

City University of Hong Kong
Course Syllabus

offered by Department of Electrical Engineering
with effect from Semester A in 2021/2022

Part I Course Overview

Course Title: Cloud Computing Systems

Course Code: EE4221

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: B4

Proposed Area: Arts and Humanities
(for GE courses only) Study of Societies, Social and Business Organisations
 Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: EE3206 Java Programming and Applications
(Course Code and Title) and
EE3009 Data Communications and Networking

Precursors: Nil
(Course Code and Title)

Equivalent Courses: Nil
(Course Code and Title)

Exclusive Courses: Nil
(Course Code and Title)

| | | | | | | | | |
|------------------------|---------------------------------------------------------------|---|---|---|---|--|--|---------------------------------------|
| Lecture and Laboratory | Learning in lectures will be supported by laboratory sessions | ✓ | ✓ | ✓ | ✓ | | | 3 hrs/wk (2 hrs Lect, 1 hr Lab) |
|------------------------|---------------------------------------------------------------|---|---|---|---|--|--|---------------------------------------|

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

| Assessment Tasks/Activities | CILO No. | | | | | | Weighting* | Remarks |
|----------------------------------------------------|----------|---|---|---|--|--|------------|---------|
| | 1 | 2 | 3 | 4 | | | | |
| Continuous Assessment: 60% | | | | | | | | |
| Tests (min.: 2) | ✓ | ✓ | ✓ | ✓ | | | 36% | |
| #Assignments (min.: 3) | ✓ | ✓ | ✓ | ✓ | | | 24% | |
| | | | | | | | | |
| Examination: 40% (duration: 2 hrs , if applicable) | | | | | | | | |
| Examination | ✓ | ✓ | ✓ | ✓ | | | 40% | |
| | | | | | | | 100% | |

* The weightings should add up to 100%.

Remark:

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination. Also, 75% laboratory attendance rate must be obtained.

may include homework, tutorial exercise, project/mini-project, presentation

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

| Assessment Task | Criterion | Excellent (A+, A, A-) | Good (B+, B, B-) | Fair (C+, C, C-) | Marginal (D) | Failure (F) |
|-----------------|--------------------------|--------------------------|---------------------|---------------------|-----------------|--------------------------------------|
| 1. Examination | Achievements in CILOs | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| 2. Coursework | Achievements in CILOs | High | Significant | Moderate | Basic | Not even reaching marginal levels |

6. Constructive Alignment with Major Outcomes

| MILO | How the course contribute to the specific MILO(s) |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1,3,5 | Students will need to evaluate various business and technology considerations to design cloud solutions that meets corporates' need and certain real world constrains. |
| 10 | Students will learn to control various cloud services via SSH terminal and AWS console. |

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

Cloud Computing Primer

Cloud computing characteristics, Virtualization and its benefits, Cloud deployment models, Cloud service types – SaaS, PaaS, and IaaS, Cloud economics and challenges, Total Cost of Ownership (TCO) analysis, Cloud payment models, Key elements of traditional data center

AWS Core Services – Compute, Storage and Database

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, Aurora

AWS Security and Networking

Shared Responsibility Model, Security Compliance Programs, Identity & Access Management (IAM), Authentication and Authorization, Virtual Private Cloud (VPC) Networking, Security Groups, Network ACL, Internet Gateway, NAT Gateway, Route 53, CloudFront, Trusted Advisor, CloudTrail

Scaling and Load Balancing

Horizontal Scaling vs Vertical Scaling, Elastic Load Balancing (ELB), Auto Scaling Group, Cloud Watch, AWS Well-Architected Framework

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

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

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

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