

## **BCA 1<sup>ST</sup> Semester**

### **BCA - 101: COMPUTER FUNDAMENTALS AND PROGRAMMING**

#### **UNIT: 1**

**Computer Fundamentals :** Introduction to Computers, History of Computers, Classification of Computers, Generations of Computers and their features, Fundamental units of Computer system- I/O devices, Primary and Secondary memories and their characteristics, Central Processing Unit.

#### **UNIT: 2**

**Data Representation:** Bits and Bytes, decimal, octal, binary and hexadecimal. Representation of integers, fixed and floating points, character representation: ASCII, EBCDIC.

**Computer Software :** Computer Programming Languages – Machine Language, Assembly Language, High Level Language, software and their classification System.

#### **UNIT: 3**

**Programming Fundamentals:** Algorithm development, Techniques of problem solving. Flowcharting, Stepwise refinement, Structured programming concepts; Top down Design, Development of efficient programs, Program Correctness, Debugging and testing of Programs.

#### **UNIT: 4**

**Programming Using C:** Representation of integers, float, characters Data types: constants and variables; scope of variables, C operators, Arithmetic Expressions, Decision Control Structures, Loop Control Structures, Standard C Library C Preprocessor.

#### **UNIT: 5**

Introduction of Array or subscripted variable, Type of array, Sorting and Searching Techniques. Manipulation of two dimensional arrays.

#### **SUGGESTED READINGS:-**

1. Computer Fundamentals by P.K. Sinha
2. Computer Fundamental and Concepts by V. Raja Raman
3. Let Us C by Yaswant P. Kanetkar
4. Programming in C by Dennis and Ritchie
5. "Magic with C" AB Publication

## **BCA-102 : FUNDAMENTALS OF MANAGEMENT**

### **UNIT : 1**

Introduction, Concepts, Nature, Scope and Significance of Management, Evolution of Management thought– (Contribution Taylor, Weber and Fayol to Management) and Foundation of Management Theories.

### **UNIT : 2**

Planning : Concept, Objectives, Nature, Limitation, Process of Planning, Importance, Forms, Techniques and Process of decision making.

### **UNIT : 3**

Organising : Concept, Objectives, Nature of Organising, Types of Organisation. Delegation of authority. Authority and responsibilities, Centralisation and Decentralisation, Span of control.

### **UNIT : 4**

Directing : Concept. Principal & Techniques of directing and Coordination, Concept of leadership-Meaning, Importance, Styles, Supervision, Motivation, Communication.

### **UNIT : 5**

Controlling Concept, Principles, Process and Techniques of controlling, Relationship between planning and controlling.

### **UNIT : 6**

Relevance of Computer Applications in Different Functional Areas of Management viz.: Financial Management, Production Management, Human Resources Management and Marketing Management.

### **SUGGESTED READINGS :**

1. Parag Diwan & L.N. Agarwal, "Management Principles & Practices".
2. Fred Luthans, "Organisational Behaviour"
3. LM. Prasad, "Principles & Practices of Management"

## **BCA-103 LANGUAGE AND COMMUNICATION**

### **UNIT: 1**

**Technical Documentation Presentation :**Accuracy and Conciseness in Technical English, Structure Format etc. for Technical Reports & Thesis, Comparing and Contrastive other aspects of short reports and long dissertations.

### **UNIT: 2**

**Communication Skills: Communication** Process: Concept & importance, System of communication: Formal & internal. Barrier to effective communication.

### **UNIT: 3**

**Principles of Business Communication:** Planning and conduction conversations, interviews and Discussion. The preparation of oral statements, effective listening, telephonic communication.

### **UNIT: 4**

**Written Communication:** Guides to effective writing for business correspondence including letter and job application Memorandum, Office orders, Reports.

### **UNIT: 5**

**Non-Verbal Communication:** Importance and Type-Cluster and congruency. Kinetics Vocal CUES. Modern Forms of Communication: Telex, Fax, Telegram & Teleconferencing & E-mail.

### **UNIT: 6**

**Practical in Business Communication:** Report writing, Public Speaking, Seminars, Presentation, Interview, Group Discussion, Effective Listening.

