

1 JAVA SCRIPT

1.2 Curriculum and proposed training materials

The curriculum has been designed according to the leading worldwide JavaScript related courses and based on the experience gained from the two previous UNDP Training projects in Web Application Development.

Training is divided into the main modules, covering the key topics related to front-end web development based on JavaScript. Certain modules will overlap in order to better mix and connect knowledge acquired from different areas (e.g., HTML and CSS; HTML and JavaScript; JavaScript and libraries/frameworks, etc.).

Course Modules

- Module 1 (12 classes): **Web technologies basics**
 - o Course introduction, e-learning platform, developer tools and platforms.
 - o Web technologies basics, protocols, services, architecture.
 - o Making personal presentation, using Sway, building and updating personal LinkedIn profile.
 - o Managing communication in IT project teams, using Microsoft Office 365 service (Outlook, Calendar, Yammer, Teams, Planner, Azure DevOps).
 - o Basics of project management and DevOps.
- Module 2 (28 classes): **HTML and CSS3**
 - o HTML syntax, editors (Visual Studio Code – installing, customizing, plugins, updating, live server).
 - o HTML elements and attributes.
 - o HTML content – headings, paragraphs, lists, tables, comments, hyperlinks, tables, images, audio, video, HTML forms.
 - o HTML styles, fonts, special characters, HTML entities, style attribute, color basics, backgrounds, borders, margins and padding, dimensions, Box model.
 - o CSS selectors (tag, id, class), CSS styles, external CSS.
 - o Colors (rgb, hex, HTML colors), advanced backgrounds (colors, gradients, images, CSS patterns).
 - o Positioning and displaying content, overflow, display, float, position.
 - o Fluid and responsive design, @media queries, HTML design.
 - o HTML APIs.
 - o Search Engine Optimization (SEO).
 - o XML and JSON.
 - o Bootstrap framework.
 - o PROJECT example.
- Module 3 (32 classes): **JavaScript language – Introduction**
 - o Editors, Interpreters, Syntax.
 - o Variables and data types, variable mutation.
 - o JavaScript operators.
 - o Conditional statements – if-else.
 - o Boolean logic and switch statements.
 - o Statements and expressions.
 - o Functions.
 - o Grouping code, blocks and scope, hoisting.

- o Loops and iteration.
- o Built-in objects properties and methods.
- o PROJECT example.
- Module 4 (36 classes): **Intermediate JavaScript**
 - o HTML Document Object Model (DOM).
 - o Math and Date objects.
 - o Functions and event handlers.
 - o Functional expressions, IIFE (Immediately-Invoked Functional Expressions).
 - o “this” keyword.
 - o Scoping Chain.
 - o First class functions, functions as arguments.
 - o Closure.
 - o AJAX – Asynchronous JavaScript Fetch API.
 - o Windows objects, screen, location, navigation.
 - o Regular expressions and RegEx objects.
 - o PROJECT example.
- Module 5 (36 classes): **Advanced JavaScript**
 - o Object Oriented Programming (OOP) in JavaScript.
 - o Prototypes and inheritance.
 - o ES5 and ES6.
 - o Custom (user created) objects.
 - o JavaScript modules, import and export.
 - o Execution stack and context.
 - o Creation and execution phases, hoisting.
 - o Hoisting in Practice.
 - o JavaScript Parsers and Engines.
 - o Error handling and debugging.
 - o PROJECT example.
- Module 6 (32 classes): **Modern JavaScript**
 - o From EcmaScript 6 (ES6 or EcmaScript 2015) to EcmaScript 2020, ES.Next.
 - o Browser support for new features.
 - o “let” and “const” keywords.
 - o Blocks and IIFEs.
 - o Strings in ES6.
 - o Arrow functions.
 - o Spread operator and rest parameter.
 - o Default parameters.
 - o Map, reduce and filter.
 - o “Class” in JavaScript.
 - o PROJECT example.
- Module 7 (16 classes): **jQuery library**
 - o jQuery selectors and filters.
 - o Accessing Parent and Child elements.
 - o Manipulating CSS styles.
 - o Checking element existence.
 - o Adding, removing and appending elements.
 - o Showing and hiding elements.
 - o Animations and effects.
 - o jQuery AJAX.
 - o PROJECT example.
- Module 8 (16 classes): **Object oriented programming: Typescript**

- o Environment setup, basic syntax, types, variables, operators.
- o Basic principles of OOP: classes, interfaces, objects.
- o Advanced: namespaces, modules, tuples.
- o PROJECT example.
- Module 9 (32 classes): **Angular framework**
 - o Introduction, environment setup, first project.
 - o Starting Angular app, architecture, displaying content.
 - o Starting application, architecture, data presentation.
 - o Using services, routing, HTTP requests.
 - o Dependency Injection, HttpClient module.
 - o Using 3rd party libraries with Angular (Bootstrap, FontAwesome).
 - o Angular translation.
 - o Advanced: interceptors, route guards, different types of modules.
 - o Unit testing with Karma and Jasmine.
 - o PROJECT: Real-world example.
- Module 10 (12 classes): **Final Project**
 - o Planning, design and development of real-world web application using the learned programming concepts, technologies, development tools and project/collaboration tools.
 - o Final quiz.

