

SEMESTER – I

BCA 1011: Computer Fundamentals and Introduction to C Programming

Course Learning Outcomes: After successful completion of the Course a student will be able to:

- Learn about basic Components of a Computer.
- Develop problem solving skills coupled with top-down design principles.
- Become skilled at developing simple algorithms and flow charts.
- Convert the algorithms into simple C programs.
- Develop simple C programs for solving real life problems.

Credit :3

45 Hours

Introduction – Introduction to computers – Evolution – Generation of Computers – Computers Hierarchy – Applications of Computers – Number System – Binary, Hexa, Octal, BCD System - Boolean Algebra – laws – logic gates – simplification of Boolean expression – k-map – sum of products – product of sums.

15hours

Introduction to computers and operating environment, program development cycle, Algorithm - Representation of Algorithms, Pseudocode, Flowchart & Decision tables, Structured Programming and Modular Programming, Introduction to C.

10hours

Data Types and sizes, variable declaration, operators, type conversion, conditional expressions, special operators, precedence rule. Control Structures- statements and blocks, if, switch, while, for, do-while, break, continue, goto and labels. [20%]

10hours

Functions & Program structure, recursion, arrays and pointers, structures and unions, standard I/O,formatted I/O, standard library functions. Files handling and pre-processing. String processing in C.

10hours

Books:

1. Programming in C-B.S. Gottfried (Sahaum Series)
2. Programming in ANSI C- E. Balaguruswami(TMH)

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(Practical)

Credit :1

30 Hours

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$

4. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$

5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.

6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.

7. WAP to compute the factors of a given number.

8. Write a macro that swaps two numbers. WAP to use it.

9. WAP to print a triangle of stars as follows (take number of lines from user):

*

10. WAP to perform following actions on an array entered by the user:

i) Print the even-valued

elements

ii) Print the odd-valued elements

iii) Calculate and print the sum and average of the elements of array

iv) Print the maximum and minimum element of array

v) Remove the duplicates from the array

vi) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also

include options to re-enter array and to quit the program.

11. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as

command line arguments.

12. Write a program that swaps two numbers using pointers.

13. Write a program in which a function is passed address of two variables and then alter its contents.

14. Write a program which takes the radius of a circle as input from the user, passes it to another

function that computes the area and the circumference of the circle and displays the value of area and

circumference from the main() function.

15. Write a program to find sum of n elements entered by the user. To write this program, allocate

memory dynamically using malloc() / calloc() functions or new operator.

16. Write a menu driven program to perform following operations on strings:

- a) Show address of each character in string
- b) Concatenate two strings without using strcat function.
- c) Concatenate two strings using strcat function.
- d) Compare two strings
- e) Calculate length of the string (use pointers)
- f) Convert all lowercase characters to uppercase
- g) Convert all uppercase characters to lowercase
- h) Calculate number of vowels
- i) Reverse the string

17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered

array.

18. WAP to display Fibonacci series (i)using recursion, (ii) using iteration

19. WAP to calculate Factorial of a number (i)using recursion, (ii) using iteration

20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.

21. Create Matrix class using templates. Write a menu-driven program to perform following Matrix

operations (2-D array implementation):

- a) Sum b) Difference c) Product d) Transpose

BCA 1021: Mathematics-I

This course introduces the students to the fundamental concepts and topics of linear algebra and vector calculus, whose knowledge is important in other computer courses. The course aims to build the foundation for some of the core courses in later semesters.

Course Learning Outcomes After successful completion of this course, the student will be able to:

- **Perform operations on matrices and sparse matrices**
- **Compute the determinant, rank and eigenvalues of a matrix**
- **Perform operations on vectors, the dot product and cross product**
- **Represent vectors geometrically and calculate the gradient, divergence, curl**
- **Apply linear algebra and vector calculus to solve problems in sub-disciplines of computer science**

Credit :4

60 Hours

Algebra: Sets, Union and Intersection, Complement, Mapping, Composition, notion of a Group, Ring, Field with simple examples. **10hours**

Complex Number: Modulus and amplitude, De Moivre's theorem **05hours**

Polynomials, Division algorithm, Fundamental theorem of classical algebra (Proof not required), Descartes rule of sign and their application, Relation between roots and coefficients; symmetric function of roots, Transformation of polynomial equation, Cardon's solution of cubic equation, Determinants, Addition and Multiplication of Matrices, Inverse of a Matrix ; Solution of linear equations in three variables by Cramer's rule and solution of three line linear equations by matrix inversion methods. **20hours**

Vector spaces, Subspaces, Bases and Dimensions, Co-ordinates, Linear Transformation, The Algebra of Linear Transformations. Vector Algebra: Scalars & vectors, vector addition, linear combination of vectors, condition of colinearity of three points, scalar and vector products, scalar triple product and vector triple product. **15hours**

Analytical Geometry: Translation and rotation of rectangular axes, invariants, general equation of second degree-reduction to standard forms and classification. Plane polar equation of a straight line, circle, ellipse, parabola and hyperbola. **10hours**

Books:

1. A Text book of Algebra- B.K. Lahiri & K. C. Roy
2. Linear Algebra- Das & Roy
3. Co-ordinate Geometry- S. L. Loney
4. Differential Calculus- Das and Mukherjee
5. Integral Calculus - Das and Mukherjee

BCA 1051: PC Software

Course Learning Outcomes: After successful completion of the Course:

- **Learners will be able to claim proficiency in MS-Office.**
- **Learners will be able to independently create professional-looking documents and presentations.**
- **Learners will be familiar with some advanced Word Power Point and Excel functions.**
- **Learners will be able to prepare research and academic related presentations.**

Credit :3

45 Hours

DOS: Introduction to DOS, internal and external commands, batch files (Autoexec.bat, config.sys), Line editors.

