GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Name: Distributed Computing

Subject Code: 3715105
Semester: I

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

Prerequisite:

- Knowledge of C Programing
- 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	Characterization of Distributed Systems	2	4
2	Resource sharing and the web	2	4
3	Challenges arising from the construction of distributed systems,	2	4
4	System Models	2	4
5	Networking and Internetworking	2	4
6	Inter process Communication, The API for the internet protocols	2	4
7	External data representation and marshalling	2	4
8	Client-server communication Group communication	2	4
9	Distributed Objects and Remote Invocation	2	4
10	Operating System Support,, Protection, Processes and threads	2	4
11	The operating System layer, Protection, Communication and invocation	2	4
12	Operating system architecture Time and Global States	2	4
13	Clocks, events and process states	2	4
14	Synchronizing physical clocks, Logical time and logical clocks	2	6
15	Global states, Distributed Debugging	2	6
16	Case studies: Ethernet, WiFi, Bluetooth and ATM Case study: inter process communication	3	6

Reference Books: - Elements Of Distributed Computing,By Garg, John Wiley & Sons (sea) P Ltd (wie)

-Distributed Computing by Sunita Mahajan, Seema Shah, Paperback

Course Outcome:

After learning the course the students should be able to:

- Understand the workings or Cluster and Cloud.
- Write the MPI programs for Clusters
- 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