



MCA (Master of Computer Applications)
MCA (Master of Computer Applications) Semester I

Course Code	PS01CMCA55	Title of the Course	COMPUTER FUNDAMENTALS
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none">1. To provide basic understanding of logical organization and architecture of a computer.2. To introduce fundamental concepts related to gates and logic circuits used in a digital computer.3. To impart fundamental knowledge on various data structures.
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Course Content		
Unit	Description	Weightage* (%)
1.	Introduction and Processor Organization <ul style="list-style-type: none">- Block diagram of a simple computer and its different functional units- Representation of information: integer & floating-point number representation, character codes- Error detection and correction codes- CPU organization- Instruction execution- Instruction-level parallelism: pipelining, superscalar architectures- Processor-level parallelism: array processors, multiprocessors, multicomputers- Microprocessor chips, Architecture of a typical microprocessor- RISC Vs. CISC	25
2.	Memory, Input/Output, Instruction Formats and Flow of Control <ul style="list-style-type: none">- Memory: main memory, secondary memory, types & organization- Input/Output: common types of I/O devices, Controllers- Design criteria for instruction formats- Addressing techniques, Instruction types- Traps & Interrupts	25





3.	Gates and Basic Logic Circuits <ul style="list-style-type: none">- Gates, Boolean algebra, Truth tables- Circuit equivalence, De Morgan's theorems- Combinational circuits- Arithmetic circuits- Latches, Flip flops- Introduction to Registers and Counters	25
4.	Introduction to Data Structures <ul style="list-style-type: none">- Primitive and composite data types- Arrays, stacks, queues, linked lists- Binary trees, B-trees- Hashing techniques- Linear Search, Binary Search- Bubble Sort	25

Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	understand the fundamental concepts related to organization of a computer system.
2.	understand the fundamental concepts related to gates and logic circuits used in a digital computer.
3.	demonstrate knowledge on different data structures.

Suggested References:





Sr. No.	References
1.	Tanenbaum A. S. : Structured Computer Organization, 3rd Edition, Prentice-Hall of India Pvt. Ltd., 1993. (Tanenbaum A. S and T Austin, Structured Computer Organization, Pearson, 6th Edition, 2016).
2.	Malvino A. P.: Digital Computer Electronics, 2nd Edition, 3rd Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 2017.
3.	Tremblay J. & Sorenson P. G. : An Introduction to Data Structures with Applications, 2nd Edition, McGraw-Hill International Edition, 2017.
4.	Hall Douglas V. : Microprocessors and Interfacing - Programming and Hardware., McGraw Hill Book Company, 3rd Edition, 2017.
5.	Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition, PHI, 1982.
6.	Singh Bhagat & Naps Thomas : Introduction to Data Structures, Tata McGraw-Hill Publishing Co. Ltd., 1985.
7.	M.M. Mano : Computer System Architecture, 3rd Edition, Pearson Education, 2000.

