Gujarat University

M. Sc. Computer Science [S. F.]
Semester-1 Syllabus
Gujarat Arts & Science College, Ahmedabad.

B. Sc. Computer Science SEM-II EFFECTIVE FROM ACADEMIC YEAR - 2016-2017			
CODE	**Titles**	**Th.**	**Pr.**
COM-103	ProgramminginC (Theory)	4	
COM-104	ProgramminginC(Practical)		4

Teaching Scheme

Unit	**Computer Theory** COM – 103 4 Credit Total 100 Marks Internal 30 Marks External 70 Marks 4 hrs/Week	**ComputerPractical** COM – 104 4 Credit Total 100 Marks Internal 30 Marks External 70 Marks 4 hrs/Week
I	Introduction to Programming: Algorithms & Flow charts	Consist of 37 Numbers of Practical Experiments
II	Basics of C	
III	Control Statements	
IV	Arrays & String	
V	Functions	
VI	Pointer	
VII	Structures & Unions	

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Course Name: Programming in C (Theory) Course

Code: COM-103

Objectives: The aim of this course is to introduce the rudiments of programming to the students. Students will become familiar with problem solving techniques and algorithm development using computers. This will include structured programming using C, a high-level programming language.

Prerequisites: None

Contents:

1. **Introduction to programming: Algorithms & Flowcharts**
   - Programs & Programming
   - Programming Languages
   - Complier, Interpreter, Loader & Linker
   - Process of compilation
   - Classification of Programming Languages
   - Concepts of Algorithm and Flowcharts

2. **Basics of C**
   - Introduction
   - Basic Structure of C & Simple Programs
   - C Tokens
   - Data Type
   - Printf & Scanf
   - Variable
   - Constants
   - Operators and Expression
   - Precedence and Associativity of Operators
   - Type Conversions

3. **Control Statements**:
   - Test Condition for selection & Iteration
   - Writing Test Expression
   - Conditional execution and selection
   - Iteration and Repetitive Executions
   - Switch Statement
   - Looping Statements
   - Goto Statements
   - Nested loops

4. **Arrays & Strings**:
   - Introduction to contiguous data types
   - One dimensional arrays
   - Multidimensional arrays
   - Array as strings
   - Multidimensional character arrays
   - Operations on strings

5. **Functions:**
   - Concept of modular programming
   - The concept of Function
   - User Defined with it's types & Library Functions
   - Using functions
   - Recursion

6. **Pointer:**
   - Understanding Memory Addresses
   - Overview of Pointer
   - Use of Pointers
   - Array, String with pointer
   - Passing Pointers to a Function
   - Dynamic Memory Allocation

7. **Structures and Unions:**
   - Defining a Structure
   - Processing a Structure
     - Copy and Compare Structure Variables
     - Operations on individual members
   - Array and Structures
   - Structures and Pointers
   - Passing Structures to Functins
   - Self-referential Structures
   - Unions

Reference Book(s):

1. **Programming in ANSI C,** by Balagurusamy, Tata McGraw Hill.
2. **Programming with C,** Byron S. Gottfried, Tata McGraw Hill.
3. **Computer Science: A Structured Programming Approach Using C,** by Behrouz A. Forouzan & Richard F. Gilberg, Thomson Education.
4. **Programming with ANSI and Turbo C**, by Ashok N Kamthane, Pearson Education.
5. **Programming in C**, by Pradip Dey & Manas Ghosh, Oxford
6. **Mastering C**, by Venugopal & Prasad, Tata McGraw Hill.
7. **C: The Complete Reference,** by Herbert Schildt, Tata McGraw Hill.
8. **Let us C,** by Yashwant Kanitkar, BPB Publication
9. **Schaum's Outline of Programming with C**, by Byron Gottfried, Shaum Series.
10. **Programming in C,** by Juneja & Seth, CENGAGE Learning

Accomplishments of the student after completing the course :

After completion of the course students should become reasonably good at problem solving and algorithm development. They would become capable of solving problems using computers through C programming language.

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Course Name: Programming in C (Practical)

Course Code: COM-104

Objectives:

The purpose of this course is to develop programming skills.

Prerequisites:

None

Contents:

- Basic C Programs
- Programs based on constants, variable and diff data types.
- Programs based on Operator and Expression
- Programs based on Decision Making and Branching
- Use of Do While loop, for loop, while loop, if loop, if else if ladder, switch, go to
- Programs based on one dimensional and two dimensional array.
- Programs based on character array and String manipulation functions.
- Programs based on user-defined functions

List of Practical (Sample Guide line):

1) Write a program to print "Hello World" message.
2) Write a program to print Name, Address and Birth Date.
3) Write a program to add, multiply and divide two integers and float numbers.
4) Write a program to accept number of days and print year, month and remaining days.
5) Write a program to determine the maximum of given3 Numbers.
6) Write a program to check whether the entered number is prime or not.
7) Admission to a professional course is subject to the following conditions: (a) Marks in mathematics >= 60
   (b) Marks in physics >= 50 (c)
   Marks in chemistry >= 40
   (d) Total in all three subjects >= 200 or total in mathematics and physics >= 150

   Given the marks in the three subjects, write a program to process the applications to list an eligible candidate.
8) Write a program to calculate the area of circle/rectangle/triangle. Determine whose area is to be calculated by accepting the code from the user. Use switch case
   c indicate circle ,
   r indicate rectangle,
   t indicate triangle.

   Use symbolic constant to define the value of pie
9) Write a program to swap the values of two variables.

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10) Print the following triangle.

```
a b c d e
a b c d
a b c
a b
a
```

11) Generate the following "pyramid" of digits, using nested loops

```
1
232
34543
4567654
567898765
67890109876
7890123210987
890123454321098
90123456765432109
```

12) Write a program to generate the following

```
A B C D E F G H G F E D C B A
A B C D E F G   G F E D C B A
A B C D E F       F E D C B A
A B C D E           E D C B A
A B C D               D C B A
A B C                   C B A
A B                       B A
A                           A
```

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13) Write a program to find the smallest divisor of an integer.
14) Write a program to find the greatest common divisor of two integers.
15) Write a program to add first n natural numbers.
16) Write a program to generate Fibonacci series.
17) Write a program to print the multiplication table.
18) Write a program to find a factorial of the entered number.
19) Write a program to print all the numbers and sum of all the integers that are greater than
100 and less than 200 and are divisible by 7.
20) Write a program to sort given array in ascending order.
21) Given the two 1-D arrays A and B, which are sorted in ascending order. Write a program to merge them into a single sorted array C that contains every item from arrays A and B, in ascending order.
22) Write a program to find string length.
23) Write a program that appends the one string to another string.
24) Write a program that finds a given word in a string.
25) Write a program to evaluate
$f(x) = x - x^3/3! + x^5/5! - x^7/7! + \ldots\ldots$
26) Write a function which returns 1 if the given number is palindrome otherwise returns 0.
27) Write a function that will scan a character string passed as an argument and convert all lower-case character into their upper-case equivalent.
28) Write a function to reverse the string.
29) Write a 'c' program that reads in two matrices and multiply them. Display the resultant matrix.
30) Write a 'c' program that reads in two matrices and add them. Display the resultant matrix.
31) Write a program to remove the duplicates from an ordered array.
32) Write a program to use pointer variable in function and perform operation on pointers.
33) Write a program to use pointer with single dimensional array.
34) Write a program to use pointer with multi-dimensional array.
35) Write a program to define structure and access of it.
36) Write a program which uses structure with functions.
37) Write a program to define Union.

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