



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSE CONTENT

CLOUD SECURITY								
VIII Semester : CSE / CSM								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
24X0536	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
ContactClasses:45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes:45			
Prerequisites: Cloud Computing								

Course Overview:

This course introduces cloud computing fundamentals including distributed systems, clustering, virtualization, and virtual machines used for scalable data-center operations and enterprise cloud migration. It explains service models IaaS, PaaS, and SaaS with VM provisioning, migration, workflow engines, cluster-as-a-service, and scientific cloud applications. The course covers data security through lifecycle management, protection at rest, in transit, and in use, auditing, and key management in Amazon Web Services and Microsoft Azure. It also discusses Identity and Access Management, federated authentication, and audits. Finally, it addresses cloud security challenges, OWASP Top 10 risks, Secure SDLC, DevSecOps practices, monitoring, logging, and server less computing services for reliable cloud operations.

Course Objectives:

- To Understand Cloud Foundations.
- To Analyze Cloud Service Models.
- To Implement Cloud Data Security.
- To Manage Identity and Access Control.
- To Develop Secure Cloud Applications.

Course Outcomes: After Completion of the Course, Students should be able to

- Understand the fundamental concepts of distributed systems, clustering, virtualization, and cloud computing models
- Analyze Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) by evaluating virtual machine provisioning, migration techniques, cluster-based cloud enhancement, and secure distributed data storage platforms.
- Apply cloud security principles by demonstrating data protection techniques (data at rest, in transit, and in use), data lifecycle management, cloud data auditing, and key management practices in AWS and Azure environments.
- Evaluate Identity and Access Management (IAM) and Federated Identity Management systems, and perform IAM audits using AWS IAM tools and cloud portals to ensure secure access governance.
- Design and implement cloud-based solutions by integrating virtualization, storage services, security controls, and IAM policies, and demonstrate practical skills using AWS CLI, Azure Portal, and workflow engines for cloud applications.

MOUDEL-I

10

FUNDAMENTALS: System Modeling, Clustering and Virtualization : distributed system models and enabling technologies, computer clusters for scalable parallel computing, virtual machines and virtualization of clusters and data centers. Introduction to cloud computing, migrating into cloud, enriching the integration of service paradigm for cloud era, the enterprise cloud computing paradigm.

MOUDEL-II

8

INFRASTRUCTURE AS SERVICE (IAAS)&PLATFORM AND SOFTWARE

SERVICE (PAAS/SAAS): Virtual machine provisioning and migration services, on the management of virtual machines for cloud infrastructure, enhancing cloud computing environments using a cluster as service, secure distributed data storage in cloud computing Aneka, comet cloud, T-systems, work flow engine for clouds ,understanding scientific applications for cloud environments.

MOUDEL-III

8

Data Protection (rest, at transit, in use), Data Information lifecycle, Cloud Data Audit (Intro, Audit, Best Practice): Aws - EBS, S3, Azure - SAS, Demo-Aws cli & PowerShell & Amazon, Azure portal, Key management, Cloud Key management Audit (Introduction, Audit, Best Practice): AWS -KMS, Azure - Azure Key Vault.

MOUDEL-IV

8

Introduction to Identity and Access Management, Introduction to Federated Identity Management, Case Study, Cloud IAM Audit (Intro, Audit, Best Practice): Aws -IAM, Demo – AWS CLI & Amazon portal

MOUDEL-V

8

Cloud Application Challenges, OWSAP Top 10, SECURE SDLC, DevsecOps, Cloud Trail, Cloud watch, Lambda

TEXTBOOKS:

- Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, 30 July 2010
- Securing the Cloud: Cloud Computer Security Techniques and Tactics – Illustrated, 1 June 2011

ELECTRONIC RESOURCES:

1. <https://aws.amazon.com/training/>
2. <https://learn.microsoft.com/training/azure/>
3. <https://nptel.ac.in/courses/cloud-computing>
4. <https://cloudsecurityalliance.org/research/guidance/>
5. <https://owasp.org/www-project-top-ten/>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Techtalk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper–I
8. Model question paper–II
9. Lecture notes