KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ

Tele: 0836-2215224
e-mail: academic.st@kud.ac.in

Pavate Nagar,Dharwad-580003
ಪಾವಟಿ ನಗರ, ಧಾರವಾಡ – 580003

NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU /Aca(S&T)/ RIH-290/CBCS/2020-21/ **315**   Date: **13 AUG 2020**

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2020–21ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸಗಳಿಗೆ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಮಾದರಿಯ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

ಉಲ್ಲೇಖ: 1. DO No. 1-1/2016(SECY), dt. 10.08.2016.

2. Academic Council Res. No. 2, 21.05.2020.

3. KU/Aca(S&T)/RIH-194/20-21/71, dt. 08.06.2020.

4. KU/VCS/2020-21, dt. 11.08.2020.

5. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ 13.08.2020.

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ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳಿಗೆ ಸಂಬಂಧಿಸಿದಂತೆ, 2020–21ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸಗಳ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್‌ಗಳಿಗೆ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಮಾದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದನೆಯನ್ನು (Pending Approval of Academic Council Meeting) ನಿರೀಕ್ಷೆಯಲ್ಲಿರಿಸಿ ಅಳವಡಿಸಲಾಗಿದೆ.

ಮುಂದುವರೆದು, ಈ ಮೇಲಿನ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಪಠ್ಯಕ್ರಮವು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ www.kud.ac.in ದಲ್ಲಿ ಬಿತ್ತರಿಸಲಾಗಿದೆ ಎಂದು ಈ ಮೂಲಕ ತಿಳಿಸಲಾಗಿದೆ.

(ಡಾ. ಹನುಮಂತಪ್ಪ ಕೆ.ಟಿ)
ಕುಲಸಚಿವರು

ಗೆ,

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ.

ಪ್ರತಿ ಮಾಹಿತಿಗಾಗಿ: ಡೀನರು, ಕಲಾ, ಸಮಾಜ ವಿಜ್ಞಾನ, ವಿಜ್ಞಾನ ಹಾಗೂ ತಂತ್ರಜ್ಞಾನ, ವಾಣಿಜ್ಯ, ಕಾನೂನು, ಶಿಕ್ಷಣ ಮತ್ತು ಮ್ಯಾನೇಜಮೆಂಟ್ ನಿಖಾಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.

ಪ್ರತಿ:
1. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಪತಿಗಳ ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಸಚಿವರ ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಸಚಿವರು(ಮೌಲ್ಯಮಾಪನ) ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ನಿರ್ದೇಶಕರು, ಇಂಟರನೆಟ್ ಸೆಕ್ಷನ್, ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕವಿವಿ, ಧಾರವಾಡ.
5. ಅಧೀಕ್ಷಕರು, ಸಿಡಿಸಿ (ಸಂಯೋಜನೆ) ವಿಭಾಗ, ಕವಿವಿ, ಧಾರವಾಡ

SEMESTER - I

B.Sc.(CS)-1.1-AECC-1: ENGLISH-1

(English-I – Syllabus is decided by respective BoS)

B.Sc.(CS)-1.2- AECC-2: MIL-1

(MIL – Syllabus is decided by respective BoS)

B.Sc.(CS)-1.3- AECC-3: INDIAN CONSTITUTION

(Indian Constitution – Syllabus is decided by respective BoS)

B.Sc.(CS)-1.4 - DSC-1A: PROBLEM SOLVING TECHNIQUE USING 'C' PROGRAMMING

Total: 48 Hrs

UNIT 1:
Computer Concepts: Block diagram of computer system, Central Processing Unit(CPU), ALU, CU, Main memory, Input/Output Unit, **Input devices:** Keyboard, Mouse, Light pen, Joystick, Scanner, Digitizer. **Output devices**: Various types of printers, Plotters, **Software:** System software, Operating System, Application Software, Machine level language, Assembly language, high level programming, Assemblers, compilers and editors, Merits and demerits of all the languages.

(4 Hrs)

UNIT 2:
Computer Programming: Basics Programming concepts- Algorithm, Flowchart. **Overview of C:** Introduction, Importance of C, Sample 'C' programs, Basic structure of C programming, Programming Style, Executing a 'C' program **Data Types in C:** C tokens, Keywords, Identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to variables, Defining symbolic constants, Simple Programs.
Input and Output statements: Input and Output statements, Reading character, Writing character, formatted input, formatted output statements**.**

(13 Hrs)

UNIT 3:
Operators and Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bitwise operators, Special operators, Type Conversion in expressions, Operator precedence, Mathematical functions. **Branching and Looping:** Simple 'if' statement, Simple, Nested, Ladder 'if–else' statement. The 'Switch' statement, The ?; operator, GOTO statement, The 'While' statement, 'do-while' statement, 'for' statement, Simple programs on branching and looping.

(11 Hrs)

UNIT 4:
Arrays: Introduction, One dimensional, Two dimensional and Multi dimensional arrays, Initialization of arrays, **Handling of Character Strings:** Declaring and Initializing string variables, reading string from terminal, writing string to screen, Arithmetic operations on characters, putting strings together, Comparison of two strings, **string handling functions:** strlen, strcpy, strcat, strcmp.

(8Hrs)

UNIT 5:
Functions: Definition of function. Return values and their types, Function calls, Function declaration, Categories of function explanation with example, Nesting of function, Recursion, Faction with arrays.
Structure and Union: Introduction, Defining Structure, declaring structure variables and structure members, arrays as structure, arrays within structure, Union. Pointers: Understanding Pointers, Accessing the address of variables, Declaring and initializing pointers, Accessing a variable through its pointers.

(12 Hrs)

Text Books:

1. Balaguruswamy: Programming in ANSI C, Tata Mc Graw-Hill.
2. Brian W. Kernighan and Dennis M. Ritchie: The C Programming Language, PHI

Reference:

1. V. Rajaraman: Fundamentals of Computers, PHI(EEE).
2. Kamthane, Programming with ANSI and Turbo C, Pearson Education, Asia.
3. Herbert Schildt: C. The complete reference, 4th edition.
4. Yeshwant Kanetkar: Let us C, BPB Publications.
5. Rajesh Hongal: Computer Concepts and C Programming.

B.Sc.(CS) 1.5-DSC-2A: COMPUTER ORIENTED NUMERICAL METHODS

Total: 48 Hours

UNIT 1:
Solution of Equations(Polynomial and Transcendental equations): Interval Halving Methods, Secant Methods, Regular Falsi Method, Newton's Raphsons Methods, Find Point Iteration Methods, Muller's Method.

