



B. Tech.
Semester V

CLOUD PRIVACY AND SECURITY
IT5042

Effective from June-2023

Syllabus version: 1.00

Subject Code	Subject Title	Teaching Scheme			
		Hours		Credits	
		Theory	Practical	Theory	Practical
IT5042	Cloud Privacy and Security	3	2	3	2

Subject Code	Subject Title	Theory Examination Marks		Practical Examination Marks	Total Marks
		Internal	External	CIE	
IT5042	Cloud Privacy and Security	40	60	50	150

Objectives of the course:

- To Understand the fundamentals of cloud computing and its impact on data privacy and security.
- To identify common security threats and vulnerabilities in cloud environments and develop strategies for securing cloud-based applications and infrastructure.

Course outcomes:

Upon completion of the course, the student shall be able to,

- CO1: Understand the fundamentals of cloud security and its need.
CO2: Analyze the infrastructure security at network, host, and application levels.
CO3: Understand and apply identity and assessment in cloud infrastructure.
CO4: Analyze security management in cloud.
CO5: Describe privacy and audit in cloud infrastructure and execute compliances.
CO6: Recognize security as a cloud service.

Sr. No.	Topics	Hours
Unit – I		
1	Introduction to Cloud Security: 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, Political issues due to global boundaries.	5
Unit – II		
2	Infrastructure Security: The Network Level, Ensuring Data Confidentiality and Integrity, Ensuring Proper Access Control, The Host Level, SaaS and PaaS Host Security, IaaS Host Security, Infrastructure Security: The Application Level, Application-Level Security Threats, DoS and EDoS, End User Security.	7

Unit – III		
3	Identity and Access Management: Trust Boundaries and IAM, Why IAM, IAM Challenges, IAM Definitions, IAM Architecture and Practice, Relevant IAM Standards and Protocols for Cloud Services, IAM Practices in the Cloud.	6
Unit – IV		
4	Security Management in the Cloud: Security Management Standards, Availability Management, SaaS Availability Management, PaaS Availability Management, IaaS Availability Management, Access Control, Security Vulnerability, Patch and Configuration Management Cloud.	7
Unit – V		
5	Privacy, Audit and Compliance in Cloud: Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, International Laws and Regulations, Internal Policy Compliance, Governance, Risk, and Compliance (GRC).	6
Unit – VI		
6	Security-as-a-Cloud Service: Origins, Today's Offerings, Potential Threats of Using CSPs, A Case Study Illustrating Potential Changes in the IT Profession Caused by Cloud Computing.	5

Text book:

1. Tim Mather, Subra Kumaraswamy, and Shahed Latif, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance", O'Reilly Publication.

Reference books:

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, "Cloud Computing A practical Approach", McGrawHill.
2. Rajkumar Buyya, James Broberg, Andrzej Goscinski, "Cloud Computing Principles and Paradigms", Wiley Publication.

Course objectives and Course outcomes mapping:

- To understand the fundamentals of cloud computing and its impact on data privacy and security: CO1, CO2, CO3
- To develop strategies for securing cloud-based applications and infrastructure management: CO4, CO5
- To Explore compliance and legal issues related to data privacy in the cloud: CO5, CO6

Course units and Course outcomes mapping:

Unit No.	Unit Name	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction to Cloud Security	✓					
2	Infrastructure Security		✓				
3	Identity and Access Management			✓			
4	Security Management in the Cloud				✓		
5	Privacy, Audit and Compliance in Cloud					✓	
6	Security-As-a-Cloud Service						✓

Programme outcomes:

- PO 1: Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering.
- PO 2: Problem analysis: An ability to identify, formulates, and solves engineering problems.
- PO 3: Design/development of solutions: An ability to design a system, component, or process to meet desired needs within realistic constraints.
- PO 4: Conduct investigations of complex problems: An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.
- PO 5: Modern tool usage: The broad education and understanding of new engineering techniques necessary to solve engineering problems.
- PO 6: The engineer and society: Achieve professional success with an understanding and appreciation of ethical behavior, social responsibility, and diversity, both as individuals and in team environments.
- PO 7: Environment and sustainability: Articulate a comprehensive world view that integrates diverse approaches to sustainability.
- PO 8: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.
- PO 9: Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.

PO 11: Project management and finance: An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: A recognition of the need for, and an ability to engage in life-long learning.

Programme outcomes and Course outcomes mapping:

Programme Outcomes	Course Outcomes					
	C01	C02	C03	C04	C05	C06
P01	✓	✓	✓			
P02				✓	✓	
P03	✓	✓				
P04				✓		
P05						✓
P06				✓		✓
P07	✓	✓				
P08						✓
P09					✓	✓
P010			✓	✓		
P011		✓			✓	
P012						✓