



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3730208

Semester – III

Subject Name: Cloud Computing

Type of course:

Prerequisite: operating system, networking

Rationale: Organizations look for cloud solutions rather than investing and maintaining infrastructure on their part. Since the Cloud structure is complex, investigations are necessary from security perspective. Organizations are looking for Cloud service providers which are stable, secure and offer more than one layer of security for their client's data. This course will help in implementing cloud architecture, analyzing the security issues, writing incidence report and deploying the security architecture for cloud platform.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	Introduction to Cloud Computing Online Social Networks and Applications, Cloud introduction and overview, Different clouds, Risks, Novel applications of cloud computing	4
2	Unit 2: Cloud Computing Architecture Requirements, Introduction Cloud computing architecture, On Demand Computing Virtualization at the infrastructure level, Security in Cloud computing environments, CPU Virtualization, A discussion on Hypervisors Storage Virtualization Cloud Computing Defined, The SPI Framework for Cloud Computing, The Traditional Software Model, The Cloud Services Delivery Model Cloud Deployment Models Key Drivers to Adopting the Cloud, The Impact of Cloud Computing on Users, Governance in the Cloud, Barriers to Cloud Computing Adoption in the Enterprise	11
3	Unit 3: Security Issues in Cloud Computing Infrastructure Security, Infrastructure Security: The Network Level, The Host Level, The Application Level, Data Security and Storage, Aspects of Data Security, Data Security Mitigation Provider Data and Its Security	10



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	Identity and Access Management Trust Boundaries and IAM, IAM Challenges, Relevant IAM Standards and Protocols for Cloud Services, IAM Practices in the Cloud, Cloud Authorization Management	
4	Unit 4: Security Management in the Cloud Security Management Standards, Security Management in the Cloud, Availability Management: SaaS, PaaS, IaaS Privacy Issues Privacy Issues, Data Life Cycle, Key Privacy Concerns in the Cloud, Protecting Privacy, Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, Legal and Regulatory Implications, U.S. Laws and Regulations, International Laws and Regulations	11
5	Unit 5: Audit and Compliance Internal Policy Compliance, Governance, Risk, and Compliance (GRC), Regulatory/External Compliance, Cloud Security Alliance, Auditing the Cloud for Compliance, Security-as-a-Cloud	8
6	Unit 6: Introduction to hybrid cloud Hybrid cloud management, Managing the Hybrid workloads, Development and Deployment in Hybrid cloud.	4

Reference Books:

1) Cloud Computing Explained: Implementation Handbook for Enterprises, John Rhoton, Publication Date: November 2, 2009

2) Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice), Tim Mather, ISBN-10: 0596802765, O'Reilly Media, September 2009

3) Hybrid Cloud For Dummies 2nd Edition

by Judith S. Hurwitz , Marcia Kaufman , Fern Halper , Daniel Kirsch

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Implement a public cloud instance using a public cloud service provider	50



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CO-2	Develop a risk-management strategy for moving to the Cloud	20
CO-3	Identify security aspects of each cloud model	20
CO-4	Apply trust-based security model to different layer	10

List of Experiments:

1. Install public cloud. Analyze how handling in public cloud differs from private cloud?
2. Implement phishing attack on cloud.
3. Write a case study of incidence reporting in case of breach of cloud security.
4. Use the services offered by Azure, AWS and GOOGLE. Compare them.
5. Use open source tool to evaluate performance of cloud platform.
6. Prepare a case study of security policy or service level agreement is signed by cloud service provider.
7. Prepare a case study of facebook, twitter data which is stored on cloud. Write a program to inject malware in this data.
8. Implement attribute based encryption algorithm for cloud.
9. Implement compartmentalization techniques, the provider can use to prevent access into virtual container of one customer by other customers.
10. Implement identity management mechanism in cloud.

Major Equipment:

Computer systems having following minimum technical configurations

Processor:i3 or i5 or higher

RAM : minimum 4 GB

HDD : 1 TB

Internet and wifi connectivity

Licence Window/Linux operating system

List of Open Source Software/learning website:

<https://npte;.ac.in>