ARSD College, University of Delhi

Lesson Plan

Course Name: Computer System Architecture **B.Sc. (Hons.) Computer Science (Practical)**						
Semester	**Course Code**	**Course Title**	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**	**Credit (C)**
I	32341102	DSC- 2 Computer System Architecture	3 Credit-3	0	1 Credit-1	4
Teacher/Instructor(s)		Ms. Uma Ojha				
Session		2022-2023				

Course Objective:

This course introduces the students to the fundamental concepts of digital computer organization, design and architecture. It aims to develop a basic understanding of the building blocks of the computer system and highlights how these blocks are organized together to architect a digital computer system.

Course Learning Outcomes:

On successful completion of the course, students will be able to:

1. Design Combinational Circuits using basic building blocks. Simplify these circuits using Boolean algebra and Karnaugh maps. Differentiate between combinational circuits and sequential circuits.
2. Represent data in binary form, convert numeric data between different number systems and perform arithmetic operations in binary.
3. Determine various stages of instruction cycle and describe interrupts and their handling.
4. Explain how CPU communicates with memory and I/O devices.
5. Simulate the design of a basic computer using a software tool

List of Experiments:

Details of the Lab Course		
Session	**Name of Experiment**	**Contact Hours**
1	Create a machine based on the following architecture: Refer to Chapter-5 of Morris Mano for description of instructions. Design the register set, memory and the instruction set.	2
2	Create a Fetch routine of the instruction cycle.	4
3	a. Write an assembly program to simulate ADD operation on two user-entered numbers. b. Write an assembly program to simulate SUBTRACT operation on two user-entered numbers.	4
4	Write an assembly program to simulate the following logical operations on two user- entered numbers. a. AND b. OR c. NOT d. XOR e. NOR f. NAND	2
5	Write an assembly program to simulate MULTIPLY operation on two user-entered numbers.	2
6	Write an assembly program for simulating following memory-reference instructions. a. ADD b. LDA c. STA d. BUN e. ISZ	2
7	Write an assembly language program to simulate the machine for following register reference instructions and determine the contents of AC, E, PC, AR and IR registers in decimal after the execution: a. CLA b. CMA c. CME d. HLT	2
8	Write an assembly language program to simulate the machine for following register reference instructions and determine the contents of AC, E, PC, AR and IR registers in decimal after the execution: a. INC b. SPA c. SNA d. SZE	2

9	Write an assembly language program to simulate the machine for following register reference instructions and determine the contents of AC, E, PC, AR and IR registers in decimal after the execution: a. CIR b. CIL	2
10	Write an assembly program that reads in integers and adds them together; until a negative non-zero number is read in. Then it outputs the sum (not including the last number).	2
11	Write an assembly program that reads in integers and adds them together; until zero is read in. Then it outputs the sum.	2
	Total	26

Evaluation Scheme:

No.	Component	Duration	Marks
1.	End Semester Examination	2 Hours	40

Suggested Books:

S. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1.	Mano, M. Computer System Architecture. 3rd edition. Pearson Education.	1992
2.	David A. Patterson and John L. Hennessy. "Computer Organization and Design : The Hardware/Software interface", 5th edition, Elsevier	2012
3.	Mano, M. Digital Design. Pearson Education Asia.	1995
4.	Stallings, W. Computer Organization and Architecture Designing for Performance 8th edition. Prentice Hall of India.	2010
5.	Null, L., & Lobur, J. The Essentials of Computer Organization and Architecture. 5th edition. (Reprint) Jones and Bartlett Learning.	2018

Mode of Evaluation:	End Semester Exam