

Advanced JavaScript (with DOM)

The Web Development, Programming & Design Series

Course: TT4112 Advanced JavaScript (with DOM)

Duration: 3 days

Focus: Advanced JavaScript development

Targeted Audience: Experienced Web Developers

Skill-level: Intermediate

Hands-On Format: This hands-on class is approximately 50/50 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

Delivery Format: We're flexible! This course is available for onsite private classroom presentation, or live online virtual presentation, or can be presented in a combined delivery learning solution. Please visit our Public Schedule for open-enrollment course dates.

Customizable: This course may be easily tailored to target your training skills objectives, tools of choice and learning goals.

JavaScript is simple and elegant, but is often difficult to work with because it's so different from the programming languages most developers are familiar with. **Advanced JavaScript** in a hands-on web development and design training course that explores variety of advanced JavaScript techniques, capabilities, and best practices.

► Course Objectives: What You'll Learn

This course provides indoctrination in the practical use of the umbrella of technologies that are on the leading edge of web development.

Working within in a dynamic, hands-on learning environment, guided by our expert team, attendees will:

- Complex and powerful JavaScript objects and functionality
- How to traverse and manipulate the DOM and how to handle events in ways that work in all browsers
- Closures and prototypes and other exotic features of JavaScript
- Best practices for using JavaScript so that it works unobtrusively and performs well

Need different skills or topics? If your team requires different topics or tools, additional skills or custom approach, this course may be easily adjusted to accommodate. We offer additional web programming, design and security courses which may be blended with this course for a track that best suits your development objectives.

Course Structure: Throughout the course students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, lab review and quizzes. This course is "skills-centric", designed to train attendees in leading-edge web development skills, coupling the most current, effective techniques with the soundest practices.

Hands- on Learning: This course is about **50% hands-on lab and 50% lecture**, with extensive programming exercises designed to reinforce fundamental skills and concepts learned in the lessons.

Our courses include ample materials and labs to ensure all students are either appropriately challenged, or assisted, at all times – no matter their skill level.

► Audience & Pre-requisites: Who Should Attend

This is an **intermediate and beyond-level** web development course, designed for experienced developers who need to extend their knowledge of web design and development.

Attendees should have previous experience or working knowledge of developing software applications. Basic HTML and CSS development skills are required. This is a programming class. Familiarity with an object-oriented language is helpful, and real world programming experience is a must.

► Related Courses – Suggested Learning Path

Take Before: Students should have working knowledge of basic HTML and CSS, or should attended this course as a prerequisite

- **TT4610 Web Essentials: HTML**
- **TT4110 Web Essentials: JavaScript**

Alternative Courses: We offer other courses that provide different levels of knowledge or focus:

- **TT4650 Mastering HTML5, CSS3 & JavaScript (3 days)**
- **TT4600 Mastering HTML5, CSS3, JavaScript & JQuery (with Advanced Topics) (4 days)**
- **TT4675 Mastering JavaScript & jQuery (5 days)**

Take After: We offer a variety of introductory through advanced web programming, development and design courses. We will collaborate with you to design the best solution to ensure your

needs are met, whether we customize the material, or devise a different educational path to help your team best prepare for this training.

Some of the more popular follow-on courses include:

- **TT4660 Web Essentials: JQuery**
- **TT4667 Mastering JQuery**
- **TTC4679 HTML RIA Development | Covering HTML5, CSS3 / LESS, Angular JS, TDD, REST, SOA, CI, MDE & More**
- **TTC4678 Advanced JQuery with Backbone, Thorax & Lumbar**
- **TTC4679 Advanced JQuery / RIA | Creating Modular and Maintainable HTML5 Rich Applications with JQuery, UI, Backbone and REST**
- **TTC4689 AngularJS | Rich Internet Applications (RIA) in JavaScript**

Please contact us for recommended next steps tailored to your longer term education, project or development objectives.

► **Student Materials: What You'll Receive**

Our robust course materials include much more than a simple slideshow presentation handout. Student materials include a comprehensive hard-copy course manual, complete with detailed course notes, detailed lab manuals and workbooks, code samples, software tutorials, diagrams and current reference materials, all directly related to the course at hand, indexed for ease of use. Step-by-step lab instructions, software tutorials and project descriptions are clearly illustrated and commented for maximum learning.

