



ಕ್ರಮಾಂಕ/No. :MU/ACC/CR.32/2021-22/A8

ಕುಲಸಚಿವರ ಕಛೇರಿ

ಮಂಗಳಗಂಗೋತ್ರಿ - 574 199

Office of the Registrar

Mangalagangothri - 574 199

ದಿನಾಂಕ/Date:04.12.2021

CIRCULAR

Sub: Practical lists and Blown up syllabus for first semester BCA(Basic/Hons)/
B.Sc. (Basic/Hons) in Computer Science)-reg

Ref: 1) This Office Notification of No: MU/ACC/CR.15/2021-22/A8,
Dated:4/11/2021.

2) E-mail letter dated 26/11/2021 from the Chairman, UG combined BOS in
Computer Science & Computer Applications, Mangalore University.

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In continuation to this office Notifications cited under reference (1), above, the practical lists and blown up syllabus for I Semester BCA(Basic/Hons) and B.Sc. (Basic/Hons) in Computer Science) to be implemented under NEP-2020 and sent vide reference 2 are enclosed herewith for information and necessary action.

REGISTRAR.

To:

- 1) The Principals of affiliated Colleges offering B.Sc. (Basic/Hons) in Computer Science)/BCA(Basic/Hons) Programmes.
- 2) The Registrar (Evaluation), Mangalore University.
- 3) Dr. Manjiah D.H., Chairman, U.G. combined BOS in Computer Science and Computer Applications and Professor, Dept. of Computer Science, Mangalore University.
- 4) The A.R/ Superintendent, Academic Section, O/o the Registrar, Mangalore University.
- 5) The Director, DUIMS, Mangalore University - with a request to publish in Website.
- 6) Guard File.

# MANGALORE UNIVERSITY

## Choice Based Credit System Semester Scheme with Multiple Entry and Exit Options in the UG Programmes under NEP 2020

### Bachelor of Science (B. Sc.) Degree Programme

2021-2022 Onwards

### I Semester B. Sc. – Computer Science

## BLOWN UP SYLLABUS & PRACTICAL LISTS

|                         |                                                                 |
|-------------------------|-----------------------------------------------------------------|
| Course Code: DSC-1      | Course Title: <b>Computer Fundamentals and Programming in C</b> |
| Course Credits: 4       | Hours of Teaching/Week: 4                                       |
| Total Contact Hours: 52 | Formative Assessment Marks: 40                                  |
| Exam Marks: 60          | Exam Duration: 3 Hours                                          |

| <b>Contents</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Hours</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Unit - 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |
| <b>Fundamentals of Computers:</b> Introduction to Computers – Definition of a computer, Characteristics of computers, Evolution of computers, Generations of computers, Classification of computers. Computer system, applications of computers.<br><b>Number Systems</b> – different types, conversion from one number system to another; Coding schemes – ASCII and Unicode.<br><b>Computer Software</b> – Categories of software.<br><b>Computer Programming and Languages</b> – Machine Level, Assembly level, and High level languages; Translator Programs – Assembler, Interpreter and Compiler. Developing a computer program, Program Development Cycle - Algorithm, Flowchart and Pseudocode with examples.<br><b>Introduction to C Programming:</b> Overview of C; History and Importance of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. | 13           |
| <b>Unit - 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |
| <b>C Programming Basic Concepts:</b> C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration and initialization of variables; Symbolic constants.<br><b>C Operators and Expressions:</b> Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.<br><b>Input and output with C:</b> Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.                                              | 13           |
| <b>Unit - 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |
| <b>Control Structures:</b> Branching: if, if-else, nested if, else-if ladder, switch. Looping: while, do-while and for loop, nested loops, exit, break, jumps in loops.<br><b>Arrays:</b> One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.<br><b>Strings:</b> Declaring and Initializing string variables; String handling functions - <i>strlen</i> , <i>strcmp</i> , <i>strcpy</i> and <i>strcat</i> ; Character handling functions - <i>toascii</i> , <i>toupper</i> , <i>tolower</i> , <i>isalpha</i> , <i>isnumeric</i> etc.                                                                                                                                                                                                                                                                 | 13           |

## Unit - 4

13

**Pointers in C:** Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers.

**User-Defined Functions:** Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.

**User-Defined Data Types:** Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.

### Text Books

1. Pradeep K. Sinha and Priti Sinha: **Computer Fundamentals** (Sixth Edition), BPB Publication
2. ITL Education Solution Limited, **Introduction to Information Technology**, Second Edition 2018, Pearson Education
3. E. Balagurusamy: **Programming in ANSI C** (TMH)

### Reference Books

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. Byron Gottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P. B. Kottur: Programming in C (Sapna Book House)

|                         |                                        |
|-------------------------|----------------------------------------|
| Course Code: DSC-1 Lab  | Course Title: <b>C Programming Lab</b> |
| Course Credits: 2       | Hours of Teaching/Week: 4              |
| Total Contact Hours: 52 | Formative Assessment Marks: 25         |
| Exam Marks: 25          | Exam Duration: 3 Hours                 |

### Practice Lab

The following activities to be carried out in the lab during the initial period of the semester.

1. Basic Computer Proficiency
  - a. Familiarization of Computer Hardware Parts
  - b. Basic Computer Operations and Maintenance
  - c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

### Programming Lab

#### Part A

1. Write a program to read three numbers and find the biggest of three
2. Write a program to find the area of a triangle using three sides of triangle.
3. Write a program to check for prime number.
4. Write a program to generate n Fibonacci numbers.
5. Write a program to read a multidigit number find the sum of the digits, reverse the number and check it for palindrome
6. Write a program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
7. Write a program to accept student name and marks in three subjects. Find the total marks, average and grade (depending on the average marks).
8. Write a program to find the roots of quadratic equation (demonstration of switch-case statement)
9. Write a program to find largest and smallest element in a list of 'n' elements (Demonstration of single dimensional array)
10. Write a program to perform addition and subtraction of Matrices

#### Part B

1. Write a program to accept 'n' and find the sum of the series  $1! + 3! + 5! + \dots + n!$
2. Write user-defined functions to (a) find the length of a string (b) concatenate two strings. Call these functions in the main program.
3. Write a function to reverse a string using pointers. Use it in a program to find whether a given string is palindrome or not.
4. Write a program to transpose a matrix of order NxM and check whether it is symmetric or not.
5. Write a program to add two matrices using pointers.
6. Write a program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
7. Write a function to generate the  $n^{\text{th}}$  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 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  $\geq 70$ , result is DISTINCTION; If percentage is  $< 70$  and  $\geq 60$ , result is FIRST CLASS; if percentage is  $< 60$  and  $\geq 50$ , result is SECOND CLASS; otherwise result is PASS CLASS. Get the output of all students in a tabular form with proper column headings.
10. 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 Pay and Net Pay as follows:  
If Basic  $< 40000$ , DA = 50% of Basic, HRA = 12% of Basic, PF = 12% of Gross Pay, PT = 250. Otherwise DA = 40% of Basic, HRA = 10% of Basic, PF = 13% of Gross, PT= 300.  
Gross Pay = Basic + DA + HRA and Net Pay = Gross Pay – PF – PT.

**Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course.**

#### Evaluation Scheme for Practical Examination

| Assessment Criteria   |                          | Marks     |
|-----------------------|--------------------------|-----------|
| Program-1 from Part A | Writing the Program      | 5         |
|                       | Execution and Formatting | 3         |
| Program-2 from Part B | Writing the Program      | 7         |
|                       | Execution and Formatting | 5         |
| Practical Records     |                          | 5         |
| <b>Total</b>          |                          | <b>25</b> |