 17	Assignment 3 Presentation **### MCQ Test 2 ###**	Assignment 3 due Assignment 3 Presentations

Assessment

a) Assessment overview

Tasks and Details	Individual or Group	Assessment Prerequisite	Weighting	Mapped Unit Learning Outcome	Mapped Graduate Attribute	Due Date
Labs	Individual	None	10%	2, 3, 4	GA1, GA6	Weeks 2 – 11
Lecture Quizzes	Individual	None	10%	1, 2, 3, 4	GA5, GA6	Weeks 3, 5, 6, 8, 10
Assignment 1a	Individual	None	5%	2, 3	GA1, GA6	Week 4
Assignment 1b	Individual	Assignment 1a	15%	2, 3	GA1, GA6	Week 6
MCQ Test 1	Individual	None	10%	1, 2, 3, 4	GA6	Week 7
MCQ Test 2	Individual	None	10%	1, 2, 3, 4	GA6	Week 12
Assignment 2	Individual	> 40% of Labs **AND** Submitted Assignment 1a **AND** > 40% in Either Assignment 1b **OR** MCQ Test1	15%	2, 3	GA1, GA2, GA6	Week 10
Assignment 3 (Project)	Group of Minimu 3 maximu 4 students	Submitted Assignment 2 AND Presented Assignment 3	20%	2, 3, 4	GA2, GA3, GA4, GA5, GA6	Week 12
Assignment 3 presentation	Group of Minimu 3 maximu 4 students	Submitted Assignment 3 Project	5%	2, 3, 4	GA1, GA2, GA3, GA4, GA5, GA6	Week 12 Interviews may extend into Week 13

I. **Lab submissions**:

Weekly labs and practical deployments **MUST** be demonstrated and assessed during in person lab tutorials to receive marks.

Lab instructors would observe student deployments and may ask simple questions for

assessment. Students will receive lab marks immediately.

Exception: Under any difficult circumstances, students **MUST** inform their lab instructor and provide evidence (e.g. medical certificate) if they cannot attend their tutorial class (lab class) and/or could not demonstrate their lab deployment during the allocated time.

If accepted, students are given maximum 7 calendar days to submit a lab report. Lab reports must be written in **IEEE standard format**, including relevant screenshots and explanations for each step to receive a full mark.

NOTE: Lab online submissions have deadlines (up to 7 calendar days after your lab class). Late submission and due date extensions are NOT applicable for lab submissions.

II. Multiple Choice Questions Test 1 (MCQ Test 1):

Resit for this assessment is available only to students who have achieved less than 40% in their first attempt AND have NOT submitted assignment 1b.
Answer keys will not be published to students after the test.

III. Multiple Choice Questions Test 2 (MCQ Test 2):

No resit for this assessment.
Answer keys will not be published to students.

Assessment Requirements	Details
b) Use of generative AI (genAI) in this unit	You can use genAI to learn, study and research into the relevant topics introduced in this unit. However, you are **NOT** allowed to use genAI to do the assessment tasks, for example, generating and / or writing your reports required in this unit.
c) Hurdle requirements	**No Hurdle requirements** **Minimum requirement to pass this Unit** To pass this unit, you must: ▪ Achieve an overall mark of 50% or more for the unit
d) Final assessment period	If the unit you are enrolled in has a final assessment (including invigilated exams), you will be expected to be available for the entire final assessment period including any Special Exam period.
e) Submission requirements	Assignments and other assessments are generally submitted online through the Canvas assessment submission system which integrates with the Turnitin . Please ensure you keep a copy of all assessments that are submitted. In cases where a hard copy submission is required an Assessment Cover Sheet must be submitted with your assignment. The standard Assessment Cover Sheet is available from the Submitting work webpage or www.swinburne.edu.au/studentforms/

