Governance Services on Mobile Using "UMANG APP", Digital Locker. Digital Financial Tools, eWallet, PoS, Internet Banking.

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

1. Describe the hardware, software and components of a digital computer
2. Explain number systems, functions of operating systems and language processors.
3. Create and use of email, e-Governance, and financial services

Text Books:

1. Pradeep K. Sinha and Priti Sinha, **Computer Fundamentals**, BPB Publication, 8th Edition, 2018.
2. V. Rajaraman, **Introduction to Information Technology**, PHI Learning; 3rd edition, 2018
3. Anita Goel, **Computer Fundamentals**, Pearson Education India; First Edition, 2010

Reference Books:

1. David Riley and Kenny Hunt, **Computational Thinking for Modern Solver**, Chapman and Hall/CRC; 1st edition, 2014.
2. Glenn Brookshear, **Computer Science: An Overview**, Pearson Education; Twelfth edition, 2017.
3. Puneet Kumar, Sushil Bhardwaj, *et al.*, **Introduction to Information Technology**, Kalyani Publishers; 2018th edition, 2018.

Semester	**: II**
Course Type	**: IDC**
Course Code	**: CSCIDC151**
Name of the Course	**: Programming Fundamentals with C**
Learning level	**: Foundation or Introductory Course**
Credits	**: 3**
Contact Hours	**: 45**
Total Marks	**: 100**
End Semester Marks	**: 70**
Internal Marks	**: 30**

Course Objectives:

1. Write algorithms, flowcharts and programs.
2. Implement different programming constructs and decomposition of problems into functions.
3. Use and implement data structures like arrays to obtain solutions.

UNIT I

Introduction to Programming: Computer Programs, Natural Language vs Programming Language, Concepts of Machine Level, Assembly Level and High-level Programming Language, Compiler, Interpreter.

Programming terms: Source Code, Target Code, Input, Output, Compiling, Warning, Running, Debugging, Testing.

Errors: Errors in Computer Programs, Different types of Errors in Computer Programs.

UNIT II

Introduction to Computing: Art of Programming through Algorithms and Flowcharts, Qualities of Good Algorithm, Flowchart Symbols, Rules for designing Flowchart.

Overview of C Programming: History and importance of C, Basic structure of C program, executing a C program.

UNIT III

Constants, Variable and Data Types: Introduction, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Defining Symbolic Constants.

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Arithmetic Expressions.

UNIT IV

Decision Making and Branching: Introduction, Decision Making with Simple IF Statement, IF-ELSE Statement, Nested of IF-ELSE Statements, ELSE IF Ladder, Switch statement.

Looping: Introduction, while Statement, do while statement, for statement.

UNIT V

Arrays: One-dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One-dimensional Arrays.

User-defined Functions: Need for functions, Elements of User-defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but no Return values, Arguments with Return Values, No Arguments but Returns a Value, Passing Arrays to Functions, Recursion.

Pointers: Introduction to pointers in C (basic Concepts)

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

1. Demonstrate problem solving skills by developing and implementing algorithms to solve problems.
2. Apply appropriate Control structures to solve problems.
3. Describe the concept of Arrays.
4. Write user defined functions and apply the concept of function to solve problems.

Text Books:

1. Brian W. Kernighan and Denis M. Ritchie, **The C Programming Language**, Pearson Education India; 2nd edition, 2015.
2. Byron S Gottfried, **Programming with C**, McGraw Hill Education; 4th Edition, 2018.
3. E. Balagurusamy, **Programming in ANSI C**, McGraw Hill Education; Eighth edition, 2019
4. V. Rajaraman, **Computer Programming in C**, PHI Learning Private Limited; Second edition, 2019

Reference Books:

1. Yashavant P. Kanetkar, **Let Us C**, BPB; 16th edition, 2017.
2. Kamthane, **Programming in C**, Pearson Education India; 3rd edition, 2015.