

# Advanced JavaScript

## 60 hours

### Introduction to Functions

- Functions
- Function expressions
- Arrow functions, the basics
- JavaScript specials
- Recursion and stack
- Rest parameters and spread syntax
- Variable scope, closure
- The old "var"
- Global object
- Function object, NFE
- The "new Function" syntax
- Decorators and forwarding, call/apply
- Function binding
- Arrow functions revisited

### *Objects: the basics*

- Objects
- Object references and copying
- Garbage collection
- Object methods, "this"
- Constructor, operator "new"
- Optional chaining '?.'
- Symbol type
- Object to primitive conversion

### *Data types*

- Methods of primitives
- Numbers, Strings, Boolean
- Arrays. Array methods
- Iterables. Map and Set
- WeakMap and WeakSet
- Object. keys, values, entries
- Destructuring assignment

- Date and time
- Object Math and its methods
- JSON methods, toJSON

### ***Regular expressions***

- Patterns and flags
- Character classes
- Unicode: flag "u" and class \p{...}
- Anchors: string start ^ and end \$
- Multiline mode of anchors ^ \$, flag "m"
- Word boundary: \b
- Escaping, special characters
- Sets and ranges [...]
- Quantifiers +, \*, ? and {n}
- Greedy and lazy quantifiers
- Capturing groups
- Backreferences in pattern: \N and \k<name>
- Alternation (OR) |
- Lookahead and lookbehind
- Catastrophic backtracking
- Sticky flag "y", searching for position
- Methods of RegExp and String

### ***Object properties configuration***

- Property flags and descriptors
- Property getters and setters

### ***Prototypes, inheritance***

- Prototypal inheritance
- F.prototype
- Native prototypes
- Prototype methods, objects without \_\_proto\_\_

### ***Classes***

- Class basic syntax
- Class inheritance
- Static properties and methods

- Private and protected properties and methods
- Extending built-in classes
- Class checking: "instanceof"
- Mixins

### ***Error handling***

- Error handling, "try...catch"
- Custom errors, extending Error

### ***Asynchronous JavaScript***

- Introduction: callbacks
- Scheduling: setTimeout and setInterval
- Promise
- Promises chaining
- Error handling with promises
- Promise API
- Promisification
- Microtasks
- Async/await

### ***Modules***

- Modules, introduction
- Export and Import
- Dynamic imports

### ***Introduction to Document Object Model***

- Browser environment, specs
- DOM tree
- Walking the DOM
- Searching: getElement\*, querySelector\*
- Node properties: type, tag and contents
- Attributes and properties
- Modifying the document
- Styles and classes
- Element size and scrolling
- Window sizes and scrolling
- Coordinates

- Mouse events
- Moving the mouse: mouseover/out, mouseenter/leave
- Drag'n'Drop with mouse events
- Pointer events
- Keyboard: keydown and keyup
- Scrolling

### ***Introduction to Events***

- Introduction to browser events
- Bubbling and capturing
- Event delegation
- Browser default actions
- Dispatching custom events

### ***Forms, controls***

- Form properties and methods
- Focusing: focus/blur
- Events: change, input, cut, copy, paste
- Forms: event and method submit

### ***Network requests***

- Fetch
- FormData
- Fetch: Download progress
- Fetch: Abort
- Fetch: Cross-Origin Requests
- Fetch API
- URL objects
- XMLHttpRequest
- Resumable file upload
- Long polling
- WebSocket
- Server Sent Events

### ***Storing data in the browser***

- Cookies, document.cookie
- LocalStorage, sessionStorage