Networking Academy

JS INSTITUTE Open Education & Development Group

JavaScript Essentials 2

Scope and Sequence

Version 1.0

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.

Contents

Target Audience 3

Prerequisites 3

Certification Alignment 3

Course Description 4

Equipment Requirements 5

Course Outline 5

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.

Target Audience

Building upon the principles laid out in JavaScript Essentials 1, this course unveils more advanced programming techniques and best practices in the realm of JavaScript. It stands as the concluding part of a two-course sequence, prepping learners for the JSA – Certified Associate JavaScript Programmer certification from the JS Institute.
JavaScript Essentials 2 (JSE2) is specifically designed for:

- Aspiring web developers who have completed the JavaScript Essentials 1 course or possess an equivalent level of basic JavaScript knowledge and want to take their skills to the next level.
- Aspiring intermediate JavaScript developers targeting junior front-end and back-end development roles who want to equip themselves with advanced JavaScript techniques to build and design more refined programs.
- Aspiring software testers seeking junior tester positions focusing on unit and integration tests for JavaScript-based applications.
- Team leaders, product managers, and project managers who want to understand the terminology and processes in the software development cycle to manage and communicate with IT, testing, and development teams more effectively.
- Industry professionals who wish to explore technologies that relate to JavaScript, or that utilize JavaScript as a foundation for more complex projects.
- Certification aspirants aiming to clear the JSA – Certified Associate JavaScript Programmer certification exam.
- Problem solvers and analysts – professionals or students keen on modeling real-world challenges and architecting solutions using object-oriented programming (OOP) and procedural techniques in JavaScript.
- Portfolio builders – individuals wanting to enhance their programming portfolio to showcase their advanced JavaScript abilities and boost their market value.

Tailored to suit a diverse audience, this course is equally beneficial for students and school learners. Its content and pacing have been designed in a way that it can comfortably fit as a one-semester course in educational settings. Whether it's high school seniors preparing for college or college students eyeing a career in tech, this course provides a comprehensive introduction to Intermediate JavaScript, ensuring they're well-prepared for the next steps in their academic and professional pursuits.

Prerequisites

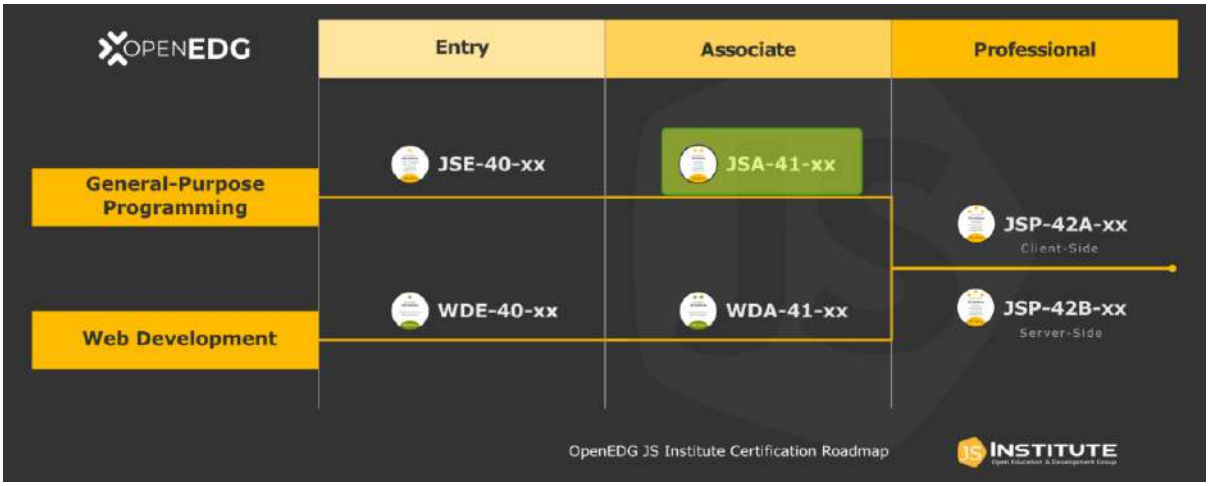
While there are no formal prerequisites for this course, it is highly recommended that learners possess skills and knowledge equivalent to the JSE certification or have completed the JavaScript Essentials 1 course.
This foundational understanding will ensure that participants can comfortably grasp the advanced topics and techniques presented, leading to a more productive and enriching learning experience. Those familiar with the core concepts of JavaScript, its basic syntax, and foundational programming techniques will find themselves best positioned to maximize the benefits of the course content.

Certification Alignment

JavaScript Essentials 2 is aligned with the JSA – Certified Associate JavaScript Programmer certification (*Exam JSA-41-0x*), offering learners a deep dive into the intermediate facets of the JavaScript language. The course guides

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.

learners through the more intricate aspects of the JavaScript language, placing particular emphasis on advanced functions usage and deepening understanding of Object-Oriented Programming (OOP) concepts, topics essential for the JSA exam.



Course Description

JavaScript Essentials 2 delves further into the intricacies of JavaScript programming, equipping learners with the tools to dissect and address real-world challenges using object-oriented programming. The course also broadens understanding of sophisticated functional techniques, particularly in asynchronous programming. Building on the foundation set by JavaScript Essentials 1, this course aims to:

- Enhance the learner's proficiency in coding techniques while introducing both class-based and classless approaches in object-oriented programming (OOP).
- Familiarize the learner with a curated range of built-in objects that extend programming capabilities.
- Educate on the manipulation of complex data structures, such as Map and Set.
- Deepen insights into advanced function usage, encompassing generators, iterators, closures, and IIEEs.
- Expound on asynchronous programming facets, showcasing the versatility of both traditional callback functions and promises.

