

Course Code: MCA 107 L T C
Paper: Computer Organization 3 1 4
INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks including subparts, if any.

OBJECTIVE: *The main objective of the syllabus is to make students understand the relevance Computer Organization in the software oriented course. It aims at introducing basic digital concepts and then use them to explain details of computer organization.*

PRE-REQUISITE:
Basics of Digital Electronics, Internal Components of the CPU
Pre-requisite based study material on Computer Organization URL: http://bvicam.in/spec-subject-files/Computer%20Organization%20
MOOC Course on Computer Architecture https://www.mooc-list.com/course/computer-architecture-coursera

1.	Computer Organization (MCA 107)	CO1	Design and demonstrate various binary digital circuits like adder, incrementer, flip-flop, etc. and understand RTL & micro-operations. (BTL 3&6)
		CO2	Understand and design the basic organizational and architectural issues of a digital computer. (BTL 2&6)
		CO3	Understand the basic concepts of parallel processing, pipelining and I/O organization. (BTL 2)
		CO4	Illustrate various memory organization and multiprocessor communication techniques. (BTL 3&4)

UNIT - I

Introduction and overview: Multiplexers, Demultiplexers, Decoders, Adders, Flip-flops : S-R, JK, D, T, Master Slave and Edge triggered, Registers, shift registers, Bi-direction shift registers.

Register Transfer and Microoperation: Register transfer language, register transfer, bus and memory transfer, arithmetic microoperations, logic

microoperations, shift microoperations. [No. of Hrs: 12]

UNIT - II

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing & control, instruction cycle, memory reference instructions, input-output and interrupts, design of basic computer, design of accumulator logic.

Microprogrammed Control Unit: Control memory, address sequencing.

Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes.

[No. of Hrs: 11]

UNIT - III

Pipeline and Vector processing: Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, Array Processors.

Input-Output Organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, direct memory access, input-output processor. [No. of Hrs: 10]

UNIT - IV

Memory organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.

Multiprocessors: Characteristics of multiprocessor, Interconnection Structure, Interprocessor Communication & Synchronization.

[No. of Hrs: 09]

TEXT BOOKS:

1. Mano M, "Computer System and Architecture", Pearson, 3rd Ed., 2009
2. Stallings W, "Computer Organization & Architecture", PHI, 8th Ed., 2010.

REFERENCES:

1. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill, 1993.
2. Hayes, J. P. "Computer Architecture and Organization", McGraw Hill, 1998.
3. Andrew S. Tanenbaum, "Structured Computer Organization", PHI, 5th Ed., 2006.
4. P. V. S Rao, "Computer System Architecture", PHI, 5th Ed., 2009.
5. Anthony J. Dos Reis, "Assembly Language and Computer Architecture using C++ and Java", C engage Learning, 2004.

PRACTICAL

Course Code: MCA-155
Paper: Computer Organization Lab

L P C
0 4 2

LEARNING OBJECTIVE:

In this subject, Students will be able to design various Circuits using Digital Kit, Logism simulator and also learn troubleshooting of Circuits.

COURSE OUTCOME (CO):

After completion of the Practical Course, the learners will be able to:-

1.	Computer Organization Lab (MCA 155)	CO1	Work with digital kit and Logism simulator. (BTL 6)
		CO2	Implement complex combinational and sequential circuits using both digital kit and Logism simulator. (BTL 3)
		CO3	Troubleshoot complex circuits using both digital kit and Logism simulator.
		CO4	Implement arithmetic, shift and logic microoperations using digital kit/simulator. (BTL 3)
		CO5	Translate digital logic aspects into real world circuits like Traffic Light simulator and LED lights. (BTL 2)