CO	PO						PSO		
	1	2	3	4	5	6	1	2	3
1.			√	√		√	√		
2.		√		√		√	√		
3.	√		√	√		√	√		
4.	√		√	√		√	√	√	√
5.	√		√	√		√	√	√	√

CP5152 **MULTICORE ARCHITECTURES** **L T P C**
3 0 0 3

OBJECTIVES:

- To introduce the students to the recent trends in the field of Computer Architecture and identify performance related parameters.
- To understand the different multiprocessor issues.
- To expose the different types of multicore architectures.
- To understand the design of the memory hierarchy.
- To understand how the various forms of parallelism are exploited by the architecture.

UNIT I FUNDAMENTALS OF COMPUTER DESIGN AND ILP **9**

Fundamentals of Computer Design – Measuring and Reporting Performance – Instruction Level Parallelism and its Exploitation – Concepts and Challenges – Limitations of ILP – Multithreading – SMT and CMP Architectures – The Multicore era.

UNIT II MEMORY HIERARCHY DESIGN **9**

Introduction – Optimizations of Cache Performance – Memory Technology and Optimizations – Protection: Virtual Memory and Virtual Machines – Design of Memory Hierarchies – Case Studies.

UNIT III MULTIPROCESSOR ISSUES **9**

Symmetric and Distributed Shared Memory Architectures – Cache Coherence Issues – Performance Issues – Synchronization Issues – Models of Memory Consistency – Interconnection Networks – Buses, Crossbar and Multi-stage Interconnection Networks.

UNIT IV MULTICORE ARCHITECTURES **9**

Homogeneous and Heterogeneous Multi-core Architectures – Intel Multicore Architectures – SUN CMP architecture – IBM Cell Architecture. Introduction to Warehouse-Scale computers, Cloud Computing – Architectures and Issues – Case Studies.

UNIT V VECTOR, SIMD AND GPU ARCHITECTURES **9**

Vector Architecture – SIMD Extensions for Multimedia – Graphics Processing Units – Case Studies – GPGPU Computing – Detecting and Enhancing Loop Level Parallelism – Introduction to Domain Specific Architectures.

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of the course, the student will be able to

- Identify the limitations of ILP and the need for multicore architectures.
- Discuss the issues related to multiprocessing and suggest solutions.
- Point out the salient features of different multicore architectures and how they exploit parallelism.
- Point out the various optimizations that can be performed to improve the memory hierarchy design.
- Point out the salient features of vector, GPU and domain specific architectures.

REFERENCES:

1. John L. Hennessey and David A. Patterson, "Computer Architecture – A Quantitative Approach", Morgan Kaufmann / Elsevier, 5th edition, 2012.
2. Darryl Gove, "Multicore Application Programming: For Windows, Linux, and Oracle Solaris", Pearson, 2011.
3. David B. Kirk, Wen-mei W. Hwu, "Programming Massively Parallel Processors", Morgan Kauffman, 2010.
4. Wen–mei W.Hwu,"GPU Computing Gems", Morgan Kaufmann / Elsevier, 2011.

CO	PO						PSO		
	1	2	3	4	5	6	1	2	3
1.	√			√		√	√	√	√
2.	√		√	√		√		√	√
3.	√			√			√	√	√
4.	√			√			√	√	√
5.	√			√		√	√	√	

CP5153 NETWORKING TECHNOLOGIES L T P C
3 0 0 3

OBJECTIVES:

- To learn about integrated and differentiated services architectures.
- To understand the working of wireless network protocols.
- To study the developments in cellular networks.
- To get familiarized with next generation networks.
- To know the concepts behind software defined networks.

UNIT I NETWORK ARCHITECTURE AND QoS 9

Overview of TCP/IP Network Architecture – Integrated Services Architecture – Approach – Components – Services – Queuing Discipline – FQ – PS – BRFQ – GPS – WFQ – Random Early Detection – Differentiated Services.