

EE5608: MODERN CLOUD ARCHITECTURE AND DEPLOYMENT PRACTICE

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Modern Cloud Architecture and Deployment Practice

Subject Code

EE - Electrical Engineering

Course Number

5608

Academic Unit

Electrical Engineering (EE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

The course aims to provide students with the essential knowledge and practical skills in cloud administration and architecting. Amazon Web Services (AWS) is a major cloud computing platform provider in the world. This course is integrated with the curriculum of AWS Academy Cloud Foundations (ACF) to deliver industry-recognized content that covers a wide range of fundamental concepts and considerations from business to technology.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 Explain the cloud computing characteristics, key benefits, and underlying principles.		x	x	
2 Identify the performance and security issues in the cloud and use appropriate AWS tools to design well-architected solutions.		x	x	
3 Describe distributed and parallel computing models and implement cloud applications to process data efficiently.		x	x	

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1 Lecture	Learning in lectures will be supported by practical exercises	1, 2, 3	3 hrs/wk

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1 Tests (min.: 2)	1, 2, 3	30	I consider these to be summative assessment tasks.	No
2 #Assignments (min.: 3)	1, 2, 3	20	I consider these to be formative assessment tasks.	Yes

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.

#Assignments may include homework, tutorial exercise, project/mini-project, lab report, presentation

Assessment Rubrics (AR)

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Achievements in CILOs

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal level

Assessment Task

Coursework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Achievements in CILOs

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal level

Assessment Task

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Achievements in CILOs

Excellent

(A+, A, A-) High

Good

(B+, B) Medium

Marginal

(B-, C+, C) Low

Failure

(F) Not even reaching marginal level

Assessment Task

Coursework (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Achievements in CILOs

Excellent

(A+, A, A-) High

Good

(B+, B) Medium

Marginal

(B-, C+, C) Low

Failure

(F) Not even reaching marginal level

Additional Information for AR

Constructive Alignment with Programme Outcomes

PILO 123: The applications of mathematics, science, and engineering related to cloud computing are central to the aims of this course with the opportunity to apply these applications to the solution of science and engineering problems.

PILO 4: In the tutorial sessions, the students will be given the chance to formulate and solve some engineering problems related to the subject.

PILO 6: A three-session laboratory is scheduled to allow students to practice this type of work which is directly linked to the theory learnt during the lecture. Students will be given the chance to interact with their fellow students and apply effective communication skills in their professions.

Part III Other Information

Keyword Syllabus

Cloud computing characteristics; virtualization and container technologies; cloud deployment models; cloud service models – SaaS, PaaS, and IaaS; cloud pricing model; cloud economics and challenges; key elements of classic data centres; shared responsibility model; authentication vs authorization; cloud storage models; RAID levels; data consistency models; data replication and fault tolerance; high availability system and architecture; availability vs reliability; horizontal scaling vs vertical scaling; load balancing algorithms; business continuity and disaster recovery strategies; Java distributed programming; MapReduce and Hadoop.

Introduction to AWS:

AWS Global Infrastructure, Region and Availability Zone, Edge Location, Elastic Compute Cloud (EC2), Lambda, Simple Storage Service (S3), Elastic Block Store (EBS), Elastic File System (EFS), Glacier, Relational Database Service (RDS), DynamoDB, Identity & Access Management (IAM), Virtual Private Cloud (VPC) Networking, Security Groups, Network ACL, Internet Gateway, NAT Gateway, Route 53, CloudFront, Elastic Load Balancing (ELB), Auto Scaling Group, Cloud Watch

Reading List

Compulsory Readings

Title	
1	AWS Documentation - https://docs.aws.amazon.com/index.html

Additional Readings

Title	
1	AWS Certified Solutions Architect Official Study Guide (Sybex, 1st edition, 2017)
2	Cloud Infrastructure and Services Participant Guide Volume 1 & 2 (EMC Education Services, Oct 2011)
3	T. Petrocelli: Data Protection and Information Lifecycle Management (Prentice Hall, 2006, ISBN 0131927574)