MCA – 101 Programming Methodologies Using C **L T**
3 1

Course Objectives:
This is an introductory course and covers the key features of the C language and its usage. The first unit help in thoroughly understanding the C syntax and basic programming paradigms. The remaining chapters focus on more complex concepts of the C language. This course will briefly touch upon some miscellaneous features and the mechanism used in the implementation of the same.

UNIT – I

Programming Tools- Problem analysis, Program constructs (sequential, decision, loops), Algorithm, Flowchart, Pseudo code, Decision table, Modular programming, Top Down and Bottom up approaches, Concept of High Level Languages, Low Level Languages, Assembly Languages, Assembler, Compiler, Interpreter, Type of errors.
Introduction- What is C, getting started with C, the first C program, compilation and execution, receiving input, C instructions, control instructions in C.
Decision Control Structure- if statement, if-else statement, use of logical operators, conditional operators.
Loop Control Structure- loops, while loop, for loop, odd loop, break statement, continue statement, do-while loop,
Case Control Structure- decisions using switch, switch vs if-else ladder, goto keyword.

UNIT – II

Functions and Pointers- what is a function, passing values between functions, scope rule of functions, calling convention, one dicey issue, function declaration and prototypes, call by value and call by reference, an introduction to pointers, pointer notation, back to function calls, recursion, recursion and stack, adding functions to the library.
Data Types Revisited- integers, long and short; integers, signed and unsigned; chars, signed and unsigned; float and double, storage classes in C.
C Preprocessor- features, macro expansion, file inclusion, conditional compilation, #if and #elif directives, miscellaneous directives.

UNIT – III

Arrays- what are arrays, array initialization, bounds checking, passing array elements to a function, pointers and arrays, two dimensional arrays, array of pointers, three dimensional array.
Strings- what are strings, more about strings, pointers and strings, standard library string functions, two-dimensional array of characters, array of pointers to strings, limitation of array of pointers to strings.
Structures- declaring a structure, accessing structure elements, how structure elements are stored, array of structures, additional features of structures, uses of structures.

UNIT – IV

Console Input/Output- types of I/O, console I/O functions.

File Input/Output- data organization, file operations, counting characters, tabs, spaces, file opening modes, string I/O in files, record I/O in files, text files and binary files, using argc and argv.

Miscellaneous Features- Enumerated data type, renaming data types with typdef, typecasting, bit fields, pointers to functions, functions returning pointers, functions with variable number of arguments, unions.

Text Book-

1. Yashwant Kanetkar, “Let us C”, BPB Publications.

Reference Books-

1. Mullis Cooper, “Spirit of C”, Jacob Publications.
2. Kerninghan B.W. & Ritchie D. M., “The C Programming Language”, PHI Publications.
3. Yashwant Kanetkar, “Pointers in C”, BPB Publications.
4. Gotterfied B., “Programming in C”, Tata McGraw Hill Publication

Course Outcomes:

By the end of the course, students will be able toMCA – 101 Programming Methodologies Using C L T 3 1 Course Objectives: This is an introductory course and covers the key features of the C language and its usage. The first unit help in thoroughly understanding the C syntax and basic programming paradigms. The remaining chapters focus on more complex concepts of the C language. This course will briefly touch upon some miscellaneous features and the mechanism used in the implementation of the same. UNIT – I Programming Tools- Problem analysis, Program constructs (sequential, decision, loops), Algorithm, Flowchart, Pseudo code, Decision table, Modular programming, Top Down and Bottom up approaches, Concept of High Level Languages, Low Level Languages, Assembly Languages, Assembler, Compiler, Interpreter, Type of errors. Introduction- What is C, getting started with C, the first C program, compilation and execution, receiving input, C instructions, control instructions in C. Decision Control Structure- if statement, if-else statement, use of logical operators, conditional operators. Loop Control Structure- loops, while loop, for loop, odd loop, break statement, continue statement, do-while loop, Case Control Structure- decisions using switch, switch vs if-else ladder, goto keyword. UNIT – II Functions and Pointers- what is a function, passing values between functions, scope rule of functions, calling convention, one dicey issue, function declaration and prototypes, call by value and call by reference, an introduction to pointers, pointer notation, back to function calls, recursion, recursion and stack, adding functions to the library. Data Types Revisited- integers, long and short; integers, signed and unsigned; chars, signed and unsigned; float and double, storage classes in C. C Preprocessor- features, macro expansion, file inclusion, conditional compilation, #if and #elif directives, miscellaneous directives. UNIT – III Arrays- what are arrays, array initialization, bounds checking, passing array elements to a function, pointers and arrays, two dimensional arrays, array of pointers, three dimensional array. Strings- what are strings, more about strings, pointers and strings, standard library string functions, two-dimensional array of characters, array of pointers to strings, limitation of array of pointers to strings. Structures- declaring a structure, accessing structure elements, how structure elements are stored, array of structures, additional features of structures, uses of structures. MCA (2 year)

Page 7 of 25 UNIT – IV Console Input/Output- types of I/O, console I/O functions. File Input/Output- data organization, file operations, counting characters, tabs, spaces, file opening

modes, string I/O in files, record I/O in files, text files and binary files, using argc and argv. Miscellaneous Features- Enumerated data type, renaming data types with typdef, typecasting, bit fields, pointers to functions, functions returning pointers, functions with variable number of arguments, unions. Text Book1.Yashwant Kanetkar, "Let us C", BPB Publications. Reference Books1.Mullis Cooper, "Spirit of C", Jacob Publications. 2.Kerninghan B.W. & Ritchie D. M., "The C Programming Language", PHI Publications. 3.Yashwant Kanetkar, "Pointers in C", BPB Publications. 4.Gotterfied B., "Programming in C", Tata McGraw Hill Publication Course Outcomes: By the end of the course, students will be able to CO 1: Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems. CO 2: Demonstrate an understanding of computer programming language concepts. CO 3: Able to develop C programs and run them. CO 4: Analyse and interpret the concept of pointers, declarations, initialization and ' ' operations on pointers and their usage. CO 5: Able to define structure, union and enumeration user defined data types. Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted

CO 1: Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.

CO 2: Demonstrate an understanding of computer programming language concepts.

CO 3: Able to develop C programs and run them.

CO 4: Analyse and interpret the concept of pointers, declarations, initialization and ' ' operations on pointers and their usage.

CO 5: Able to define structure, union and enumeration user defined data types.

Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted