JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

MCA I Semester
Problem Solving with C

Course Objectives: This course is aimed at enabling the students to

- Formulate simple algorithms for
- ms (in C language).
- Test and execute the programs and correct syntax and logical errors.
- Implement conditional branching, iteration and recursion.
- Decompose a problem into functiarithmetic and logical problems.
- Translate the algorithms to prograons and synthesize a complete program using divide and conquer approach.
- Use arrays, pointers and structures to formulate algorithms and programs.
- Apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
- Apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration.

Course Outcomes (COs): At the end of the course, student will be able to

- Understand the basic concepts used in computer programming
- Write, compile and debug programs in C language
- Design programs involving decision structures, loops and functions.
- Understand about the application and implementation of 2-dimentional array, structures and strings
- Understand the dynamics of memory by the use of pointers.
- Develop solutions to problems using derived data types and files.

UNIT – I:
Introduction to Computers: Introduction to computer programming, Algorithm, flow chart, Program development steps. **Computer languages:** Machine level, Assembly level and High-level language. **Number System:** Conversions- decimal, binary, octal, hexadecimal. **'C' Fundamentals:** Structure of a C-program, C-character set, C Tokens- variables, constants, identifiers, data types and sizes, operators

UNIT – II:
I/O Functions: Header files, Standard I/O library functions-formatted I/O functions. **Decision making statements:** simple if, if-else, nested if-else, else-if ladder, switch-case statements and sample programs. **Iterative Statements:** for, while, do-while. Jump Statements-break, continue, goto

UNIT – III:
Arrays: declaration, initialization, storing and accessing elements of 1-D, 2-D and multidimensional arrays, **Array Applications:** addition, multiplication, transpose, symmetry of a matrix, **Strings**: declaration, initialization, reading and writing characters into strings, string operations, character and string manipulation functions

UNIT – IV:

Functions- declaration, definition, prototype, function call, return statement, types of functions, parameter passing methods, and function recursion, **Pre-processor:** #define, #include Statement, #ifdef, #endif, and storage classes.

UNIT – V:

Structure and Union: Declaration, initialization, storing and accessing elements by using structure and union, **Pointers:** Introduction to pointers, defining a pointer variable, Pointer to Pointer, Examples of pointers, using pointers in expressions, pointers and arrays. Files: Definition, Input and output operation into file.

Text Books:

1. Programming in C, 3rd edition, Ashok N. Kamthane, Pearson
2. Computer science, A structured programming approach using C, Third edition, B.A. Forouzan and R. F. Gilberg, Thomson

Reference Books:

1. The C Programming Language, B.W. Kernighan, Dennis M. Ritchie, PHI/ Pearson.
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3. Programming in C, , 3rd Edition, Stephen G. Kochan, Pearson