1. **Course number and name**: UTA007; Computer Programming-I

2. **Credits and contact hours**: 4.0 and 5

3. **Text book, title, author, and year**

   Text Books / Reference Books
   - *"Brain W. Kernighan, Dennis M. Rithchie", The C Programming Language (2nd Edition), Prentice Hall, 1988.*
   - *"Ajay Mittal", Programming in C-A Practical Approach, Pearson, 2010.*
   - *"Reema Thareja", Computer Fundamentals and Programming in C, Oxford University Press, 2012.*
   - *"Zed. A. Shaw", Learn C the Hard Way, Pearson, 2015.*

      a. Other supplemental materials
         - Nil

4. **Specific course information**
   a. Brief description of the content of the course (catalog description)
   Computers Fundamentals: Classification of Computers, Application of Computers, Basic organization of computer, Input and Output Devices, Binary Number System, Computer memory, Computer Software.
   Algorithms and Programming Languages: Algorithm, Flowcharts, Pseudocode, Generation of Programming Languages.
   C Language: Structure of C Program, Life Cycle of Program from Source code to Executable, Compiling and Executing C Code, Keywords, Identifiers, Primitive Data types in C, variables, constants, input/output statements in C, Operators, type conversion and type casting. Conditional branching statements, Iterative statements, Nested loops, break and continue statements.
   Functions: Declaration, Definition, Call and return, Call by value, Call by reference, showcase stack usage with help of debugger, Scope of variables, Storage classes, Recursive functions, Recursion vs Iteration.
   Arrays, Strings and Pointers: One-dimensional, Two-dimensional and Multi-dimensional arrays, operations on array: traversal, insertion, deletion, merging and searching, Inter-function communication via arrays: passing a row, passing the entire array, matrices. Reading, writing and manipulating Strings, Understanding computer memory, accessing via pointers, pointers to arrays, dynamic allocation, drawback of pointers.
   Linear and Non-Linear Data Structures: Linked lists, Stacks and Queues.

5. **Specific goals for the course**
   After the completion of the course, the students will be able to:
   - Comprehend concepts related to computer hardware and software, draw flowcharts and write algorithm/pseudocode.
   - Write, compile and debug programs in C language, use different data types, operators and console I/O function in a computer program.
   - Design programs involving decision control statements, loop control statements, case control structures, arrays, strings, pointers, functions and implement the dynamics of

memory by the use of pointers.
- Comprehend the concepts of linear and Non-Linear data structures by implementing linked lists, stacks and queues.

6. **Brief list of topics to be covered**
    - Functions
    - Arrays
    - Strings
    - Pointers