COURSE SYLLABUS

Software Engineering Certificate Program Online

Learn front-end development with HTML & CSS, JavaScript, and React, plus back-end development with Python and Django. Build full-stack web applications through hands-on coding labs and project-based assignments, and gain the coding, debugging, version control, and agile skills needed to launch a career as a junior Software Developer or Full-Stack Developer.

> Group classes (Live Online) and onsite training are available for this course. For more information, email partnerships@vdci.edu or visit: https://vdci.edu/certificates/software-engineering-certificate-program-online



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Course Outline

This package includes these courses

- Web Development with HTML & CSS Course Online (18 Hours)
- Advanced HTML & CSS Course Online (18 Hours)
- Flexbox, Grid, & Bootstrap Course Online (12 Hours)
- JavaScript for Front-End Course Online (18 Hours)
- Front-End Tools & Portfolio Course Online (18 Hours)
- JavaScript Programming Bootcamp Online (120 Hours)
- JavaScript Development with Node, Express, & MongoDB Course Online (96 Hours)
- React Development Bootcamp Online (96 Hours)
- Entering the Web Development Industry Course Online (24 Hours)
- Python Programming Course Online (30 Hours)
- Python Web Development with Django Course Online (30 Hours)
- Web Development Labs Online (10 Hours)

Choose two of the classes below as free electives (contact us after registration).

- AI Coding Bootcamp with Claude Code Online
- Python for AI: Create AI Apps with Flask & OpenAI Course Online
- SQL Bootcamp Online
- WordPress Course Online

Web Development with HTML & CSS Course Online

Learn to code web pages with HTML and CSS, from structuring and tagging your content to styling it and making your pages responsive. Then upload everything through FTP to bring your sites live.

- Begin building websites by hand-coding HTML and CSS
- Mark up content like text, images, lists, and links using HTML (Hypertext Markup Language)
- Style that content with CSS (Cascading Style Sheets), controlling font, size, color, spacing, width, and much more
- Create multi-page sites that bring together text, images, and other elements
- Adjust your layouts for different screen sizes to build responsive webpages
- Use browser developer tools to look under the hood and test out code changes
- Publish your site by uploading the files through FTP

Advanced HTML & CSS Course Online

Push your CSS abilities further with this in-depth course built around the topics that separate basic styling from refined design. You'll work through SVG, CSS variables, gradients, shadows, positioning, transitions, transforms, and responsive images, gaining the tools to build webpages that look clean, modern, and genuinely professional.

- Master advanced CSS concepts including positioning, complex selectors, sizing units (px, em, rem), and the calc() function
- Create sophisticated visual styles using multiple background images, RGBA transparency, gradients, shadows, and more
- Work with SVG graphics in a variety of ways and learn to style them directly with CSS
- Build responsive images with img srcset and the picture element for optimized performance
- Use CSS variables to write cleaner, more flexible, and maintainable code
- Create mobile-friendly off-screen navigation menus using only CSS
- Add motion and interactivity through CSS transitions and transforms

Flexbox, Grid, & Bootstrap Course Online

Learn how to use CSS Flexbox and Grid to arrange and align webpage content and make it adapt to screens of every size. See how both of these newer CSS techniques prove useful and when to reach for each one. You'll also learn how to use Bootstrap (which relies on Flexbox) to build out layouts quickly.

- CSS Flexbox to arrange and align webpage content
- CSS Grid for a fresh way to think about laying out entire webpages
- Bootstrap (built with Flexbox) to assemble layouts quickly
- How Flexbox and Grid reshape the way you approach webpage layout
- Sizing, positioning, aligning, and reordering content with Flexbox and Grid

JavaScript for Front-End Course Online

Learn how to make your webpages more dynamic and engaging with JavaScript and animations using GreenSock. From the fundamentals of JavaScript code to creating stunning animations with GSAP, this course equips you with the skills to transform your web projects into complex, interactive designs.

