COURSE SYLLABUS

# Software Engineering Certificate Program (Self-Paced)

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 onsite@graduateschool.edu or visit: https://www.graduateschool.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 following four bonus courses at no additional cost.

- 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

- Begin building websites by hand-coding HTML and CSS
- Mark up content like text, images, lists, and links using HTML
- Style that content with CSS, controlling font, size, color, spacing, and width
- Create multi-page sites that bring together text, images, and other elements
- Adjust your layouts for different screen sizes to build responsive webpages
- Publish your site by uploading the files through FTP

## Advanced HTML & CSS Course Online

- 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, and shadows
- Work with SVG graphics in a variety of ways and 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
- Add motion and interactivity through CSS transitions and transforms

## Flexbox, Grid, & Bootstrap Course Online

- Use CSS Flexbox to arrange and align webpage content
- Use CSS Grid for a fresh way to lay out entire webpages
- Size, position, align, and reorder content with Flexbox and Grid
- Recognize which layout system fits a given situation
- Build responsive pages that adjust gracefully to any screen size
- Assemble layouts quickly with Bootstrap while writing far less CSS of your own

## JavaScript for Front-End Course Online

- Write JavaScript to add interactivity to webpages
- Learn the fundamentals of the JavaScript language, including variables, loops, arrays, and functions
- Use free pre-made JavaScripts to quickly add many kinds of common functionality
- Create animated slideshows
- Build animated image enlargers
- Animate any content within a webpage, including SVG, using GreenSock (GSAP)

## Front-End Tools & Portfolio Course Online

- Go from a website design to a coded website with guidance from an expert developer
- Build portfolio-ready projects you can show to employers or clients
- Learn what Git is and how it works
- Install and set up Git to track changes in your code
- Use GitHub to collaborate with other developers, all within Visual Studio Code
- Speed up your coding with Emmet shortcuts and Visual Studio Code features

## JavaScript Programming Bootcamp Online

- JavaScript programming fundamentals, including variables, conditional logic, arrays, objects, and loops

- Modern ES6+ features such as arrow functions, let, and const
- Functions, parameters, return values, higher-order functions, and callbacks
- Array methods, string methods, and parsing JSON data
- Asynchronous JavaScript using promises and async-await, plus APIs and JavaScript libraries
- Object-oriented programming and modules, with coding interview prep alongside projects and portfolio development

## JavaScript Development with Node, Express, & MongoDB Course Online

- Synchronous and asynchronous JavaScript inside Node.js
- The role of Node Package Manager (npm) in managing dependencies
- Getting an Express.js server up and running
- Building RESTful APIs with Express.js routing and middleware
- Integration with MongoDB, a NoSQL database
- Authentication, server security, and API development

## React Development Bootcamp Online

- 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 and 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

- Build a professional web development portfolio that highlights your skills and projects
- Practice solving algorithms and coding challenges that come up in technical interviews
- Prepare for technical and behavioral interviews
- Shape a networking strategy for connecting with tech recruiters and industry professionals
- 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

## Python Programming Course Online

- Build a strong foundation in Python through structured, self-paced lessons
- Learn core programming concepts including data types, control flow, functions, and object-oriented programming
- Navigate technical documentation and handle errors and exceptions effectively
- Gain confidence writing Python programs independently through hands-on coding exercises
- Follow industry standards and best practices for writing clean, maintainable code
- Create two finished projects to feature in your coding portfolio

## Python Web Development with Django Course Online

- Set up Django projects and work with URL dispatchers, templates, and database models
- Build full-stack web applications using Django's MVC architecture and generic views

- Implement authentication, user management, and secure API endpoints with Django REST
- Automate tasks in Django, including background processes and scheduled jobs
- Work with RESTful APIs, including building and consuming web services
- Prepare Django applications and APIs for deployment in production environments

## 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