# CS 204: COMPUTER ORGANIZATION & ARCHITECTURE (3-1-2: 5)

**Overview:** Block diagram of a computer system, Instruction execution model.

**Processor Organization:**

Instruction set architecture- types, formats, addressing modes; Register set; Assembly language programming.
Data path organization, Control unit design - Hardwired control, Microprogramming.
CISC and RISC architecture, Instruction pipelining.

**Arithmetic and Logic unit:**

Computer arithmetic- Review of addition and subtraction; Multiplication- Booth's, Array; Division- Restoring and non-restoring; Floating point arithmetic.

**Memory Organization:**

Interfacing of memory with processor, Memory hierarchy, Multiple-module memory, Cache memory, Virtual memory.

**Input/output Organization:**

Synchronization of data transfer- strobed and handshaking;
I/O mapping and control- Program controlled, Interrupt driven, DMA, Interrupt and DMA mechanisms.

**Suggested Laboratory Experiments:**

1. Designing Registers and Counters on a simulator.
2. Designing Adder, Multiplier, ALU on a simulator.
3. Designing memory unit on a simulator.
4. Designing CPU on a simulator.
5. Writing machine code on a µP 8086 kit.
6. Writing assembly language code on a µP 8086 emulator.

**Text Book:**

1. Hamacher, Vranesic, and Zaky, Computer Organization, McGraw Hill.
2. Mano M.M., Computer System Architecture, PHI (EEE).

**References:**

1. Mano M.M., Computer System Architecture, PHI (EEE).
2. Stallings, Computer Organization and Architecture, PHI (EEE).
3. . Hamacher, Vranesic, and Zaky, Computer Organization, McGraw Hill.