

RAMAKRISHNA MISSION VIDYAMANDIRA
CBCS Syllabus B.Sc. Computer Science Honours

Semester-I

Course Code: CMSA CC 1 Credit: 6

Course Type: Core 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

CMSA CC 1 T: Computer Organization

Credit: 4

Marks: 50

Introduction to Computer Fundamentals: CPU, Primary and Secondary Storage, I/O Devices, Concept of Super, Mainframe, Mini and Personal Computer, System and Application Software.

[2 L]

Number Systems and Codes: Weighted and Non-Weighted Codes, positional, Binary, Octal, Hexadecimal, Binary coded Decimal (BCD), Gray Codes, Alphanumeric codes, ASCII, EBCDIC, Conversion of bases, Parity bits, Single Error bit detection and correcting codes: Hamming Codes, Fixed and Floating Point Arithmetic: Addition, Subtraction, Multiplication and Division.

[12 L]

Logic: Proposition, Predicates, Logical connectives, Well-formed formula.

[4 L]

Boolean algebra: Theorems and Postulates of Boolean Algebra with proof Functionally Completeness, Universal Logic

Boolean Functions: Standard form and Canonical form and their equivalence.

Truth table and minimization of Boolean function upto four variables: Algebraic, K-map; tabular method: Quine –McClusky and Graphical method: Binary Decision Diagram

[20 L]

Basic Computer Organization: Von Neumann vs Harvard architecture, Dataflow vs Control flow architecture.

Register organization, arithmetic and logical micro-operations, stack organization, microprogrammed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.

[8 L]

Control Unit: Hardwired Control vs Micro programmed 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]

CMSA CC 1 P: Programming in C Laboratory

Credit: 2

Marks: 25

C Programming Elements: Character sets, Keywords, Constants, Variables, Data Types, Operators- Arithmetic, Relational, Logical and Assignment; Increment and Decrement and Conditional, Operator Precedence and Associations; Expressions, type casting. Comments, Functions, Storage Classes, Bit manipulation, Input and output. [6 L]

Statements: Assignment, Control statements- if, if else, switch, break, continue, goto, Loops- while, do_while, for. [6 L]

Functions: Argument passing, return statement, return values and their types, recursion [6 L]

Arrays: String handling with arrays, String handling functions. [4 L]

Pointers: Definition and initialization, Pointer arithmetic, Pointers and arrays, String functions and manipulation, Dynamic storage allocation. [6 L]

User defined Data types: Enumerated data types, Structures. Structure arrays, Pointers to Functions and Structures, Unions [6 L]

File Access: Opening, Closing, I/O operations. [4 L]

C Preprocessor: File inclusion, Macro substitution. [2 L]

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. Computer Architecture: A Quantitative Approach 5th Edition by David A. Patterson, John L. Hennessy, Elsevier Science.
 6. Switching and Finite Automata Theory by Zvi Kohavi and Niraj K Jha 3rd Edition, Cambridge.
 7. The C Programming Language (ANSI C Version) 2nd Edition by Kernighan and Ritchie, PHI.
 8. Programming With C by Byron Gottfried 3rd Edition, McGraw Hill Education (India) Private Limited.
 13. C: The Complete Reference 4th Edition by Herbert Schildt, McGraw Hill Education (India) Private Limited
 14. Let us C by Yeshavant Kanetkar, 16th Edition, BPB.
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