3/4 B.Tech - SECOND SEMESTER

IT6T5FE4 ADVANCED COMPUTER SYSTEM ARCHITECTURE Credits:3
Lecture: 3 Periods/week Internal assessment: 30 marks
Practice/Interaction: 1Period/week Semester end examination: 70 marks

Objectives:

- To focus on design aspects of the processor and pipe lining
- To Introduce the concepts of super scalar and memory hierarchies
- To Demonstrate simulation techniques

Outcomes:

Students will be able to

- Understand the classes of computers, and new trends and developments in computer architecture
- Understand the concepts of pipelining, instruction set architectures, memory addressing.
- Understand the performance metrics of microprocessors, memory, Networks, and disks
- Understand the various techniques to enhance a processors ability to exploit Instruction-level parallelism (ILP), and its challenges.

Pre requisite:

Computer System Architecture

Syllabus:

UNIT-I

Introduction to Parallel Processing: Parallel Computer Structures, Architectural Classification Parallel Processing Applications.

UNIT-II

Memory and I/O sub-systems: Hierarchical Memory Structures, Cache Memories and Management, I/O sub-systems

UNIT-III

Principles of Pipelining and Vector Processing: Pipelining, Instruction and Arithmetic Pipelines, Principles of designing pipelined processors,

UNIT-IV

Structures and Algorithms of Array Processors (SIMD Computers): SIMD Array Processors, SIMD Interconnection networks, Parallel Algorithms for Array Processors Algorithm examples – matrix multiplication.

UNIT-V

Multiprocessor Architecture and Programming: Functional Structures, Interconnection Networks, Multi Processor Operating Systems.

Text Book:

1. Kai Hwang and F. A. Briggs, Computer Architecture and Parallel Processing, Tata McGraw Hills

Reference Books:

1. Hennessy Patterson, Computer Architecture, A quantitative Approach , 5th Edition, Elsevier.
2. Dongarra, Foster, Fox & others, Source Book of parallel Computing, Elsevier.
3. M.J Quinn, Designing Efficient Algorithms for Parallel Computers, McGrawHil

e-Learning Resources:

1. http://onlinevideolecture.com/?course_id=1309
2. http://nptel.ac.in/video.php?subjectId=106102062