GUJARAT TECHNOLOGICAL UNIVERSITY

Integrated MCA

Year – 1 (Semester – I) (W.E.F. JULY 2018)

Subject Name: Fundamentals of Programming 1 (FOP-1)
Subject Code: 2618603

1. Objectives:

- To acquire the ability to develop logic, corresponding flowcharts and an algorithm for solving programming problems.
- To learn about the data types, operators and functions in C programming language.
- To be able to write code in C programming language for a variety of problems

2. Prerequisites: Logical thinking, Basic Mathematics including number systems

3. Course Contents:

Sr. No.	Course Content	Weightage Percentage
1	**Introduction to programming:** Programs & programming, programming languages, compiler, interpreter, loader & linker, C program execution, Classification of Programming Languages, Concept of Structured Programming and Algorithms; Good programming practices: In-line comments, Meaningful variable names, etc	10%
2	**C Programming Basics:** Simple program in C, Structure of C Program, Concept of Variable, Data types in C, Program statements, declarations, How the computer stores data in memory, Tokens, Operators and Expressions, Expressions revisited, L-values and R-values, Working with complex numbers. **Input Output:** Basic Screen and Keyboard I/O in C, Unformatted Input and Output, Formatted Input and Output Functions	15%
3	**Control Statements:** Specifying Test Condition for Selection and Iteration, Writing Test Expression, Conditional execution and selection, Iteration and	15%

	Repetitive Execution: for and while loops; when to use which loop, goto statement, special control statements, nested loops.	
4	**Arrays & strings:** One-dimensional Array, Strings, String: One dimensional Array, Multi-dimensional array, Array of string, two dimensional Arrays	30%
5	**Functions:** Concepts of Function, Using Functions, Working with function, Passing array to Function, Scope and Extent, Storage class, In-line function	30%

4. Main Reference Books:

Pradip Dey, Manas Ghosh, "Programming in C", Second Edition, Oxford Higher Education

5. Suggested Additional Reading:

- Programming in ANSI C, by Balaguru samy, Publisher - Tata McGraw Hill.
- Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education.
- Mastering C, by Venugopal & Prasad, Publisher – Tata McGraw Hill.
- C: The Complete Reference, by Herbert Schildt, Publisher – Tata McGraw Hill.
- Let us C, by Yashwant Kanitkar, Publisher – BPB Publication

6. Chapter wise Coverage from Main Reference Book(s):

Unit No.	Chapter No.
1	1
2	2,3
3	4
4	5
5	6 (Except 6.4, 6.10,6.11, 6.12)

Indicative Practical List

1. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches and width of 5 inches.

2. Write a C program to convert specified number of days into years, weeks and days.

3. Write a program that converts Centigrade to Fahrenheit.

4. Write a C program that reads an integer between 1 and 12 and print the month of the year in English

5. Write a C program that accepts two item's weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items.

6. Write a C program that accepts three integers and find the maximum of three.

7. Write a C program to read an amount (integer value) and break the amount into smallest possible number of bank notes.

8. Write a C program that reads an integer and check the specified range where it belongs. Print an error message if the number is negative and greater than 80.

9. Write a C program to find and print the square of each one of the even values from 1 to a specified value.

10. Write a C program to find the eligibility of admission for a professional course based on the following criteria:
Marks in Maths >=65 Marks in Phy >=55 Marks in Chem>=50
Total in all three subject >=180

11. Write a C program to read the coordinates(x, y) (in Cartesian system) and find the quadrant to which it belongs (Quadrant -I, Quadrant -II, Quadrant -III, Quadrant -IV).

Note: A Cartesian coordinate system is a coordinate system that specifies each point uniquely in a plane by a pair of numerical coordinates. These are often numbered from 1st to 4th and denoted by Roman numerals: I (where the signs of the (x,y) coordinates are I(+,+), II (−,+), III (−,−), and IV (+,−).

12. Write a C program to print 3 numbers in a line, starting from 1 and print n lines. Accept number of lines (n, integer) from the user.
Example:

Input number of lines: 5 Expected Output:

1 2 3

4 5 6

7 8 9

10 11 12

13 14 15

13. Write a C program to calculate the value of S where S = 1 + 3/2 + 5/4 + 7/8.
14. Write a C program that reads an integer and find all its divisor.
15. Write a program in C to display the first n terms of Fibonacci series.
16. Write a program in C to convert a decimal number into binary without using an array.
17. Write a C program to generate a random number.
18. Write a C program to sort the elements of an array.
19. Write a C program to check whether an alphabet is a vowel or consonant.
20. Write a program in C to calculate and print the Electricity bill of a given customer. The

Unit	**Charge/unit**
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :
If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

21. Write a program in C to display the pattern like right angle triangle with a number.

1

12

123

1234

22. Write a program in C to make such a pattern like a pyramid with numbers increased by 1.

1

2 3

4 5 6

7 8 9 10

23. Write a program in C to display the pattern like a diamond.

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24. Write a program in C to copy the elements of one array into another array.

25. Write a program in C to merge two arrays of same size sorted in decending order.

26. Write a program in C for multiplication of two square Matrices.

27. Write a program in C to find the length of a string without using library function.

28. Write a program in C to compare two string without using string library functions.

29. Write a C program to sort a string array in ascending order.

30. Write a program in C to Concatenate Two Strings Manually.

31. Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the function.

32. Write a program in C to convert decimal number to binary number using the function.

33. Write a program in C to check whether a number is a prime number or not using the function.

34. Write a program in C to get the largest element of an array using the function.

35. Write a program in C to check whether two given strings are an anagram using function.