

SEMESTER I

MCA701C (Core)	Computer Fundamentals and Programming in C	3+1+0=4
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UNIT I: Basic Fundamentals [4 lectures]

History of C, Evolution of Computer system, Classification of Computer, Modern Computer, Hardware and Software. Major components of a Digital Computer, A brief introduction of CPU, Memory Hierarchy and I/O devices, Bootstrapping a Computer.

UNIT II: Algorithm [7 Lectures]

Problem solving approaches: pseudocode, flowchart, algorithm, decision table; bottom-up and top down design strategies, notations of flowchart and algorithm, design and analysis of algorithms.

Asymptotic notations: Definitions, physical representation, performance study and comparative analysis.

UNIT III: Basics of C – Language [12 Lectures]

Constant and variable, data types – primitive and user define; statement and expression; operators, hierarchy of operators and associativity, creation and evaluation of expressions; preprocessor directives, header files, macro, standard C library functions; control structures - decision making and loop; use of break, goto and continue statement.

UNIT IV: Array and pointer [12 Lectures]

Array: representation of array – one dimensional, two dimensional and multi-dimensional; passing array elements to a function.

Pointer: pointer and address, pointer arithmetic, pointer array, pointer and function argument

Storage class: automatic, external, static, register, scope and lifetime of variables.

UNIT V: Functions [5 Lectures]

Function definition, Declaration and prototypes, Call by Value and Call by Reference, Recursion.

UNIT VI: Structures and Files [8 Lectures]

Structure: declaration and use, member resolution operator – structure and structure pointer, arrays of structures.

File operations: opening, closing, reading and writing of files, seeking forward and backward.

Textbooks:

1.G. Dromey, How to solve it by computer, PHI.

Recommended Books:

1.Byron Gottfried, Programming with C, TMGH.

2.Dennis Ritchie, ANSI-C Programming.

3.Yashavant Kanetkar, Let us C

4.E. Balaguruswamy, Programming in C

5.Reema Thareja : Introduction to C Programming

MCA702C (Core)	Digital Logic	3+1+0=4
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UNIT I: Data Representation [6 Lectures]

Data encoding: BCD, EBCDIC, ASCII, ISCII, Unicode; Number system: Decimal, binary, octal, hexadecimal and their inter-conversion; Sign data representation; 1's and 2's complement; Introduction: Addition, Subtraction, Multiplication, Division, Floating Point, Fixed point representation and arithmetic.

UNIT II: Digital Logic [4 Lectures]

Boolean algebra, Theorems and postulates, de Morgan's theorem, Boolean identity, Duality theorem. Logic gates: OR, AND, NOT, NAND, NOR, XOR and XNOR.

UNIT III: Reduction Techniques [10 Lectures]

Standard representation of Boolean expressions, SOP and POS forms, minterm and maxterm expressions, reduction techniques – Karnaugh map, Quine McCluskey method and algebraic simplification.

UNIT IV: Combinational circuits [10 Lectures]

Concept and definitions; adders, encoder, decoder, multiplexer, demultiplexer; case study of read only memory and programmable logic array.

UNIT V: Sequential circuits [10 Lectures]

Concept and definitions; flip flop – SR, JK, D and T, master-slave and edge triggered; latches; case study of register, counter and random access memory.

UNIT VI: Counters [8 Lectures]

Counters: Asynchronous Counters Ripple, Mod, Up-Down Counters- Decoding Gates - Synchronous Counters - Ring, Decade, Presettable, Shift Counters. Memory: Basic Terms & Ideas - Magnetic Memories - Memory Addressing - Types of ROMs - Types of RAMs.

Textbooks:

1. Digital Logic and Computer Design, M. M. Mano, PEARSON.

Recommended Books:

1. Digital Computer Electronics: Malvino; Tata McGraw Hill.

MCA703C (Core)	Mathematical Foundation of Computer Science	3+1+0=4
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UNIT I: Sets & Relations [10 Lectures]

Sets: Types of sets, algebra of sets, Cardinal number in a set, inclusion exclusion principle, power set, intervals, partition of a set, multi sets, ordered pairs, Cartesian product, principles of Cartesian product, computer representation of sets; Relations: domain of a relation, range of a relation, types of relations, properties of relations, equivalence relation, equivalence class, properties of equivalence classes, partitions; partial order relations, closure of relations.