Workshop Topics Covered

Session: Advanced JavaScript

Lesson: JavaScript Reviewed

- JavaScript Defined
- Embedding Scripts in HTML
- Identifiers and literals
- Non-Standard Operators
- Loop Structures
- Iteration
- Conditional Structures
- The with Statement
- Functions in JavaScript
- Invoking Functions
- Functions as Data
- Functions as Methods
- Function Constructor
- Function Scope and Closures

Lesson: JavaScript Objects

- JavaScript Object
- JavaScript Literals
- Associative array
- Object Universal Properties
- JavaScript Arrays
- Arrays
- Array Methods
- Working with Arrays
- Strings
- String Objects
- JavaScript and Regular Expressions
- Regex Content
- Character Sets and Alternation
- Additional Constructs
- Repetition
- Example:
- Using Regular Expressions in JavaScript
- Creating Regular Expressions

- Using Regular Expressions – String Match
- Using Regular Expressions – String Replace
- Using Regular Expressions – String Split
- Using Regular Expressions – String Search
- Working with the RegEx Object

Lesson: JavaScript Classes

- JavaScript Classes are NOT
- Classes as Functions or Functions as Classes
- Function Constructors
- Creating New Objects in JavaScript
- JavaScript Classes
- Creating Multiple Objects
- Prototypes
- Prototype Property
- Extending Classes With Prototype
- Extending Classes
- Prototyping
- Extending Built-in Objects
- Reusable, Flexible Classes

Lesson: JavaScript Event Handling

- JavaScript Event Handling
- Event Models
- Basic Event Handling
- HTML Events
- Handling HTML Events
- Event Handling With Dom Level 2
- DOM 2 Event Propagation: Three Phases
- Event Handler Registration
- InnerHTML

Session: Working with DOMs

Lesson: HTML DOM Mechanics

- The HTML Document Object Model (DOM)
- Introduction to Objects in Documents
- DOM Structure
- Structure of a Page in Browser Memory
- Dynamic Document Content
- The HTML DOM
- Accessing Nodes
- Accessing Element Nodes
- getElementByTagName() Code Sample
- getElementByTagName() Code Explanation
- getElementById()
- getElementById() Code Explanation
- Properties for Accessing Element Nodes
- The this Object
- Attaching Events
- Code Explanation and Walkthrough
- DOM Element Properties
- Event Handler by Function Assignment
- Event Handler by Closure
- Unobtrusive JavaScript
- Accessing Attribute Nodes
- Accessing Nodes by Type, Name or Value
- Node Type Constants
- nodeName
- nodeValue
- Accessing Nodes by Class Name
- getElementByClassName() Method

- removeChild() Method
- DOM Differences: The Whitespace Problem
- Creating New Nodes
- Methods for Inserting Nodes
- Rendered Code and HTML in Example
- Using Node Manipulations
- setAttribute() Method
- Review of Forms
- Form Object
- Scripting Form Elements

Session: Javascript Techniques

Lesson: Pushing Javascript

- JavaScript Security Limits Capability
- Same Origin Policy
- Timers Within Browser Windows
- Scheduling in JavaScript
- setTimeout() in Action
- setInterval() in Action
- Uses for JavaScript Timers
- Window and Screen Information
- Opening And Manipulating Windows
- Retrieving X,Y Location of Mouse Click
- JavaScript Execution: Global Object
- JavaScript Execution: Call Object
- JavaScript Execution Context
- Scope Chain
- Window Object – Global Context
- Executing Scripts
- The onload Event Handler
- Window Object As Execution Context
- Threading (Actually Non-Threading)
- Manipulating Document During Loading

Lesson: JavaScript Best Practices

- JavaScript Code Convention Overview
- Managing JavaScript
- Formatting and Structure
- Comments, Comments, Comments
- Variable Declarations

- Function Declarations
- Names in JavaScript
- Drupal Naming Conventions
- Statement Structure
- return and if Statement Conventions
- Control Statement Conventions
- Managing Whitespace
- JavaScript Best Practices Overview
- Naming Best Practices
- Globals are a Bad Thing
- Resolving Shared Resources
- Enforce Quality Code
- Never Use eval or Similar Constructs
- Enhance Progressively
- Modularize and Encapsulate
- Do NOT Trust Data Returning From the End Point
- Additional JavaScript Best Practices

Lesson: Performance and Optimization

- Code Optimization
- Adding Elements to a Page
- JavaScript Verbosity Tradeoffs
- Minimizing Dot-Notation
- The Venkman Profiler
- Venkman Profiling Results
- Profiling Kayak
- A Snippet from the Results
- Using the Results
- Memory Considerations
- JavaScript Memory
- Tools for Measuring Memory Footprint
- Removal of DOM Nodes
- Cyclic References
- Reusing DOM Nodes
- Interactions Between Techniques

Lesson: Security

- Misconception #1
- Security: The Complete Picture
- Verizon's 2011 Data Breach Report
- US Secret Service Continues to Battle
- Verizon AppSec Recommendations
- Unvalidated Input: Description
- Unvalidated Input: Fixes