### **SUGGESTED READINGS:-**

1. Lesikar “ Business Communication” AITBC
2. S. M. Ray “Business Communication” HP

## BCA - 104 MATHEMATICS – 1

### UNIT : 1

**BASIC CONCEPTS:** Definition of Sets, Number systems, Relations Functions.

**LIMIT CONTINUITY:** Definition of limit, Limit of a function, Right and Left hand Limits, Algebra of limits, General principle for existence of limit, limit of inequalities, Method of finding limits, Continuity of functions, Cauchy's definition, graphical meaning of continuity, Kinds of discontinuities.

**DIFFERENTIAL CALCULUS:** Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's Theorem, change of variables, Jacobian theorem.

### UNIT : 2

**INTEGRAL CALCULUS:** Integration of rational and Irrational functions, Reduction Formulae, Definite Integral, Rectification; Quadrature, volumes and surfaces of Revolution, Simple applications of integration & simple problems of double and triple integrals.

### UNIT : 3

**DIFFERENTIAL EQUATION:** Differential equations of first order, Differential equations of 2nd order, Differential of 2nd order with constant coefficients.

### UNIT : 4

**VECTOR CALCULUS AND ALGEBRA:** Vectors, Differentiation and partial differentiation of vector functions, derivative of sum, Dot product and cross product of two vectors, gradient, divergence and curl.

### UNIT : 5

**COORDINATE GEOMETRY:** Straight lines, Circles and the system of circles; standard equations and properties of Parabola. Ellipse and Hyperbolas, General equation of second degree in two variables, tracing of simple conic section.

#### **Suggested Readings :**

1. E. Kreyzig, "Engineering Mathematics".
2. B.S. Grewal, "Higher Engineering Mathematics"
3. Shanti Narayan, "Differential Calculus"
4. K.P. Gupta. "Vector Calculus"

## **BCA -105 Personal Computer Software**

### **UNIT-I**

Profiling an operating system, Booting sequence: operating system files and command processor, file, Definition of a file; file names, Booting from floppy and HDD, Warm and cold reboot, Type of DOS commands: Internal and External, Introduction to AUTOEXEC.BAT, Directory commands: DIR, MD, RD, FREE, PATH, SUBST, Different versions of MS-DOS, Wildcards definition, File management commands: COPY, XCOPY, DEL, RENAME, ATTRIB, BACKUP, RESTORE, FIND, SYS, General commands: TYPE, DATE, TIME, PROMPT, Disk organisation: Disk storage capacity, Sectors in a disk, Diskette compatibility, Boot record, Disk partitioning and master boot record, File allocation Table (FAT), disk management commands: FORMAT, CHKDSK, DISKCOPY, LABEL, VOL, DISKCOMP, COMP, RECOVER.

### **UNIT II**

Windows: Start windows, Using different windows simultaneously, Moving through windows and mouse, Maximize/Minimize windows, use of help feature, Exit windows, Use of Help Feature, Exit windows, Starting an application Run and manage multiple applications, Close applications. Using the Program Manager: Create/Add Groups using Program Manager, Move/ Copy/ Delete program items, Change program item properties, Delete groups, Open file Manager, Expand compressed directories and files, Open and manage multiple directory windows, View and sort files, Save file Manager settings, Exit file Manager. File management through windows: Select file and directories, Copy, Move, Delete, File/ Directories, Creating directories, Renaming files and directories, Disk operations using file Manager. Using essential accessories: starting and using Write, Type and Edit text in a document in Write, Insert pictures in a document in write, Format text in Write document, Save and Print a document file in write, Starting and using paintbrush, Printing a drawing, DLE Concepts.

### **UNIT III**

Word Processing Package: Basics of word processing: Text selection, Opening documents and creating documents, Saving document / quitting documents, Cursor control, Printing documents, Using the interface, Editing Text, Finding and replacing text, Spell check feature / AutoCorrect feature, grammar facility, Retrieving Often used text: AutoText, Character formatting, Document Enhancement : Adding borders and shading, Adding headers and footers, Setting up multiple columns, sorting blocks, Adjusting margins and hyphenating documents, Creating master document, Creating data source, Merging documents, using mailmerge feature for labels and envelopes, Graphics and using templates and wizards, Hands-on experience in word processing under XOS, Familiarity in word processing under Windows.