UNIT II: Lattice and Functions [10 Lectures]

Hasse and lattice diagrams for posets; Special elements in posets: Greatest elements, Least elements, Maximal elements, Minimal elements; Lattice : least upper bounds, greatest lower bounds, Algebra of Lattice, Distributive inequalities, Principle of duality, homomorphic image of a lattice, sub lattice, complete lattice, bounded lattice, complemented lattice, distributive lattice, modular lattice; functions, types of functions, composition of functions.

UNIT III: Algebraic Structures [9 Lectures]

Semi groups, products and quotients of semi groups; groups, cosets, normal subgroups, quotient groups, Lagrange's Theorem, products of groups; use of groups in coding of binary information and error detection, decoding and error correction.

UNIT IV: Combinatorics, Recurrence Relations [9 Lectures]

Combinatorics and Recurrence Relations: Permutation and combination, principles of counting and enumeration; recurrence relations, the Fibonacci sequence, solutions of recurrence relations by substitution and generating functions, solution of non-recurrence relations by conversion to linear recurrence relations.

UNIT V: Introduction to Graph Theory [10 Lectures]

Graph Theory: Introduction to graphs, representation of graphs, graph isomorphisms, subgraphs, directed and undirected graphs; Euclidean paths and circuits; Hamiltonian paths and circuits; colouring graphs.

Textbooks:

1. Discrete mathematics, S Santha, Cengage learning

Recommended Books:

1. Discrete mathematical structures with application to Computer Science, Tremblay and Manohar, McGraw Hill

2. Discrete mathematics, Veerarajan, TMGH

MCA704C (Core)	Accountancy and Financial Management	3+1+0=4
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UNIT I: Introduction to Accounting [10 Lectures]

Utility of Accounting in business enterprises, Double entry system of accounting, accounting equation, accounting principle concepts and conventions, journal, ledger, trial balance, cash book (single, double and triple column).

UNIT II: Final Accounts and Statements [12 Lectures]

Distinction between capital and revenue expenditure, construction of trading, profit and loss accounts and balance sheet of sole proprietorship concerns with adjustments, manufacturing account, simple problems on final accounts of companies.

Preparation of Income and Expenditure account and balance sheet (from receipts and payments account) with common adjustments for non trading institutions.

UNIT III: Techniques of costing [10 Lectures]

Definition of costing and cost accounting, classification of cost, Marginal costing – Basic concepts, break-even analysis, construction of break-even chart, problems on marginal costing, application of marginal costing in decision-making.

UNIT IV: Financial management [8 Lectures]

Financial Statement Analysis- Ratio Analysis – Meaning, Advantages, limitations and types of ratios and their usefulness, simple problems on ratio analysis. Fund Flow Analysis- preparation of statement of changes in working capital, preparation of fund flow statement.

UNIT V: Budget [8 Lectures]

Budget – Different types of budget, Theoretical concept, preparation of flexible budgets and cash budgets.

Textbooks:

1. Lal, J., Accounting for Management, Mumbai: Himalaya Publishing House

Recommended books:

1. Juneja, C. M.; R. C. Chawla; K. K. Saksena, Double Entry Book Keeping (Sixth Edition), Ludhiana: Kalyani Publishers, 1994

2. Jain, S.P.; K. L. Narang, Cost Accounting (Thirteen Edition), Ludhiana: Kalayani Publishers, 1995

3. Shukla; Grewal; Gupta, Advanced Accounts, New Delhi: S. Chand & Sons, 2005

4. Jain; Narang, Advanced Accountancy, Ludhiana: Kalyani Publishers, 1995

MCA705L (Lab Course)	LAB-I	0+1+2=3
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Laboratory programs:

1. At least 15 programs from UNIT III
2. At least 20 programs from UNIT IV
3. At least 5 programs from UNIT V
4. At least 10 programs from UNIT VI

MCA706S (SEC)	Internet Programming	2+0+0=2
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UNIT I : HTML Introduction [8 Lectures]

Introduction,Editors,Elements,Attributes,Headings,Paragraphs,Styles,Formatting,Comments

UNIT II : CSS [12 Lectures]

Syntax,colors,backgrounds,borders,margins,padding,height/width,boxmodel,outline,text,fonts,links,align,float,display,opacity

UNIT III : Javascript [12 Lectures]

Introduction,syntax,statements,comments,variables,operators,arithmetic,datatypes,functions,objects,scope,events,strings,string methods, arrays

Textbooks:

1. Head First HTML and CSS,Publisher: O'Reilly Media by Eric Freeman

Recommended Books:

1. Beginning JavaScript and CSS Development,Publisher: Wrox-Wiley,By Richard York