(10 Hrs)

UNIT 2:
Solutions of system of Linear Equations: Gaussian Elimination Method, Gauss Iteration Method, Gauss-Jordan, Gauss-Jocobi, Gauss-Siedal Iterative Methods, LU Decomposition Method, Eigen Value and Eigen Vector of a Matrix.

(12 Hrs)

UNIT 3:
Finite Differences: Forward Difference, Backward Differences & Central Differences & operations, Interpolation for Equal Intervals, Newton's Forward Interpolation Formula, Newton's Backward Interpolation Formula, Central differences formula-Gauss forward and backward formula Stiriling's formula ,Bessel's formula, Lagrange Interpolation, Curve fitting by least Squares Method.

(15 Hrs)

UNIT 4:
Numerical Differentiation and Integration: Derivative using Newton's Forward Difference Formula, Derivative using Newton's Backward Difference Formula, Derivative using Sterling's formula, Maxima and Minima, Numerical Integration :General Quadrature formula, Trapezoidal Rule,simpsom's $1/3^{rd}$ Rule, Simpsons $3/8^{th}$ Rule, Weddle's Rule,Euler-Maclaurin summation formula.

(11 Hrs)

Text Books:

1. **"**Numerical Methods", Dr. P.Kandasamy and Dr. K Gunavati, S Chand & Co Ltd, India.
2. "Elementary engineering mathematics" B.S Grewal. Khanna Publisher.

Reference Books:

1. **"**Introductory Methods of Numerical Analysis", 5th edition, S Sastry, PHI.
2. "Numerical Methods for Science and Engineering Computation", M.K. Jain, S.R.K. Iyengar, Wiley Eastern Limited.

B.Sc.(CS)-1.6- DSC-3A: INTRODUCTION TO LINUX

Total: 48 Hrs

UNIT 1:
Introduction to Unix: Brief History, What is Unix?, Unix Components, Using Unix, Commands in Unix, Some Basic Commands, Getting Help, Command Substitution, Giving Multiple Commands, Aliases.

(8 Hrs)

UNIT 2:
Files and File Organization: Unix Files, Categories of Files, Hidden Files, File System, Path Names, Home Directory, Directory Commands, File Related Commands, Wild Cards, Displaying the Contents of a File, Printing of Files, Comparing Files.
File Attributes and Permissions: Ownership of Files, File Attributes, File Command, Changing File Permission, Changing the Owner of a File, Changing the group of a File, Times Associated with a File, umask Command.

(10 Hrs)

UNIT 3:
The vi Editor: vi Editor, Editing with vi, Moving the Cursor, Editing, Copying and Moving Text, Pattern Searching, Repeating the Last Editor Command, Undoing Commands, Joining Lines, Writing Selected Lines onto a Separate File, Using the Shell from vi, Configuring the vi Environment.

(10 Hrs)

UNIT 4:
Regular Expressions: grep Family of Commands and sed : Regular Expressions, grep Family, egrep Command, fgrep Command, Stream Editor-sed.

(5 Hrs)

UNIT 5:
Shell Programming : Shell Variables, export Command, .profile File – A Script Run during Starting, The First Shell Script, read Command, Positional Parameters, The $? Variable – Knowing the Exit Status, More about the set Command, exit Command, Branching Control Structures, Loop-Control Structures, continue and break Statements, expr Command, Real Arithmetic in Shell Programs, The here Document (<<), sleep Command, Debugging Scripts, script Command, eval Command, exec Command.

(15 Hrs)

Text Books:

1. M.G.Venkateshmurthy: Introduction to Unix & Shell Programming, Pearson Education

Reference Books :

1. John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
2. Sumitabha Das: Your Unix - The Ultimate Guide, TMH.
3. Richard Petersen: The Complete Reference – Linux, McGraw-Hill
4. Yashwant Kanetkar: Unix & Shell programming – BPB

B.Sc.(CS)-1.7- DSC-1A (Pr): C- PROGRAMMING LAB

Programs:

1. Write a C program to find the area of a circle given radius.

2. Write a C program to find the area of a triangle given three sides.

3. Write a C program to calculate simple interest and compound interest.
4. Write a C program to convert temperature in Fahrenheit to Celsius and Celsius to Fahrenheit.
5. Write a C program to find the GCD and LCM of two integer numbers.
6. Write a C program to check whether the given integer is even or odd using if condition statement.
7. Write a C program to accept two integers and determine in which quadrant it lies using if ladder.
8. Write a C program to simulate a simple calculator with addition, subtraction, multiplication, division and it should display the error message for division for 0 using switch case.
9. Write a C program to print number from 100 to 200 which are divisible by 7 and display their sum and count using for loop.
10. Write a C program to reverse a given integer number and check whether the number is palindrome or not using while loop.

11. Write a C program the pattern given below using nested for loop

```
1. * * * * *          2. 1
     * * * *               1 2
     * * *                 1 2 3
     * *                   1 2 3 4
     *                     1 2 3 4 5
```

12. Write a C program to read N integers (zero, positive and negative) into an array and find sum of positive numbers, sum of negative numbers and average of all numbers.

13. Write a C program to find the addition and subtraction of two matrices.
14. Write a C program to calculate the factorial of a number using function.
15. Write a C program to find if a character is alphabetic or numeric or special character.
16. Write a C program to count the number of vowels, consonants and special   characters in a given sentence.
17. Write a C program to accept a sentence and convert all lowercase letters to uppercase letters and vice-versa.
18. Write a C program to find the length of a string using user defined function.
19. Write a program to accept different goods with the number, price and date of purchase, finally display them (using structure).
20. Write a C program to implement array using pointers.

Note: All programs should be carried out on UNIX/LINUX platform

B.Sc.(CS)-1.8- DSC-2A (Pr): NUMERICAL METHODS LAB

Programs:

1. Program to interchange primary and secondary diagonal elements of a square
2. Program to find the row sum, column sum, primary diagonal sum and secondary diagonal sum of a matrix.
3. Program to check whether the given matrix is singular or not.
4. Program to find the addition, subtraction and multiplication of two matrices using functions
5. Program to accept a square matrix and determine whether it is an identity matrix or not.
6. Program to find the root of the equation using Bisection Method.
7. Program to find roots of an eqn $f(x) = 0$ using Regular-Falsi Method.
8. Program to find the root of the equation using Newton Raphson Method.
9. Program to solve the system eqn $Ax = B$ using Gauss Elimination Method.
10. Program to solve the system eqn $Ax = B$ using Gauss Jacobin Method.
11. Program to solve the system eqn $Ax = B$ using Gauss Seidel Method.
12. Program to find integral of a function using Trapezoidal rule.
13. Program to find integral of a function using Simpson's $1/3^{rd}$ rule.
14. Program to find integral of a function using Simpson's $3/8^{th}$ rule.

