

TypeScript for Angular Application Development

Course Duration: 8 Hours

Course code: TAAD

1. Course Overview

This course focuses on TypeScript as the foundation for Angular application development. TypeScript adds strong typing, object-oriented features, and advanced tooling support to JavaScript, making Angular development more scalable, reliable, and maintainable. Learners will start with TypeScript basics and progress toward applying it effectively in real-world Angular projects. By the end of this course, you'll be confident in writing clean, type-safe, and production-ready code for Angular applications.

2. What you'll learn?

By the end of the course, you will be able to:

- Understand TypeScript fundamentals and why it is essential for Angular.
- Work with data types, variables, functions, and operators in TypeScript.
- Implement object-oriented programming (classes, interfaces, inheritance, generics).
- Use modules, namespaces, and decorators effectively in Angular context.
- Apply type annotations, type inference, and advanced types.
- Handle asynchronous programming with promises and async/await.
- Integrate TypeScript features in Angular applications (components, services, directives).
- Debug and optimize TypeScript code in Angular projects.

3. Target Audience

- Angular developers who want to strengthen their TypeScript foundation.
- JavaScript developers planning to transition to Angular application development.
- Students or professionals aiming to build enterprise-scale Angular apps.

4. Pre-Requisites

- Basic knowledge of JavaScript.
- Familiarity with Angular framework concepts (recommended but not mandatory).
- Understanding of HTML and CSS.

5. Course content

Module 1: Introduction to TypeScript for Angular

- Why Angular uses TypeScript
- Setting up the environment (Node.js, TypeScript, Angular CLI)
- Compiling TypeScript to JavaScript

Module 2: TypeScript Basics

- Variables, constants, and data types
- Type inference vs type annotations
- Functions and arrow functions
- Union and intersection types

Module 3: Working with Arrays, Tuples, and Enums

- Arrays and array methods
- Tuples in TypeScript
- Enums and real-world use cases

Module 4: Object-Oriented TypeScript

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

Module 5: Advanced TypeScript Features

- Generics in TypeScript
- Type aliases
- Utility types (Partial, Readonly, Record, etc.)
- Decorators and metadata

Module 6: Modules and Namespaces

- Import and export in TypeScript
- Organizing Angular projects with modules
- Namespaces in large applications

Module 7: Asynchronous Programming in TypeScript

- Callbacks vs Promises
- Async/Await in Angular services
- Handling API calls with HttpClient in Angular

Module 8: TypeScript in Angular Applications

- Using TypeScript in Angular components and services
- Strong typing with Angular forms and models
- Dependency Injection with TypeScript
- Using interfaces for data contracts

Module 9: Debugging and Best Practices

- Debugging TypeScript in Angular apps
- Linting and code formatting
- Writing clean, maintainable Angular TypeScript code
- Error handling strategies

Module 10: Capstone Project

- Build an Angular application with full TypeScript integration

- Example: Task Manager, E-commerce Product List, or Movie Finder App
- Implement: services, components, modules, API integration, and Type safety

