

TYPESCRIPT SYLLABUS

Module 1: Introduction to TypeScript

- What is TypeScript and why use it
- TypeScript vs JavaScript
- Installing TypeScript
- Setting up environment (tsconfig.json)
- Compiling TypeScript to JavaScript

Module 2: Basic Types

- Number, String, Boolean
- Array and Tuple
- Enum
- Any, Unknown, Void, Never
- Type inference

Module 3: Variables & Functions

- Declaring variables (let, const)
- Function types
- Optional and default parameters
- Arrow functions
- Return types

Module 4: Objects & Interfaces

- Object types
- Interfaces
- Optional properties
- Readonly properties
- Interface vs type

Module 5: Classes & OOP

- Classes and constructors
- Access modifiers (public, private, protected)
- Inheritance
- Abstract classes
- Implementing interfaces

Module 6: Advanced Types

- Union and Intersection types
- Type aliases
- Type assertions
- Literal types
- Nullable types

Module 7: Generics

- Introduction to generics
- Generic functions
- Generic classes
- Constraints

Module 8: Modules & Namespaces

- Import and export
- Module resolution
- Namespaces basics

Module 9: Decorators

- Introduction to decorators
- Class decorators
- Method decorators
- Property decorators

Module 10: Error Handling

- try, catch, finally
- Custom error types
- Debugging

Module 11: Working with APIs

- Fetch API with TypeScript
- Axios with TypeScript
- Handling JSON data
- Type-safe API calls

Module 12: TypeScript with Frameworks

- Using TypeScript with React
- Using TypeScript with Node.js
- Using TypeScript with Angular

Module 13: Configuration & Tooling

- tsconfig options
- Linting (ESLint)
- Formatting (Prettier)
- Build tools integration

Module 14: Testing

- Unit testing
- Testing with Jest
- Type-safe testing

Module 15: Performance & Best Practices

- Writing clean TypeScript code
- Avoiding common mistakes
- Code organization

Module 16: Real-World Projects

- TypeScript-based web app
- API integration project
- Full stack app with TypeScript
- Dashboard application