1st Semester:-

BCA-101: Mathematical Foundation

Total Lectures = 50

Unit-I: Differential Calculus: Successive Differetiation, Leibnitz Theorem, Expansion of function of one variable in Taylor's and Meclaurin's infinite series, Maxima and minima of functions of one variable, Partial Derivatives, Euler's theorem, change of variables, Total differentiation, Taylor's series in two variables, Maxima and Minima of two variables.

Unit – II: Integral Calculus: Definite integral and its application for area, length and volume, multiple integrals, change of order of integration .

Unit – III: Differential Equation: First degree and first order differential equation: Higher order differential equation with constant coefficients, Linear partial differential equation of first order P.D.E. of higher orders with constant coefficients.

Unit – IV: Matrix Algebra: Elementary transformation, inverse of a matrix by row operation, rank, solution of a system of linear simultaneous equation by matrix method, Eigen values and Eigen Vectors, Cayley Hamilton theorem, Quadratic forms.

Note: Stress should be given on the development of ideas. Proofs of theorems and derivation of formulae are not required.

Text Books:

1. Engineering Mathematics, Dr. B.S. Grewal
2. Matrix by A.R. Vashishtha
3. Advanced Engg. Maths, by Chandrika Prasad
4. Elements of Modern Algebra, J.N.Sharma, Krishna Prakashan, Meerut
5. Topics in Algebra, I.N.Herstein, Vikas Publications.

BCA-102: COMPUTER FUNDAMENTALS

Total Lectures = 50

Unit – I: Introduction to Computers:

Brief History of Development of Computers, Computer System Concepts & Characteristics, Capabilities and Limitations of Computers; Type of Computers- Analog, Digital, Hybrid, General, Special Purpose, Macro, Mini, Mainframe, Super; Generations of Computers, Type of PCs: - Desktop, Laptop, Notebook, Palmtop, Workstations etc and their characteristics

Unit- II

Computer organization and Working:- Basic Components of a Computer System: - CPU, Memory-RAM, ROM, EPROM, PROM, and other types of Memory.

Unit-III

Input Devices: Keyboard, Mouse etc.; **Output Devices:** Monitors: Characteristics and type of monitors, Printers: Daisy Wheel, Dot Matrix, Ink Jet, Laser, Line Printer. Plotter, Sound Card and Speakers, Projectors

Storage Devices: Storage Fundamentals: - Primary versus Secondary Data Storage and retrieval method- Sequential, Direct, Index Sequential.

Various storage Device:- Magnetic Tape, Magnetic Discs, Cartridge Tape, Hard Disk Drives, Optical Disks, CD, DVD, Zip Drive

Unit – IV

Computer Software: Need, Types of software: System Software and application Software

System Software: Operating System, Utility Program, Programming Languages, Assemblers, Compilers and Interpreters

Operating System:- Functions type- Batch, Single, Multiprogramming, Multiprocessing, Programming Language: Machine Level, Assembly, High Level, 4GL, their merits and demerits,

Application Software: Word processing, Spreadsheet, Presentation Graphics, Database Management Software, Characteristics, Usages and Examples and areas of Application of each of them.

Unit- V

Algorithms, Flowcharts: Symbols, Rules for making Flowcharts, types of flowcharts, advantages and disadvantages; Pseudo Codes, Decision Tree, Decision Table, System Flowchart.

Unit- VI

Programming Techniques- Top-Down, Bottom-Up, Modular, Structured- Features, Merits and demerits, Comparative Study.

Programming Logic- Simple, Branching, Looping, Recursion.

Introductory concepts of Computer Security and Virus

Text Books:

1. V. Rajaraman, Fundamentals of Computers, PHI.
2. Introduction to Information Technology, ITL Education Solutions Ltd. , Pearson
3. Fundamentals of Information Technology- P.K. Sinha
4. Computer Fundamentals- Reema Thareja, Oxford Press

BCA-103: BUSINESS COMMUNICATION & INFORMATION SYSTEM

Total Lectures = 50

Unit-I: Meaning and Process of Communication, Barriers to communication, Verbal Communication and non-verbal communication.

Business Communication and its importance in business organisation. Listening, Reading, Writing skills.

Unit – II: Principles of Letter Writing, Business Letters: Quotations, Orders, Tenders, Sales Letters, Complaints, Claim and Adjustment Letters, and Col Lect.ion Letters, Social Correspondence: Letters of congratulation, Invitations, Introduction, Recommendation, Condolence, Conveying Acceptance and regrets, etc., Summarisation, Punctuation.