- Write JavaScript code to add animation and interactivity to webpages
- Learn the fundamentals of the JavaScript language (variables, loops, arrays, functions, and more)
- Understand how to use free pre-made JavaScript to quickly add many different kinds of common functionality
- Create animated slideshows and build animated image enlargers

- Animate any content within a webpage, including SVG, using GreenSock (GSAP)

Front-End Tools & Portfolio Course Online

Learn how to turn a webpage design into code, track changes, collaborate with other developers using Git and GitHub, and boost your coding speed with Emmet and Visual Studio Code. Build your portfolio with guidance from an expert instructor and gain hands-on coding experience.

- Go from design to a coded website with guidance from an expert developer
- What Git is and how it works
- Installing and setting up Git to track changes in your code
- Using GitHub to collaborate with other developers

JavaScript Programming Bootcamp Online

Pick up the essentials of JavaScript programming for building web applications, including variables, conditional logic, functions, DOM manipulation, arrays, loops, async events, APIs, and OOP. This hands-on course is designed to prepare you for work on practical web design projects.

- JavaScript programming fundamentals from the ground up, including variables, conditional logic (if-else), arrays, objects, and loops
- Modern ES6+ features such as arrow functions, let, and const
- Functions, parameters, arguments, return values, along with higher-order functions and callbacks
- Array methods, string methods, and parsing JSON (JavaScript Object Notation) data
- Asynchronous JavaScript using promises and async-await
- APIs (Application Programming Interfaces) and JavaScript libraries
- OOP (Object-Oriented Programming) and modules
- Coding interview challenge prep alongside projects and portfolio development

JavaScript Development with Node, Express, & MongoDB Course Online

Learn how to create and host full-stack web applications using JavaScript along with Node.js, Express, and MongoDB. This course covers back-end development, API creation, and database management for today's web applications.

- Work with Node.js to build server-side applications, handle file execution, and manage input/output operations.
- Use npm (Node Package Manager) to install and keep track of dependencies for scalable projects.
- Build RESTful APIs with Express.js, putting together efficient routing and middleware functions.
- Set up and configure MongoDB to store, query, and manage structured data.
- Put authentication and security measures in place for safe database connections.
- Fine-tune application performance through advanced query filtering, pagination, and data population.

React Development Bootcamp Online

Learn how to create dynamic web applications with React through this comprehensive bootcamp. Covering everything from the basics of React and Node.js to advanced components and server deployment, it gives you the skills to put together fully functioning web apps.

- The fundamentals of React functionality, including components, props, and state

- The lifecycle of React hooks, covering useEffect, useState, useContext, and more
- One-way data binding and the reusability that React components bring
- How higher-order components (HOC) come into play in React
- Front-end web security
- Deployment to the cloud through AWS and alternate stacks
- The full cycle of full-stack web development with the MERN stack

Entering the Web Development Industry Course Online

- Put together a professional web development portfolio that highlights your skills and projects.
- Practice working through coding challenges and algorithms that come up often in technical interviews.
- Shape a networking strategy for connecting with tech recruiters and industry professionals.
- Learn how to present your skills and experience clearly and effectively during job interviews.
- Get a real feel for the day-to-day responsibilities and expectations placed on web developers.
- Prepare for job applications through practical career exercises and interview-focused guidance.

Python Programming Course Online

- Learn Python fundamentals such as variables, data types, loops, and functions
- Strengthen logical programming skills using conditionals, indexing, and slicing
- Work with files by reading, writing, and appending data in text files
- Explore computer science basics, including Big-O notation and common sorting algorithms
- Build scalable applications using object-oriented programming (OOP) principles
- Use Git and GitHub to manage code, track changes, and create a polished coding portfolio

Python Web Development with Django Course Online

- Learn how to set up Django projects and organize back-end web applications
- Work with URL dispatchers, templates, database models, generic views, and Django's MVC architecture
- Use Django REST to manage authentication, user accounts, and secure API endpoints
- Practice automating common development tasks, including background processes and scheduled jobs
- Build and consume RESTful APIs for dynamic web applications
- Explore how Django applications and APIs are prepared for real-world deployment

Web Development Labs Online

- Code along with guided lessons in a class-style format.
- Complete independent coding challenges with starter code and scaffolding.
- Practice job interview-style challenges with increasingly complex problems and no scaffolding.
- Review multiple solution approaches, from acceptable to optimized.
- Debug code containing errors and logic issues to strengthen troubleshooting skills.
- Build confidence through targeted drills designed to reinforce specific programming concepts.