This course is divided into four distinct modules, each carefully designed to facilitate a structured learning experience in JavaScript. In Module 1, learners will explore classless objects, while Module 2 delves into classes and the class-based approach. Module 3 introduces learners to built-in objects, and in Module 4, learners will dive deep into advanced function usage.

Throughout this journey, learners will have access to study resources and labs for hands-on practice, with each module culminating in a test to evaluate their understanding. Finally, course completion will be marked by a comprehensive final test, ensuring learners have honed their skills in JavaScript Essentials 2.

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.

Equipment Requirements

This course can be accessed on mobile phones, providing flexibility in the learning process. However, for an enhanced and optimal learning experience, the use of a laptop or desktop computer is recommended, alongside an internet browser like Google Chrome. Additionally, a reliable internet connection is advised to ensure seamless access to course materials and resources.

Course Outline

Over four modules, JavaScript Essentials 2 covers topics from classless objects to advanced function usage, preparing the learner for the JSA – Certified Associate JavaScript Programmer certification.

Table 1: Module Title and Objective

Course Component	Topics	Objectives	Labs	Assessment
JSE2: Module 1: **Classless Objects**	1. Object manipulation using literals and property management. 2. The nuances between dot and bracket notations. 3. Techniques for testing and enumerating object properties. 4. Object comparison strategies and deep cloning concepts. 5. Implementing object methods, along with getters and setters. 6. Prototypes, inheritance, and object configurations.	After completing Module 1, learners should have the ability to construct objects using various techniques, including literals, constructors, and factories. They should also be able to access object fields, both nested and non-nested, using dot and bracket notation. Furthermore, they should be proficient in modifying objects by adding, deleting, or altering properties and methods. Learners should also understand how to check the existence of object fields, list them, and configure objects and their fields accordingly. They should grasp the concept that objects are stored in variables as references and understand its implications. Finally, learners should comprehend the context of a method call and effectively use the 'this' keyword. They should also have a solid grasp of object prototypes and inheritance using prototype chains.	5	Module Test
JSE2: Module 2: **Classes and Class-Based Approach**	1. Class declarations. 2. The dynamics of properties within classes. 3. The practical use of getters and setters. 4. Inheritance. 5. The role of static members in classes. 6. The distinctions between classes and constructors.	After completing Module 2, learners should be capable of declaring classes and instantiating objects from them. They should understand how to define class properties through methods or directly within the class. Additionally, they should have a sound understanding of class inheritance and how to implement and utilize static methods and properties in classes. Learners should also be able to establish getters and setters within classes.	5	Module Test
JSE2: Module 3: **Built-in Objects**	1. Manipulating Number and String objects, including format conversions. 2. Date object handling, time zones, and performance measurement.	After completing Module 3, learners should possess the knowledge and skills to understand and utilize JavaScript's built-in objects. They should be able to differentiate between primitive types and their corresponding wrapper objects and employ autoboxing. Additionally, learners should be proficient in manipulating	5	Module Test

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.

	3. Comprehensive array techniques, from basic operations to advanced methods like filter and map. 4. Utilizing Set, Map, and using objects as dictionary structures. 5. Conversion and parsing with the JSON format. 6. Mathematical operations with the Math object and pattern searching using regular expressions. 7. Enhancing built-in types through prototypes.	Array data using methods like filtering, sorting, and merging. They should also be able to employ destructuring assignments and spread operators with arrays. Learners should have the ability to decide when to use Map and Set objects over Array and Object for data storage and manipulate their elements accordingly. Furthermore, they should be able to convert objects and arrays to and from the JSON format. Finally, learners should know how to utilize the Math object for basic mathematical operations and apply basic regular expressions with the RegExp type for string parsing. They should also be aware of how to extend native JavaScript types with new properties and methods.		
JSE2: Module 4: **Advanced Function Usage**	1. Extended function parameters and their usage, including default values and the spread operator. 2. Concepts of closure and the application of IIFE. 3. Techniques of forwarding calls using the 'this' keyword and related methods. 4. Function decoration and the principles of higher order functions. 5. Utilizing generators, iterators, and the notion of iterable objects. 6. Asynchronous programming and the role of callback functions in handling asynchronous events.	After completing Module 4, learners should be proficient in applying advanced function-related mechanisms such as Extended Parameter Handling, Recursion, and Forwarding calls. They should have a strong grasp of generators and iterators and understand their use via lazy evaluation. Learners should also be able to identify situations that warrant asynchronous programming techniques and employ callback functions for handling asynchronous operations effectively. They should comprehend the Promise mechanism and use it as an alternative to callback functions. Additionally, learners should understand and apply the async function with the await keyword for promise handling.	5	Module Test
JSE2: **Final Test**	-	Upon finishing the course and successfully completing the Final Test, learners will be fully prepared to pursue the JSA – Certified Associate JavaScript Programmer certification from the JS Institute. They will have a deep understanding of the core JavaScript language, advanced function usage, and a comprehensive set of data types and built-in JavaScript objects. Graduates will be equipped with strong algorithmic thinking and problem-solving skills, enabling them to design, develop, and improve JavaScript programs using classes and objects. They will also possess a solid understanding of a programmer's role in the software development process and the use of fundamental development tools. Finally, graduates will be able to create and develop their own programming portfolio, showcasing their expertise in JavaScript programming.	-	Final Test

© 2023 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public Information.