Note: All programs should be carried out on UNIX/LINUX platform

SEMESTER - II

B.Sc.(CS) 2.1-AECC-4: ENGLISH-2

(English – Syllabus is decided by respective BoS)

B.Sc.(CS) 2.2-AECC-5: MIL-2

(MIL – Syllabus is decided by respective BoS)

B.Sc.(CS) 2.3-AECC-6: HUMAN RIGHTS AND ENVIRONMENTAL STUDIES

(HR & ES – Syllabus is decided by respective BoS)

B.Sc.(CS) 2.4-DSC-1B: PROBABILITY & STATISTICS

Total: 48 Hours

UNIT 1:
Introduction: Meaning and scope, origin and development of statistics, definition of statistics, importance and scope of statistics, limitations of statistics, distrust of statistics.
Collection of Data: Introduction ,objectives and scope of enquiry, statistical units to be used, source of information(Data),methods of data collection, degree of accuracy aimed at in the final results, types of enquiry, primary and secondary data, choice between primary and secondary data, methods of collecting primary data, direct personal investigation, indirect oral investigation, information received through local agencies, mailed questionnaire method, schedules sent through enumerators, drafting or framing the questionnaire, sources of secondary data, published sources, unpublished sources, precautions in the use of secondary data.

(13 Hrs)

UNIT 2:
Classification and tabulation : Introduction, classification, functions of classifications, rules for classifications, basis of classifications, frequency distributions, array, discrete or ungrouped frequency distribution, grouped frequency distribution, continuous frequency distribution, basic principles for forming a grouped frequency distribution, types of classes, number of classes, size of class intervals, cumulative frequency distribution, less then cumulative frequency, more than cumulative frequency, bivariate frequency distribution, tabulation-meaning and importance, parts of a table, requisites of a good table, type of tabulation.

(9 Hrs)

UNIT 3:
Diagrammatic and graphic representation : Introduction, difference between diagrams and graphs, diagrammatic representation, general rules for construction for diagrams, types of diagrams, one dimensional diagrams, two dimensional diagrams, three dimensional diagrams, pictograms, cartograms, choice of diagrams, graphical representational data, technique of construction of graphs, general for graphing, graphs of frequency distributions, graphs of time series or histograms, semilogarthamic line graphs or ration charts, limitations of diagrams and graphs.

(9 Hrs)

UNIT 4:
Averages: Introduction , requisites of good average or measure of central tendency ,various measure of central tendencies, arithmetic mean, step deviation method for computing arithmetic mean, mathematical properties of arithmetic mean, weighted arithmetic mean, median, partition values, graphic methods of locating partition values, mode, computations of mode, merits and demerits of modes, graphic location of mode, empirical relation between mean(M),median(Md),mode(Mo),Geometric mean, merits and demerits of Geometric mean, compound interest formula, average rate of a variable which increases by different rates at different periods, weighted geometric mean and harmonic mean, merits and demerits of harmonic mean, weighted harmonic mean ,relation between arithmetic mean, geometric mean and harmonic mean and harmonic mean, selection of an average, limitations of averages.

(7 Hrs)

UNIT 5:
Dispertion: Introduction and meaning range, Quartile deviation, Mean deviation and average deviation, standard deviation, Coefficient of variation.
Skweness and Kurtosis: Introduction, Skweness, Moments, Charlier checks. Kurtosis.

(10 Hrs)

Text Books:

1. Fundamentals of Statistics by S C Gupta, Himalaya publishing house.

Reference Books:

1. Statistical Methods by S P Gupta, Sultan Chand & Sons, 2011
2. Statistical Concept and Application by Nabendu Pal and Sahadeb Sarkar, PHI.

B.Sc.(CS) 2.5-DSC-2B: OOP with C++

Total 48 Hrs

UNIT 1:
Introduction: Procedural languages, definition of OOP, Basic concept of OOP, Object, Class, Data Abstraction, Encapsulation, Data Hiding, member functions, Reusability, Inheritance, Creating new data Type, Polymorphism, Overloading, Dynamic binding, Message Passing.

C++ Features: The iostream class, C++ comments, C++ keywords, variable declaration, the const qualifier, the endl, setw, set Precision, Manipulators, The scope resolution operator, the new and delete operators.

Functions: Simple functions: function declaration, calling the function, function definition, passing argument to, returning value from function, passing constants, variables, pass by value, passing structure variables, pass by reference, default arguments, return statements, return by reference, overloaded functions, different number of arguments, different kinds of arguments, inline functions.

(10 Hrs)

UNIT 2:
Objects & Classes: classes & objects, class declaration, class members, data constructors, destructors, member functions, class member visibility: private, public, protected. The scope of the class object constructors, default constructor, constructor with argument, constructor with default arguments, dynamic constructors, copy constructor, overloaded constructor, object as function arguments, member functions defined outside the class, objects as arguments, returning objects from functions, class conversion, manipulating private data members, destructors, classes, objects &memory, array as class member data, Array of objects, string as class member.

(10 Hrs)

UNIT 3:
Operator Overloading: Overloading unary operator, operator keyword, operator arguments, operator return value, nameless temporary objects, limitations of increment operator, overloading binary operator, arithmetic operator, comparison operators, arithmetic assignment operator, Data conversion: conversion between basic to class types, conversion between objects and basic types, conversion between objects of different classes.

(8 Hrs)

UNIT 4:
Inheritance: Derived class & Base class: Specifying the derived class accessing the base class members, the protected access specifier, derived class constructor, overriding member functions, public & private inheritance, access combinations, classes & structures, access specifies, level of inheritance: Multilevel inheritance, hybrid inheritance, multiple inheritance, member functions in multiple inheritance, constructors in multiple inheritance, Containership: classes within classes, Inheritance & program development.

(10 Hrs)

UNIT 5:
Virtual Functions: Normal member function accessed with pointers, virtual member function accessed with pointers, dynamic binding, pure virtual functions, Friend function: friends for functional notation, friend classes, this pointer, accessing member data with this, using this for returning values.

Templates & Exception Handling: Introduction, templates, class templates, function templates, member function templates, template arguments, Exception handling.

(10 Hrs)

Text Book:

1. E.Balaguruswamy: Object oriented Programming with C++ Tata McGraw Hill publications.
2. Lafore Robert: Object oriented Programming in Turbo C++ Galgotia Publications.

Reference Books:

1. Stanley B. Lippman, Josee Lajoie, Barbara E. Moo : C++ primer, 5th Edition, Addison-Wesley.
2. Prata : C++ primer Plus, 4th Edition, Person Education.
3. Strousstrup: The C++ programming Language Pearson Education .

