**ICT 4017 CLOUD COMPUTING**

**Abstract:**

Fundamentals Of Cloud Computing, Understanding Cloud Architecture And Services, Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), Cloud Security, Business Continuity In Cloud, Cloud Infrastructure, Management And Migration, Hadoop In Cloud Computing

**Syllabus:**

**Fundamentals of Cloud Computing:**

Fundamental concepts of Distributed Systems, IT Chall enges, Technology Foundations of Cloud Computing, What is Cloud Computing? NIST Definition and Overview of Cloud Computing, Journey of the Cloud, Essential Characteristics of Cloud Computing, Cloud Components, Cloud Challenges, Economics of the Cloud **[5 Hours]**

**Understanding Cloud Architecture And Services:**

Cloud Architecture, Service Model and Deployment Model, Stack, Management Layers, Standards, Interoperability, Cloud Maturity, Introducing SOA, Relating SOA and Cloud Computing, Architectural Influences, Services: Storage-as-a-Service, Database-as-a-Service, Information-as-a-Service, Identity-as-a-Service, Process-as-a-Service, Integration-as-a-Service, Compliance-as-a-Service, Security-as-a-Service, Management/Governance-as-a-Service, Testing-as-a-Service **[5 Hours]**

**Infrastructure-As-A-Service (Iaas):**

Virtualization Overview, **Virtualized Data Center (VDC) – Compute**: Why Virtualize, How to Virtualize, Types of Virtualization, Understanding Hypervisors, Virtual Machine and its Components, Resource Management, Share, Limit and Reservation, Optimizing Memory Resource, Memory Ballooning, Virtual Machine Affinity, Physical to Virtual Conversion: Hot and Cold Conversion Process , **Virtualized Data Center (VDC) – Storage**: Benefits, Storage Virtualization at different Layers, Virtual Machine Storage Options and Considerations, Virtual Provisioning, Storage Tiering, **Virtualized Data Center (VDC) – Networking**: BenefitsComponents of VDC network infrastructure, Virtual Network Components, Virtual LAN, VLAN, Trunking, VLAN Tagging, Network Traffic Management, **Virtualized Data Center (VDC) - Desktop and Application**, VMware vSphere **[13 hours]**

**Platform-As-A-Service (Paas)**

PaaS: Overview, Web Application Frameworks, Web Hosting Services- 1: Google App Engine

Web Hosting Services- 2: Microsoft Azure Service [**3 Hours]**

**Software-As-A-Service (Saas)**

SaaS: Overview, Web Services 2.0, REST API, SOAP API, User Authentication, Case Study: Healthcare or Banking **[3 Hours]**

**Cloud Security**

Cloud Security: Information Security, Basic Terminology, Security Domains, Security Concerns and Threats, Access Control and Identity Management in Cloud, Governance, Risk and Compliance, Virtualization Security Management, Cloud Security Risk, Incident Response, Retirement, Cloud Computing Security Architecture, Architectural Consideration, Trusted Cloud Computing, Data Privacy, Testing from SOA to the Clouds **[7 Hours]**

**Business Continuity In Cloud**

Business Continuity in Cloud: Fault Tolerance Mechanisms in VDC, Backup in VDC, Replication and Migration in VDC, Capacity Planning, Vertical Scaling, Private Cloud Planning, Business Continuity Plan, Availability **[4 Hours]**

**Cloud Infrastructure, Management And Migration**

Cloud Infrastructure and Service Creation, Cloud Service Management, Cloud Administration, Cloud Monitoring, Cloud Migration Consideration: Migration Considerations, Phases to Adopt the Cloud **[3 Hours]**

**Hadoop In Cloud Computing**

Overview of Big Data Analytics, Overview of Hadoop and Map Reduce, Example of Map Reduce, Hadoop as a Service in Public Cloud, Hadoop in Private Cloud, HDInsight **[5 Hours]**

**References :**

1. John Rhoton, Cloud Computing Explained, 2nd Edition , Recursive Press, , 2010.
2. Barrie Sosinsky, Cloud Computing: Bible, Wiley India, 2011
3. John W. Rittinghouse and James F. Ransome, Cloud Computing, Implementation, Management and Security, CRC Press, 2010
4. David S. Linthicum, Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide, Addison Wesley, 2009
5. Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, Prentice Hall, 2007
6. George Reese, Cloud Application Architectures, O’Reilly, 2009
7. Mark C. Chu-Carroll, Code in the Cloud: Programming Google App Engine, Pragmatic Programmers, LLC, 2011
8. Roger Jennings, Cloud Computing with the Windows Azure Platform, Wrox, Wiley India, 2010