GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Name: Cluster and Grid Computing (Elective I & II- Group 1)

Subject Code: 3715107

Semester: I

Type of course: M.E. Computer Engineering (IT systems and Network Security)

Prerequisite:

- Knowledge about Server systems
- Understanding about Cluster systems
- Understanding of cloud infrastructure
- Understanding on Network Communication
- Understanding of Linux/Unix

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	PA (V) ESE	PA (I)	
3	2	0	4	70	30	30	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment;

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Early Grid Activities and Models	2	4
2	Grid Application and Grid Infrastructure	2	4
3	Grid Computing Organizations Grid Computing Anatomy	2	4
4	Parallelism, scheduling	2	4
5	Sequential Programming	2	4
6	Parallel Programming Overview, Architecture Taxonomy	2	4
7	Parallel Programming Paradigms	2	4
8	Paradigms for Message passing and Parameter parallel programming	2	4
9	Cluster Computing Models	2	4
10	Grid Service Architecture	2	4
11	Web Services Architecture Open Grid Services Architecture (OGSA)	2	4
12	Sample Use Cases that Drives the OGSA	2	4
13	OGSA Platform Components	2	4
14	Technical Details of OGSI Specification	2	6
15	Grid Service: Naming and Change Management Recommendations	2	6
16	Parallel Programming Model, Anonymous Remote Computing and Communication Model Introduction to the Grid Computing Toolkits	3	6

Reference Books: - Grid and Cluster Computing, Prabhu, Phi Learning

. -Parallel Programming: for Multicore and Cluster Systems by Thomas Rauber, Gudula Ra1/4nger, Gudula Ranger, and Springer

Course Outcome:

After learning the course the students should be able to:

- Understand the workings or Cluster and Cloud.
- Understanding of Big Data.
- Understanding to troubleshoot the critical Servers
- Able to work for High Performance Computing development

List of Experiments: (with Open Ended Problems)

- Creating the small 3 node cluster
- Creating the private cloud
- Develop a High availability Cluster
- Develop a High Performance Computing Cluster
- Develop a failover Cluster
- Develop a load balancing cluster

Major Equipment:

- Linux
- VMWare
- Hypervisor
- Switches

List of Open Source Software/learning website:

- OpenStack
- Pirana
- Dijekstra