ADVANCED COMPUTER ARCHITECTURE

Course Code		**Year**	II	**Semester**	II
Course Category	**Honors**	**Branch**	CSE	**Course Type**	Theory
Credits	4	**L-T-P**	4-0-0	**Prerequisites**	-
Continuous Internal Evaluation :	30	**Semester End Evaluation:**	70	**Total Marks:**	100

COURSE OUTCOMES		
Upon successful completion of the course, Student will be able to		
CO1	Understand Technological Trends in Computer Architecture	**L2**
CO2	Apply organizational enhancements to the processor for improving performance.	**L3**
CO3	Apply Reduced instruction set architecture to optimize pipelining and to enhance instruction level parallelism.	**L3**
CO4	Analyze parallel processing capabilities of a system.	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1														
CO2	3								2	2				3
CO3	3								2	2				3
CO4		3							2	2				3

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Processor Structure and Function:** Processor Organization, Register Organization, The Instruction Cycle, Instruction Pipelining.	**CO1, CO2**
II	**Reduced Instruction Set Computers (RISCs):** Instruction Execution Characteristics, The Use of a Large Register File, Compiler-Based Register Optimization, Reduced Instruction Set Architecture, RISC pipelining.	**CO1, CO3**
III	**Instruction-Level Parallelism and Superscalar Processors:** Overview, Design Issues , Pentium 4, ARM Cortex-A8.	**CO1, CO3**
IV	**Parallel Processing:** The Use of Multiple Processors, Symmetric Multiprocessors, Cache Coherence and the MESI Protocol, Multithreading and Chip Multiprocessors, Clusters, Nonuniform Memory Access Computers.	**CO1, CO4**
V	**Multicore Computers:** Hardware Performance Issues, Software Performance Issues, Multicore Organization, Intel x86 Multicore Organization.ARM11 MPCore.	**CO1, CO4**

Learning Resources
Text Books
1. "Computer Organization and Architecture- Design for performance", William Stallings, Pearson Education, Eighth Edition, 2013.
References
1. "Computer Architecture - A Quantitative Approach", John L. Hennessy and David A. Patterson, Morgan Kaufmann/Elsevier, Fifth edition, 2012. **2.** "Advanced Computer Architecture", Kai Hwang, Tata McGraw-Hill Education, Second Edition, 2013.
e- Resources & other digital material
1. https://nptel.ac.in/courses/106103206 2. https://nptel.ac.in/courses/106102229