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Web Development Study Guide

Contents

What is Web Development?

Web development is essentially building and maintaining websites and web applications on the internet. It involves creating the website layout, backend infrastructure and functionality of the websites. There are two main parts to web development: frontend and backend.

- Frontend development focuses on interacting with the users directly and writing code to create the visual elements, layouts and interactions of a website that people can see in their browsers.
- Backend development focuses on getting things done behind the scenes with the servers, thus the name 'backend'. It involves managing databases, setting up servers and handling the data transaction between the database and the website to ensure functionality.

- Full-stack development is a combination of front-end and the backend development where the developer work on all aspects of the website from the visuals to the servers. It often requires mastery of the two developments and long experiences.

Web development offers various career opportunities. They include frontend developer, backend developer, full-stack developer, UI/UX designer, web designer, Quality Assurance (QA) Tester, DevOps Engineer, Information Security.

Article on web development (5 mins): what-is-web-development
Article on web development career paths (3 mins read): web-development-career-paths

Key skills for Web Development and Popular Frameworks

Key skills for Front-End Development

1. HTML (Hypertext Markup Language): for creating the structure and content of the website
2. CSS (Cascading Style Sheets): to style and format the HTML elements. Responsible for the overall visual presentation of a website.
3. JavaScript: For adding interactivity, animations, and dynamic behavior to websites.
4. Responsive Design: ability to create websites that function across various devices and screen sizes
5. Frontend Framework and Libraries: Web development can be done by only using HTML, CSS, and JavaScript. However, it is very tedious to make big and complex websites this way. Instead, people utilize these so-called frontend 'frameworks' for efficient development

Common frameworks for frontend development

- **React.js:** JavaScript library development by Facebook. Has a component-based architecture and uses virtual DOM. Very popular in the industry, has high demand but also a high supply of developers.
- **Vue.js:** Lightweight component-based JavaScript Library. Easy to pick up but has smaller community than react
- **Angular.js**: TypeScript based library maintained by Google that uses a Model-View-Controller architecture. Has a steeper learning curve and less flexibility than React or Vue
- **Svelte:** a slightly newer framework with a compile-time rendering and small bundle size. The framework is constantly changing and has less support due to the smaller community.
- **jQuery:** The oldest JavaScript. Can be fun to learn but has a medium job demand.

Key skills for backend development

1. Proficiency in at least one backend programming language such as
   - PHP
   - Java

  - JavaScript
  - Python
  - Ruby
2. Server-side management
3. Database management:
   - SQL databases: most popular and easy to learn
   - NoSQL databases: also, popular and easy to learn
   - Graph, Vector, etc.: newer and harder to learn. Has a niche
4. Application Programming Interface (API): to design APIs for communication between systems and services
5. Web Servers and Development: like Apache and Nginx for servers and Heroku and GitHub Pages
6. Security Knowledge: To prevent common vulnerabilities and ensure data encryption and user authentication

Common frameworks for backend development

Deciding what framework to use for backend development is slightly different from frontend development. The framework you choose will be heavily reliant on the backend language you are proficient in and the specific needs and goals of the project. Each language usually has one big and popular backend framework that most companies in industry use with some emerging frameworks.

- Laravel (PHP)
- Spring Boot (Java)
- Espress.js (Node.js)
- Django (Python)
- Ruby on Rails (Ruby)
- Flask (Python)
- ASP.Net Core (.NET)

Popular vs Old School Web Development

Old school development refers to the traditional technologies and practices that have been in use for a very long time. These tech stacks involve language, tools, and frameworks that have been prevalent in the market for decades. For example, PHP, ASP.NET web forms, and older server-side scripting languages such as Perl. These technologies were very popular and may still be in use for legacy systems. The traditional approach to web development in the old-school era put a heavy emphasis on server-side rendering and less emphasis on dynamic user experiences.

The popular development refers to the modern technologies and practices adopted in the industry today. This modern approach focuses more on a modular and scalable architecture with more emphasis on responsive and interactive web experiences. Technologies like React, Angular, and Vue have gained popularity with their component-based approach that provides flexibility and easier maintenance. For server-side scripting, Node.js has also gotten popular due to its non-blocking I/O model.

