

Software Engineering Lectureflow

The below given flow should be followed by each faculty while taking lectures. If the faculty decides to change the flow - he/she will need to first take permission from the Training coordinator at the HO (Ahmedabad office)

Module-1) SE - Overview of IT Industry	5
<ul style="list-style-type: none"> • Introduction of students • Career in IT • Understanding Student Login of TOPS ERP • Using Lab • What is Program • What is programming? • Types of Programming Language • World Wide Web • How Internet Works • Network Layers on Client and Server • Client And Servers • Types of Internet Connections • Protocols • Application Security • Software Applications and its types • Software Architecture • Layers in Software Architecture • Software Environments • Types of Programming Languages • Source Code • Github and introductions • Student Account in Github • Types of Software • Introduction of Software • Application software • Software development process • Software Requirement • Software Analysis • System Design • Software Testing • Maintenance • Development • Web Application • Designing • mobile application • DFD • Desktop Application • Flow Chart 	
Module-2) SE- Introduction to HTML and CSS	6

- What is Internet, HTTP/HTTPS, WWW, Domain name and Top Domain name
- SEO, What is HTML, What is Text Editor, Web Browser, Downloading Text Editor , HTML Structure, First Program in HTML
- 1) HTML Introduction 2) HTML Getting Started 3) HTML Elements 4) HTML Attributes 5) HTML Basic Tags
- 1) HTML Doctypes 2) HTML Layout 3) HTML Head 4) HTML Meta 5) HTML Scripts
- Web Programming Design web pages with HTML structure
- Practical Examples: 1) Create any simple web page to display your name. 2) Importance of meta tag and Doctypes
- Tags and self Closing Tags, Basic Tag , Attribute and Events, Marquee Tag
- HTML - Meta Tags, HTML - Comments, HTML - Images, HTML - Tables, HTML - Lists, HTML - Text Links, HTML - Image Links
- HTML basic tags-P,BR,MARQUEE etc
- HTML Headings HTML Paragraphs HTML Links HTML Text Formatting HTML Styles HTML Images
- Anchor Tag, Img Tag, Image Mapping
- List Tag, Tables, Forms
- PRactical Examples: 1) Create simple Doc and display your name using different heading tag 2) Create link for open google. 3) Create document using all text formatting tags
- Form tags with input tag
- Practical Examples: 1) Create simple table 2) Create time table for your school 3) Create table with colspanrowspan example 4) Create invoice using table 5) Create hotel menu. 6) Create index page for your book. 7) Create list with different categories.
- PRactical Examples: Create registration form with all fields and validation
- 1) CSS 2) In-line CSS Internal Style External Style Sheet @import Style Sheet 3) CSS Class CSS ID
- What is CSS How to Implement CSS Class and ID Width and Height Css Unit Box Model (Margin,padding,Border) and create basic template design
- CSS Selectors , Pseudo Classes and Elements , Float and Clear and Alignment , Font Styling , Opacity and Visibility , Line Height
- Practical example : Create page with difference color text
- 1) CSS Text 2)CSS Font 3) CSS Background 4) CSS Links 5) CSS Lists 6) CSS Display 7) CSS Visibility

- Overview of C Programming - What is C Programming? History and Evolution, Importance and Applications
- Setting Up Environment -Installing a C Compiler (e.g., GCC), Choosing an IDE (DevC++. VS Code, Codeblocks, etc) Writing Your First Program
- Basic Structure of a C Program - Structure of a C Program ,Comments in C, Data Types and Variables, Constants, Keywords and Identifiers
- Operators - Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Bitwise Operators, Conditional Operator
- Control Flow Statements - Decision-Making in C - If Statement, If_Else statement, If_elseif (Elseif Ladder), Nested if-else statement, Switch statement
- Looping in C - While Loop, For Loop, Do-While Loop
- Loop Control Statements - Break, Continue, Go to
- Functions in C - Introduction to Functions, Function Declaration and Definition, Function Call and Return
- Arrays in C - Introduction to Arrays, One-Dimensional Arrays, Multi-Dimensional Arrays
- Pointers in C - Introduction to Pointers, Pointer Declaration and Initialization
- Strings in C - Introduction to Strings, String Handling Functions, strlen, strcpy, strcat, strcmp, strcmpi, strchr, String Input and Output
- Structures in C - Introduction to Structures, Structure Declaration and Initialization, Array of Structure Nested Structures
- File Handling in C, File Operations (Opening, Closing, Reading, and Writing), File Pointers, File Handling Functions