- Define System and Trust Boundaries
- Focus on Each Trust Boundary
- Injection Flaws: Description
- SQL Injection Example
- Or
- Heartland – Expensive SQL Injection Exploit
- Initial Goal of XSS Attack: Insert Content
- Ultimate Goal of Attacker: Get User to “touch” Location
- XSS: Description
- Spoofing: Description
- Targeted Spoofing Attacks Can be Damaging
- Attacks are Constant and Changing
- Spoofing: Fixes
- JavaScript is Integral Part of Rich Interfaces
- How Attackers See JavaScript Applications
- Attack Surface Change When Moving to AJAX
- JavaScript Privacy Concerns
- Factors that Increase Attack Surface
- Injection and Cookie Tampering
- Data Tampering
- Cross Site Scripting
- Dangerous Developer Assumptions
- High Level Recommendations (Client Side)
- Three Basic Tenets for Safe JavaScripting
- Common Vulnerabilities and Exposures
- OWASP Top Ten for 2010
- How Many Principles Can be Violated?
- CWE/SANS Top 25 Most Dangerous SW Errors
- Monster Mitigations
- Useful Links
- JavaScript Security Resources

► Delivery Environment: Tools to Use

This course can be delivered using a variety of software combinations and tooling. Our detailed lab workbooks are complete with software-specific instructions and tutorials, screen shots and step-by-step illustrations for using the software you select. In most cases we can port our classes to run in the

environment of your choosing. Please inquire for details.

► Setup Made Simple!

Our mission is to ensure a smooth start to your course with minimum set up burden for your team or firm. We offer several course set up options to help meet that goal. Please inquire for

details on requirements and costs.

- **Manual Course Setup.** Our team provides a detailed setup guide with specific instructions, packaged software and links for all course tools and labs, as well as much live assistance as required to prepare your attendees or classroom for the course.
- **LoadNGo Instant Classroom Kit (DVD Image).** Depending on the course, we can supply a custom, course-specific DVD that houses the course set up software, labs, and other pertinent useful student resources such as whitepapers, tutorials and additional examples. This image is simple to install and remove, without impacting your student environments.
- **Remote Lab Environment.** Your team can access our hosted environment to access and use the software, labs and tools required for the hands-on portion of the training.
- **Provide Pre-Loaded Equipment.** If needed, we can ship in pre-loaded equipment to your site.

► **Focused, Skills-Driven Training | Maximizing Your Training Time and Value, while Reducing Risk**

Our training programs are designed to be skills-driven, focused events, targeted to deliver the true skills you need to succeed in your projects and role. We'll work with you to ensure that your valuable training time and dollar is truly maximized. If your team requires more or less advanced materials or additional or custom topics, this course may be easily adjusted to accommodate. We offer and can blend on a wide variety of surrounding and

supporting tools and elements to build out a truly robust educational experience, for you, your team, or your entire organization.

Please contact us for details about our **Extended Education Programs** that support, surround, supplement or extend your learning initiatives such as

- **Collaborative mentoring** for your team
- **Pre-and post-training assessments** help place learners on the right path
- Mentored, comprehensive **case-studies** can be woven into your training programs, complete with guided work and instructor interaction
- **Guided or self-paced projects**, homework and exams
- **Interactive, self-paced programs** students
- **Virtual lab hours** and/or constant Mentor access
- Role-basic, Topic-based or Goal-based corporate **Training Roadmap and Learning Paths development**, rollout and support
- Skills-focused custom **New Hire Training Programs** and team **Reskilling initiatives**
- **Learning Management or Vendor Management Services** for your organization

Plus many additional, flexible learning modules, initiatives and programs that can be delivered across a variety of subjects and modalities, completely tailored for your organization

► **Why Choose Trivera Technologies?**

Whether you're a manager choosing a training provider or course to bring to your team, an instructor looking for reliable, solid course materials, or a student looking for an exciting, targeted training class to attend or to recommend to your colleagues - ***Our single focus is to make YOUR training event or experience a success.*** Here's why choosing our team as your web development, programming and design training and courseware resource takes the risk right out of your decision making process...

