# Parul University - Faculty of Engineering and Technology

**Department of Computer Science & Engineering**

**SYLLABUS FOR 2nd Sem BTech PROGRAMME**

**Programming for Problem Solving (303105102)**

**Type of Course:** BTech

**Prerequisite:** Requires Basic Knowledge of Computer

**Rationale:** This course is design to provide basic ideas of computer programming. This course also makes help to understand programming language. It will help to develop their logical abilities.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credit | Examination Scheme | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | External | | Internal | | | |
| Lect Hrs/ Week | Tut Hrs/ Week | Lab Hrs/ Week | | T | P | T | CE | P | |
| 3 | 0 | 2 | 4 | 60 | 30 | 20 | 20 | 20 | 150 |

**Lect** - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

**Contents:**

| Sr. | Topic | Weightage | Teaching Hrs. |
|---|---|---|---|
| 1 | **Number System:**:<br><br>Introduction and type of Number system, Conversion between number system, Arithmetic operations on number system, Signed and unsigned number system Software, Computer Languages and Computer Program | 2% | 3 |
| 2 | **Introduction to 'C' Programming:**:<br><br>Features of C language, structure of C Program, Flow Charts and Algorithms Types of errors, debugging, tracing/stepwise execution of program, watching variables values in memory. | 3% | 3 |
| 3 | **Constants, Variables and data Types:**:<br><br>Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, Assigning values to variables, typedef, and Defining symbolic constants. | 5% | 2 |
| 4 | **Operators and Expression:**:<br><br>Introduction to Operators and its types, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Operator precedence and associatively. | 10% | 3 |
| 5 | **Management Input and Output Operators:**: Introduction, reading a character, writing a character, formatted input, formatted output. | 5% | 2 |
| 6 | **Control structure in C:**:<br><br>Decision Making & branching: Decision making with If &If .. Else statements, If .. Else statements (Nested …. Ladder), The Switch &goto statements, The turnery (?:) Operator Looping: The while statement, The break statement & The Do.. While loop, The FOR loop, Jump within loops – Programs | 15% | 4 |

| | | | |
|---|---|---|---|
| 7 | **Array:**:<br><br>Introduction, One-dimensional arrays, Two-dimensional arrays, arrays, Concept of Multidimensional arrays. | 10% | 4 |
| 8 | **String:**: string , string storage , Built-in-string functions | 10% | 3 |
| 9 | **User-Defined Functions:**:<br><br>Concepts of user defined functions, prototypes, definition of function, parameters, parameter passing, calling a function, recursive function, Macros, Pre-processing. | 10% | 5 |
| 10 | **Structure and Unions:**:<br><br>Introduction, Structure definition, declaring and initializing Structure variables, Accessing Structure members, Copying & Comparison of structures, Arrays of structures, Arrays within structures, Structures within Structures, Structures and functions, Unions | 10% | 5 |
| 11 | **Pointers:**:<br><br>Basics of pointers, pointer to pointer, pointer and array, Pointer to array, array of pointers , functions returning a pointer | 10% | 5 |
| 12 | **Dynamic memory allocation:**: Introduction to Dynamic memory allocation, malloc(), calloc(), free(), realloc() | 5% | 2 |
| 13 | **File Management in C:**: Introduction to file management and its functions | 5% | 1 |

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**


1. Programming in ANSI C (TextBook)
   E. Balaguruswamy; Tata McGraw-Hill
2. C Programming: Test Your Skills
   Ashok Kamthane
3. Computer Fundamentals
   P.K.Sinha and Priti Sinha; BPB Publications; 4th Edition
4. Star C Programming
   ; STAR Certification; C Certification Exam
5. Programming with C
   Byron Gottfried; Tata McGraw Hill Education
6. C The Complete Reference
   Herbert Schildt
7. Let Us C
   Yeshavant Kanetkar; BPB Publications


**Course Outcome:**

After Learning the course the students shall be able to:

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1. Recognize the computer's basic principles and organizations.
2. Understand Concepts of Computer Programming Language.
3. Develop the algorithm for solving basic Engineering Problems.
4. Write, Compile and debug program with C Programming.
5. Analyse the Solved, Complex Computational Program written in C.
6. Develop simple projects using C Language.

**List of Practical:**

## 1. Practical Set 1 (Basics)

1. Write a program to print HELLO FRIENDS!
2. Write a program that reads two nos. from key board and gives their addition, subtraction, multiplication, division and modulo.
3. Write a program to calculate area of circle,use Ω as symbolic constants.
4. Write a program to convert days into months and days.
5. Write a program which calculates the summation of three digits from the given 3 digit number.
6. Write a program to demonstrate enumerates data type.
7. Write a program to compute Fahrenheit from centigrade.
8. Write a program to calculate simple interest.
9. Read the price of item in decimal form e.g. 12.50 and separate Rs and Paise from the given value e.g. 12 rupees and 50 paise.

## 2. Practical Set 2 (Control Structures)

1. Write a program to find the largest of the three nos. using Nested-If-Else statement.
2. Write a C program to enter a character and to check whether it is a small letter or it is a capital letter or it is a digit or it is a special symbol.
3. Write a program to read marks from keyboard and your program should display equivalent grade according to following table.

| Marks | Grade |
|---|---|
| 100-80 | Dist |
| 60-79 | First Class |
| 35-59 | Second Class |
| 0-34 | Fail |

1. Write a program to read marks of a student from keyboard whether the student id pass (if).
2. Write a program to find the sum of first N odd numbers.
3. Write a program using while loop construct which finds the factorial of a given integer number.
4. Write a C program using do…while and for loop constructs to reverse the digits of the number.
5. Write a program to demonstrate use of Switch- Break Statement.
6. Write a program to find out all the numbers divisible by 5 and 7 between 1 to 100.

Check for Armstrong number. A number is Armstrong if sum of cube of every digit is same as the original number. E.g. 153=13+53+33=153

1. Write a program to print the output of bellow series. 1!+2!+3!+4!+..... n!
2. Write a program to print the following outputs using for Loop.

(a) 1
12
123

(b) *
**
***

1. Write a program to print the following outputs using for Loop.

(a) 1
21
321

(b) 321
21
1

## 3. Practical Set 3 (Array & Strings)

1. Write a program which sorts 10 numbers into ascending order.
2. Write a program to find maximum element from 1-D array.
3. Write a program to find number of odd and even elements from the 1-D array.
4. Write a program add two 2x2 matrices.
5. Write a program to count number of positive, negative and zero elements from 3x3 matrix.
6. Write a function for the following operations on string:

**Copy** one string to another
**Comparing** two strings
**Adding** a string to the end of another.

1. Write a program to count vowels from a entered String.
2. Write a program which finds whether a string is a palindrome or not.

## 4. Practical Set 4 (Functions)

1. Write a program to find factorial of a number using recursion.
2. Write a program that used user defined function Swap ( ) and interchange the value of two variable.
3. Write a function to return 1 if the number is prime otherwise return 0.

## 5. Practical Set 5 (Structures)

1. Define a structure type, personal that would contain person name, date of joining and salary.
2. Define a structure called cricket that will describe the following information: Player name Team name Batting average

## 6. Practical Set 6 (Pointers)

1. Write a program to add two numbers using pointers.
2. Write a program to swap two numbers using pointer

## 7. Practical Set 7 (File Management)

1. Write a program to illustrate reading files contents.
2. Write a program to illustrate the use of fgets( ).