The following list shows some of the materials available:

Ved Antani, Stojan Stefanov, Objektno-orjentisan JavaScript, 3rd Edition (Translated), Kompjuter Biblioteka Beograd, 2017. (ISBN 978-86-7310-519-2, hard copy, available at Faculty of Technical Sciences library).

Julie C. Meloni, Samostalno naučite PHP7, MySQL i JavaScript, 6th Edition (Translated) „SAMS Teaches You PHP, MySQL and JavaScript“, Kompjuter biblioteka Beograd, 2018. (ISBN 978-86-7310-552-2, hard copy, available at Faculty of Technical Sciences library)

Vil Grant, 101 princip za dobar UX dizajn, (Translated), Kompjuter biblioteka Beograd, 2018. (ISBN 978-86-7310-531-4, hard copy, available at Faculty of Technical Sciences library)

Laura Lemay, HTML5, CSS3 i JavaScript za razvoj veb strana, 7th Edition (Translated), Kompjuter biblioteka Beograd, 2016. (ISBN 978-86-7310-510-9, hard copy, available at Faculty of Technical Sciences library)

JuanDiego Gauchat, Rejf Kolburn, Dženifer Kirnin, HTML5, CSS3 i JavaScript: Intergrisane tehnologije za razvoj veb strana, (Translated), Kompjuter biblioteka Beograd, 2014. (ISBN 978-86-7310-510-9, hard copy, available at Faculty of Technical Sciences library)

Steve Suehring, JavaScript : korak po korak, 3rd Edition (Translated), CET Beograd, 2014. (ISBN 978-86-7991-378-4, hard copy, available at Faculty of Technical Sciences library)

Marijn Haverbeke, Eloquent Javascript, 3. izdanje, No Starch Press (papirno izdanje), 2018. <https://eloquentjavascript.net>

Addy Osmani, Learning JavaScript Design Patterns, Copyright © Addy Osmani 2012-2020, O-Reilly <https://addyosmani.com/resources/essentialjsdesignpatterns/book/>

Andrea Chiarelli, Mastering JavaScript Object-Oriented Programming, Packt publishing, Birmingham-Mumbai, 2016. (e-knjiga dostupna za nove registrovane članove tokom probnog perioda na www.packtpub.com, primeri sa kodom iz knjige dostupni na Github servisu: <https://github.com/PacktPublishing/Mastering-JavaScript-Object-Oriented-Programming>).

Sridhar Rao Chivukula, Aki Iskandar, Web Development with Angular and Bootstrap, treće izdanje, Packt publishing, Birmingham-Mumbai, 2019.)

Minko Gechev, Switching to Angular, treće izdanje, Packt Publishing, Birmingham-Mumbai, 2017.

Open Educational Resources:

JavaScript Introduction

Michel Buffa, University Côte d'Azur

URL: <https://www.edx.org/course/javascript-introduction>

Programming for the Web with JavaScript

Chris Murphy, Swapneel Sheth, University of Pennsylvania

URL: <https://www.edx.org/course/programming-for-the-web-with-javascript>

HTML5 and CSS Fundamentals

Marwa Hussein, Andrew Byrne, Adrian Leven, Gerry O'Brien, Microsoft

URL: <https://www.edx.org/course/html5-and-css-fundamentals>

CSS Basics

Kasey Champion, Microsoft

URL: <https://www.edx.org/course/css-basics>

Designing the User Experience

Cait von Schnetlage, University of Maryland

URL: <https://www.edx.org/course/designing-the-user-experience>

Creative Coding

Kevin Siwoff, New York University

URL: <https://www.edx.org/course/creative-coding>

Articles and tutorials:

Smashing Magazine, Responsive Web Design Guidelines and Tutorials, <https://www.smashingmagazine.com/responsive-web-design-guidelines-tutorials/>

MSDN Channel 9: HTML5 & CSS3 Fundamentals: Development for Absolute Beginners,
URL: <https://channel9.msdn.com/Series/HTML5-CSS3-Fundamentals-Development-for-Absolute-Beginners>

JavaScript from Null: Video Series, URL: <https://code.tutsplus.com/series/javascript-from-null--net-35330>

MDN Web docs Moz://a, Web technology for developers
URL: <https://developer.mozilla.org/en-US/docs/Web>