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# TypeScript training : Optimize your JavaScript code

3 days (21 hours)

## Presentation

Learn how to optimize the performance and security of your JavaScript code with our TypeScript training course.

TypeScript adds new features to JavaScript to enhance the quality of your applications. This language, [beloved by developers](#), has proven its worth with a strong and rapid adoption curve.

Our TypeScript training course will teach you the basics of the language. You'll learn about the most important concepts: syntax, Types, compiling, functions, classes and decorators.

We'll also teach you about interoperability between TypeScript and JavaScript, and how to debug your developments.

As always, this course is based on the latest version of the technology, [TypeScript 4.9](#).

## Objectives

- Understanding TypeScript, how to use it and compile it
- TypeScript coding skills
- Understanding the link between JavaScript and TypeScript
- Migrating JavaScript code to TypeScript

## Target audience

- Front-end developers

- Technical architects
- Project managers
- Design engineers
- Webmasters

## Prerequisites

- Knowledge of HTML and CSS
- JavaScript experience or [JavaScript training](#)

## TypeScript training program

### Introduction

- From JavaScript to TypeScript
- Why use TypeScript?
- What TypeScript isn't
- Installation

### Types

- TypeScript vs JavaScript
- What is a Type?
- How do I use them?
- Assignability
- Annotations
- Type assignment and inference
- Type shapes
- Modifiers

### Compiling it

- Inclusion and exclusion of files
- TypeScript Core libs
- Configuring the compiler
- Checking code quality
- Compiling your project

### TypeScript basics

- Index.ts

- Variable types
  - The figures
  - G-strings
  - Booleans
- Object types
- Types of arrays
- Tuples
- Enums
- Coding with types
  - Any
  - Union
  - Literal
  - Aliases and custom types
  - Unknown
  - Never

## The functions

- Function types
- Functions as Types
- Parameters
- Return types
- Call-signature compatibility

## Classes and interfaces

- Class and inheritance
- Using "this"
- Public and private access modification
- Readonly
- Getters and Setters
- Abstract classes
- Why use interfaces?
- Interfaces as function types
- Extensions
- Merging interfaces
- Parameters and optional properties
- JavaScript compilation

## Decorators

- What are decorators?
- Decorator factories
- Improving the use of decorators
- Add several decorators
- The properties
- Accessor and parameters

## Migrating from ES to TypeScript

- Type Declarations
- Rest parameters
- Arrow functions
- The Spread operator
- How do I migrate from JavaScript to TypeScript?
- Type lookup
- Using third-party Javascript

## Troubleshooting

- Return null
- The exceptions
  - Throwing
  - Returning
- The Option Type

## Reactive programming

- Understanding reactive programming
- What is asynchronous propagation?
- Promises and futures
- ReactiveX observables
- Composable operators
- Hot observables vs. cold observables

## Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

## Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

## Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

## Organization

The course alternates theoretical inputs from the trainer supported by examples and

brainstorming sessions and group work.

## Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

## Sanction

A certificate will be issued to each trainee who completes the course.