

GUJARAT TECHNOLOGICAL UNIVERSITY

Parallel Processing SUBJECT CODE: 3716101

Type of course: Elective

Prerequisite: NA

Rationale:

Teaching and Examination Scheme:

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

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Overview of Parallel Processing and Pipelining, Performance analysis, Scalability		
2	Principles and implementation of Pipelining, Classification of pipelining processors, Advanced pipelining techniques, Software pipelining		
3	VLIW processors: Case study: Superscalar Architecture- Pentium, Intel Itanium Processor, Ultra SPARC MIPS on FPGA, Vector and Array Processor, FFT Multiprocessor Architecture		
4	Multithreaded Architecture, Multithreaded processors, Latency hiding techniques, Principles of multithreading, Issues and solutions		
5	Parallel Programming Techniques: Message passing program development, Synchronous and asynchronous message passing, Shared Memory Programming, Data Parallel Programming, Parallel Software Issues		
6	Operating systems for multiprocessors systems Customizing applications on parallel processing platforms		

Reference Books:

1. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing", MGH International Edition
2. Kai Hwang, "Advanced Computer Architecture", TMH
3. V. Rajaraman, L. Sivaram Murthy, "Parallel Computers", PHI.
4. William Stallings, "Computer Organization and Architecture, Designing for performance" Prentice Hall, Sixth edition
5. Kai Hwang, Zhiwei Xu, "Scalable Parallel Computing", MG

6. David Harris and Sarah Harris, “Digital Design and Computer Architecture”, Morgan Kaufmann

Course Outcome:

After learning the course the students should be able to:

1. Identify limitations of different architectures of computer.
2. Analysis quantitatively the performance parameters for different architectures
3. Investigate issues related to compilers and instruction set based on type of architectures