MANGALORE UNIVERSITY
Bachelor of Science (B.Sc.) Degree Programme
2019-2020 Onwards
Computer Science
II Semester B. Sc. – Blown Up Syllabus

Group I Course 1 Theory/Week: 4 Hrs Credits: 2	BSCCSC 181 Problem Solving using C Language	48 hours IA: 20 Exam: 80	
Topic		**Text Book**	**Sections**
Unit – I			
Algorithm - Features, simple examples. Flowchart – Symbols used in a flowchart, suitable examples. Program Translators – Assembler, Compiler, and Interpreter. Programming languages –Machine level language, Assembly level language, High level languages.		Book 2	1.2, 1.3 [All sub Sections] 2.2 [All sub Sections]
Overview of C: Importance of C, C character set, C tokens, Constants, variables and data types. Declaration of variables, assigning values to variables. Data type conversion, basic structure of C program, executing a C program, sample C programs. **Operators in C:** Arithmetic operators, relational operators. Logical operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, special operators, Hierarchy of operations.		Book 1	1.2 to 1.5 1.8 to 1.10 2.1 to 2.14 3.1 to 3.15
Unit – II			
Input and output statements, reading a character: getchar(), writing a character: putchar(), formatted and unformatted i/o statements. **Control structures: Branching**: if, if-else, nested if, else-if ladder, switch. **Looping:** while, do-while and for loop, nested loops. **Arrays:** Introduction, single dimensional array, two-dimensional arrays, initializing two-dimensional arrays, multi-dimensional arrays.		Book 1	4.2 to 4.5 5.2 to 5.9 6.2 to 6.5 7.1 to 7.7
Unit – III			
Handling of character strings: Declaring and initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, putting strings together, comparison of two strings, string handling functions. **User-defined functions**: Need for user defined functions, Declaring, defining and calling C functions return values and their types, Categories of functions: With/without arguments, with/without return values, recursion, and functions with arrays, the scope, visibility and lifetime of variables (Storage classes).		Book 1	8.2 to 8.8 9.2 to 9.19
Unit – IV			
Structures: Definition and declaration of a structure, assigning and accessing the members of a structure, structure initialization, structure elements in memory, comparison of structure variables, arrays of structures, arrays within structures, structures within structures.		Book 1	10.2 to 10.6 10.8 to 10.10

Unions: Definition and declaration, accessing the members of a union. Comparison of structure and union.		10.12
Pointers: Introduction to pointers, advantages of pointers, declaration of pointer variable, pointer expressions, pointers and functions: call by value and call by reference.		11.1 To 11.6, 11.8,11.13
The Preprocessor: Macro substitution and file inclusion.		14.1 to 14.3
Files: Definition, types of files. Creating text file. Modes of opening a file, formatted and unformatted i/o operations.		12.1 to 12.4

Text Books:
1. E. Balagurusamy, **Programming in ANSI C**, Sixth Edition, Tata McGraw Hill
2. M. T. Somashekara, **Problem Solving with C**, PHI.

Reference books:
1. S. Byron Gottfried, **Programming with C**, Tata McGraw-Hill
2. Brian W. Kernighan & Dennis M. Ritchie, **ANSI C Programming**, PHI

Group I Practical 2	**BSCCSP 182**	**36 Hrs**
Practical/Week: 3 Hrs **Credit: 1**	**C Programming Lab**	**IA: 10** **Exam: 40**

Part A

1	Write a program to find the roots of a given quadratic equation using **if-else** statement. (Note: If the discriminant of the quadratic equation is >= 0, find the root(s). Else write 'Roots are complex').
2	Write a program to reverse a multi-digit integer and check if it is a palindrome.
3	Write a program to find the sum of the following series: $\sin(x) = x - \dfrac{x^3}{3!} + \dfrac{x^5}{5!} - \dfrac{x^7}{7!}$ ..., upto n terms. (Note: Input x in degrees and convert into radians by multiplying with $\pi/180$).
4	Write a program to generate the prime numbers between two given integers.
5	Write a program to find the smallest of three distinct integers using **nested if** statement.

(Note: Flowcharts to be written in class records for the programs of PART A; but not to be asked in the examination)

Part B

6	Write a program to transpose a matrix of order NxM and check whether it is symmetric or not.
7	Write a recursive function to generate the nth Fibonacci number and use this function in the main program to display the first n Fibonacci numbers.
8	Write a function to find the GCD of two integers and use this function in the main program to find the GCD of n integers.

9	Write functions to
	    find the length of a string
	    concatenate two strings
	Use these functions in the main program.

10	Write a function to reverse a string using pointers. Use it in a program to find whether a given string is palindrome or not.

Part C

11	Write a program to enter the information of n students (name, register number, marks in three subjects) into an array of structures. Compute and print the result of all students. For passing, student should get at least 35 in each subject, otherwise result is "FAIL". If the student passes and if percentage >= 70, result is DISTINCTION; if percentage is < 75 and >= 60, result is FIRST CLASS; if percentage is < 60 and >= 50, result is SECOND CLASS; otherwise result is THIRD CLASS. Get the output of all students in a tabular form with proper column headings.

12	Write a program to prepare the pay slip of n employees using an array of structures. Input the employee name, employee number and basic pay. Calculate the DA, HRA, PF, PT, Gross and Net pay as follows: If Basic <= 40000, DA = 40% of Basic, HRA = 10% of Basic, PF = 12% of Gross, PT = 250. Otherwise DA = 50% of Basic, HRA = 15% of Basic, PF = 13% of Gross, PT= 300. Gross pay = Basic + DA + HRA and Net Pay = Gross pay – PF – PT.

13	Write a menu driven program to
	    a) create a text file
	    b) display the contents of an entered filename
	    c) append the contents of a text file to another existing file by accepting filenames
	    d) exit
	Create two text files during the execution of the program. Display their contents. Perform appending and display the contents again. Always check for the existence of the input files.

14	Write a program to create a data file ITEM to input item information ItemNo, Name, Stock and Rate/unit. Read the table ITEM and copy only those records where stock is more than 100 to another file STOCK100. Display the contents of both the files separately. Also print total number of records in each file.

Scheme of Practical Examination

Sl. No.	Details			Marks	Total
1	PART A	i.	Problem solving and coding	4	8
		ii.	Compiling and debugging	2	
		iii	Execution and testing	2	
2	PART B	i.	Problem solving and coding	5	10
		ii.	Compiling and debugging	3	
		iii	Execution and testing	2	
3	PART C	i.	Problem solving and coding	6	12
		ii.	Compiling and debugging	3	
		iii.	Execution and testing	3	
4	Class Records				5
5	Viva – Voce				5
Total Marks					**40**