

Course code: **HTML5/BB**

Course title: **Development of Web applications on the basis of HTML5, JavaScript, jQuery and Backbone**

Days: 5

Description:

Course intended for:

The course has been developed for programmers having basic knowledge of HTML and JavaScript, who would like to develop their skills in the field of development of interactive Web applications.

Course objective:

The training objective is to get the users familiar with theoretic and practical aspects of HTML 5 and JavaScript technologies, jQuery library and Backbone framework for development of applications in the MVC architecture.

The training participants will learn to:

- Develop pages and forms in HTML 5, also in the way that ensures data portability,
- Use the CSS 3 style for formatting of Web pages and creation of graphic effects,
- Use the advanced HTML 5 functionalities, such as operations on files, drag & drop, server communication or multimedia embedding,
- Create any graphic effects thanks to the new components of HTML 5,
- Use the JavaScript language to solve popular problems,
- Implement the Model-View-Controller architecture in a Web application thanks to use of Backbone,
- Apply ready solutions and increase independence of the code from the browser thanks to jQuery.

The above knowledge will allow the participants to create advanced Web application interfaces, using popular standards.

Requirements:

The participants are required to be familiar with the HTML, XML, HTML DOM standards and to know the basic principles of Web application development. Basic programming skills in JavaScript or any other script language will make it much easier to grasp the training material.

Course parameters:

5*8 hours (5*7 net hours) of lectures and workshops (with a visible emphasis on workshops).

Group size: no more than 10 participants.

Course curriculum:

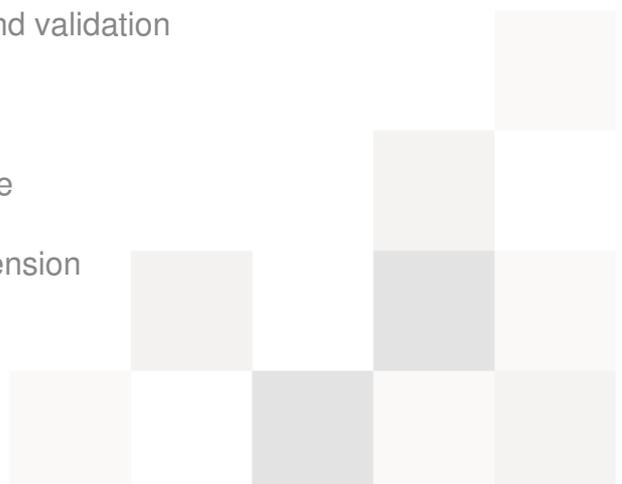
1. HTML 5

I. Introduction to HTML 5, CSS and JavaScript

- i. Web page development and application of basic styles
- ii. The advantages of HTML 5. Comparison with HTML 4
- iii. Supporting browsers for HTML 5
- iv. A review of key new structural tags in HTML 5
- v. Introduction to JavaScript and a syntax review
- vi. Introduction of JavaScript in the HTML DOM structure
- vii. Handling of input events
- viii. Creation of the format and validation of input data using HTML 5 or JavaScript attributes
- ix. Exercises with data format and validation

II. Programming in JavaScript

- i. The JavaScript code structure
- ii. Object development and extension



- iii. The selected best practices
- iv. Exercises: inheritance from objects and code refactoring

III. Programming interfaces in HTML 5

- i. Access to the file system, file operations
- ii. Drag & Drop
- iii. Multimedia embedding
- iv. Introduction to Web Audio API
- v. API Geolocation
- vi. Web application debugging and profiling
- vii. Exercises with HTML 5 API

IV. Offline applications in HTML5

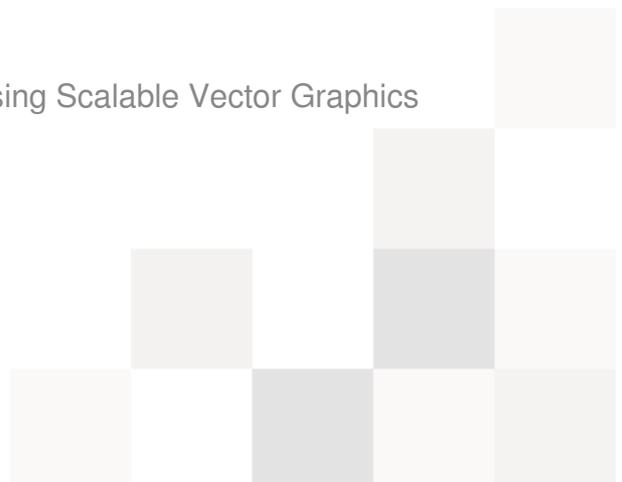
- i. Management of local data
- ii. Local application buffering
- iii. Exercises: application and offline data

