**B.Tech / I Semester R-20 Syllabus**

**C Programming for Problem Solving**

**Course Outcomes**

**The student will be able to**

1. Analyze a computational problem and develop an algorithm/flowchart to find its solution
2. Develop C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
3. Divide a given computational problem into a number of modules and develop C program with arrays.
4. Write C programs which use pointers for array processing and parameter passing
5. Develop C programs with structure or union and files for storing the data to be processed.

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| **UNIT-I** | **Contact Hours : 10** |
| **INTRODUCTION TO PROGRAMMING :** What is computer, Block diagram of Computer, Development of Computer languages, Translators, Computer Codes, Computer Arithmetic, Programming Techniques, Algorithm, Flowchart | |
| **BASICS OF C :** History of C, Character Set, Identifiers, Keywords, Tokens, Variables, constants, operators, Data types, expressions, expression evaluation, Type conversion, operator precedence and associativity, C program structure. | |
| **UNIT-II** | **Contact Hours : 8** |
| **CONSOLE I/O OPERATIONS : Formatted I/O - printf & scanf, Unformatted I/O functions.** | |
| **CONTROL FLOW STATEMENTS: Branching Statements - if, if – else, switch. Looping statements- while, do – while, for, nested for. Unconditional Statements - break, continue, goto, exit.** | |
| **UNIT-III** | **Contact Hours : 12** |
| **FUNCTIONS: Introduction to Functions, Types of Function, Function prototypes, parameter passing techniques, Scope of variables, Storage classes, Recursion**  **ARRAYS : Array declaration , initialization and Accessing, Types of Arrays : 1-D and 2-D Arrays, Arrays as Function Arguments** | |
| **UNIT-IV** | **Contact Hours : 8** |
| **STRINGS: Reading String from terminal, Writing string to Screen, String Handling Functions.** | |
| **POINTERS: Pointer Declaration, Initialization and Accessing , Types of Pointers, Pointer Arithmetic, Dynamic memory allocation** | |
| **UNIT-V** | **Contact Hours : 10** |
| **STRUCTURE : Introduction to structures, Definition of structure , declaration of structure variable, accessing of structure members, array of structures, Union, enum, bit fileds, typedef**  **FILES : Introduction to Files, Types of File, File Modes, Writing and Reading Files, File management I/O functions** | |

**Text books**

**Programming in ANSI C by E. Balguruswamy, Tata Mc-Graw Hill**

**Programming for Problem Solving, Behrouz A. Forouzan, Richard F.Gilberg, CENGAGE.**

**Reference Books**

1. The ‘C’ programming language by Kernighan and Ritchie, Prentice Hall
2. Computer Programming in ‘C’ by V. Rajaraman , Prentice Hall
3. Programming and Problem Solving by M. Sprankle, Pearson Education
4. How to solve it by Computer by R.G. Dromey, Pearson Education

**Online Practice and Reference Material**

**• http://www2.its.strath.ac.uk/courses/c/**

**Notes on C programming by University of Strathclyde Computer Centre. This tutorial was awarded the NetGuide Gold Award during the 1990s.**

**•http://www.princeton.edu/~achaney/tmve/wiki100k/docs/C\_%28programming\_language%29.html**

**This site contains notes on C programming from Princeton University, USA. These are very useful for students who are learning C as their first programming Language.**

**• http://www.stat.cmu.edu/~hseltman/Computer.html**

**Online reference material on Computers and Programming from Carnegie Mellon University, Pittsburgh, USA**

**• http://projecteuler.net/**

**Collection of mathematical problems which make you use programming skills**