

GUJARAT TECHNOLOGICAL UNIVERSITY

SUBJECT NAME: Parallel Processing

SUBJECT CODE: 3715308

Semester I

Type of course: NA

Prerequisite: NA

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE(E)	PA (M)	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	Introduction to Parallel Architectures, Why Parallel Architectures, Diversity and Convergence of Parallel Architectures	6	10
2	Fundamental Design Issues, Parallel Programming and Workload-Driven Evaluation The Parallelization Process, Workload-Driven Evaluation, Cache Coherent Bus-Based	6	10
3	Multiprocessors Cache Coherence and Bus Snooping, Design Space for Snooping Protocols, Single- Level	6	10
4	Caches with an Atomic Bus , Multilevel Cache Hierarchies , Split-Transaction, Bus Design, Memory Consistency Sequential Consistency, Relaxed memory consistency models, Synchronization Mutual Exclusion, Event, and Barrier Synchronization, Algorithms for locks and Barriers Directory-Based Cache Coherent Multiprocessors	6	15
5	Directory-Based Approaches, Memory-Based Directory Protocols, Cache-Based Directory Protocols, Hierarchical Coherence, Vector Processors Vector Programming Model, Vector Instruction Set and its advantages, Vector Arithmetic Execution, Vector Memory System	6	15
6	Interconnection Networks, Organizational Structure, Topologies, Routing, Switch Design, Flow Control, Communication Performance	5	10

Text Book:

1. Fundamentals of Parallel Processing by Jordan Harry, Alagband Gita/PHI Learning

Reference Books:

1. Introduction to Parallel Processing by Prakash P. Ravi/PHI learning
2. Fundamentals of Parallel Processing by Jordan/Pearson

Course Outcome:

- To develop structural intuition of how the hardware and the software work, starting from simple systems to complex shared resource architectures;
- To provide guidelines about how to write and document a software package;
- To familiarize the audience with the main parallel programming techniques and the common software packages/libraries.