Module-4) Introduction to OOPS Programming

8

- Introduction to C++ - Understanding the Basics of Programming, Introduction to C++ Language, POP Vs OOP, Advantages of OOP, Setting Up C++ Development Environment, Writing and Running Your First C++ Program, Input and Output Operations in C++
- Variables, Data Types, and Operators - Variables and Constants in C++, Data Types and Size Specifiers, Assignments, Arithmetic, Relational, Logical, and Bitwise Operators, Type Conversion in C++, Constants and Literals
- Control Flow Statements - Conditional Statements: if, if_else, else if ladder, nested if, Switch Statement, Loops: while, do-while, for, Break and Continue Statements, Nested Control Structures
- Functions and Scope - Introduction to Functions ,Function Prototypes and Definitions, Parameters and Return Values, Scope of Variables
- Arrays and Strings - Introduction to Arrays, Single-Dimensional and Multi-Dimensional Arrays, Array Initialization, Accessing Elements, and Manipulation, Introduction to Strings in C++, String Operations and Functions
- Introduction to Object-Oriented Programming -Understanding the Basics of Object-Oriented Programming, Advantages of OOP Paradigm, Key Concepts: Classes, Objects, Inheritance, Polymorphism, Encapsulation, Introduction to C++ as an Object-Oriented Language
- Classes and Objects - Declaring Classes and Objects in C++, Class Members: Data Members and Member Functions, Constructors and Destructors, Access Specifiers: Public, Private, Protected, Class Member Functions: Inline and Outside Definitions
- Inheritance - Concept of Inheritance and Reusability, Types of Inheritance: Single, Multiple, Multi-level, Hierarchical, Base and Derived Classes in C++, Access Control and Inheritance, Constructors and Destructors in Inheritance
- Polymorphism - Understanding Polymorphism in OOP, Compile-Time and Runtime Polymorphism, Function Overloading and Operator Overloading, Virtual Functions and Dynamic Binding, Abstract Classes and Pure Virtual Functions, Scope resolution operator, Static Keywords, Inline Function
- Encapsulation - Understanding Encapsulation and Information Hiding, Access Specifiers: Public, Private, Protected, Encapsulation in C++ Classes, Benefits of Encapsulation in OOP, Friend Functions and Friend Classes
- File Handling - Introduction to File Handling in C++, Opening, Closing, Reading, and Writing Files, Error Handling in File Operations, Working with File Streams

Module-5) SE - Introduction to DBMS

9

- Introduction to SQL - SQL Overview, Definition of SQL, Importance of SQL in Database Management, DBMS-RDBMS
- SQL Syntax - Basic SQL Syntax, Structure of SQL Statements
- SQL Constraints - Types of Constraints (NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY), Implementing Constraints in Tables
- Main SQL Commands and Sub-commands - Data Definition Language (DDL), CREATE Command, Creating Tables, Specifying Column Names, Data Types, and Constraints
- ALTER Command - Modifying Existing Tables, Adding, Modifying, or Dropping Columns
- DROP Command - Deleting Tables from the Database
- Data Manipulation Language (DML) - INSERT Command, Adding Data into Tables Specifying Column Names and Values
- UPDATE Command - Modifying Existing Data in Tables, Changing Values in Specific Columns
- DELETE Command - Removing Data from Tables, Deleting Specific Rows with WHERE Clause
- Data Query Language (DQL) - SELECT Command, Retrieving Data from Tables, Filtering Data with WHERE Clause, Sorting Data with ORDER BY Clause, Limiting Results with LIMIT or FETCH FIRST Clause
- Data Control Language (DCL) - GRANT Command, Granting Privileges to Users or Roles, Granting SELECT, INSERT, UPDATE, DELETE Permissions
- REVOKE Command - Revoking Privileges from Users or Roles, Removing SELECT, INSERT, UPDATE, DELETE Permissions
- Transaction Control Language (TCL) - COMMIT Command, Saving Changes Permanently to the Database
- ROLLBACK Command - Reverting Uncommitted Changes, ?SAVEPOINT Command - Creating Intermediate Points in a Transaction for Rollback
- SQL Joins - Inner Join, Left Join, Right Join, Full Outer Join
- SQL Group By - Grouping Data in SQL Queries
- SQL Stored Procedure - Definition and Purpose of Stored Procedures, Creating and Executing Stored Procedures
- SQL View - Creating Views in SQL, Advantages of Using Views
- SQL Trigger - Introduction to Triggers, Types of Triggers (INSERT, UPDATE, DELETE)
- Introduction to PL/SQL - Definition and Purpose of PL/SQL, Benefits of Using PL/SQL
- PL/SQL Syntax - Structure of PL/SQL Blocks, Variables, Constants, and Data Types in PL/SQL
- PL/SQL Control Structures - IF-THEN, IF-THEN-ELSE, CASE Statements ,Loops (WHILE, FOR)
- SQL Cursor - Introduction to Cursors in PL/SQL, Implicit vs. Explicit Cursors
- Rollback and Commit Savepoint - Transaction Management in PL/SQL