C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology and Engineering
DEPARTMENT OF: - Information Technology
SEMESTER: - VIII
CODE: - **4TE08ACO1**
NAME: – **Advanced Computing**

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE08ACO1	**Advanced Computing**	**4**	**0**	**2**	**6**	**5**	**30**	**1.5**	**70**	**3**	**---**	**20**	**30**	**150**

Objectives:

The learning objectives of this course are to:
- Introduce students to Cluster Computing.
- Introduce students to Grid Computing and Cloud Computing.
- Make students understand what Grid and Cloud Computing is.
- Make students understand how Grid Computing and Cloud Computing work.

Prerequisites:
- Basic understanding of Networking, Database etc.
- Basic knowledge about Web applications.

Course outline:

Sr. No.	Course Contents	Total Hrs.
1	**Cluster Computing – Introduction:** Eras of Computing, Scalable Parallel Computer Architecture, Towards LowCost Parallel Computing & Motivation, Windows opportunity, A ClusterComputer And Its Architecture, Cluster Classification, Commodity Components for Clusters, Network Services/Communication SW, Cluster Middleware andSingle Systems Image, Resource management & Scheduling (RMS),Programming environment Tools, Cluster Applications, Representative ClusterSystems, Clusters of SMPS (CLUMPS)	9
2	**Grid Computing - Introduction:**Early Grid Activities, Current Grid Activities, An Overview of Grid Business Areas, Grid Applications, Grid Infrastructure. **Grid Computing Organizations and their Roles:** Organizations Developing Grid Standards and Best Practice Guidelines, Organizations Developing Grid Computing Toolkits and the Framework,	7

	Organizations Building and Using Grid-Based Solutions to Solve Computing, Data, and Network Requirements, Commercial Organizations Building and Using Grid-Based Solutions.	
3	**The Grid Computing Anatomy:** The Grid Problem: The concept of virtual organization, Grid Architecture, Grid Architecture and Relationship to Other Distributed Technologies. **The Grid Computing Road Map,** Autonomic Computing, Business On Demand and Infrastructure Virtualization, Service-Oriented Architecture and Grid, Semantic Grids	6
4	**Merging the Grid Services Architecture with the Web Services Architecture:** Service-Oriented Architecture, Web Service Architecture, XML, Related Technologies, and Their Relevance to Web Services, XML Messages and Enveloping, Service Message Description Mechanisms, Relationship between Web Service and Grid Service, Web Service Interoperability and the Role of the WS-I Organization.	6
5	**Open Grid Services Architecture (OGSA):** Introduction to OGSA, OGSA Architecture and Goal. **Some Sample Use Cases That Drive the OGSA**: Commercial Data C enter (CDC), National Fusion Collaboratory (NFC), Online Media and Entertainment. **The OGSA Platform Components:** Native Platform Services and Transport Mechanisms OGSA Hosting Environment, Core Networking Services Transport and Security, OGSA Infrastructure OGSA Basic Services	7
6	**Cloud Computing:** Defining Cloud Computing, Cloud Types, The NIST model, The Cloud Cube Model, Deployment models, Service models, Examining the Characteristics of Cloud Computing, Paradigm shift, Benefits of cloud computing, Disadvantages of cloud computing, Assessing the Role of Open Standards	5
7	**Assessing the Value Proposition:** Measuring the Cloud's Value,Avoiding Capital Expenditures, Right-sizing, Computing the Total Cost of Ownership, Specifying Service Level Agreements, Defining Licensing Models, **Understanding Cloud Architecture:** Exploring the Cloud Computing Stack, Connecting to the Cloud,	5
8	**Understanding Services and Applications by Type:** Defining Infrastructure as a Service (IaaS), Defining Platform as a Service (PaaS), Defining Software as a Service (SaaS), Defining Identity as a Service (IDaaS), Defining Compliance as a Service (CaaS)	4
9	**Cloud Computing For Everyone:** Cloud Computing for the Family, Cloud Computing for the Community, Cloud Computing for the Corporation,	3
10	**Using Cloud Services**: Collaborating on Calendars, Schedules, and Task Management , Collaborating on Event Management, Collaborating on Contact Management, Collaborating on Project Management, Collaborating on Word Processing, Collaborating on Spreadsheets, Collaborating on Databases, Collaborating on Presentations, Storing and Sharing Files and Other Online Content, Sharing Digital Photographs, Controlling It All with Web-Based Desktops	8
	Total	**60**

Learning Outcomes:

After completing this course:

- Students will understand of Cluster Computing, Grid Computing and Cloud Computing.

- Students will get to know when to use Cluster Computing, Grid Computing and when to use Cloud Computing.
- Students will get to know various Cluster Computing, Grid Computing and Cloud Computing applications.
- Students will get to know how Grid Computing and Cloud Computing work

Books Recommended:

1. **High Performance Cluster Computing**, Volume 1, Architecture and Systems, Rajkumar Buyya, Pearson Education
2. **Grid Computing**, By Joshy Joseph, Craig Fellenstein, *Pearson* Education
3. **Grid Computing : Making the Global Infrastructure a Reality**,FRAN BERMAN, GEOFFREY C. FOX, ANTHONY J.G. HEY , *Wiley India Pvt Ltd*
4. **Cloud Computing Bible,** Barrie Sosinsky,*Willey India Pvt Ltd.*
5. **Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online,** Michael Miller**,** Pearson Education
6. **Cloud Computing for Dummies,** Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper**,** *Willey India Pvt Ltd.*