First Year – First Semester
C Programming (BCA-111)
Discipline Core (DC); 4 Credits (3-1-0)

Objective:

1. To understand the basic concept of C Programming, and its different conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming

2. To acquire knowledge about the basic concept of writing a program.

S. No.	Topic	No. of Lectures
Unit 1	**Introduction to c** History, features of c language, Character set, Identifiers: variables, constants, symbolic constants, keywords. Data types, Operators: Arithmetic, relational, logical, assignment, bitwise, increment/decrement and special operators. Structure of program, Input and Output Functions.	**8**
Unit 2	**Control Structures** Conditional statements: if, If-else nested if-else, switch statement. Loops: while, for, do..While loop, Unconditional statements: Break, continue, exit, go to statements. **Functions** Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.	**8**
Unit 3	**Arrays and Strings** Arrays: Meaning and definition, Declaration, Initialization and types of arrays (single and multidimensional arrays). Strings: Meaning and definition, Declaration, Initialization String functions strlen() ,strrev(),strlwr(),strupr(),strcat(),strcmp()strcpy().Handling of character array.	**8**

Unit 4	**Pointers** Definition and declaration, Initialization, indirection operator, address of operator, pointer arithmetic, dynamic memory allocation, arrays and pointers, function and pointers **Structures** Definition and declaration, Variables initialization, Accessing fields and structure operations, Nested structures, Union-Definition and declaration, Differentiate between Union and structure	8
Unit 5	**Introduction C Preprocessor** Definition of Preprocessor, Macro substitution directives, File inclusion directives, Conditional compilation. **File handling** Definition of Files, Opening modes of files, Standard function:fopen( ), fclose( ), feof( ), fseek( ), rewind( ), Using text files: fgetc( ), fputc( ), fprintf( )	8
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Text Books:
1. The C programming Language by Ritchie and Kernighan.
2. Let us C by Y.C. Kanetkar.
3. Introduction to programming using C by Prof.D.R.Patil, Pawar, Shinde and Lad(Dreamtech).
4. Programming in C by D Ravichandran.

5. C Programming by Venugopal.

Element of Statistics (ES-101)
Basic Science (BS); 4 Credits (3-1-0)

Objectives:

- To provide a Statisticians help to design data collection plans, analyse data appropriately and interpret and draw conclusions from those analyses. The central objective of the undergraduate major in Statistics is to equip students with consequently requisite quantitative skills that they can employ and build on in flexible ways.

S. No.	Topic	No. of Lectures
Unit 1	**POPULATION, SAMPLE AND DATA CONDENSATION:** Definition and scope of statistics, concept of population and sample with Illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution.	**8**
Unit 2	**MEASURES OF CENTRAL TENDENCY:** Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.	**8**
Unit 3	**MEASURES OF DISPERSION:** Concept of dispersion, Absolute and relative measure of dispersion, range, variance, standard deviation , Coefficient of variation.	**8**
Unit 4	**STATISTICAL QUALITY CONTROL:** Introduction, control limits, specification limits, tolerance limits , process and product control. Control charts for X and R. Control charts for number of defective (np- chart), control charts for number of defects (c- chart)	**8**
Unit 5	**SAMPLE SPACE , EVENTS AND PROBABILITY, PERMUTATIONS AND COMBINATIONS:** sample space, discrete sample space, events. Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event. Simple examples. Classical definition of probability, Addition theorem of probability without proof (up to three events are expected), Definition of Conditional Probability Definition of	**8**

	independence of two events, Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetitions). nPr = n!/ (n-r) !(without proof). Combinations of 'r' objects taken from 'n' objects. nCr = n!/ (r(n-r) !) (without proof) . Simple examples , Applications	
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TEXT BOOKS:

1. Gupta S.P., Statistical Methods, Pub Sultan Chand and sons New Delhi

2. S.C. Gupta, Fundamentals of Statistics, Sultan chand & sons, Delhi.

REFERENCES:

1. D.N. Elhance, Fundamentals of Statistics, Kitab Mahal, Allahabad.

2. Montgomery D.C., Statistical Quality Control, John Wiley and sons.

3. Montgomery D.C., Statistical Quality Control, John Wiley and sons.

4. Hogg R.V. and Craig R.G., Introduction to Mathematical Statistics Ed 4 (1989), Macmillan Pub. Co. New York

Computer Fundamental and Office Automation (BCA-112)
Discipline Core (DC); 4 Credits (3-1-0)

Through this course, students should learn basic principles of using Windows operation system.
Be able to access the Internet, Worldwide Web, as well as use Internet directories and search engines, and locate www addresses.
Be able to find and evaluate information on the Web (learn how to be critical and evaluate what is valid and reliable).

S. No.	Topic	No. of Lectures
Unit 1	**Introduction to Computers** Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages).	**8**

	Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication	
Unit 2	**Algorithm and Flowcharts** Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples	**8**
Unit 3	**Operating System and Services in O.S.** Dos – History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.	**8**
Unit 4	**Windows Operating Environment** Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.	**8**
Unit 5	**Editors and Word Processors** Basic Concepts, Examples: MS-Word, Introduction to desktop publishing. **Spreadsheets and Database packages** Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.	**8**
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Text Books:

1. Fundamental of Computers – By V.Rajaraman B.P.B. Publications
2. Fundamental of Computers – By P.K. Sinha
3. Computer Today- By Suresh Basandra
4. Unix Concepts and Application – By Sumitabha Das
5. MS-Office 2000(For Windows) – By Steve Sagman
6. Computer Networks – By Tennenbum Tata MacGrow Hill Publication

Programming Principles and Algorithms (BCA-113)
Discipline Core (DC); 4 Credits (3-1-0)

Objectives:

- Expose the basics of measuring the efficiencies of algorithms and how to identify basic operations within an algorithm. Certain objectives have been set out to ensure that outlines the principles of a good programming style.

S. No.	Topic	No. of Lectures
Unit 1	**Introduction to 'C' Language**, Language Fundamentals History, Structures of 'C' Programming, Function as buildingblocks. Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, Comments.	8
Unit 2	**OperatorsBuild in Operators and function**, Types of operators, Precedence and Associativity, Expression, Statement and types of statements , Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.	8
Unit 3	**Control structures Decision making structures**: If, If-else, Nested If-else, Switch; Loop Control structures: While, Dowhile, for, Nested for loop; Other statements: break, continue, goto, exit	8
Unit 4	**Introduction to problem solving, Concept**: problem solving, Problem solving techniques, (Trail & Error, Brain Stroming, Divide & Conquer), Steps in problem solving (Define Problem, Analyze Problem, Explore Solution) Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditionals in pseudo-code, Loops in pseudo code Time complexity: Big-Oh notation, efficiency Simple Examples: Algorithms and flowcharts (Real Life Examples)	8
Unit 5	**Simple Arithmetic Problems Addition** / Multiplication of integers, Determining if a number is +ve / -ve / even / odd, Maximum of 2 numbers, 3 numbers, Sum of first n numbers, given n numbers, Integer division, Digit reversing, Table generation for n, ab , Factorial, sine	8

	series, cosine series, nCr , Pascal Triangle, Prime number, Factors of a number, Other problems such as Perfect number, GCD numbers etc (Write algorithms and draw flowchart), Swapping,Functions Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.	
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Text Books:

1. Let us C-Yashwant Kanetkar.

2. Programming in C-Balguruswamy