Meeting, Interview and Group Communication, Drafting of Notice, Agenda, and minutes of company meeting, Report writing and Proposal

Unit – III: Office procedure: Receipt and Dispatch of mail, Filing and Indexing Systems, Classification of mail. E-mail, On-line meeting, On-line interviews.

Forms of Oral Communication – Group Discussion, Debate, Extempore, Presentation, Seminar and Conference

Unit–IV: Data and information, Characteristics, sources and types of information. Importance of information for Managers,Value of Information,Information economics, Role of Computers.

Unit – V: Concept, role and importance of Management Information System (MIS), Concept of system, characteristics and types of system, Information needs and management levels – OAS,TPS, MIS,DSS. Role of OAS in organisations.

Unit – VI: MIS and Decision making concepts, Herbert-Simon model of Decision Making. Concept and philosophy of DSS, MIS Project Planning

Text Books: 1. Essentials of Business Communication – Reddy, Apparnaiah, Rao
2. Essentials of Business Communication – R. Pal and J.S.Korlahalli
3. Business Communication – U.S.Rai and S.M.Rai
4. Management Information & Control System, Dr. Sushila Madan, Taxmann Publ.
5. Management Information System-Text and Cases, W.S.Jawadekar, McGraw Hill Publ.
6. Management Information System, Dr Nirmalya Bagchi, Vikas Publ. 2010.
7. Information System for Modern Management, R.G.Murdick, Joel E. Ross, & J.R.Clagget, PHI.

BCA-104: C – Programming

Total Lectures = 50

Unit - I:

1.1 Structures of 'C' Programming Language,

1.2 Elements of C Programming

1.3 Algorithms and flowcharts (Real Life Examples), Exercises

2.1 C Tokens , Keywords, Identifiers, Variables, Constant

2.2 Data Types

2.3 Operators

2.4 Types of operators

Unit – II:

3.1 Decision Making: if, if-else, GOTO, Nesting, Switch Statements.

3.2 Looping: for, Nesting of for-loop, While loop, do-while loop

4.1 Array: One Dimensional

4.2 Two Dimensional

5.1 Concept of header files: Pre-processor directives: #include, #define

Unit – III:

6.1 Functions: User Defined Functions

6.2 Nesting, Recursion

6.3 Function with Array

6.4 Parameter Passing

6.5 Call by value

6.6 Call by reference

Unit – IV:

7.1 String Handling: String Manipulation

7.2 String Handling Functions.

Unit – V:

8.1 Structure

8.2 Structure Array

9 Pointers: Pointer of Array, Structure Pointer

Unit – VI:

10.1 File Handling

10.2 Reading and Writing a File

Text Books:

1. Let us C - Yashwant Kanetkar.
2. Programming in C- E. Balaguruswamy
3. The C programming Language – Dennis Ritchie, Pearson
4. Structured Programming approach using C - Furouzan & Ceilberg Thomson Learning publ.
5. Pointers in C – Yashwant Kanetkar
6. How to solve it by Computer – R. G. Dromy
7. Introduction to algorithms – Cormen, Leiserson, Rivest, Stein
8. Programming in C – R. Subburaj, Vikas Publishing House
9. Computer Programming in C – V Rajaraman, PHI
10. Programming in C using ANSI C – Ashok N. Kamthane, Pearson Education

BCA – 105: Lab on MS- Windows and DOS

Total Lab Classes = 60

Features of MS Windows, Desktop, creation of folders and shortcuts, icons, features of Windows explorer, Internet Explorer, Windows Accessories(Paint, Notepad etc., Windows Media Player, Internet Browsers), control Panel, Taskbar.

Familiarisation with MS packages – Word, Excel, PowerPoint

Disk Operating System (DOS)

DOS commands
Internal: DIR, MD, CD, RD, COPY, DEL, VOL, DATE, TIME, CLS, PATH, TYPE, PROMPT etc.
External: CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, RESTORE, EDIT, MODE, ATTRIB, HELP, SYS etc.
Executable vs. non-executable files in DOS.

BCA – 106: Lab on C

Total Lab Classes = 60

Sample Exercise1: Basics

Write programs to: print sample strings like "hello world", "Welcome to C Programming" with different formats using escape sequences, print different data types in 'C' and their ranges, initialize, assignment & printing variables of different data types.

