JS_PROG1 - JavaScript I: Basics

Course code: JS_PROG1

This course is designed for anyone who wants to learn the basics of JavaScript scripting language, use it on the client or server side of web applications or for testing, or as a stepping stone for TypeScript. Participants will learn about primitive and complex data types, variable declaration, using expressions and operators, creating and using functions, conditions and loops. They will also learn how to work with built-in objects such as String, Array, Date, and Math. The course also covers more advanced concepts such as anonymous functions, Arrow functions, Rest and Spread operators, and modules. The course is not suitable for complete beginners who have never programmed in any programming language; a basic knowledge of algorithmization and programming at the [PRG] course level is recommended, or basic experience programming in another language.

Required prior knowledge

- Basic knowledge of algorithmization and programming at the PRG course level, or experience with programming in another language.
- The course is not suitable for complete beginners who have never programmed in any programming language.

Course outline

Introduction and basic concepts

- Features of JavaScript
- History and development of JavaScript
- Transpilation and minification
- Recommended resources

Data types and variables

- Data types
- Using the String type
- Template literals
- String interpolation
- Multi-line strings
- Using the Number type
- Using the Boolean type
- Arithmetic, logical, and comparison operators
- Declaring variables and constants (var, let, const)
- Using strict mode
- Data type conversion
- Using standard input and output

Conditions and loops

- Conditional constructs
- if
- switch
- conditional operator
- Loops
- for, while, do-while

Using functions

- What is a function?
- Return values
- Function parameters
- Global and local variables
- Pure/Impure functions
- Optional parameters

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- Named parameters
- Recursion

Debugging and error handling
- Debugging
- Handling general exceptions
- Handling specific exceptions
- JavaScript exception hierarchy
- Throwing exceptions

Using collections
- Collection types
- Arrays
- Sets
- Maps
- Array destructuring
- Using Rest syntax
- Using Spread syntax
- Using Strings as Collections

Built-in Objects in JavaScript
- Object Basics
- Overview of JavaScript Built-in Objects
- String Object
- Date Object
- Math Object

Advanced use of functions
- Function declarations vs. function expressions
- Anonymous and self-executing functions (IIFE)
- Hoisting
- Arrow functions
- Iteration methods for Arrays (forEach, map, filter)

Using modules (optional)
- Modules
- Importing and exporting modules
- Structuring code using modules
- Package management tools (npm, Yarn)

Practical use of JS in a browser
- Running a script on a web page
- Basics of DOM manipulation using JavaScript

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