

TypeScript for Angular Application Development

Duration: 8 hrs

Prerequisites: Knowledge of JavaScript

Session 1: TypeScript in Angular (1 hr)

- Why Angular uses TypeScript instead of plain JavaScript.
- Exploring Angular project structure (.ts files in components, services, modules).
- Understanding tsconfig.json and TypeScript compilation behind the scenes.
- Modifying an Angular component with a typed property & method.

Lab:

- Create and display a typed property (title: string) in app.component.ts.
 - Add a simple typed method and bind it in template.
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Session 2: TypeScript Essentials for Angular Components (2 hrs)

- Primitive & special types (string, number, boolean, any, unknown).
- Arrays, Tuples, Enums.
- Functions with typed parameters & return values.
- Type inference vs explicit typing.
- Type assertions in Angular templates.

Angular Mapping:

- Using typed properties & methods inside components.
- Enforcing type safety in data binding ([property], {{interpolation}}).

Lab:

- Add multiple typed properties & functions in app.component.ts.
 - Display different data types in Angular template.
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Session 3: OOP in TypeScript for Angular Services (2 hrs)

- Classes, constructors, properties, and methods.
- Access modifiers (public, private, protected).
- Interfaces and their role in Angular.
- Inheritance and abstract classes.

Angular Mapping:

- Using classes in Angular services.
- Defining interfaces for models (e.g., User, Product).
- Creating typed service methods for CRUD-like operations.

Lab:

- Create an IUser interface and UserService class with strongly typed methods.
 - Inject UserService into a component and display data using Angular template.
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Session 4: Advanced TypeScript for Angular Apps (1.5 hrs)

- Generics in functions, classes, and interfaces.
- Union & Intersection types.
- Type Aliases.
- Decorators in Angular (@Component, @Injectable, @NgModule).

Angular Mapping:

- Using generics for API response handling in services.
- Applying decorators in Angular components and services.

Lab:

- Create a generic function in UserService for handling lists of items.
 - Demonstrate decorators by creating a new service with @Injectable and component with @Component.
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Session 5: Mini Project – Task Manager in Angular (1.5 hrs)

Objective: Apply TypeScript concepts in a functional Angular feature.

- Define a Task interface (id, title, completed).
- Create a TaskService using a TypeScript class.
- Use strong typing in service methods (addTask, toggleTask, listTasks).
- Bind typed data to Angular component template.