

**B.P. PODDAR INSTITUTE OF MANAGEMENT AND TECHNOLOGY**

Academic Year -2024–25 (Even Semester)

LESSON PLAN**Program: Computer Science and Engineering****Credit: 3****Contact: 3L****Paper : Computer Architecture****Paper Code: PCC-CS402**

L.NO	Topics Covered	Books	Teaching Aids	Teaching Methodology
L1	Introduction to Computer Architecture – Overview	T1, R1	Green board	Lecturing
L2	Quantitative Techniques in Design	T3	Green board	Lecturing
L3	Measuring and Reporting Performance	T4	PPT	Lecturing
L4	Basics of Pipelining	T4	Green board	Lecturing
L5	Instruction Pipeline	T4	Green board	Lecturing
L6	Arithmetic Pipeline	T4	Green board	Lecturing
L7	Pipeline Hazards – Data Hazards	T2	PPT	Lecturing
L8	Pipeline Hazards – Control & Structural Hazards	T4	Green board	Lecturing
L9	Exception Handling in Pipelines	T4	Green board	Lecturing
L10	Optimization Techniques in Pipelines	T4	Green board	Lecturing
L11	Compiler Techniques for Pipeline Optimization	T4	PPT	Lecturing
L12	Revision of Pipelining	T4	Green board	Interactive Session
L13	Introduction to Memory Hierarchy	T4	Green board	Lecturing
L14	Inclusion, Coherence, and Locality Principles	T4	PPT	Lecturing
L15	Cache Memory Organization	T4	Green board	Lecturing
L16	Cache Misses & Reduction Techniques	T4	Green board	Lecturing
L17	Virtual Memory – Concepts and Mapping	T4	Green board	Lecturing
L18	Memory Replacement Policies	T4	Green board	Lecturing
L19	Paging, Segmentation Basics	T4	PPT	Lecturing
L20	Hierarchical Memory Design – Summary	T4	Green board	Recap
L21	Introduction to Instruction-Level Parallelism (ILP)	T4	PPT	Lecturing

L22	Superscalar Architectures	T4	Green board	Lecturing
L23	Super-Pipelined Architectures	T4	PPT	Lecturing
L24	Very Long Instruction Word (VLIW) Processors	T4	Green board	Lecturing
L25	Vector Processors	T3	PPT	Lecturing
L26	Array Processors	T3	PPT	Lecturing
L27	ILP Techniques – Summary	T4	Green board	Interactive
L28	Multiprocessor Architecture: Overview	T4	PPT	Lecturing
L29	Taxonomy of Parallel Architectures	T4	PPT	Lecturing
L30	Centralized Shared Memory Architecture	T4	PPT	Lecturing
L31	Synchronization and Memory Consistency	T4	Green board	Lecturing
L32	Interconnection Networks	T4	PPT	Lecturing
L33	Distributed Shared Memory Architecture	T4	Green board	Lecturing
L34	Cluster Computers	T4	Green board	Lecturing
L35	Non-von Neumann Architectures – Introduction	T4	Green board	Lecturing
L36	Dataflow Architectures	T4	Green board	Lecturing
L37	Systolic Architectures	T4	PPT	Lecturing
L38	Reduction Computers	T4	Green board	Lecturing
L39	Full Syllabus Recap and MCQs	T4,R1	Green board	Interactive Q&A
L40	Mock Test and Discussion	T4,R1	Green board	Problem Solving

Text Books

T1: V. Carl, G. Zvonko, and S.G. Zaky, *Computer Organization*, McGraw Hill

T2: Barry Brey, C.R. Sarma, *The Intel Microprocessors*, Pearson

T3: J.L. Hennessy and D.A. Patterson, *Computer Architecture – A Quantitative Approach*, Morgan Kaufmann

T4: W. Stallings, *Computer Organization*, PHI

Reference Books

R1: Rajaraman, *Computer Organization & Architecture*, PHI

R2: B. Ram, *Computer Organization & Architecture*, New Age

R3: Y.C. Lieu and G.A. Gibson, *Microcomputer Systems: The 8086/8088 Family*, PHI

R4: J. Uffenbeck, *The 8086/8088 Design, Programming, Interfacing*, PHI

R5: P. Barry and P. Crowley, *Modern Embedded Computing*, Morgan Kaufmann

Web References:

W1: NPTEL. Computer Architecture.

<https://nptel.ac.in/courses/106102062>

W2: GeeksforGeeks. Computer Organization and Architecture Tutorials

<https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials>

W3: Tutorialspoint. Advanced Computer Architecture

https://www.tutorialspoint.com/advanced_computer_architecture/index.htm

Course Faculty