B.Sc.(CS) 2.6-DSC-3B: DISCRETE MATHEMATICAL STUCTURE

Total: 48 Hrs

UNIT 1:
Fundamental principles of counting: The rules of sum and product, Permutations, combinations, the binomial theorem, combinations with repetitions.

(9 Hrs)

UNIT 2:
Fundamental of Logic: Basic connectives and truth tables, Logical equivalence, the laws of logic, logical implication, rules f inference, use of quantifiers, quantifiers, definitions and proofs of theorems.

(12 Hrs)

UNIT 3:
Set theory: sets and subsets, set operations and laws of set theory, counting and venn diagram, Probability.

(8 Hrs)

UNIT 4:
Properties of integers and Mathematical induction: the well-ordering principle, Mathematical induction, recursive definitions, the division algorithm, prime numbers, the GCD, Euclid's algorithm, the fundamental theorem of arithmetic.

(12 Hrs)

UNIT 5:
Relations and functions: Cartesian Products and relations, Functions, plain & one-one function, Onto functions.

(7 Hrs)

Text Books :

1. Ralph. P. Grimaldi, Discrete and Combinational Mathematics, An applied introduction, Pearson Education(LPE) Fourth edition, 4th Indian Reprint.
2. Kolman, Busby & ross, Discrete Mathematical 5/e, Pearson Education .

Reference Books:

1. C. L. Liu, Elements of Discrete Mathematics, McGraw Hill, 1985.
2. Richard Johnsonbaugh, Discrete Mathematics, 5th Edition, Pearson Education, 2003.
3. Rajendra Akerkar and Rupali Akerkar, Discrete Mathematics, Pearson Education, 2004

B.Sc.(CS) 2.7-DSC-1B(Pr): PROBABILITY & STATISTICS LAB

Programs:

1. Program to construct a discrete frequency distribution table and find mean and standard deviation.
2. Program to construct a continuous frequency distribution table for given data and find mean and standard deviation.
3. Program to find the mean, mode and median of continuous frequency distribution.
4. Program to find Karl Pearson correlation coefficient between two variables.
5. Program to find the rank correlation, coefficient between two variables.
6. Program to fit the regression equation X on Y and Y on X.
7. Program to fit Binomial distribution.
8. Program to fit straight line equation and obtain trend value.
9. Program to fit Poisson distribution.
10. Program to find AM, GM, HM for given set of observation.
11. Program to calculate GM for tabulated data.
12. Program to calculate combined AM and find HM for continuous set of data
13. Program to calculate combined SD.
14. Program to calculate median for raw set of data.
15. Program to find median for tabulated data.

Note: All programs should be carried out on UNIX/LINUX platform

Programs:

1. Demonstrate digital clock
2. Calculate area and circumference of a circle using inline function
3. Demonstrate default arguments function.
4. Demonstrate object as function arguments and returning objects from function.
5. Input roll number, name, marks of three subjects and display total and average demonstrating array as object.
6. Swap two numbers using friend function.
7. Demonstrate single inheritance.
8. Demonstrate multiple inheritances.
9. Perform addition of 2 matrices using operator overloading.
10. Demonstrate multiplication of two matrices using operator overloading.
11. Demonstrate to overload Arithmetic Assignment "+=" and "-=" operators
12. Implement operations on stack.
13. Demonstrate derived class constructor and overriding member functions in base and derived class.
14. Sort elements using function template.
15. Demonstrate class template.
16. Demonstrate default constructor and parameterized constructor.
17. Demonstrate copy constructor.
18. Find area and circumference of rectangle and triangle using function overloading.
19. Compare two strings using equal operator.
20. Demonstrate virtual function.

Note: All programs should be carried out on UNIX/LINUX platform

SEMESTER -I

BCA-1.1-AECC-1: ENGLISH-1

(English-I – Syllabus is decided by respective BoS)

BCA-1.2- AECC-2: MIL-1

(MIL – Syllabus is decided by respective BoS)

BCA-1.3- AECC-3: INDIAN CONSTITUTION

(Indian Constitution – Syllabus is decided by respective BoS)

BCA-1.4 - DSC-1A: COMPUTER CONCEPTS AND 'C' PROGRAMMING

Total: 48 Hrs

UNIT 1:
Computer Concepts: Block diagram of computer system, Central Processing Unit (CPU), ALU, CU, Main memory, Input/Output Unit, Input devices:- Keyboard, Mouse, Light pen, Joystick, Scanner, Digitizer. Output devices- Various types of printers, Plotters, Software: System software, Operating System, Application Software, Machine level language, Assembly language, high level programming, Assemblers, compilers and editors, Merits and demerits of all the languages.

(4 Hrs)

UNIT 2:
Computer Programming: Basics Programming concepts- Algorithm, Flowchart. **Overview of C:** Introduction, Importance of C, Sample 'C' programs, Basic structure of C programming, Programming Style, Executing a 'C' program **Data Types in C:** C tokens, Keywords, Identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to variables, Defining symbolic constants, Simple Programs.
Input and Output statements: Input and Output statements, Reading character, Writing character, formatted input, formatted output statements**.**

(13 Hrs)

UNIT 3:
Operators and Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bitwise operators, Special operators, Type Conversion in expressions, Operator precedence, Mathematical functions**. Branching and Looping:** Simple 'if' statement, Simple, Nested, Ladder 'if–else' statement. The 'Switch' statement, The ?; operator, GOTO statement, The 'While' statement, 'do-while' statement, 'for' statement, Simple programs on branching and looping.

(11 Hrs)

UNIT 4:
Arrays: Introduction, One dimensional, Two dimensional and Multi dimensional arrays. Initialization of arrays. **Handling of Character Strings:** Declaring and Initializing string variables, reading string from terminal, writing string to screen, Arithmetic operations on characters, putting strings together, Comparison of two strings, string handling functions: strlen, strcpy, strcat, strcmp.

(8 Hrs)

UNIT 5:
Functions: Definition of function. Return values and their types, Function calls, Function declaration, Categories of function explanation with example, Nesting of function, Recursion, Faction with arrays. Structure and Union: Introduction, Defining Structure, declaring structure variables and structure members, arrays as structure, arrays within structure, Union. Pointers: Understanding Pointers, Accessing the address of variables, Declaring and initializing pointers, Accessing a variable through its pointers.

