

PIS219: VIRTUALIZATION AND CLOUD SECURITY

L	T	P	Cr
3	0	2	4.0

Course Objectives: The course helps to understand the technologies and applications of cloud computing and its virtualization foundation used in servers, along with the data security tools.

Introduction: Basics of the emerging cloud computing paradigm, Cloud Benefits, Business scenarios, Cloud Computing Evolution, cloud vocabulary, Essential Characteristics of Cloud Computing, Cloud deployment models, Virtualization Technology and Cloud Computing

Cloud Computing: Cloud Service Models, cloud-computing vendors, Cloud Computing threats, Cloud Reference Model, The Cloud Cube Model, Security for Cloud Computing

Virtualization: concept and properties of virtualization, CPU virtualization, memory virtualization, I/O virtualization, Forms of CPU virtualization

Virtualization scenarios: Server consolidation, Software development, Debugging, Fault Tolerance, and security. **Planning, Designing, Migrating and Deploying Virtual Infrastructure using Microsoft hyper-V, Citrix Xen Server, QEMU and VMWare**

Cloud security: Cloud Security challenge, Principal Characteristics of Cloud Computing security, Data center security Recommendations, Encryption and key management in the cloud, identity and access management, trust models for cloud, Cloud forensics, traditional security, business continuity and disaster recovery

Data security tools and techniques for the cloud: Understanding the cloud architecture, Governance and enterprise risk management, design of customized cloud security measures, application security, targets of cyber crime

Trustworthy cloud infrastructures, Secure computations, Cloud related regulatory and compliance issues, Virtual Machines and Security Issues

Laboratory Work: Includes setting up a private cloud and implementing secure data transfer techniques.

Recommended Books

1. Virtual Machines: Versatile Platforms for Systems and Processes, Jim Smith, Ravi Nair, Morgan Kaufmann, 1st Edition, 2005
2. Cloud Computing: Implementation, Management, and Security, John Rittinghouse and James F.Ransome, CRC Press, Reprint 2010.
3. Cloud Computing: Concepts, Technology & Architecture, Thomas Erl, Ricardo Puttini, Zaigham Mahmood Krutz, Ronald and Russell Dean Vines, Prentice Hall, 1st Edition, 2013