

RAMAKRISHNA MISSION VIDYAMANDIRA
NEP Syllabus B.Sc. Computer Science

Semester-III

Course Code: 3CMSMJC2
Course Type: Major Course

Course Outcome:

- i) Identify different input output devices and the control circuit.
- ii) Able to understand the design and implementation of ALU.
- iii) Understanding the working of computer memory.
- iv) Developing concepts of computer hardware.
- v) Ability to develop skill on writing computer programs.
- vi) Ability to write program with structured programming approach

3CMSMJC2: Computer Organization and Microprocessor

Credit: 3

Marks: 75

Basic Computer Organization: Von Neumann vs Harvard architecture, Dataflow vs Control flow architecture. Register organization, arithmetic: fixed and floating point; micro-operations, stack organization, Instruction formats, addressing modes, RISC, CISC architectures, pipelining and parallel architecture. [8 L]

Control Unit: Hardwired Control vs Microprogrammed Control (Basic Concept), Horizontal vs Vertical Microinstruction. [2 L]

Memory: Hierarchy, Register Organizations; Cache: Write Policies, Mapping, Miss Techniques; SRAM, DRAM, EPROM, Associative memory, Disk accessing strategy. [6 L]

Bus and Interconnection: D/A and A/D converter, Tri State Devices, Bus Arbitration, Standard Bus Protocols (only basic idea): SCSI, PCI, USB. [3 L]

Input-Output: Programmed (Memory mapped & IO mapped), Interrupted (Single line, Multiline & Vectored), DMA. [3 L]

Microprocessor case study:

8085 Microprocessor: Hardware and Programming Model, Address and data bus DEMultiplexing, Status Signals and the control signals. Instruction format, Instruction set of 8085 microprocessor, Timing diagram, 8085 Assembly Language Programming, Interrupts. [12 L]

8086 Microprocessor: Basic Architecture, Addressing Modes, 8085 Assembly Language Programming, Minimum and Maximum modes of operations. Register Support for virtual Memory. [10 L]

3CMSMJJC2 (Practical): Computer Organization and Microprocessor Lab.

Credit: 1

Marks: 25

Experiment with 8085 based microcomputing kits: Data movement between register – register, register-memory, memory-memory, Arithmetic and logic operations, Jump and Branch instructions, sorting searching, block transfer.

Experiment with 8086 based microcomputing kits or Simulator: Data movement between register – register, register-memory, memory-memory, Arithmetic and logic operations, Jump and Branch instructions, sorting searching, block transfer.

Recommended Books:

1. Computer Organization and Architecture by William Stallings, 9th Edition, Pearson.
2. Computer Architecture and Organizations by J. P. Hayes 3rd Edition, McGraw Hill Education (India) Private Limited.
3. Computer Organization by Zvonko Vranesic , Safwat Zaky , Carl Hamacher, 5th Edition McGraw Hill Education (India) Private Limited.
4. Computer System Architecture 3rd Edition by M. Morris Mano, Pearson Education.
5. Microprocessor Architecture, Programming and Applications with the 8085 by Gaonkar, 6th Edition, Penram.
6. Fundamentals of Microprocessors and Microcontrollers by B. Ram, Dhanpat Rai & Co. (Pvt.) Ltd.