In summary, old-school development focuses on maintainability and performance whilst modern development focuses on flexibility and speed. Old frameworks employed the conventional MVC architecture, and modern frameworks have component-based structures. The demand for modern frameworks is very high whilst the demand for the old school frameworks remains moderate but may be slowing down.

Self-Study Web Development

To get started with web development, there are so many resources online. The options listed below are the popular paths that are used by the online community. I will split the resources into paid and free categories. In the free category, famous and reliable websites for learning web development are Free Code Camp and The Odin Project. This one drive folder contains IT325 web systems ppts.

Free Category

Free Code Camp

Free Code Camp is a free website that offers many certification courses on various technologies such as JavaScript data structures and algorithms, Python for machine learning, and responsive web design. There are currently 15 certification courses with newer ones added at a regular pace. Students can sign up to the website using a Gmail account and get started on the courses. You will be rewarded with an official certificate once 5 final projects are completed for each course. Free Code Camp has a website platform where the students code and run all their projects. They also have a very big YouTube channel that has many free online courses with source code. FCC is very reliable, and I recommend checking out their blog even if you don't take their courses.

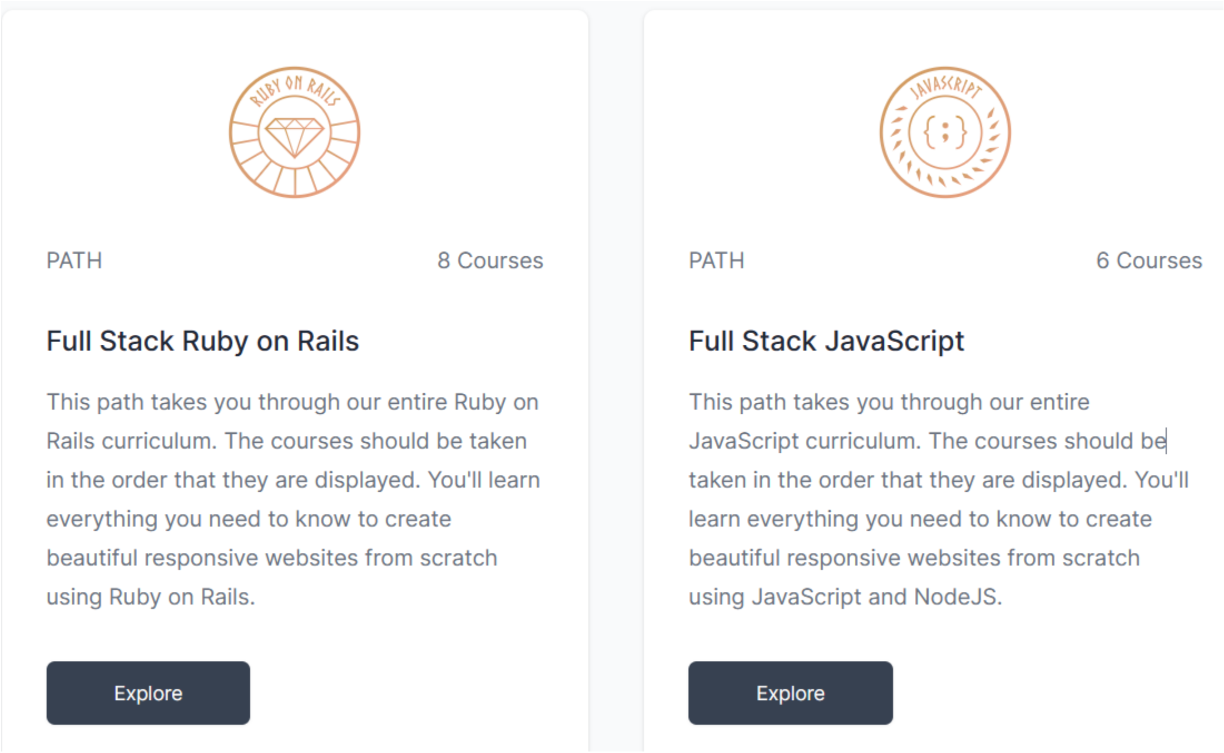
(New) Responsive Web Design Certification

JavaScript Algorithms and Data Structures Certification

Front End Development Libraries Certification

The Odin Project

The Odin Project offers two curriculums for web development: Full Stack JavaScript or Full Stack Ruby on Rails. They have a project-based style of teaching but require the students to set up their local environment using modern IDEs and version control systems instead of providing their own IDE like FCC. This approach is more practical and can set up students for the future but will have a harder learning curve. They also have an extensive online community and give certificates after completion of an online course.