(12 Hrs)

Text Books:

3. Balaguruswamy: Programming in ANSI C, Tata Mc Graw-Hill.
4. Brian W. Kernighan and Dennis M. Ritchie: The C Programming Language, PHI

Reference:

6. V. Rajaraman: Fundamentals of Computers, PHI(EEE).
7. Kamthane, Programming with ANSI and Turbo C, Pearson Education, Asia.
8. Herbert Schildt: C. The complete reference, 4th edition.
9. Yeshwant Kanetkar: Let us C, BPB Publications.
10.   Rajesh Hongal: Computer Concepts and C Programming.

BCA-1.5- DSC-2A: INTRODUCTION TO LINUX

Total: 48 Hrs

UNIT 1:
Introduction to Unix: Brief History, What is Unix?, Unix Components, Using Unix, Commands in Unix, Some Basic Commands, Getting Help, Command Substitution, Giving Multiple Commands, Aliases.

(8 Hrs)

UNIT 2:
Files and File Organization: Unix Files, Categories of Files, Hidden Files, File System, Path Names, Home Directory, Directory Commands, File Related Commands, Wild Cards, Displaying the Contents of a File, Printing of Files, Comparing Files.
File Attributes and Permissions: Ownership of Files, File Attributes, File Command, Changing File Permission, Changing the Owner of a File, Changing the group of a File, Times Associated with a File, umask Command.

(10 Hrs)

UNIT 3:
The vi Editor: vi Editor, Editing with vi, Moving the Cursor, Editing, Copying and Moving Text, Pattern Searching, Repeating the Last Editor Command, Undoing Commands, Joining Lines, Writing Selected Lines onto a Separate File, Using the Shell from vi, Configuring the vi Environment.

(10 Hrs)

UNIT 4:
Regular Expressions : grep Family of Commands and sed : Regular Expressions, grep Family, egrep Command, fgrep Command, Stream Editor-sed.

(5 Hrs)

UNIT 5:
Shell Programming : Shell Variables, export Command, .profile File – A Script Run during Starting, The First Shell Script, read Command, Positional Parameters, The $? Variable – Knowing the Exit Status, More about the set Command, exit Command, Branching Control Structures, Loop-Control Structures, continue and break Statements, expr Command, Real Arithmetic in Shell Programs, The here Document (<<), sleep Command, Debugging Scripts, script Command, eval Command, exec Command.

(15 Hrs)

Text Books:

2. M.G.Venkateshmurthy: Introduction to Unix & Shell Programming, Pearson Education

Reference Books :

5. John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
6. Sumitabha Das: Your Unix - The Ultimate Guide, TMH.
7. Richard Petersen: The Complete Reference – Linux, McGraw-Hill
8. Yashwant Kanetkar: Unix & Shell programming – BPB

BCA-1.6- DSC-3A: FUNDAMENTALS OF MATHEMATICS FOR COMPUTER

Total: 48 Hrs

UNIT 1:
Trigonometric Functions: Introduction, Angles, Trigonometric Functions, Trigonometric Functions of Sum and Difference of two Angles, Trigonometric Equations.

(5 Hrs)

UNIT 2:
Complex Number and Quadratic Equations: Introduction, Complex Number, Algebra of Complex Number, The Modulus and Conjugate a Complex Number, Argand Plane and Polar Representation, Quadratic Equations.

(10 Hrs)

UNIT 3:
Fundamental principles of counting: The rules of sum and product, Permutations, combinations, the binomial theorem, combinations with repetitions.

(9 Hrs)

UNIT 4:
Fundamental of Logic: Basic connectives and truth tables. Logical equivalence, the laws of logic, logical implication, rules of inference, use of quantifiers, quantifiers, definitions and proofs of theorems.

(15 Hrs)

UNIT 5:
Set Theory: sets and subsets, set operations and laws of set theory, counting and venn diagram, Probability.

(9 Hrs)

Text Books :

3. Ralph. P. Grimaldi, Discrete and Combinational Mathematics, An applied introduction, Pearson Education(LPE) Fourth edition, 4th Indian Reprint.
4. Kolman, Busby & Ross, Discrete Mathematical 5/e, Pearson Education .
5. P.G. Umarani & B.G. Umarani: A Text of Mathematics for PUC I & II.

Reference Books:

4. C. L. Liu, Elements of Discrete Mathematics, McGraw Hill, 1985.
5. Richard Johnsonbaugh, Discrete Mathematics, 5th Edition, Pearson Education, 2003.
6. Rajendra Akerkar and Rupali Akerkar, Discrete Mathematics, Pearson Education, 2004
7. B.M. Shrinivasrao: A Text book of Mathematics: Excellent Publication.
8. H.S. Hali & S.R. Knight: Higher Algebra, Surjeet Publications(1988).
9. Shanti Narayan: Differential Calculus. S. Chand & Co.
10. S. L. Loney, Trigonometry, Surjeet Publication.

BCA-1.7- DSC-1A(Pr): C- PROGRAMMING LAB

Programs:

1. Write a C program to find the area of a circle given radius.
2. Write a C program to find the area of a triangle given three sides.
3. Write a C program to calculate simple interest and compound interest.
4. Write a C program to convert temperature in Fahrenheit to Celsius and Celsius to Fahrenheit.
5. Write a C program to find the GCD and LCM of two integer numbers.
6. Write a C program to check whether the given integer is even or odd using if condition statement.
7. Write a C program to accept two integers and determine in which quadrant it lies using if ladder.
8. Write a C program to simulate a simple calculator with addition, subtraction, multiplication, division and it should display the error message for division for 0 using switch case.
9. Write a C program to print number from 100 to 200 which are divisible by 7 and display their sum and count using for loop.
10. Write a C program to reverse a given integer number and check whether the number is palindrome or not using while loop.

11. Write a C program the pattern given below using nested for loop

```
1. *  *  *  *  *              2. 1
    *  *  *  *                    1 2
    *  *  *                       1 2 3
    *  *                          1 2 3 4
    *                             1 2 3 4 5
```

12. Write a C program to read N integers (zero, positive and negative) into an array and find sum of positive numbers, sum of negative numbers and average of all numbers.

13. Write a C program to find the addition and subtraction of two matrices.
14. Write a C program to calculate the factorial of a number using function.
15. Write a C program to find if a character is alphabetic or numeric or special character.
16. Write a C program to count the number of vowels, consonants and special characters in a given sentence.
17. Write a C program to accept a sentence and convert all lowercase letters to uppercase letters and vice-versa.
18. Write a C program to find the length of a string using user defined function.
19. Write a program to accept different goods with the number, price and date of purchase, finally display them (using structure).
20. Write a C program to implement array using pointers.

