Course Specification
— (Bachelor)

Course Title: **Cloud Computing Security**

Course Code: IT473

Program: **B.Sc. Information Technology**

Department: **INFORMATION TECHNOLOGY**

College: CCIS

Institution: MAJMAAH UNIVERSITY

Version: *Course Specification Version Number*

Last Revision Date: *Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2,2,0)

2. Course type

A.	☐University	☐ College	☒ Department	☒ Track	☐Others
B.	☐Required		☒ Elective		

3. Level/year at which this course is offered: Level 8

4. Course general Description:

This course provides the ground-up coverage on the high level concepts of cloud landscape, architectural principles, techniques, design patterns and real-world best practices applied to Cloud service providers and consumers and delivering secure Cloud based services. The course will describe the Cloud security architecture and explore the guiding security design principles, design patterns, industry standards, applied technologies and addressing regulatory compliance requirements critical to design, implement, deliver and manage secure cloud based services. The course delves deep into the secure cloud architectural aspects with regards to identifying and mitigating risks, protection and isolation of physical & logical infrastructures including compute, network and storage, comprehensive data protection at all OSI layers, end-to-end identity management & access control, monitoring and auditing processes and meeting compliance with industry and regulatory mandates. The course will leverage cloud computing security guidelines set forth by ISO, NIST, ENISA and Cloud Security Alliance (CSA).

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

1. To understand fundamentals of cloud computing architectures based on current standards, protocols, and best practices intended for delivering Cloud based enterprise IT services and business applications.
2. To identify the known threats, risks, vulnerabilities and privacy issues associated with Cloud based IT services.
3. To implementing appropriate safeguards and countermeasures for Cloud based IT services

4. To understand approaches to designing cloud services that meets essential Cloud infrastructure characteristics – on demand computing, shared resources, elasticity and measuring usage.
5. To recognize security architectures that assures secure isolation of physical and logical infrastructures including compute, network and storage, comprehensive data protection at all layers, end-to-end

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1				
2.0	Skills			
2.1	Understand fundamentals of cloud computing architectures based on current standards, protocols, and best practices intended for delivering Cloud	S2		Lab Based Assignments, MiniProject

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	based enterprise IT services and business applications		Mini Project, Lab Exercises	
2.2	Identify the known threats, risks, vulnerabilities and privacy issues associated with Cloud based IT services	S2	Mini Project, Lab Exercises	Lab Based Assignments, MiniProject
2.3	CLO3:Identify and implement appropriate safeguards and countermeasures for Cloud based IT services	S3	Oral /Written Communicat ion,Seminar	Group Assignments, Mini Project
2.4	CLO4: Understand approaches to designing cloud services that meets essential Cloud infrastructure characteristics – on demand computing, shared resources, elasticity and measuring usage	S4	Mini Project, Graduation Project, Lab Exercises	Case Study Implementation/ Laboratory /Mini project
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Fundamentals of Cloud Computing and Architectural Characteristics	4
2.	Security Design and Architecture for Cloud Computing	4
3.	Data protection for Confidentiality and Integrity	8
4.	Enforcing Access Control for Cloud Infrastructure based Services	8
5.	Monitoring, Auditing and Management Proactive activity	8
6.	Introduction to Identity Management in Cloud Computing	8
7.	Cloud Computing Security Design Patterns – I	8

8.	**Cloud Computing Security Design Patterns – II**	**8**
9.	**Policy, Compliance & Risk Management in Cloud Computing**	**4**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1,2	Week 4 and 12	10%
2.	Mid Exam	Week 8	20%
3.	Exercise	Every Week	15%
4	Project	Week 13	15%
5	Final Exam	Week 16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Securing The Cloud: Cloud Computing Security Techniques and Tactics by Vic (J.R.) Winkler, Syngress/Elsevier) - 978-1-59749-592-9 • Cloud Computing Design Patterns by Thomas Erl (Prentice Hall) - 978-0133858563
Supportive References	"Cloud Computing Security" by John R. Vacca Released September 2016 Publisher(s): CRC Press ISBN: 9781315354927
Electronic Materials	https://www.tutorialspoint.com/cloud_computing/cloud_computing_security.htm
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Class Room, PC**
Technology equipment (projector, smart board, software)	**LCD Projector, VM**
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Instructor	Quiz, Mid exam, Assignments, Exercises, Final Exam and Indirect Survey
Quality of learning resources	Convener, instructors, HOD	Regular follow ups
The extent to which CLOs have been achieved	Instructor, TA	Performance in the exam for a particular CLO(s)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	