***CS101 Introduction to Computing***

**Syllabus:**

Unit 1. **Introduction to Programming, Algorithms and Flow Chart:** Generation of programming languages, steps involved in Problem Solving, Algorithm, Flow chat, Pseudo code **1 Lecture**

Unit 2. **Basics of C:** A Simple C program, Header files, data types and sizes, Constants, variables, token, identifiers, Operators: arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators; expressions, L-value, r-value, type conversions, conditional expressions, precedence and order of evaluation, data type conversion, mixed- mode operation, Managing Input and Output operation (formatted and unformatted) **3 Lectures**

Unit 3. **Control Statements:** Conditional control statement—if, if-else, nested-if, switch; Go-to-statement; Looping—while, do-while, for, nested for; jumps in loops—break and continue statement **4 Lectures**

Unit 4. **Arrays:** Definition, one-dimensional arrays—declaration and initialization, two—dimensional arrays, multidimensional arrays, dynamic arrays **3 Lectures**

**Strings:** Introduction, Declaring and initializing strings, reading and writing strings, String Handling Function, Implementation of string functions, Arithmetic operation on strings, comparison of Strings. **3 Lectures**

Unit 5. **Functions:** Function definition, arguments and parameters, categories of function, scope and extent, Storage classes, static and register variables, parameter passing mechanism, Inline function, nesting of function, recursion, passing arrays to function, passing strings to function, variable length argument list. **4 Lectures**

Unit 6. **Pointers:** Understanding memory address, declaring and initializing pointer variables, void pointer, null pointer, accessing a variable through pointer, array and pointer, pointer and string, pointer as function arguments, Pointer arithmetic, pointers to pointer, function returning pointer , pointers and structure, Dynamic memory allocation (Malloc , Calloc, releasing the used space, Realloc), Memory leak and memory corruption. **9 Lectures**

Unit 7. **User defined data:** Structure- defining, declaring, initializing; accessing structure members, processing of structure , array of structures, structures within structure, structure and function, type definition; Union—definition, declaration, accessing union members , initializing union Types: **4 Lectures**

Unit 8. **Pre-processor:** Introduction, macro substitution, File Inclusion, Compiler control Directives **1 Lectures**

Unit 9. **Files:** Introduction, file declaration, opening and closing a file, working with text and binary files, I/O operations on file, error handling, random access to files **4 Lectures**

Unit 10. **Graphics programming:** Introduction, Command line argument, function used in graphics, drawing shapes, designing using graphics. **3 Lectures**

**Suggested Readings:**

1. Pradip Dey and Manas Ghosh, Programming in C, Oxford

2. Ashok kamthane, Programming in C, Pearson Education,

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.

3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

4. Practical C Programming (3rd Edition) by Steve Oualline, O’reilly Press

5. C: The Complete Reference by Herbert Schildt, TMH