Note: All programs should be carried out on UNIX/LINUX platform

BCA-1.8- DSC-2A(Pr): LINUX LAB

Programs:

1. Study Experiment- UNIX basics
2. Basic Shell Programming (Fibonacci Series generation, Factorial of a given number, Checking for Armstrong number)
3. Designing a Arithmetic calculator
4. Generation of Multiplication table
5. Base Conversion (Decimal to Binary, Binary to Decimal) 6. Checking for a Palindrome of a number
6. Finding the information about the Login name and File name
7. Write a shell script to exchange the contents of two variables.
8. Write a shell script, which accepts three subject marks scored by a student and declare the result.
9. Write a shell script program to find area of a square, rectangle, circle and triangle.
10. Write a shell script to print integer numbers from 1 to 20.
11. Write a shell script to perform arithmetic operation on two number depending on +, -, * and /.
12. Write an interactive shell script to display a menu and perform the following task:
       i. Renaming a file ii. Deleting a file iii. Copying a file iv. Exit
13. Write a shell script which counts the number of lines in a file.
14. Write a shell script to accept three command line arguments and display each one of them.
15. Write a c program to a. Display the PID of parent and PID of child. b. Copy the contents of one file into the other using command line arguments.
16. Write a shell script program to check whether the given file is present in a directory and check what is all the permission given for the owner.
17. Write a shell script program to read 2 filename and check which 1 is newer and which is older.
18. Write a shell script program to find the number of directory files and ordinary files in the current directory.

SEMESTER -II

BCA 2.1-AECC-4: ENGLISH-2

(English – Syllabus is decided by respective BoS)

BCA 2.2-AECC-5: MIL-2

(MIL – Syllabus is decided by respective BoS)

BCA 2.3-AECC-6: HUMAN RIGHTS AND ENVIRONMENTAL STUDIES

(HR & ES – Syllabus is decided by respective BoS)

BCA 2.4-DSC-1B: FUNDAMENTALS OF ALGORITHMS

Total: 48 Hrs

UNIT 1:
Introduction to computer problem solving: Introduction, the problem solving aspects, Top-down design, Implementation of Algorithms, program verification, The Efficiency and Analysis of Algorithm.

(6 Hrs)

UNIT 2:
Fundamentals of Algorithms: Exchanging the values of two variables, Counting, Summation of set of Numbers, Factorial Computation, Sine function computation, Generation of Fibonacci Sequence, Reversing the Digits of an Integer, Base conversion, character to number conversion

(8 Hrs)

UNIT 3:
Factoring Methods: Finding the Square Root of a Number, The Smallest Divisor of an Integer, The Greatest Common Divisor of two Integers, Generating Prime Numbers, Computing the Prime Factors of an Integer, Generation of Pseudo-Random Numbers, Raising a Number to a Large Power, Computing n^{th}Fibonacci number.

(10 Hrs)

UNIT 4:
Array Techniques: Array Order Reversal, Array Counting, Finding the Maximum Number in a Set, Removal of Duplicates from an Ordered Array, Partitioning an Array, Finding the kth Smallest Element.

(12 Hrs)

UNIT 5:
Merging, Sorting, Searching: The two-way Merge, Sorting by Selection, Sorting by Exchange, Sorting by Insertion, Sorting by Partitioning, Linear Search, Binary Search.

(12 Hrs)

Text Books:
1. R.G. Dromey: How to Solve it by Computer, Pearson Education.

Reference Books:

1. N. Writh : Algorithms and Data Structures, Oberon version, 2004.
2. Alan Gibbons: Algorithmic Graph Theory, Cambridge University Press.
3. M.C. Goulmbic: Algorithmic Graph Theory and Perfect Graphs, 2nd edition, Elsevier, 2004

BCA 2.5-DSC-2B: NUMERICAL AND STATISTICAL METHODS

Total: 48 Hrs

NUMERICAL METHODS:
UNIT 1:
Solution of equations (polynomial and transcendental equations), Interval halving methods, secant, Regular Falsi, Newtons-Raphsons methods, fixed point iteration methods, Solutions of system of linear equations, Gaussian elimination method, Gauss- Jordan, Gauss-Siedal iteration methods LU Decomposition method, Eigen values and Eigen vectors of a Square matrix

(14 Hrs)

UNIT 2:
Newton's forward and backward differences, Interpolation formula- Lagrange interpolation, Curve fitting by least squares method, Numerical Differentiation, Integration, Trapezoidal and Simpson's formula. Romberg integration**.**

(9 Hrs)

STATISTICAL METHODS:
UNIT 3:
Basic Concepts and Definition of Statistics, Mean, standard deviation, Coefficient of variation, Skewness and Kurtosis, Carl Pearson Correlation, rank Correlation and illustrated examples**.**
Probability: Basic concepts and definition of probability axions, Laws of Probability (based on set theory concepts), Conditional probability Boy's theorem, Problems and applications.

(12 Hrs)

UNIT 4:
Random variable and Expectation: Discrete and continuous random variables, expectation of random variables, theorems on expectation, illustrative examples, Probability Distribution: Probability function, probability mass / density function, Discrete Distribution- Bernoulli Binomial, Geometric distributions, Continuous distribution- Exponential, normal and Weibul Distribution, applications and problems.

(10 Hrs)

UNIT 5:
Reliability: Basic concepts and definition of reliability, hazard, IFR and DFR, parallel and series system, Application and problems.

(3 Hrs)

References:

1. M. K. Jain, SRK Iyengar and R. K Jain Numerical methods for Scientific and engineering computation: Wiley Eastren(1998).
2. S. S. Shastry: Introductory methods of numerical Analysis PHI(New Delhi) 2001.
3. K. S Trevedi (1998) Probability and statistics with Relability Queing and computer Science application Prentice Hall of India, Pvt Ltd, New Delhi.
4. Vik Kapoor & Gupta: Mathematical statistics S. Chand & Co., New Delhi.
5. S. K. Shina & B. K. Gale: Theory & Relability.

BCA 2.6-DSC-3B: FUNDAMENTALS OF DIGITAL LOGIC

Total: 48 Hrs

UNIT 1:
Number system and codes: Binary number system, decimal number system, octal number system, hexadecimal number system. Bases inter conversions. Representation of negative numbers 1's and 2's complements. Codes: BCD, GRAY, EXCESS-3.

(4 Hrs)

UNIT 2:
Boolean algebra and logic systems: Laws of Boolean algebra, Boolean laws. Evaluation of Boolean expression, De Morgan's theorems and proof, simplification on Boolean expressions using Boolean laws Basic gates (AND, OR, NOT): truth table, Definition, Boolean expression and symbols, universal gates (NAND, NOR): truth table, definition, Boolean expression and symbols, design of basic gates using NAND and NOR gates. Logical gates using NAND and NOR, Design of given Boolean expression using basic gates or NAND gate or NOR gate. XOR and XNOR gate (Definition, Boolean expression and symbols, truth table).

