

CLOUD COMPUTING

VII Semester: IT								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AIT007	Elective	L	T	P	C	CIA	SEE	Total
		3	1	3	4	30	70	100
Contact Classes: 45		Tutorial Classes: 15		Practical Classes: Nil			Total Classes: 60	
<p>COURSE OBJECTIVES: The course should enable the students to:</p> <ol style="list-style-type: none"> I. The fundamentals of cloud Computing, evolution of the paradigm, benefits as well as current and future challenges II. The architecture and various cloud models such as SaaS, IaaS, and PaaS III. The Layers of cloud architecture and differentiate cloud service models IV. The different CPU, memory and I/O virtualization techniques that serve in offering software, computation and storage services on the cloud V. Various security threats in cloud computing and ways to mitigate them VI. The deploy software applications on commercial cloud platforms <p>COURSE OUTCOMES: At the end of the course the students should be able to:</p> <p>CO 1 Outline the concept of cloud computing, its evolution for on demand network access to a shared pool of configurable computing resources over the internet. CO 2: Determine the cloud models with applications.</p> <p>CO 2 Explain distributed and cloud computing system models using Multi-core CPUs and Multithreading Technologies to handle diversified tasks in Network based Systems</p> <p>CO 3 Illustrate the benefits and drawbacks of cloud software environments for distributed systems that help multiple computers to host different software components to accomplish a common goal</p> <p>CO 4 List the cloud security providers and their impact for obtaining power requirements of high performance computing (HPC)/ high density applications</p> <p>CO 5 Outline the architectural design for running applications, storing data, files and performing backups of compute and storage clouds</p> <p>CO 6 Relate the various layers in the cloud building blocks for differentiating cloud service models which satisfy a unique set of industry requirements</p> <p>CO 7 Distinguish various threats and techniques used in cloud security for accurate access control between cloud providers and their customers</p> <p>CO 8 Illustrate the reasons for full virtualization and para virtualization techniques used in CPUs to enhance resource sharing and improve computer performance</p> <p>CO 9 Compare classical OS virtual memory and system memory virtualization for CPU and I/O devices communication and management</p> <p>CO 10 Identify the need for policies, mechanisms and techniques for automation, orchestration of resources and key scheduling in a cloud.</p> <p>CO 11 Explain the fundamental aspects of parallel and distributed programming models for implementing Inter-Process Communication in Cloud and Grid platforms</p> <p>CO 12 Compare Amazon AWS, MS Azure and Google cloud used in programming large clusters of servers that store many terabytes and petabytes of information</p>								

CO 13 Analyze different cloud programming models to obtain solutions for cloud problems such as storage and design to meet exact needs.		
UNIT -I	SYSTEM MODELING, CLUSTERING AND VIRTUALIZATION	Classes: 15
Scalable computing over the Internet, Technologies for network-based systems, System models for distributed and cloud computing, Software environments for distributed systems and clouds Performance, security and energy efficiency		
UNIT -II	VIRTUAL MACHINES AND VIRTUALIZATION OF CLUSTERS AND DATA CENTERS	Classes: 15
Implementation levels of virtualization, Virtualization tools, structures and mechanisms, Virtualization of CPU, Memory and I/O devices, Virtual clusters and resource management, Virtualization for data center automation.		
UNIT -III	CLOUD PLATFORM ARCHITECTURE	Classes: 15
Cloud computing and service models, Architectural design of compute and storage clouds, Public cloud platforms, Inter-cloud resource management. Cloud security and trust management, Service oriented architecture (SOA), Message-oriented middleware.		
UNIT -IV	CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENTS	Classes: 15
Features of Cloud and grid platforms, Parallel and distributed programming paradigms, Programming support of Google App Engine, Programming on Amazon AWS and MS Azure, Emerging cloud software environments.		
UNIT -V	CLOUD RESOURCE MANAGEMENT AND SCHEDULING	Classes: 15
Policies and mechanisms for resource management applications of control theory to task scheduling in a cloud, Stability of a two-level resource allocation architecture, Feedback controls based on dynamic thresholds, Coordination of specialized autonomic performance managers, Resource Bundling		
Text Books:		
<ol style="list-style-type: none"> 1. Cloud computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M.Goscinski,wiley,2011 2. Distributed and Cloud Computing, Kai Hwang, Geofferyu C.Fox, Jack J.dongarra, Elsevier, 2012 3. Distributed and Cloud Computing, Kai Hwang et al, Elsevier. 4. Cloud Computing, Theory and Practice, Dan Marinescu, Elsevier. 5. Cloud Computing, A Hands-On Approach, Arshadeep Bagra and Vijay Madiseti, University Press. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Cloud Computing: A practical approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGrawHill,2011 2. Enterprise Cloud Computing, Gautam Shroff, Cambridge University press,2010 3. Cloud Computing: Implementation, Management and Security, John W. Ritting house, James F.Ransom, CRC press, rp2012 4. Cloud Applications Architectures: Building Applications and Infrastructure in the Cloud, George Reese, O Reilly, SPD, rp2011 5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance,im Mather, Subra Kumaraswamy, Shahed Latif, O Reilly,SPD, rp2011 		