### **UNIT IV**

Spreadsheet Package: Worksheet basics; Data entry in cell: entry of numbers, text and formulae, Moving data in worksheet, Moving around in a worksheet, Selecting data range, Using the interface, Editing basics, Working with workbooks, Saving and quitting, Cell referencing, Formatting and calculations: Calculations and worksheets- using AutoFill, Working with formulae, Efficient data display with data formatting( Number formatting, data formatting etc.), Working with ranges, Worksheet printing, Working with graphs and charts: Adding / formatting text data with autofill, Creating embedded chart using Chart Wizard, Sizing and moving parts, Updating charts, changing chart types, Creating separate chart sheets, Adding titles, legends and gridlines, Printing charts, Database management: Finding records with data form, Adding/ deleting records, Filtering records in a worksheet, Function and macros: Work sheet with worksheet function using function-wizard, Creating macros, Record macros, Running macros, Assigning macros to buttons, Defining macros from scratch, Multiple worksheets and scenarios.

### **An overview of selected packages:**

Desktop publishing, Office automation, Popular packages on communications like CCMail, PRUCOMPLUS etc., E-Mail, Computer viruses, Presentation graphics features of Harvard Graphics, Print master, CorelDraw, PowerPoint etc.

formatting, data formatting etc.), Working with ranges, Worksheet printing. Working with graphs and charts: Adding / formatting text data with autoformat, Creating embedded chart using ChartWizard, Sizing and moving parts, Updating charts, changing chart types, Creating separate chart sheets, Adding titles, legends and gridlines, Printing charts. Database management: Finding records with data form, Adding/ deleting records, Filtering records in a worksheet. Function and macros: Work sheet with worksheet function using function-wizard, Creating macros, Record macros, Running macros, Assigning macros to buttons, Defining macros from scratch, Multiple worksheets and scenarios.

### **An overview of selected packages:**

Desktop publishing, Office automation, Popular packages on communications like CCMail, PRUCOMPLUS etc., E-Mail, Computer viruses, Presentation graphics features of Harvard Graphics, Print master, CorelDraw, PowerPoint etc.

## **BCA 2<sup>nd</sup> Semester**

### **BCA-201 DIGITAL ELECTRONICS**

#### **UNIT: 1**

**Information Representation :** Number system, binary, Octal Hexadecimal system, integers and real numbers, Conversion from one number system to another number system, Data representation in a register, Signed and Unsigned numbers 2's Complement and 1's Complement representation and Operation on numbers (addition and subtraction), Floating point representation of numbers.

#### **UNIT: 2**

**Switching Circuit Theory & Boolean Algebra:** Introduction to digital Electronics, General Switching problems, algebra of relay contacts, Gates (OR, AND, NOR, NAND, XOR & XNOR), Truth tables, converting from Boolean Expression to logic gates. Venn diagrams theorems in Boolean algebra, Demorgan's laws, Boolean laws, Circuit Designing techniques (SOP, POS, K-Map).

#### **UNIT: 3**

**Boolean Functions and Circuit Elements :** Operation on Boolean function, Complementation, K-maps, Relation of NAND –NOR logic to AND-OR Logic, Mixed Logic, Half Adder and Full Adder circuit with truth tables, Binary to Decimal and Decimal to Binary Decoders, Multiplexers, Demultiplexer, Encoders.

#### **UNIT: 4**

**Flip-Flops :** Asynchronous & Synchronous flip-flops, The family of Flip Flop circuits- S-R Flip Flop, D Flip Flop, J-K Flip Flop, T Flip Flop, State table and Excitation Table, Race around condition & Master Slave Flip Flop and Propagation Time delay. Counters (Binary and UP-Down) and Registers (serial & parallel).

#### **SUGGESTED READINGS:-**

1. M.M. Mano, "Digital Logic and Computer Design" PHI 1998.
2. M.M. Mano, "Computer Architecture", PHI 1998.
3. Malvino and Leach, "Digital Electronics", TMH, 1998.
4. William Stallings, "Computer Organization and Architecture," PHI 1998.

## BCA-202: DISCRETE MATHEMATICS

### UNIT: 1

**Mathematical Logic:** Proposition & Propositional Form conditional and Bi-conditional Statements, Negation operation, Logic connectives and compound statements, conjunction, disjunction, truth tables, Duality conditional and in-conditional statements.

### UNIT: 2

**Boolean Algebra :** Development of Boolean Algebra, Truth functions, The AND, OR, NOT operators, Laws of Boolean Algebras, Reducing Boolean Expressions, Boolean expressions and logic diagrams Universal Building blocks, Negative Logic Min terms, Truth tables and K-maps, Reduction of K maps Disjunctive normal form.