(10 Hrs)

UNIT 3:
Simplification of Boolean functions: SOP and POS form, min term and max term, expression of Boolean equation in Min and Max term (conversion of SOP and POS forms to standard form) K-map method: Rules, simplification of Boolean equation using K-map (up to 4 variables), without and with don't-care condition, Implementation using basic gates or NAND gate or NOR gate, Quine - Mc Cluskey Tabulation method, determination and selection of prime implicates.

(12 Hrs)

UNIT 4:
Combination logic: Design procedure, design of half adder and full adder, half subtract or and full sub tractor. Code converters:- BCD to Excess 3 code, gray code, magnitude comparator, encoders (BCD to decimal), decoder (decimal to BCD), multiplexer(4:1 and 8:1), de-multiplexer(1:4 and 1:8).

(08 Hrs)

UNIT 5:
Sequential logic: Introduction, Flip-flops – SR, JK, D, T, JK-MS (Detailed Study) Registers – Introduction, shift register- types and applications. Counters – synchronous and asynchronous counters (Up, down, up down).

(14 Hrs)

Text Book:

1. M. Moris Mano, Computer System Architecture, 2nd Edition, Prentice Hall of India.

Reference:

1. Heuring and Jordan, Computer systems design and architecture, Pearson Education
2. William Stallings, Computer Organization and Architecture, Pearson Education 2003.
3. Andrew S Tenenbaum, Structured Computer Organization, 3rd Edition, Prentice Hall of India(1990).

BCA 2.7-DSC-1B(Pr): ALGORITHMS LAB

Programs:

1. Write a function that accepts N integers to find maximum and minimum element in an 1 to N integers.
2. Write a C program to find N Fibonacci Series.
3. Program to read N (minimum 5) students marks and find number of students passed and fail depending on the marks.
4. Write a C program to find the roots of the given quadratic equation using nested if statement.
5. Write a C Program to compute $x^n/n!$
6. Program to convert binary number to decimal.
7. Program to find Geometric Mean G.M=$\sqrt[n]{(x1 X x2 X x3 X x4 \dots xn)}$
8. Program to iteratively compute the reciprocal of a number.
9. Check whether given number is Armstrong or not
10. Generate N prime numbers.
11. Partition given array into two sub array and print each sub array elements.
12. Program to remove duplicates from an ordered array.
13. Program to merge two separate array into single array.
14. Sort the array elements by using Exchange. Selection and Insertion
15. Binary search using recursive as well as iterative techniques.
16. Write a C program to reverse the digits of an integer and characters of the string.
17. Write a C program to display all possible permutations of given input string – if the string contains duplicate characters, you may have multiple repeated results. Input should be of the form permute string and output should be a word per line. sample: cat: cat, cta, act, atc, tac, tca
18. Write a C program design and implement scientific calculator using math and string functions.

Note: All programs should be carried out on UNIX/LINUX platform

BCA 2.8 -DSC-2B(Pr): NUMERICAL AND STATISTICAL METHODS LAB

Programs:

Numerical Methods Programs

1. Program to check whether the given matrix is singular or not.
2. Program to find the root of the equation using Bisection Method.
3. Program to find roots of an eqn f(x) =0 using Regular-Falsi Method.
4. Program to find the root of the equation using Newton Raphson Method.
5. Program to solve the system of equation Ax = B using Gauss Elimination Method.
6. Program to solve the system eqn Ax = B using Gauss Jacobin Method.
7. Program to solve the system eqn Ax = B using Gauss Seidel Method.
8. Program to find integral of a function using Trapezoidal rule.
9. Program to find integral of a function using Simpson's $1/3^{rd}$ rule.
10. Program to find integral of a function using Simpson's $3/8^{th}$ rule.

Statistical Methods Programs

1. Program to construct a discrete frequency distribution table and find the mean and standard deviation.
2. Program to construct a continuous frequency distribution table and find the mean and standard deviation.
3. Program to find the mean, mode and median of continues frequency distribution.
4. Program to find the Karl Pearson correlation coefficient between two variables.
5. Program to find AM, GM, HM for given set of observation.
6. Program to calculate GM for tabulated data.
7. Program to calculate combined AM and find HM for continuous set of data
8. Program to calculate combined SD.
9. Program to calculate median for raw set of data.
10. Program to find median for tabulated data.

Note: All programs should be carried out on UNIX/LINUX platform

B.Sc. Semester -I
COMPUTER SCIENCE: CST: A
Problem solving techniques using 'C'

Credits	I. Theory	: 04	Theory class 4Hours /week. Total theory: 60Lectures 80 Marks for Semester End Examination (3 Hours) & 20 marks IA
	II. Practical	: 02	Practical: 4 Hours /week Total Practical: 52 Hours. 40 marks for Semester End Examination (3 Hours) & 10 marks IA
	Total Credits	: 06	Total Theory marks 100 and Practical marks 50

Unit I: 15 Hours

Computer Fundamentals: History & Evolution of Computers. Characteristics, Types and Generations of Computers. System logical Organization: Von - Neumann concept of computer with block diagram: Components of Computer & their functions. Input Devices, Output Devices, Storage Devices. Processor & Main Memory: Central Processing Unit: ALU & CU. Architecture of Processor & Main Memory, Processor Registers, Main Memory: Organization of Main Memory, Main Memory Capacity. RAM, ROM, PROM, EPROM, EEPROM, Cache Memory.

Computer Software: Types of Software: System Software & Application Software. Translators: Compiler, Interpreter Linker, Loader and Editor. Computer Languages: Machine Level, Assembly Level & High Level, Their Merits & Demerits. Planning a Computer Program: Algorithm, Flowchart and Pseudo code.

Unit II: 10 Hours

Introduction to C: Over View of C: Introduction. Importance and Features of C. Structure of a C Program. Sample C Programs. Creating and Executing a C Program. Block diagram of execution of C program. Basic Concepts : C Character Set. C tokens: keywords, identifiers, constants and variables. Data types. Declaration & initialization of variables. Symbolic constants. Formatted I/O functions: *printf* and *scanf*: control stings and escape sequences, output specifications with *printf* functions. Unformatted i/o functions to read and display single character and a string: *getchar*, *putchar*, *gets* and *puts* functions.

Unit III: 10 Hours

Operators & Expressions : Arithmetic operators, Relational operators, Logical operators, Assignment operators, increment & decrement operators, bitwise operators, conditional operator and special operators. Computational Problems, Operator Precedence and Associatively. Evaluation of arithmetic expressions, Type conversion.

