

RAMAKRISHNA MISSION VIDYAMANDIRA
NEP Syllabus B.Sc. Computer Science

Semester-III

Course Code: 3CMSMIC1

Credit: 4

Course Type: Minor Course

Course Outcome:

- i) To impart the basic concepts of digital computers.
- ii) Ability to develop algorithms for mathematical and scientific problems.
- iii) Ability to develop skills in modelling problems in a computational environment.
- iv) Ability to write programs with a structured programming approach

3CMSMIC1: Computer Fundamentals

Credit: 3

Marks: 75

Introduction to Computer Fundamentals: CPU, Primary and Secondary Storage, I/O Devices, Concept of Super, Mainframe, Mini and Personal Computer, System and Application Software. [4L]

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. [12L]

Logic: Proposition, Predicates, Logical connectives, Well-formed formula. [6L]

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 up to four variables: Algebraic, K-map; tabular method: Quine –McClusky and Graphical method: Binary Decision Diagram [18L]

Introduction to Programming: Programming Concept: Flow Charts and Algorithms; Languages: Machine Language, Assembly Language, High-Level Language. [5L]

3CMSMIC1: C Programming Laboratory

Credit: 1

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. [6L]

Statements: Assignment, Control statements- if, if else, switch, break, continue, goto, Loops- while, do-while, for. [3L]

Functions: Argument passing, return statement, return values and their types, recursion [5L]

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

Pointers: Definition and initialization, Pointer arithmetic, Pointers and arrays, String functions and manipulation, Dynamic storage allocation. [5L]

User defined Data types: Enumerated data types, Structures. Structure arrays, Pointers to Functions and Structures, Unions. [3L]

File Access: Opening, Closing, I/O operations. [2L]

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

Text/Reference Books:

1. Computer Organization and Architecture 8th Edition by William Stallings, Pearson Education.
2. Computer Architecture and Organizations 3rd Edition, J. P. Hayes, McGraw Hill Education (India) Private Limited.
3. Computer Organization 5th Edition by [Zvonko Vranesic](#), [Safwat Zaky](#), Carl Hamacher, 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. Digital Logic and Computer Design 1st Edition by M.Morris Mano, Pearson Education.
7. Digital Systems Principles and Applications by Ronal J. Tocci and Neal S. Widmer, 8th Edition, PHI.
8. Digital Circuits and Design 4th Edition by S Salivahanan and S Arivazhogan, Vikas Publishing House Pvt Ltd.
9. Fundamentals Of Digital Circuits 3rd Edition by [A. Anand Kumar](#), PHI.

10. Programming in ANSI C, Balaguruswamy, McGraw Hill.
11. Programming with C, Byron S. Gottfried, McGraw Hill.
12. The C Programming Language, Kernighan and Dennis, PHI.
13. The Complete reference C, Herbert Schildt, McGraw Hill.
14. Let Us C, Kanetkar, BPB Publication.
