COURSE SYLLABUS

# Software Engineering Certificate

Learn front-end development with HTML & CSS, JavaScript, and React, and back-end development with Python, Django, and Node.js. Get 1-on-1 mentoring and a structured curriculum to become a skilled Software Engineer or Full-Stack Developer.

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




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## Course Outline

This package includes these courses

- Web Development with HTML & CSS (18 Hours)
- Advanced HTML & CSS (18 Hours)
- Flexbox, Grid, & Bootstrap (12 Hours)
- JavaScript for Front-End (18 Hours)
- Front-End Tools & Portfolio (18 Hours)
- JavaScript Programming Bootcamp (120 Hours)
- JavaScript Development with Node, Express, & MongoDB (96 Hours)
- React Development Bootcamp (96 Hours)
- Entering the Web Development Industry (24 Hours)
- Python Programming Bootcamp (30 Hours)
- Python Web Development with Django (60 Hours)
- Web Development Labs (Self-Paced) (0 hours)

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

- SQL Bootcamp
- WordPress Bootcamp
- Python for AI: Create AI Apps with Flask & OpenAI

### Web Development with HTML & CSS

- Start learning to build websites by hand-coding HTML and CSS
- Markup content (text, images, lists, links, etc.) using HTML (Hypertext Markup Language)
- Style the content using CSS (Cascading Style Sheets), setting font, size, color, spacing, width, and more
- Create multi-page websites with text, images, and more

- Adapt the layout for different screen sizes to create responsive webpages
- Use web browser developer tools to look behind the scenes and experiment with code changes
- Upload your website files using FTP to make the site live

## Advanced HTML & CSS

- Master important CSS concepts such as positioning, advanced CSS selectors, relative sizing units (px, em, rem), calc(), and much more
- Learn sophisticated styling with multiple background images, transparent colors using RGBA, CSS gradients, shadows, and more
- Learn multiple ways to use and style SVG in webpages
- Code responsive images using img srcset and the picture element
- Learn CSS variables for cleaner, more flexible code
- Create mobile-optimized off-screen navigation menus using only CSS
- Create animated effects using CSS transitions and transforms

## Flexbox, Grid, & Bootstrap

- CSS Flexbox to lay out and align webpage content
- CSS Grid for an entirely new way to think about laying out entire webpages
- Use Bootstrap (which is made with Flexbox) to build out layouts quickly
- Learn how Flexbox and Grid change the way you approach webpage layout
- Size, position, align, and reorder content using Flexbox and Grid

## JavaScript for Front-End

- Write JavaScript code to add animation and interactivity to webpages
- Learn the fundamentals of the JavaScript language (variables, loops, arrays, functions, etc.)
- Understand how to use free pre-made JavaScripts to quickly add many different kinds of common functionality
- Create animated slideshows and build animated image enlargers
- Learn to animate any content within a webpage—including SVG—using GreenSock (GSAP)

## Front-End Tools & Portfolio

Learn how to turn a webpage design into fully functional code while mastering essential front-end development tools. This course covers Git, GitHub, Emmet, and Visual Studio Code to streamline coding and collaboration.

- Build a coding portfolio by developing a project from scratch with expert guidance.
- Learn Git fundamentals to track code changes, revert versions, and manage repositories.
- Use GitHub for collaboration, including pushing, pulling, cloning, and handling merge conflicts.
- Master Visual Studio Code shortcuts and features to improve workflow and efficiency.
- Utilize Emmet coding shortcuts to speed up HTML and CSS development.
- Gain hands-on experience in real-world coding workflows and best practices.

## JavaScript Programming Bootcamp

Learn the fundamentals of JavaScript programming to build interactive web applications.

- Fundamentals of JavaScript programming from the ground up

- Variables, conditional logic (if-else), arrays, objects, and loops
- Latest ES6 and ES7 features, including arrow functions, let, and const
- Functions, parameters, arguments, and return values
- Higher-level functions and callbacks
- Array and string methods
- Asynchronous JavaScript with promises and async-await
- APIs (Application Programming Interfaces)
- Parsing and working with JSON (JavaScript Object Notation) data
- OOP (Object-Oriented Programming) and modules
- Coding interview challenge prep
- Projects and portfolio development
- JavaScript libraries

## JavaScript Development with Node, Express, & MongoDB

Learn how to build and host full-stack web applications using JavaScript with Node.js, Express, and MongoDB.

- Synchronous and Asynchronous JavaScript in Node.js
- The purpose of Node Package Manager (npm)
- The fundamentals of starting an Express.js server
- Integration of MongoDB (a NoSQL database)
- Authentication, server security, and API development

## React Development Bootcamp

- The fundamentals of React functionality: components, props, and state
- The lifecycle of React hooks: useEffect, useState, useContext, and more
- One-way data binding and the reusability of React components
- The use of higher-order components (HOC) in React
- Front-end web security
- Deployment to the cloud with AWS and alternate stacks
- The complete cycle of full-stack web development using the MERN stack

## Entering the Web Development Industry

- Build a professional portfolio
- Practice solving algorithms
- Prepare for technical and behavioral interviews

## Python Programming Bootcamp

- Gain a foundational understanding of the Python programming language
- Become a proficient Python programmer by learning from experienced mentors
- Learn how to search and navigate technical documentation and efficiently handle errors and exceptions
- Get comfortable developing Python programs on your own through a series of coding exercises
- Become familiar with industry standards and learn the best practices for writing code

- Master your programming skills by working on real-world projects—perfect for resume building
- Create two projects to showcase in your coding portfolio

## Python Web Development with Django

- Automate tasks with Python and Django
- Interact with APIs using REST
- Deploy projects to GitHub using Git
- Build a portfolio of projects throughout the course

## Web Development Labs (Self-Paced)

This hands-on, project-focused course is designed to equip you with the essential skills to create functional, visually appealing, and professional websites and web applications. Whether you're aiming to start a career in web development or elevate your existing skill set, this course provides the tools and practical experience needed to succeed.

- Code-along to book (class-style)
- On-your-own coding challenges (but with kickstarter code/scaffolding)
- Job interview-style challenges (harder, no scaffolding, ok-better-best solutions)
- Debugging code (errors and/or flaws in logic that make it not work)
- Targeted drills: "reps" to build specific skills