Exercise2: Operators

i) Write a Program to demonstrate arithmetic operators. (+, -, *, /, %)

ii) Demonstrate logical operators.(logical AND, logical OR) ii) read radius value from the keyboard and calculate the area of circle and print the result in both floating and exponential notation.

iii) Calculate simple interest. iv) Convert temperature (Fahrenheit – Centigrade and vice-versa)

Exercise3: Operators

i) Write a Program to demonstrate relational operators.(,<=,>=,==,!=) ii) Check equivalence of two numbers using conditional operator. Iii) Demonstrate pre increment and post increment.(++a, a++ where a is a value to be initialized) iv) Demonstrate pre decrement and post decrement.(--a, a-- where a is a value to be initialized)

v) Computing the volume of sphere, cone and cylinder assume that dimensions are integer's use type casting where ever necessary.

Exercise4: Decision Statements

i) Write a Program to read marks of a student in six subjects and print whether pass or fail (using if-else).

ii) Calculate roots of quadratic equation (using if-else). iii) Calculate electricity bill. Read starting and ending meter reading. The charges are as follows. No. of Units Consumed Rate in(Rs) 1-100 1.50 per unit 101-300 2.00 per unit for excess of 100 units 301-500 2.50 per unit for excess of 300 units 501-above 3.25 per unit for excess of 500 units

Exercise 5: Switch operations

i) Write a Program to perform arithmetic operations using switch case. ii) Display colors using switch case (VIBGYOR). iii) Display vowels and consonants using switch case.

iv) Display names of days in a Week using switch case.

Exercise 6: Basic Loop operations

Do the Following Programs Using for, while, do-while loops.

i) Write a program to calculate sum of individual digits of a given number. ii) Check whether given number is palindrome or not. Iii) Print prime numbers in the given range. iv) Display multiplication tables from 1 to 10 except 3 and 5.

Exercise 7: Advanced loops

i) Write a program to print the Fibonacci series for given 'N' value.

ii) Check whether a given number is a Fibonacci number or not. iii) Read 2 numbers x and n then compute the sum of the Geometric Progression. 1+x+ x2 +x3 + - - - - - - - +xn iv) Print the following formats. 1 * 1 2 * * 1 2 3 * * * 1 2 3 4 * * * *

Exercise 8: 1-D arrays

i) Write a program to store 10 elements in the 1-D array and print sum of the array. ii) Print minimum and maximum elements in the 1-D array. iii) Count no. of positive numbers, negative numbers and zeros in the array. iv) Search the given element by using linear search. v) Sort the given elements using bubble sort technique.

Exercise 9: 2-D arrays

i) Perform matrix addition and matrix subtraction. ii) Perform matrix multiplication by checking the compatibility. iii) Print the transpose of a matrix.

Exercise 10: Strings

i) Write a program to perform various string manipulations using built-in functions. ii) Print the given strings in ascending order. iii) Verify the given string is palindrome or not (without built-in functions, with using built-in functions). Iv) Concatenate two strings using arrays.

Exercise 11: Math Functions and I/O Fucntions

i) Write a program to read values from keyboard and find the values using abs(), sqrt(),floor(), ceil() and pow().

ii) Read and display a value using getch() and putch(). iii) Read and display a value using getchar(), putchar(),gets() and puts().

Exercise 12: Functions

i) Write a program to find sum of two numbers using functions. ii) Find product of two numbers using functions without arguments, without return type. iii) Find difference of two numbers using functions without arguments, with return type. iv) Find sum of two numbers using functions with arguments &without return type. v) Find product of two numbers using functions with arguments, with return type.

Exercise 13: Functions and Recursion

i) Write a program to swap two numbers using a) Call By Value B) Call By Reference.

ii) Calculate factorial, gcd using recursion and non-recursion functions. iii) Perform arithmetic operations using pointer. iv) Matrix addition using pointers.

Exercise 14: Structures

i) Write a program to create structure for an account holder in a bank with following Fields: name, account number, address, balance and display the details of five account holders.

ii) Find total marks of individual student and average marks for 10 students using structures.

iii) Create structure called traveler and members of structure are train no, coach no, seat no, source, destination , gender, age, name and departure date. iv) Illustrate passing an entire structure to a function.

Exercise 15: File operations using command line arguments

i) Write a program which copies the contents of one file to another file using command line arguments.

ii) Reverse the first n characters in a file use command line arguments.

A Mini Project