

Credit Hours: 3

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Designation: Assistant Professor

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1. COURSE OUTLINE:

The computer lies at the heart of computing. All students of computing should acquire some understanding and appreciation of a computer system's functional components, their characteristics, their performance, and their interactions. It is important to understand Computer Architecture in order to structure a program so that it runs efficiently on a real machine. This course will cover the basic concepts of Computer Architecture that are important for you to understand, including the CPU control and data path, memory systems including caching and virtual memory, and input/output subsystems. It covers topics such as instruction set design, hardware and software methods for exploiting parallelism, input/output systems and multiprocessor concepts.

2. Weekly Course Outline

Week	Contents
01	Introduction and Overview
02	Computer Evolution and Performance
03	Instruction Set Architecture
04	Pipelining and Overview
05	Memory Hierarchy
06	Input/Output
07	Operating System Support
08	Computer Arithmetics
Midterm Examination	
09	Computer Arithmetics
10	CPU Structure and Functions
11	Reduced Instruction Set Computers
12	Instruction Level Parallelism
13	Super Scalar Architecture and Processors
14	The Control Unit Operations
15	Introduction to Parallel architecture and multithreading
16	Course Revision
Final Examination	

3. CLASS LEARNING OUTCOMES (CLOs) and its Mapping with Program Learning Outcome (PLOs)

At the end of the course, the students will be able to:

CLO #	CLO	Cognitive Domain	PLOs
CLO-1	Describe the computer organization and architecture concepts that are taught in course theory.	C2 (Comprehension)	PLO1 (Engineering Knowledge)
CLO-2	Describe standard bottlenecks in computer architecture design (e.g. control, data and structural hazards, exceptions etc)	C2 (Comprehension)	PLO1 (Engineering Knowledge)
CLO-3	Analyze various techniques (boolean algorithm, signed arithmetics techniques etc) compare them and select an optimal solution for a given problem.	C4 (Analysis)	PLO3 (Design/Development of Solutions)

4. MAPPING OF CLOs WITH COURSE ASSESSMENT TOOLS

Course Assessment Tools	CLOs		
	CLO 1	CLO 2	CLO 3
Assignments	✓	✓	
Quizzes		✓	
Midterm Exam	✓		✓
Final Exam		✓	✓

5. Assessment:

- Midterm examination = 20%
- Finalterm examination = 50%
- Sessional = 30%

6. RESOURCES

- Computer Organization and Architecture: Designing for Performance, 8th Edition, Prentice Hall by William Stallings.
- Computer Architecture: A Quantitative Approach, 5th Edition, Fourth Edition, Morgan Kaufman by John L. Hennessy and David A. Patterson.