MS Windows: Desk top cell user interface action, icon on desktop, closing windows, renaming icons, resizing windows (maximizing and minimizing), control panel.

MS Word: Overview, creating, saving, opening, importing, exporting, and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size, editing, positioning, viewing texts, searching and replacing text, inserting page breaks, page numbers, bookmarks, symbols, and dates. Using tabs and tables, header, footer, and printing,

MS Excel: Worksheet overview, entering information, worksheet creation, opening and saving workbook, formatting numbers and texts, protecting cells, producing charts, and printing operations.

MS Access: Introduction, understanding databases, creating tables, queries, forms, reports, adding graphs to your reports. PowerPoint: Slide creation with PowerPoint.

BOOKS:

1. Computer Fundamentals – Raja Raman – Prentice Hall of India .
2. Digital Circuits & Design – S.Salivahanan, S.Arivazhagan – Vikas Publishing House Pvt Ltd.
3. Digital logic & Computer Design- M.Mano- Prentice Hall of India.

Comm1031: FUNDAMENTALS OF ACCOUNTING

Marks: 50 Course Evaluation: Semester Examination (40 Marks) and Internal Assessment (10 Marks)

Credit: 3

Lectures: 48 Hours

Objectives: The objective of this course is to provide students with a comprehensive understanding of various fundamental issues associated with Accounting which will help them in interpreting the financial statements of business firms as well as non-profit seeking organizations.

Course Outcomes: After successful completion of the course, students will be able to:

1. Understand the basic concepts of Accounting.
- 2 Prepare the Financial Statements of the proprietary concerns.
3. Prepare the Financial Statements of non-profit seeking concerns.

CONTENTS

Unit 1: Introduction of Accounting

8 Lectures

- (i) **Accounting:** Meaning, objectives, Types of accounting information, Users of accounting information and their needs. Basis of accounting – cash basis, accrual basis and hybrid basis. Types of accounting – Financial Accounting, Cost Accounting and Management Accounting.

- (ii) **Accounting Principles:** Entity Concept, Money Measurement Concept, Going Concern Concept and Accounting Period Concept.
- (iii) **Basic Accounting Terms:** Transaction, Event, Capital, Drawings, Asset (Fixed and Current), Liabilities (Long term, Short Term or Current), Receipts (Capital & revenue), Expenditure (Capital, Revenue and Deferred Revenue), Income, Profit/Loss, Purchase, Sales, Stock, Debtors, Creditors, Cost, Revenue, Discount (Cash & Trade)

Unit 2: Recording of Transactions and Preparation of Trial Balance 20 Lectures

- (i) **Double Entry System:** Introduction, Rule for Debit and Credit – classification of accounts and application of Golden Rule.
- (ii) **Evidence of transactions:** invoice, cash memo, pay-in-slip, cheque; Preparation of Voucher (Cash, Credit and Transfer)
- (iii) **Books of Original Entry:** Meaning, Format & Recording.
- (iv) **Cash Book:** Single Column Cash Book, Double Column Cash Book & Petty Cash Book
- (v) **Special Purpose Books:** Purchase Book, Sales Book, Purchase Return Book, Sales Return Book, Bills Receivable Book, Bills Payable Book and Journal Proper.
- (vi) **Ledger:** Meaning, Utility, Format; posting from Journal, Cash Book and Special Purpose Books; balancing of Ledger Accounts.
- (vii) **Trial Balance:** Meaning, Objectives and Preparation.
- (viii) **Bank Reconciliation Statement:** Meaning, Need and Preparation.

Unit 3: Financial Statements 10 Lectures

- (i) **Financial Statements:** Objective and Importance.
- (ii) **Trading and Profit & Loss Account:** Preparation of Accounts.
- (iii) **Balance Sheet:** Need for Preparation, Grouping and Marshalling of Assets & Liabilities.
- (iv) **Preparation of Financial Statements:** Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietorship trading concern.

Unit 4: Financial Statements of Non-Profit Seeking Organizations 10 Lectures

- (i) **Non-Profit Seeking Organization:** Concept
- (ii) **Receipts and Payments Account:** Need for preparation and features.
- (iii) **Income and Expenditure Account:** Need for preparation and features.
- (iv) **Financial Statements:** Preparation of Income & Expenditure Account and Balance Sheet from the given Receipts & Payments Account and additional information.

Suggested Readings:

1. Charles T. Horngren and Donna Philbrick, Introduction to Financial Accounting, Pearson.
2. M.C. Shukla, T.S. Grewal and S.C. Gupta, Advanced Accounts, Vol.-I. S. Chand & Co.
3. P.C. Tulsian, Financial Accounting, Pearson Education.
4. Amitabha Basu, Financial Accounting I and II, Tee Dee Publications.
5. T. S. Grewal, Financial Accounting, Sultan Chand,
6. Rajasekaran, Financial Accounting, Pearson
7. Mukherjee and Mukherjee, Financial Accounting I and II, Oxford
8. Amitabha Mukherjee, Mohammed Hanif, Financial Accounting I&II, McGraw Hill Education.
9. S. Anil Kumar, V. Rajesh Kumar and B. Mariyappa, Fundamentals of Accounting, Himalaya Publishing House.
10. V.K. Goyal, RuchiGoyal, Financial Accounting, PHI Learning.
11. Debashri Bhattacharya, Financial Accounting I, Law Point