f) Extensions and late submissions	Applications for an extension of **5 calendar days or less** (from the original due date) can be submitted through Swinburne Special Consideration and Extensions portal or directly to the unit convenor via email, providing documentary evidence. Unit convenor would process extension applications directly and students may be asked to apply for a Special Consideration Assessment (SCA/SPC) application to validate requester's situation and documentary evidence in detail. All extension requests for **more than 5 calendar days** (from the original due date) are submitted via Swinburne Special Consideration and Extensions portal. For further information, please refer to Special Consideration and Extensions page on Swinburne website. **NOTE**: Late submission and due date extensions are **NOT** applicable for **Online Lab Submissions**, **Lecture Quizzes**, and any assessments due in **Week 12** of the semester. **IMPORTANT**: Students seeking an extension for their assignments due to medical reasons must acquire Swinburne General Practitioner Medical Impact Statement form. ***Students should note that submitting fraudulent medical documentation could result in suspension or exclusion from the university.*** Further instructions and forms can be found on Swinburne special consideration and extensions page.
g) Referencing	To avoid breaching academic integrity, you are required to provide references whenever you include information from other sources in your work and acknowledge when you have used Artificial Intelligence (AI) tools (such as ChatGPT). Further details regarding academic integrity are available in Section C of this document. Referencing conventions required for this unit are: As long as consistent. Helpful information on referencing can be found at http://www.swinburne.edu.au/library/referencing/
h) Groupwork guidelines	A group assignment is the collective responsibility of the entire group, and if one member is temporarily unable to contribute, the group should be able to reallocate responsibilities to keep to schedule. In the event of longer-term illness or other serious problems involving a member of group, it is the responsibility of the other members to notify immediately the Unit Convenor or relevant tutor. Group submissions must be submitted with an Assignment Cover Sheet, signed by all members of the group. All group members must be satisfied that the work has been correctly submitted. Any penalties for late submission will generally apply to all group members, not just the person who submitted.

Required Textbook(s)

NA

Recommended Reading Materials

Swinburne Library has a large collection of resources. Listed below are some references that will provide valuable supplementary information to this unit. It is also recommended that you explore other sources to broaden your understanding.

Implementing AWS: Leverage AWS Features to Build Highly Secure, Fault-Tolerant, and Scalable Cloud Environments
Wadia, Yohan ; Udell, Rowan ; Chan, Lúcás ; Gupta, Udita

Birmingham: Packt Publishing, Limited; 2019

PART C: FURTHER INFORMATION

For further information on any of these topics, refer to Swinburne's Student webpage http://www.swinburne.edu.au/student/

Student behaviour and wellbeing

All students are expected to: act with integrity, honesty and fairness; be inclusive, ethical and respectful of others; and appropriately use University resources, information, equipment and facilities. All students are expected to contribute to creating a work and study environment that is safe and free from bullying, violence, discrimination, sexual harassment, vilification and other forms of unacceptable behaviour.

The Student Charter describes what students can reasonably expect from Swinburne in order to enjoy a quality learning experience. The Charter also sets out what is expected of students with regards to your studies and the way you conduct yourself towards other people and property.

You are expected to familiarise yourself with University regulations and policies and are obliged to abide by these, including the Student Academic Misconduct Regulations, Student General Misconduct Regulations and the People, Culture and Integrity Policy. Any student found to be in breach of these may be subject to disciplinary processes.

Examples of expected behaviours are:

- conducting yourself in teaching areas in a manner that is professional and not disruptive to others
- following specific safety procedures in Swinburne laboratories, such as wearing appropriate footwear and safety equipment, not acting in a manner which is dangerous or disruptive (e.g. playing computer games), and not bringing in food or drink
- following emergency and evacuation procedures and following instructions given by staff/wardens in an emergency response.

Canvas

You should regularly log on to the Swinburne learning management system, Canvas. You can access Canvas via the Student login webpage or https://swinburne.instructure.com/ Canvas is updated regularly with important unit information and communications.

Communication

All communication will be via your Swinburne email address. If you access your email through a provider other than Swinburne, then it is your responsibility to ensure that your Swinburne email is redirected to your private email address.

Academic Integrity

Academic integrity is about taking responsibility for your learning and submitting work that is honestly your own. It means acknowledging the ideas, contributions and work of others; referencing your sources and acknowledging the use of generative artificial intelligence; contributing fairly to group work; and completing tasks, tests and exams without cheating. Artificial intelligence tools should only be used where approved by the Unit Convenor.

