CS-13: COMPUTER ORGANIZATION AND ARCHITECTURE

Objectives:

- Understand how logic circuits and boolean algebra forms as the basics of digital computer.
- Demonstrate the building up of Sequential and Combinational logic from basic gates

Prerequisites:

- General Knowledge of Computer

Unit No.	Topic	Detail
1	**Digital Logic Circuits**	• **Logic Gates** ▪ AND,OR,NOT,NAND,NOR,XOR, Exclusive NOR gates • **Boolean Algebra** ▪ Boolean algebra? ▪ Boolean variable and Boolean function (Analog and Digital Signals) ▪ Truth table ▪ Postulates ▪ Theorem related to postulates ▪ Simplified Boolean function using postulates and draw logical diagram of simplified function ▪ Simplified Boolean function using Karnaugh map method with DON'T CARE condition • **Sequential And Combinational Circuits** ▪ Clock pulses ▪ Combinational circuit, sequential circuit and adder • **Flip Flops** ▪ SR, Clocked SR, D, JK, JK – Master Slave, T • **Universal Gate**
2	**Central Processing Unit**	• Introduction Of CPU • Major component of CPU • General Register Organization ▪ control word ▪ Accumulator Register • **Stack Organization** ▪ Register stack ▪ Memory stack ▪ Polish notation and reverse polish notation

		• **Arithmetic And Logic Unit** ▪ Block diagram of ALU • **Interrupts**
3	**Input-Output Organization**	• Memory buses • Block diagram and function • Data Bus, Address Bus and Control lines • Input Output Buses • Concept of input output interface • Input Out Processor (IOP) • Direct Memory Access • DMA controller

Student seminar - 5 Lectures
Expert Talk - 5 Lectures
Students Test - 5 Lectures
Total Lectures 60 + 15 = 75

Reference Books:

1. Computer System Architecture – By Morris Mano (PHI).
2. Digital Logic And Computer Design – By Morris Mano.
3. Digital Computer Electronics – By Malvino And Leach.

Course Outcome:

- Able to Understand logic circuits and boolean algebra forms as the basics of digital computer.
- Able to Explore the building up of Sequential and Combinational logic from basic gates
- Able to explore digital components
- Able to Understand data representation

Hands On (Not to be asked in examination):

- Instruction Formats - Simulator Base Program

Additional Topics to be taught during the semester-2 (Not to be asked in examination):

Following tools should be used to train students.

- Simulator 8051
- Using Trainer kit