

## **Software Engineering Micro-Credential Career Track Web Development Boot Camp**

**C1:** July 5 to August 7 (Tue, Wed, Thur: 5-9pm; Sun: 9 am-6 pm)

<p>Week 1 (20 hrs)</p> <p>Intro to Software Engineering</p> <p>HTML, CSS, Github</p>	<p><b>Day 1 topics covered:</b></p> <ul style="list-style-type: none"><li>• Topics to be covered for the entire course</li><li>• Definition of software engineering</li><li>• Role and responsibility of software developers/integrators</li><li>• Identifying and understanding the requirements for the software development</li><li>• Integration of software into new and existing systems</li><li>• Validation of software</li><li>• Ongoing maintenance of software</li><li>• Overview of Git and Github</li><li>• Description of GitHub essentials, including:<ul style="list-style-type: none"><li>○ Repositories (GitHub)</li><li>○ Branches (Git)</li><li>○ Commits (Git)</li><li>○ Git commands</li></ul></li><li>• Overview of HTML, CSS and JavaScript.</li><li>• <b>Introduction to HTML</b></li><li>• <b>Assignment 1</b></li></ul> <p><b>Day 2 topics covered:</b></p> <ul style="list-style-type: none"><li>• Review of Monday topics</li><li>• Dive into HTML</li><li>• Practical application of HTML</li><li>• Tools used for development of HTML</li><li>• In class assignment to create or enhance software based on customer requirements and using HTML to implement</li></ul>	<p>Assessment:</p> <p>Project 1 – Build A Static Website (e.g. An Informative Travel Theme Website )</p>
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	<ul style="list-style-type: none"> <li>• Publish website introduction</li> <li>• Assignment 2</li> </ul> <p><b>Day 3 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Review of Assignment 2 on HTML and solutions</li> <li>• Introduction to CSS</li> <li>• Deeper dive into CSS</li> <li>• In class activity using CSS</li> <li>• Detailed description of Saturday project <ul style="list-style-type: none"> <li>○ Assignment description</li> <li>○ Showing students how to start their work</li> <li>○ Answering common questions related to the assignment</li> <li>○ Verifying that everyone understands what to do</li> </ul> </li> </ul> <p><b>Day 4 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Review of expected project 1 results and requirements</li> <li>• Student work on project 1 <ul style="list-style-type: none"> <li>○ Setup Github essentials</li> <li>○ Develop a travel theme website using HTML and CSS</li> </ul> </li> <li>• Discussion of additional topics of CSS, Github, HTML, and software engineering that students should study on their own</li> <li>• Light introduction of the following weeks topics</li> </ul>	
<p>Week 2 (20 hrs)</p> <p>Bootstrap,</p> <p>JavaScript Fundamentals</p>	<p><b>Day 5 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Brief review of week 1 topics</li> <li>• Review of Project 1</li> <li>• CSS Layout</li> <li>• In class activity</li> <li>• Discuss in greater detail the relationship between HTML, CSS and JavaScript</li> </ul>	<p>Assessment:</p> <p>Project 2 – Build An Ecommerce business Website Template</p>

	<ul style="list-style-type: none"> <li>• Assignment 3</li> </ul> <p><b>Day 6 topics covered:</b></p> <ul style="list-style-type: none"> <li>• CSS Animation</li> <li>• <i>CSS Modal Window</i></li> <li>• In class activity</li> <li>• Assignment 4</li> </ul> <p><b>Day 7 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Review of Monday and Wednesday classes</li> <li>• Introduction of Bootstrap</li> <li>• In-Class Activity;</li> <li>• Explain Project 2 - Product Selling Website; Apply HTML CSS and JavaScript(Optional) in Project 2;</li> </ul> <p><b>Day 8 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Explain real world web application examples</li> <li>• Students work on Project 2- Review the results.</li> <li>• Select a few students to do a simple presentation of Project 2</li> <li>• Dive into Bootstrap</li> <li>• Introduction of JavaScript</li> <li>• HTML, CSS and JavaScript work together</li> </ul>	
<p>Week 3 (20 hrs)</p> <p>Intermediate Javascript</p> <p>Introduction of API</p>	<p><b>Day 9 topics covered:</b></p> <ul style="list-style-type: none"> <li>• JavaScript Fundamentals <ul style="list-style-type: none"> <li>○ JavaScript Language Basics (Data Types, Variables, Operations)</li> </ul> </li> <li>• Deeper dive into JavaScript - 1</li> </ul>	<p>Assessment:</p> <p>Project 3 – Build A Dynamic Web App (eg. Budget Web App with API)</p>