### UNIT: 3

**Graph theory:** Definition of a graph, finite and infinite graphs, Incidence and degree, null graph, Subgraphs walks, Paths and circuits in a graph, connected graphs, Trees, Properties of Trees, Planner graphs. Incidence Matrix.

### UNIT: 4

**Function and Relation :** Injective and surjective functions, composition of function, Inverse function, Use of function in coding theory, Relation composition of relation, Equivalence relation.

### SUGGESTED READINGS:-

1. C.L. Liu, "Elements of Discrete Mathematics" Mc Graw Hill Book Co., 1985
2. N. Deop, "Graph Theory with applications to Engineering and Computer Science", PHI 1993.
3. B. Colman and Robert C. Busby, "Discrete Mathematical structure for Computer Science," PHI.
4. Olympia Nicodemi, "Discrete Mathematics" CBS Publication, Delhi.
5. M.N.S. Swamy and K. Thulasiraman, "Graphs, Networks and Algorithms," Wiley Inter Science, NY, 1989.



## BCA-203 : MATHEMATICS-II

### UNIT : 1

The real number system as a complete ordered field neighborhood open and closed sets limit points of sets.

### UNIT : 2

**Limits and Continuity:** Definition of Limit, Algebra of Limits, Right hand and Left hand Limits, Definition of Continuity, Types of Discontinuity and algebra of Continuous functions.

### UNIT : 3

**Infinite Series:** Convergent series, Divergent series Oscillatory series, Leibnitz test(Alternating Series test), Positive term series test, p-series test, Comparison test, D'Alembert's ratio test, Cauchy's nth root test and Raabe's test.

### UNIT : 4

**Mean Value Theorems :** Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean Value theorem and Maclaurin series for  $\sin x$ ,  $\cos x$ ,  $\tan x$ ,  $\log(1-x)$ ,  $\log(1+x)$ ,  $e^x$  etc, Indeterminate forms, maxima and minima(Application of maxima or minima to simple problems).

### UNIT : 5

**Sequence :** Sequence, Subsequence, Bounded Sequence, Convergent Sequence, Divergent Sequence, Monotonic Sequence, Cauchy Sequence.

#### Suggested Readings-

1. E. Kreyzing Engineering Mathematics
2. Gorakha Prasad Differential Calculus
3. Shanti Narayan Differential Calculus
4. Prof. P.N. Chatterji Infinite Series

## **BCA-204 PROGRAMMING IN 'C'**

### **UNIT: 1**

Introduction of data types, Storage class, Operators, Operator precedence and associativity, Input/Output Functions, Sequential approach problems, If-else statement, Nesting of if statement, compound conditional if statement, switch statement, nesting of switch statement, selected approach problems, goto statement, loop statements(while statement, do-while statement and for statement), repetitive structure problems. Nesting of while statement, Nesting of do-while statement, Nesting of for statement, break and continue statement, Multiple loop variable, comma operator.

### **UNIT: 2**

Introduction of One Dimensional and Two dimensional array, Declaration, Initialization, manipulation of one dimensional array, Insertion, deletion of new element in array, sorting, searching and merging of one dimensional array. Matrix manipulation of two dimensional array.

### **UNIT: 3**

Modular programming, user defined function, passing arguments by value and array parameter, local and global variable, nesting of function, Recursion. string manipulation by string handling functions. Structure and Union data type, nested structure, array of structure, passing structure to the function.

### **UNIT: 4**

Introduction to Pointers, declaration, address arithmetic, pointer arithmetic, using pointer as function argument (call by reference), dynamic memory allocation and de-allocation.

### **UNIT: 5**

File handling in C : creation of file, open a file, accessing, appending and deleting data of a file, updating data file, Defining and calling macros, standard c library and other standard c functions.

### **SUGGESTED READINGS:-**

1. "Concept of 'C'" by Robert laffore, TMH Publication.
2. "Programming in 'C'" by E. Balaguruswami, TMH Publication
3. "Let Us C" by Yaswant P. Kanetkar, Narosa Publication
4. "Magic in C" AB Publication.

## **BCA-205 Managerial Economics**

Meaning nature and scope of managerial economics, Micro economic theory of consumer behavior, Decision making process, Concept of demand, Law of demand and elasticity of demand and demand forecasting. Cost Concept, Cost-Output relationship, production decisions managerial use of cost function. Price-output decision under different market condition pricing policies and methods. Nature and concept of profit in managerial economics.

BOOKS: MANAGERIAL ECONOMICS-P.L.MISHRA