Course Number and Name
BCS 701- Grid and Cloud Computing

Credits and Contact Hours
3 and 45

Course Coordinator's Name
Mr B.Sundarraj

Text Books and References

TEXTBOOKS:

1**.** Joshy Joseph & Craig Fellenstein, "Grid Computing", PHI, PTR-2003(UNIT I)

2.Kai Hwang, Geoffrey C Fox,Jack G Dongarra "Distributed and Cloud Computing ,From parallel processing to the Internet of Things" Morgan Kaufmann Publishers,2012(Unit-II to Unit-V)

REFERENCE BOOKS:

1.John W.Rittinghouse and James F.Ransome, "Cloud Computing Implementation, Management and Security", CRC Press, 2010

2. Toby Velte, Anthony Velte, Robert Elsenpeter,"Cloud Computing, A Practical Approach", TMH, 2009.

3. Kumar Saurabh,"Cloud Computing –Insights into New-Era Infrastructure ", Wiley India, 2011

4. George Reese, "Cloud Applications Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly.

5**.** https://benzology.files.wordpress.com/2013/05/grid-computing-joshy-joseph-ebook.pdf

6. http://cloudipedia.com/files/2009/11/cloud_computing_made_easy.pdf

Course Description

- Identify the technical foundations of cloud systems architectures.
- Analyze the problems and solutions to cloud application problems.
- Apply principles of best practice in cloud application design and management.
- Identify and define technical challenges for cloud applications and assess their importance.

Prerequisites	Co-requisites
Computer Communication and Networks,	NIL

required, elective, or selected elective (as per Table 5-1)
selected elective

Course Outcomes (COs)

CO1: Understand the fundamental principles of distributed computing.

CO2: Understand how the distributed computing environments known as Grids can be built from lower level services.

CO3: Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.

CO4: Analyze the performance of Cloud Computing.

CO5: Understand the concept of Cloud Security.

CO6: Learn the Concept of Cloud Infrastructure Model.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1		H	M	M	M						H
CO2			H					M	M		
CO3	M										
CO4		M	M								H
CO5				M	M						
CO6	M	M	H					M			M

List of Topics Covered

UNIT- I GRID COMPUTING   **9**

Introduction - Definition and Scope of grid computing, Computational and Data Grids, Current Grid Activities – Overview of Grid Business Areas, Grid Applications, Grid Computing Anatomy-Concept of Virtual Organization, Grid Architecture- Fabric layer, Connectivity layer, Resource Layer, Collective Layer, Application Layer, Layered Grid Architecture

UNIT-II CLOUD ARCHITECTURE AND MODEL   **9**

Technologies for Network Based system-System Models for Distributed and Cloud Computing-NIST Cloud Computing Reference ArchitectureCloud models: Characteristics-Cloud Services-Cloud Models (IaaS, PaaS, SaaS)-Public vs. Private Cloud-Cloud Solutions-Cloud ecosystem-Service Management-Computing on demand.

UNIT-III CLOUD INFRASTRUCTURE   **9**

Architectural Design of compute and Storage Clouds-Layered Cloud Architecture Development-Design Challenges-Inter Cloud Resource Management-Resource Provisioning and Platform Deployment-Global Exchange of Cloud Resources.

UNIT-IV PROGRAMMING MODEL   **9**

Parallel and Distributed Programming Paradigms-Map Reduce-Twister and Iterative Map Reduce-Hadoop Library from Apache-Mapping Applications-Programming Support-Google App Engine, Amazon AWS-Cloud Software Environments-Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT-V SECURITY IN THE CLOUD   **9**

Security Overview-Cloud Security Challenges and Risks-Software-as-a-Service-Security Security Governance-Risk Management-Security Monitoring-Security Architecture Design-Data Security-Application Security-Virtual Machine Security-Identity Management and Access Control-Autonomic Security.