CP456: CLOUD COMPUTING
CREDITS = 5 (L=3, T=0, P=2)

Course Objective:

To learn and deployment of the advance computing architecture models i.e. cluster, grid and Cloud Computing.

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Assessment Scheme				Total Marks
				Theory		Practical		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	5	70	30	30	20	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Cluster Computing architecture, set up and administration**: Ease of Computing, Scalable Parallel Computer Architecture, Towards Low Cost Parallel Computing & Motivation, Windows opportunity, A Cluster, Computer And Its Architecture, Cluster Classification, Commodity Components of Clusters, Network Services and Communication SW, Cluster Middleware and Single Systems Image, Resource management & Scheduling (RMS), Programming environment Tools, Cluster Applications, Representative Cluster Systems, Clusters of SMPS, Setting up the cluster, Security, System Monitoring, System Tuning.	08
2	**Grid Computing:** Beginning of the grid, building blocks of the grid, grid applications and application middleware, future of the grid, Evolution of the Grid: first, second and third generation, Grid context, Grid support for collaboration, Building an initial multisite, computational and data grid, cross site trust management, Transition to a prototype production grid.	08
3	**Introduction to Cloud Computing:** Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks.	05

Unit No.	Topics	Teaching Hours
4	**Cloud Architecture, Services and Applications:** Exploring the Cloud Computing Stack, Connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frameworks, Software as a Service Cloud Deployment Models, Public vs Private Cloud, Cloud Solutions, Cloud ecosystem, Service management, Computing on demand, Identity as a Service, Compliance as a Service, Resource management in cloud.	10
5	**Virtualization:** Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hyper visors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context.	10
6	**Cloud Based Case-Studies:** Open Source cloud Platforms and simulators.	04
	TOTAL	**45**

List of References:

1. Rajkumar Buyya, "*Cloud Computing: Principles and Paradigms",* Wiley India Edition
2. Sosinsky B., *"Cloud Computing Bible*", Wiley India
3. Rajkumar Buyya, C. Vecchiola & S. Thamarai Selvi, *Mastering Cloud Computing,* McGRAW Hill Publication
4. Miller Michael, "*Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online",* Pearson Education India.
5. Rajkumar Buyya, *"High Performance Cluster Computing"*, Volume 1, Architecture and Systems, Pearson Education
6. Berman, Fox and Hey, *"Grid Computing – Making the Global Infrastructure",* A Reality, Wiley India

Course Outcomes (COs):

At the end of this course students will be able to.

1. Understand the cluster architecture.
2. Understand the grid architecture.
3. Identify the architecture, infrastructure and delivery models of cloud computing
4. Understand virtualization concept.
5. Choose the appropriate cloud provider, Programming Models and approaches.
6. Configure cloud Services.