Swinburne University uses the Turnitin system, which helps to identify inadequate citations, poor paraphrasing and unoriginal work in assignments that are submitted via Canvas. Your Unit Convenor will provide further details.

Plagiarism, collusion, contract cheating, unauthorised file sharing, falsification, fabrication, manipulation or misrepresentation of information, reuse of previous work and non compliance with instructions in an invigilated or non-invigilated assessment item are all breaches of academic integrity and treated as academic misconduct. Examples of breaches of academic integrity include, but are not limited to:

- submitting work as your own for assessment that has been fully or partially completed by a third party, either paid or unpaid
- using output from artificial intelligence tools (e.g. ChatGPT) in whole or part without acknowledgement and/or without the approval of the Unit Convenor
- using another person's work or ideas as though it is your own work, without appropriate attribution
- working closely with another student or group of students (either past or current), to submit for assessment, some or all of the other student or students' work as your own work
- sharing without permission of the Unit Convenor, Swinburne resources or other material related to assessment to an entity or document repository site • creating, intentionally modifying or inventing information that is intended to be submitted as part of an assessment item
- using the whole or part of a computer program written by another person as your own without appropriate acknowledgement
- poorly paraphrasing somebody else's work
- using a musical composition or audio, visual, graphic and photographic work created by another person without acknowledgment
- enabling others to cheat, including letting another student copy your work or by giving access to a draft or completed assignment
- letting someone or something else impersonate you, or you impersonate someone else in an invigilated or non-invigilated assessment item
- accessing, obtaining and/or providing to others unauthorised materials relating to an invigilated or non-invigilated assessment item.

The penalties for academic misconduct can be severe, ranging from a zero grade for an assessment task through to exclusion from Swinburne. For further details, see https://www.swinburne.edu.au/student-login/academic-integrity/

Student support

Swinburne offers a range of services and resources to help you complete your studies successfully. Your Unit Convenor or studentHQ can provide information about the study support and other services available for Swinburne students. For further information, see the Current students web page.

Special consideration

If your studies have been adversely affected due to serious and unavoidable circumstances outside of your control (e.g. severe illness or unavoidable obligation), you may be able to apply for special consideration (SPC).

Applications for Special Consideration are submitted via the SPC online tool normally no later than 5.00pm on the third working day after the submission/sitting date for the relevant assessment component. See https://www.swinburne.edu.au/life-at-swinburne/student support-services/special-consideration-assistance/

Note: Submitting fraudulent (fake or altered) medical certificates is considered misconduct and can lead to serious penalties from Swinburne. In addition, your doctor may report fraudulent medical certificates as a prosecutable

offence under the Victorian Crimes Act.

AccessAbility Services

If you are a student with a disability, medical or mental health condition or you have significant carer responsibilities, you may require reasonable adjustments to fully access and participate in education. Swinburne's AccessAbility Services can develop an Education Access Plan (EAP) that includes the services and reasonable adjustments that you need.

It is recommended that you register with AccessAbility Services when you first commence your course but you can contact the service at any time during your studies to find out about reasonable adjustments. Contact Accessibility Services to discuss further.

Review of marks

An independent marker reviews all fail grades for major assessment tasks. In addition, a review of assessment is undertaken if your final result is between 45 and 49 or within 2 marks of any grade threshold.

You can ask the Unit Convenor to check the result for an assessment item or your final result. Your request must be made in writing within 10 working days of receiving the result. The Unit Convenor can discuss the marking criteria with you and check the aggregate marks of assessment components to identify if an error has been made. This is known as local resolution. If you are dissatisfied with the outcome of the local resolution, you can lodge a formal complaint.

Feedback, complaints and suggestions

In the first instance, discuss any issues with your Unit Convenor. If your concerns are not resolved or you would prefer not to deal with your Unit Convenor, then you can complete a feedback form. See https://www.swinburne.edu.au/corporate/feedback/

Advocacy

Should you require assistance with any academic issues, University statutes, regulations, policies and procedures, you are advised to seek advice from an Academic Student Support Officer at Swinburne Student Life.

For an appointment, please call 19006412 or email swin@fe.edu.vn .For more information, please see https://portal.swin.edu.vn