

**CATEGORY Programming**

### **Typescript**

**Course Snapshot**

* **Course:** Typescript
* **Duration:** 3 days
* **Skill-level**: Intermediate level programming skills for the skilled team members.
* **Targeted Audience**: This course is designed for software developers who want to broaden their skill set by learning TypeScript.
* **Hands-on Learning:** It's certainly an appealing prospect, but learning a new language can be challenging, and it's not always easy to know where to begin. This course is the perfect place to start. It provides the ideal platform for JavaScript programmers to get to grips with writing eloquent, productive TypeScript code.
* **Delivery Format:** This course is available for onsite private classroom presentation.
* **Customizable:** This course may be tailored to target your specific training skills objectives, tools of choice and learning goals.

###### **What You Will Learn:**

* You'll learn how to create declaration files from scratch
* Introducing basic functions in TypeScript
* How to create classes that take in multiple objects as arguments to build dynamic behavior
* Using the power of interfaces and inheritance in TypeScript to write better
* How to use type literal and type alias
* Introduces dependency injection (DI) in TypeScript
* How to use generics to make your code more type-safe and avoid errors at runtime
* Higher-Order Functions and Callbacks
* The motivation for using Promises and then teaches you how you can implement them in TypeScript.
* TypeScript and React, covers the React library and how to build enhanced user interfaces with TypeScript

**Topics Covered**: This is a high-level list of topics covered in this course. Please see the detailed Agenda below

* TypeScript Fundamentals
* Declaration Files
* Functions
* Classes and Objects
* Interfaces and Inheritance
* Advanced Types
* Decorators
* Dependency Injection in TypeScript
* Generics and Conditional Types
* Event Loop and Asynchronous Behavior
* Higher-Order Functions and Callbacks
* Guide to Promises in TypeScript
* Async/Await in TypeScript
* TypeScript and React

**Audience & Prerequisites**

By the end of this course , you'll have the confidence and understanding to make it happen with TypeScript.

**Pre-Requisites:** Students should have familiar with

* Basic knowledge of JavaScript
* Experience of using another similar programming language

**Course Agenda / Topics**

1. **TypeScript Fundamentals**

* Getting Started with TypeScript
* TypeScript and Functions
* TypeScript and Objects
* Basic Types
* Making Your Own Types

1. **Declaration Files**

* Introduction
* Declaration Files
* Third-Party Code Libraries

1. **Functions**

* Functions in TypeScript
* Function Expressions
* Arrow Functions
* Type Inference
* Functional Programming
* Organizing Functions into Objects and Classes
* Import, Export, and Require
* Unit Testing with ts-jest
* Error Handling

1. **Classes and Objects**

* What Are Classes and Objects?
* TypeScript Interfaces
* Generating HTML Code in Methods

1. **Interfaces and Inheritance**

* Introduction
* Interfaces
* TypeScript Inheritance

1. **Advanced Types**

* Type Aliases
* Type Literals
* Intersection Types
* Union Types
* Index Types

1. **Decorators**

* Reflection
* Importance of Decorators
* Decorators and Decorator Factories
* Class Decorators
* Method and Accessor Decorators
* Activity 7.01: Creating Decorators for Call Counting
* Using Metadata in Decorators
* Property Decorators
* Parameter Decorators
* Application of Multiple Decorators on a Single Target

1. **Dependency Injection in TypeScript**

* Introduction
* The DI Design Pattern
* InversifyJS

1. **Generics and Conditional Types**

* Introduction
* Generics
* Generic Set class
* Conditional Types

1. **Event Loop and Asynchronous Behavior**

* Introduction
* The Multi-Threaded Approach
* Executing JavaScript
* Browsers and JavaScript
* Environment APIs
* Promises

1. **Higher-Order Functions and Callbacks**

* Introduction
* Higher-Order Functions
* Callbacks
* The Event Loop

1. **Guide to Promises in TypeScript**

* Introduction
* The Evolution of and Motivation for Promises
* Anatomy of a Promise
* Enhancing Promises with Types
* Libraries and Native Promises — Third-Party Libraries, Q, and Bluebird
* Promisify
* Asynchronous FileSystem
* Working with Databases
* Developing with REST
* Putting It All Together – Building a Promise App

1. **Async/Await in TypeScript**

* Introduction
* Evolution and Motivation
* async/await in TypeScript
* Syntax
* Exception Handling
* Top-Level await
* Promise Methods

1. **TypeScript and React**

* Introduction
* Typing React
* Hello, React
* The Component
* JSX and TSX
* Routing
* React Components
* State Management in React
* Firebase
* Styling React Applications

**Student Materials:** Each student will receive a **Student Guide** with course notes, code samples, software tutorials, diagrams and related reference materials and links (as applicable). Our courses also include step by step hands-on lab instructions and solutions, clearly illustrated for users to complete hands-on work in class, and to revisit to review or refresh skills at any time. Students will also receive the project files (or code, if applicable) and solutions required for the hands-on work.