C/C++ COURSE CONTENTS

4th Semester Electrical Engineering

Introduction of C

- The Basic of C Programming
- Syntax of C and C program structure
- Arithmetic expressions and variables
- Characteristics of C
- Control structures
- Why we use C?
- Loops in C
- Arrays
- Functions
- Arguments-Call by value &Call by reference
- External variables and scope

Types, Operators and Expressions

- Variable Names
- Data Types and Sizes
- Constants
- Declarations
- Arithmetic Operators
- Relational and Logical Operators
- Type Conversions
- Increment and Decrement Operators
- Bitwise Operators
- Assignment Operators and Expressions
- Conditional Expressions

Control Flow

- Statements and Blocks
- If-Else statement
- Else-If
- Switch
- Nested Loops
- Loops –While , Do-While and For
- Type Conversions
- Break and Continue
- Go to and labels

Functions and Program Structure

- Using of Functions and types of function
- Functions Returning Non-integers
- Function Declaration
- Scope rules and header files
- Functions and Types
- Static variables and register variables
- Parameters and Functions
- Block Stucture and initialization
- Function arguments passed by value and by reference
- Declaring parameters
- Recursion
  The C Preprocessor

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Pointers and Arrays

- What is pointer and uses for pointer
- Pointers and Function arguments
- Pointer syntax, Types casts
- Pointers and Arrays
- Address Arithmetic, Pointers and Initialization
- Calling functions by pointer
- Pointer Arrays; pointers to Pointers
- Pointers vs. Multi-dimensional Arrays

Structures

- Defining a Structure
- Array in Structures
- Arrays and pointers of Structures
- Structures as Function Arguments
- Self-referential Structures
- Table Lookup
- Type def
- Unions
- Structures within Structures(NestedStructures)
- Bit-fields

Input and Output

- Standard I/O and line I/O
- Reading and writing with fprintf, fscanf, fputc, and fgetc
- Variable-length argument lists
- Formatted Output – printf and formatted Input-scanf
- Formatted Input/ Output
- Typecasting
- Error FILE handling in C

File Handling

- Introduction to I/O function
- Creating I/O functions
- Command line argument

Preprocessors & graphics

- Defining Processors
- Macro Substitution
- Graphics in C

Internet Programming in C

- Network communications in C
- Packets & Sockets
- Protocols and Creating Sockets

Introduction of C++

- Syntax of C++
- Why we use C++?
- Structure of a C++ program
- Compiling a Simple C++ Program
- How C++ Compilation Works
- Variables
- Simple Input/output statements
- Memory
- Integer Numbers
- Characters
- Strings
- Names

Data Types, Operators & Expressions

- Integer, Float and Character data types
- Parentheses
- Arithmetic and Relational Operators
- Logical Operators
- Bitwise Operators
- Increment/DecrementOperators
- Assignment Operator
- Conditional Operator
- Comma Operator
- The size of Operator
- Operator Precedence

Statements and OOP's Concepts

- Knowledge about OOP's
- OOP's Concept
- Abstract data types
- Polymorphism and Virtual functions
- Simple and Compound Statements
- If Statement
- Switch case Statement
- Iteration structures-While statement, Do-while statement, For statement
- The break statement
- The go to statement
- Break Statement
- Return Statement

Functions

- A C++ Simple Function program
- Parameter sand Arguments
- Global and Local Scope
- Scope Resolution Operator
- Auto Variables
- Register Variables
- Static Variables and Functions
- Extern Variables and Functions
- Enumerations
- Default values in parameters
- Run time Stack
- Inline Functions

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Arrays, Pointers, and References

- Overview of arrays
- Accessing the values of an array
- Multidimensional Arrays
- Define Pointers
- Dereference operator(*)
- Reference operator(&)
- Dynamic Memory and static memory
- Declaring variables of pointer types
- Pointer Arithmetic
- Function Pointers
- References
- Type defs

Classes and Objects

- A Simple Class
- Objects, Classes methods and properties
- Inline Member Functions
- Constructors
- Destructors
- Friends

- Default Arguments
- Implicit Member Argument
- Scope Operator
- Class Scope
- Classes defined with struct and union

Overloading

- Function Overloading and Characteristic
- Operator Overloading
- Type conversion
- Inline functions
- Constructors and destructors
- Declaring functions
- Overloading->,*,and&
- Member wise initialization
- Member wise assignment
- Overloading new and delet

Exception Handling

- Flow Control
- The Throw Clause
- The Try Block and Catch Clauses
- Function Throw Lists