Unit IV: 10 Hours

Control Structures (Branching & Looping) : Decision making with *if* statements: *simple if, if _ else* statements, *nested if _ else* and *else_if ladder. Switch case* Statement. *goto, break*&*continue* statements. Looping Statements : Entry controlled and Exit controlled, *while, do-while*&*for* loops. Nested loops.

Arrays and Strings: One Dimensional arrays: Declaration, Initialization and Memory representation. Two Dimensional arrays : Declaration, Initialization and Memory representation. Declaring & Initializing string variables. String handling functions: *strlen, strcmp, strcpy and strcat.* Character handling functions: *toascii, toupper, tolower, isalpha, isnumeric* etc.

User Defined Functions: Need for user defined functions. Format of C user defined functions. Components of user defined functions: return type, name, parameter list, function body, return statement and function call. Categories of User defined functions: with and without parameters and return type
Structures & Unions: Definition of Structure & Union. Declaring structure variables, Accessing structure members, Structure members initialization, Difference between structure and union.

Text Books:

1. P. K. Sinha & Priti Sinha :Computer Fundamentals (BPB)
2. V. Rajaraman : Computer Fundamentals
3. E. Balguruswamy: Programming in ANSI C (TMH)
4. V. Rajaraman : Programming in C (PHI – EEE)
5. Yashwant Kanitkar : Let us C
6. P.B. Kottur : Programming in C (Sapna Book House)

Reference Books :

1. Moris mano: Computer Organization & Architecture
2. Norton : Computer Applications
3. Kamthane : Programming with ANSI and TURBO C(Pearson Education)
4. S. Byron Gottfried: Programming with C (TMH)
5. Kernighan & Ritche : The C Programming Language.(PHI)

COMPUTER SCIENCE LAB: CSPr: A

Sample Programs: Write algorithm, draw flowchart and write 'C' programs for the following:

1. Find the area and circumference of a circle
2. Check whether the given number is prime or not.
3. Generate prime numbers up to N terms
4. Check whether a given number is palindrome or not.
5. Find the sum of digits of a given number.
6. Read coefficients a, b and c and to display proper message about the roots of quadratic equation (Illustration *switch case* statement)
7. Display multiplication table (nested for loops)
8. Find the factorial of a number
9. Convert an integer to binary.
10. Calculate x raised to y
11. Find a length of a string without using built in function
12. Check whether the given string is palindrome or not
13. Read a string and find the number of alphabets, digits, spaces and special characters. (Illustration of character functions).
14. Illustrate string functions - *strcmp*, *strcpy*, *strlen* and *strcat*
15. Find maximum and minimum integers in an array.

Distribution of Marks:

Assessment Criteria		Marks
Program – 1	Writing the Program	05
	Flowchart	02
	Execution	08
Program -2	Writing the Program	05
	Flowchart	02
	Execution	08
Viva Voice based on 'C' Programming		05
Journal		05
Total		**40**

B.Sc. Semester - II
COMPUTER SCIENCE:CST: B
Digital Logic & Computer Design

Credits	**I. Theory**	**: 04**	Theory class 4Hours / week Total theory: 60Lectures 80 Marks for Semester End Examination (3 Hours) & 20 marks IA
	II. Practical	**: 02**	Practical: 4 Hours / week Total Practical: 52 Hours. 40 marks for Semester End Examination (3 Hours) & 10 marks IA
	Total Credits	**: 06**	Total Theory marks 100 and Practical marks 50

Unit I: 05 Hours
Number system and codes: Binary number system, decimal number system, octal number system, hexadecimal number system. Bases inter conversions. Representation of negative numbers 1's and 2's complements. Codes: BCD, GRAY, EXCESS-3.

Unit II: 15 Hours
Boolean algebra and logic systems: Laws of Boolean algebra, Boolean laws. Evaluation of Boolean expression, De Morgan's theorems and proof, simplification on Boolean expressions using Boolean laws Basic gates (AND, OR, NOT): truth table, Definition, Boolean expression and symbols, universal gates (NAND, NOR): truth table, definition, Boolean expression and symbols, design of basic gates using NAND and NOR gates. Logical gates using NAND and NOR, Design of given Boolean expression using basic gates or NAND gate or NOR gate. XOR and XNOR gate (Definition, Boolean expression and symbols, truth table).

Unit III: 15 Hours
Simplification of Boolean functions: SOP and POS form, min term and max term, expression of Boolean equation in Min and Max term(conversion of SOP and POS forms to standard form) K-map method: Rules, simplification of Boolean equation using K-map (up to 4 variables), without and with don't-care condition, Implementation using basic gates or NAND gate or NOR gate, Quine - Mc Cluskey Tabulation method ,determination and selection of prime implicates.

Unit IV: 15 Hours
Combination logic: Design procedure, design of half adder and full adder, half subtract or and full sub tractor. Code converters:- BCD to Excess 3 code, gray code, magnitude comparator, encoders (BCD to decimal), decoder (decimal to BCD), multiplexer(4:1 and 8:1), de-multiplexer(1:4 and 1:8).

Unit V: 10 Hours
Sequential logic: Introduction, Flip-flops – SR,JK, D, T, JK-MS (Detailed Study) Registers – Introduction, shift register- types and applications. Counters – synchronous and asynchronous counters (Up, down, up down).

Text Books:

    2. M.Moris Mano, Computer System Architecture, 2nd Edition Prentice Hall of India.

Reference Books:

1. Heuring and Jordan, Computer systems design and architecture, Pearson Education
2. William Stallings, Computer Organization and Architecture, Pearson Education 2003.
3. Andrew S Tenenbaum, Structured Computer Organization, 3rd Edition, Prentice Hall of India(1990).

COMPUTER SCIENCE LAB: CSPr: B

Sample Programs: Microprocessor (8085) Lab

1. 8- bit Subtraction
2. 8- bit Division
3. Palindrome
4. Ascending order
5. Descending order
6. 16- bit Addition
7. BCD to binary conversion
8. Binary to BCD conversion
9. Addition of a series of numbers
10. 8- bit Multiplication
11. Largest number in a list
12. Stepper Motor
13. Traffic Light
14. LCD
15. Segment display

Note: All the programs to be executed on Simulator

Distribution of Marks:

Assessment Criteria		Marks
Program – 1	Writing the Program	05
	Algorithm	02
	Execution	08
Program -2	Writing the Program	05
	Algorithm	02
	Execution	08
Viva Voice based on Digital Logic & Computer Design		05
Journal		05
Total		**40**