	<ul style="list-style-type: none"> <li>○ Data Structures and Algorithm Training</li> <li>● In-class assignment using JavaScript</li> <li>● Assignment 5</li> </ul> <p><b>Day 10 topics covered:</b></p> <ul style="list-style-type: none"> <li>● Deeper Dive into JavaScript -2</li> <li>● Arrays ,Objects</li> <li>● JavaScript Functions</li> <li>● Modern JavaScript: Using ES6+</li> <li>● In-class activity</li> <li>● Assignment 6</li> </ul> <p><b>Day 11 topics covered:</b></p> <ul style="list-style-type: none"> <li>● Review of Monday and Wednesday classes</li> <li>● Additional JavaScript Functions Practice</li> <li>● Loops</li> <li>● Introduce the concept of API</li> <li>● Class activity using JavaScript</li> <li>● Explain Project 3 requirements, get students ready for Project 3;</li> </ul> <p><b>Day 12 topics covered:</b></p> <ul style="list-style-type: none"> <li>● DOM Manipulation and Events</li> <li>● Review of Project 3 requirements and expected results</li> <li>● Hints and Q&amp;A for Project 3;</li> <li>● Students work on Project 3 in small group;</li> <li>● Review of the project results from students ;</li> <li>● Introduction to json /ajax, JS jQuery</li> </ul>	<p><b>Goal:</b></p> <p>Train students how to think as a web developer and how to improve user experience</p>
<p>Week 4 (20 hrs)</p> <p>SQL/PostgreSQL</p>	<p><b>Day 13 topics covered:</b></p> <ul style="list-style-type: none"> <li>○ Introduction to database, SQL and Introduction SQL Database</li> <li>○ Install PostgreSQL</li> <li>○ Create Database</li> </ul>	<p><b>Assessment:–</b></p> <p>Create A Database From Scratch (part of final project)</p>

	<ul style="list-style-type: none"> <li>○ Create Table, Drop Table, Alter Table</li> <li>○ Constraints</li> <li>○ Explain SQL syntax</li> <li>○ Data Types</li> <li>○ Select Query</li> <li>○ In-class Activity</li> <li>○ Assignment 7</li> </ul> <p><b>Day 14 topics covered:</b></p> <ul style="list-style-type: none"> <li>○ Dive into SQL in PostgreSQL</li> <li>○ Work with Database</li> <li>○ Update, Insert, Delete Syntax</li> <li>○ Joins</li> <li>○ In Class Activity</li> <li>○ Assignment 8</li> </ul> <p><b>Day 15 topics covered:</b></p> <p>Dive into PostgreSQL</p> <ul style="list-style-type: none"> <li>○ Schema</li> <li>○ Relational model</li> <li>○ Advanced SQL queries <ul style="list-style-type: none"> <li>○ <i>Views, Triggers, Procedures, Functions</i></li> </ul> </li> <li>○ Explore PostgreSQL Interfaces</li> <li>○ In Class Activity</li> <li>○ Explain Final Project requirements, each student will work in a team.</li> </ul> <p><b>Day 16 topics covered:</b></p> <ul style="list-style-type: none"> <li>○ Additional SQL topics for database development</li> <li>○ Dive into web application backend development topics</li> <li>○ Node.js Crash Course</li> <li>○ Get ready for final project</li> <li>○ Provide additional resource for future study</li> <li>○ Review the final project Results from selected students</li> <li>○ Working on final project plan</li> </ul>	
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<p>Week 5 (20 hrs)</p> <p>Introduction to Python programming &amp; Cloud Computing</p>	<p><b>Day 17 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Introduction to Python</li> <li>• Detailed description of Python <ul style="list-style-type: none"> <li>◦ Data types, Variables and Operators</li> <li>◦ Make Program Interactive, Make Choices and Decisions</li> </ul> </li> <li>• In class activity using Python</li> <li>• Discussion of additional topics of python that students need to know to understand the topics to be covered on python in the following class</li> <li>• Introduction of final project using Python and PostgreSQL</li> <li>• Explanation and examples of how to get started with Saturday project</li> </ul> <p><b>Day 18 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Detailed description of Python <ul style="list-style-type: none"> <li>◦ Functions and Modules</li> <li>◦ Working with Files</li> </ul> </li> <li>• Class Activity (Related to Final Project)</li> <li>• (An introduction of Cloud Computing)</li> <li>● working on Final Project</li> <li>• Assignment 9</li> </ul> <p><b>Day 19 topics covered:</b></p> <ul style="list-style-type: none"> <li>• Review Monday and Wednesday course contents;</li> <li>• Continuing the topic <ul style="list-style-type: none"> <li>◦ Data Structures in Python</li> <li>◦ Intermediate Python</li> </ul> </li> <li>• Use real world examples of Object Oriented Programing with Final Project related class activities (Students should be able to write more than 50 -100 lines code independently)</li> <li>• Q&amp;A for previous contents and Final Project</li> </ul>	<p><b>Assessment:</b></p> <p>Group Project (Culminating Project) – Build Real World Application</p> <p>(eg. A Full Stack Web App)</p> <p>Goal: Train students to work independently and as a part of team by creating real world applications</p>
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<p>21st century workplace skills such as leadership, critical thinking, resilience, communication and collaboration are embedded in the project-based learning throughout the course. Peer-to-peer learning is also highlighted. Other job readiness workshops (such as career panel and mock interviews) and wraparound services will be provided by CEWD job developer team and invited keynote speakers from industry partners and CEO Council.</p>		