PATH 8 Courses

Full Stack Ruby on Rails

This path takes you through our entire Ruby on Rails curriculum. The courses should be taken in the order that they are displayed. You'll learn everything you need to know to create beautiful responsive websites from scratch using Ruby on Rails.

PATH 6 Courses

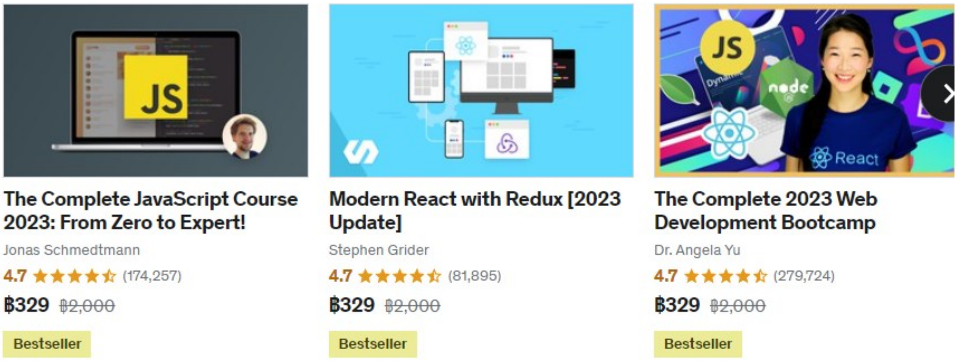
Full Stack JavaScript

This path takes you through our entire JavaScript curriculum. The courses should be taken in the order that they are displayed. You'll learn everything you need to know to create beautiful responsive websites from scratch using JavaScript and NodeJS.

Paid Category

Udemy

Udemy is probably the most popular website for learning how to code online. However, the courses on Udemy are not free but there is always a huge discount sale that reduces the costs to around 300 to 500 baht. The online courses are often taught by 3rd party instructors, compared to Coursera which partners with institutions, but the sheer number of students and reviews make the courses reliable. The students will receive a certificate of completion after finishing the entire course but the projects during the online courses are the most important aspects for learning. Udemy online courses can be completed in any duration depending on the student's pace which makes studying on Udemy very flexible.



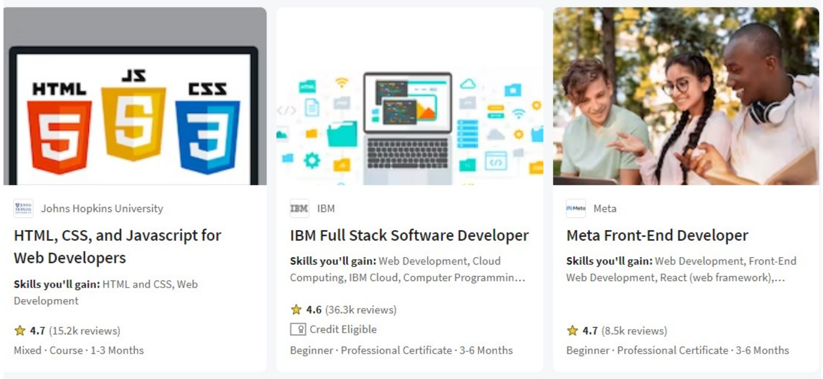
The Complete JavaScript Course 2023: From Zero to Expert!
Jonas Schmedtmann
4.7 ★★★★☆ (174,257)
฿329 ~~฿2,000~~
Bestseller

Modern React with Redux [2023 Update]
Stephen Grider
4.7 ★★★★☆ (81,895)
฿329 ~~฿2,000~~
Bestseller

The Complete 2023 Web Development Bootcamp
Dr. Angela Yu
4.7 ★★★★☆ (279,724)
฿329 ~~฿2,000~~
Bestseller

Coursera

Coursera is another online learning platform that offers courses on a wide variety of topics. They offer both free and paid online courses and students can also audit the paid courses for free to access the contents without paying for them. The downside to auditing is that you won't get an official certificate unless you pay at the end. The learning structure of Coursera is time-gated meaning you will have to go through the courses week by week like university courses. The good thing about Coursera is that a lot of universities like Harvard or Stanford partner with the website to offer online courses and you can subscribe to Coursera Plus monthly to get access to these courses.