- **Our prices and services are guaranteed.** We stand behind our courses, courseware and instructors 100%. We'll match or beat any pricing for similar services, any time. Whether you're a stakeholder organizing your firm's educational services, a student in our live or virtual classroom or a trainer using our materials to educate your own client or team.
- **Our Instructors and Mentors bring years of leading-edge, hands-on Web Development, Design & Programming experience into the classroom and content.** Our engaging, dynamic instructors and course authors are also skilled web developers and designers, who work on exciting web projects in between training engagements. Many of our web team members are game designers and developers, mobile app developers, and mobile app and web development security experts - all of whom are immersed in the latest skills, tools and technologies available in this fast-changing industry. They bring experience and expertise well-beyond the course materials.
- **Our 'skills-driven' courses are efficient, focused, current and comprehensive.** Our experts target exactly the skills your team needs to succeed in their jobs, projects or roles, rather than taking a 'laundry-list' approach to training, which can often result in overtraining, course overload or overwhelmed students. We'll work with you to define what it is you need to accomplish, and create the right program, training to those goals. Students of all skill levels will be able to hit the ground running with their new skills right after class ends, since the program was correctly designed from the start.
- **Our 360° Turn-Key Training Services ensure your Important Event is Truly Targeted, Exceeds Your Expectations and is delivered 100% Worry-Free!** The Trivera team treats every delivery engagement like a first-run, important event, not simply a staffing assignment. For every class we deliver, our team works closely with yours to ensure that your course runs smoothly from start to finish, and that there are **no surprises** in the classroom for you, your students or the instructors. Our experts work with you to choose the right topics and courses that align with your true skills goals, tuning as needed. We align the best all-around trainer to fit your exact needs – not just whoever happens to be 'on the bench'. We offer pre-reading, quizzes and support resources to help assess and prepare your team for the

training, so we can best tune the training and maximize their time in the classroom. We'll ensure that your classroom is set up and ready to go prior to course start. Throughout the course delivery, our instructors constantly evaluate the class delivery and students, tuning topics, activities, discussions and labs as needed to ensure all student skill levels and needs are targeted. All activities, data and results are documented and shared with your firm so you have a complete picture of the course and its results, throughout the course delivery, and afterwards. Post training support is also included for your students to address any future related questions.

- **We wholly-own our course content, giving Trivera flexibility & quality above the rest.** Our course materials are **owned** by our company and **fully customizable at little or no cost**. Dozens of training firms and independent instructors purchase and use our course materials, and hire us for training support as well. As a result, our courseware is subject to very stringent quality requirements. Not only will your organization benefit from our own technical team's technical expertise, but also from the feedback of hundreds of students and trainers using these materials, worldwide, on a regular basis. This unique fact guarantees that our materials are not only robust and interesting, but also technically correct, current and of the highest quality and usability.
- **Our content is always updated and ready to go.** Our dedicated course development team keeps our training content, courses and student resources completely updated with the latest skills, industry trends and software editions to ensure your team is always getting the most current information, techniques and skills available.
- **We take the pain out of classroom set up.** Our mission is to ensure a smooth start to your course with minimum set up burden for your team or firm. We offer several course set up options to help meet that goal. We'll work closely with you to ensure your classroom is 100% ready to go, well in advanced of the class start so your class can hit the ground running.
- **We're here for Extended Support Service** for students, instructors, facilities or anyone using our content or working with our instructors, in any way. There is someone here to assist you with questions, technical calls, set up, content – or whatever you need - at all times. Your success is our singular goal. We also support all of our students long after the class ends by offering pertinent free technical resources, live mentoring and technical support to help you apply your newly learned skills, and steeply discounted additional training offerings.
- **We're published authors and industry speakers.** Our team was selected to write the online *JEE, EJB, EJB CMP-CMR and Web Services Tutorial Series for IBM developerWorks®*. These are the same instructors who train our classes and author the courseware. Most of our trainers/consultants have also authored additional articles on web services, EJB, Struts, JEE and advanced Java topics, and are recognized speakers and presenters on the industry technical seminar circuit. Our team is comprised on several successful published authors. Members of our team have written or contributed to: *Python Programming, Eclipse Kick Start, Mastering Eclipse; Professional Struts; Using Java Tools for Extreme Programming; Mastering Resin; Mastering TomCat and others*.
- **Need a small-business status with whom to team?** Trivera Technologies is a 100% Woman-Owned Small Business Concern. Please contact us to team with us for your small-business or woman-owned set aside opportunities.
- **Our prices and services are guaranteed.** We stand behind our courses and instructors 100%. We'll match or beat any pricing for similar services, any time. Whether you're a stakeholder organizing your firm's educational services, a student in our live or virtual classroom or a trainer using our materials to educate your own client or team – **Our core mission is to make YOU a success in the classroom.**

► For More Information

For more information about our training services, collaborative mentoring services, courseware licensing options, courseware development services, public course schedule, training management services, partner and reseller programs, or to see our complete list of course offerings please visit us at www.triveratech.com, email Info@triveratech.com or call 609.953.1515.

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MENTORING | ASSESSMENTS | LEARNING PLAN DEVELOPMENT | PARTNER PROGRAMS | CORPORATE TRAINING MANAGEMENT SERVICES

For a Complete List of our Course Offerings please visit: <http://www.triveratech.com/Courses/Courselist.htm>

Trivera Technologies is a Woman-Owned Small-Business Firm