V. Application customizing

- i. Portable interface development
- ii. Device detection and selection of the proper representation. CSS 3 Media Queries
- iii. Exercise: preparation of the page for printout and displaying on a mobile device

VI. Advanced graphic operations

- i. Interactive vector graphics using Scalable Vector Graphics
- ii. „Canvas" drawing
- iii. Exercises



VII. Use of CSS 3 in the HTML 5 pages

- i. Text style application
- ii. Application of styles to block components
- iii. CSS3 selectors
- iv. Improvement of graphic effects using CSS3
- v. Exercises: header styling

VIII. Animations

- i. Fade-in effects in CSS3
- ii. Component transformation
- iii. CSS Key-Frame animations

IX. Network communication between the server and the application

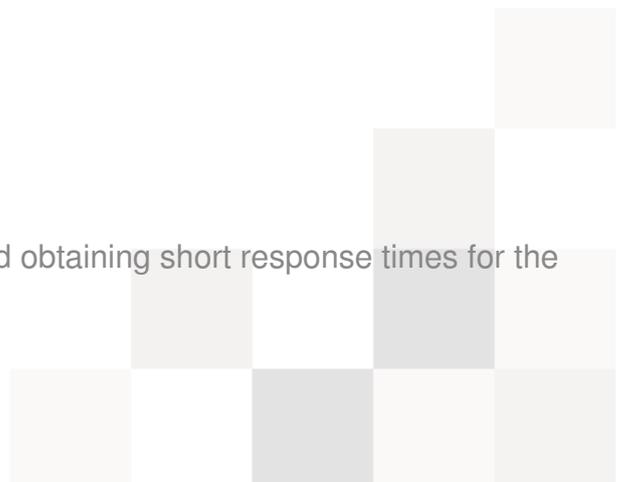
- i. Transmission and receipt of data using XMLHttpRequest
- ii. Exercises: Marshalling and exchange of data in a Web application
- iii. Introduction to Web Sockets
- iv. Transmission and receipt of data using Web Sockets
- v. Exercises: Web Sockets

X. Web Messaging API

- i. Exchange of messages between documents
- ii. Authentication of domains
- iii. Channels and ports
- iv. Exercises

XI. Web Worker Process

- i. Asynchronous operations and obtaining short response times for the application



- ii. Web Worker types
- iii. Browser support
- iv. Displaying of messages during processing of time-consuming operations

XII. Extra (option)

- i. Native Web applications in Google Chrome: structure, development and portability (requires knowledge of C/C++ languages)

2. CSS 3: selected issues and exercises

- I. Use of fonts in Web applications with CSS3
- II. Text effects
- III. Document layout with many columns
- IV. Edge effect
- V. Color, transparency and gradient
- VI. 2D and 3D transformations
- VII. Fade-in effects and animations
- VIII. Box Layout – a flexible layout
- IX. Document background

3. JavaScript

- I. Selected language issues
 - i. Tables and other data structures
 - ii. Functions as objects
 - iii. Transmission of a variable list of arguments to the function
 - iv. Function prototypes
 - v. In-built prototypes



- vi. Function closure
- vii. Regular expressions

II. Selected problems and applications of JavaScript with Exercises

- i. JavaScript code launching from external locations
- ii. Mouse position interception
- iii. "Forward" and "Back" buttons
- iv. Development of alerts in JavaScript
- v. Browser recognition. Document type detection
- vi. Forwarding
- vii. Opening of new window
- viii. Date and time
- ix. Performance with a delay
- x. Image loading before displaying
- xi. Change of the button image after moving mouse over the button
- xii. Random number generator
- xiii. Operations on literals
- xiv. Formatting numbers to currencies
- xv. Memory leaks in JavaScript

4. Backbone: MVC in JavaScript

- I. Reminder of MVC: Model-View-Controller
- II. Models in Backbone
- III. Views and templates
- IV. Routers



V. Collections

VI. Exercises: development of applications with MVC

5. jQuery: presentation and examples

I. Introduction: installation and syntax

II. Basic structures: selectors and events

III. Graphic effects in jQuery

IV. Animation control, fade-in effect

V. Command chains

VI. Response to end of effect

VII. jQuery in access to HTML DOM and its edition

VIII. AJAX in jQuery