Johns Hopkins University
HTML, CSS, and Javascript for Web Developers
Skills you'll gain: HTML and CSS, Web Development
★ **4.7** (15.2k reviews)
Mixed · Course · 1-3 Months

IBM
IBM Full Stack Software Developer
Skills you'll gain: Web Development, Cloud Computing, IBM Cloud, Computer Programmin...
★ **4.6** (36.3k reviews)
Credit Eligible
Beginner · Professional Certificate · 3-6 Months

Meta
Meta Front-End Developer
Skills you'll gain: Web Development, Front-End Web Development, React (web framework),...
★ **4.7** (8.5k reviews)
Beginner · Professional Certificate · 3-6 Months

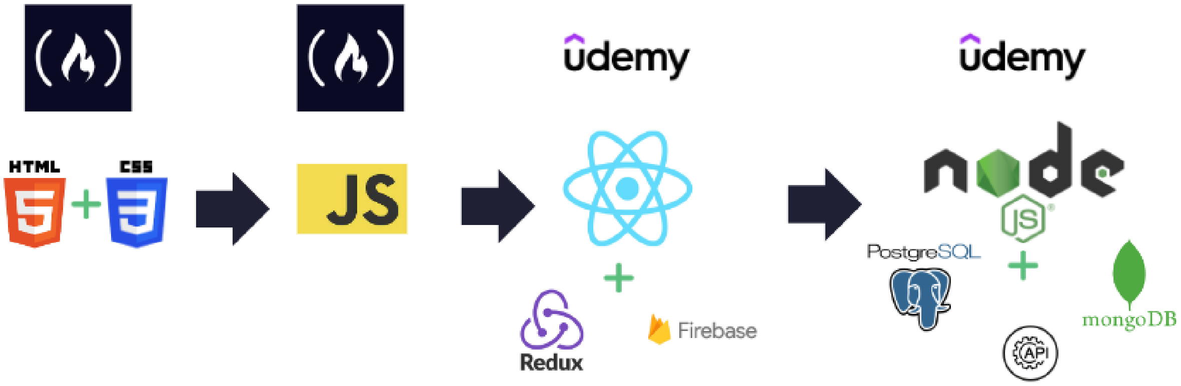
Leo's study path

I can break down my self-study journey for web development into three parts: the fundamentals, the front end, and the back end.

In the fundamentals section, I started my self-study journey by taking the Responsive Web Design Course on Free Code Camp to study the fundamentals of HTML and CSS. Afterward, I did the JavaScript Data Structure and Algorithm course, again from FCC, to learn the fundamentals of JavaScript. I understood the basics of website creation from these two courses.

In the frontend section, I purchased the 'React – The Complete Guide' online course (link) by Academind by Maximillian Schwarzmüller, AWS-certified, Professional Web Developer and Instructor. I learned how to use the React.js library, which is a framework but technically classifies as a library, to make single-page web applications. I went through a ton of projects and learned how to create a front-end web app and how to connect to a backend via HTTP.

In the backend section, I purchased 'NODEJS – The Complete Guide' (link), again, by Academind by Maximillian Schwarzmüller. Here, I learned about the NodeJS economy, building server-side rendered apps, and most importantly, creating Rest APIs and GraphQL APIs to work with databases like PostgreSQL or MongoDB.



Conclusion

Web development is a fun topic to learn with many career opportunities. There are way more resources online than everything listed in this study guide. A few YouTube channels like Fireship and Web Dev Simplified are great for learning specific topics or exploring new topics. Medium and FCC blogs also have articles on any questions you may have during your self-study. Make sure to get your classmate involved in projects, so you can fully get the experiential learning process. The IT Club is a good way to get started. There are also many online communities on many different platforms, and you are only one Google search away from getting involved. I hope this study guide offers good information and gets you started on your self-learning journey. Cheers.