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**Presidential Initiative for Artificial Intelligence and Computing (PIAIC)**

https://www.piaic.org

**Blockchain Specialist Program**

Course Syllabus

**Quarter III: BC-450 Dapp Development**

First Quarter 2020 (12 Weeks)

**Teaching Team: Zeeshan Hanif, Qasim Shabbir Ferozpurwala, Muhammad Hammad Ahmed, Umair Munaf Moon, Muhammad Mudassir Khan, Mirza Fasihullah Baig, Muhammad Ali Raja, Yousuf Hanif, and Aaly Malik**

**Class Duration: 4 hours**

**Course Description: We start this course by elearning HTML and CSS. We will start the onsite course by focusing on advanced Ethereum smart contracts using Solidity. Then we will learn how to use web3 and the Truffle framework. Then our focus will shift towards learning React. Lastly, we will learn how to tie everything together.**

**Please bring a Laptop with you for the Classes (Required, but not mandatory)**

**Preparation for the Pearson VUE Certified Blockchain Developer - Ethereum (CBDE) exam:**

[Pearson VUE Certified Blockchain Developer – Ethereum (CBDE)](https://blockchaintrainingalliance.com/products/cbde)

**Textbooks:**

1. [Learn Version Control with Git: A step-by-step course for the complete beginner by Tobias Günther](https://www.amazon.com/Learn-Version-Control-step-step-ebook/dp/B00K54OL8I/ref=sr_1_3)
2. [CBDE Official Exam Study Guide](https://blockchaintrainingalliance.com/products/cbde-official-exam-study-guide)
3. [Solidity Programming Essentials by Ritesh Modi](https://www.amazon.com/Solidity-Programming-Essentials-beginners-blockchain-ebook/dp/B078YYB2SM/ref=sr_1_1)
4. [Solidity Smart Contracts by Rangel Stoilov](https://www.amazon.com/Solidity-Smart-Contracts-Ethereum-Blockchain-ebook/dp/B07NJ96D9G/ref=sr_1_2)
5. [Mastering Ethereum: Building Smart Contracts and DApps by Andreas M. Antonopoulos, Gavin Wood](https://github.com/ethereumbook/ethereumbook)
6. [Building Ethereum Đapps: Decentralized Applications on the Ethereum Blockchain by Roberto Infante](https://www.manning.com/books/building-ethereum-dapps)

**PIAIC Announcements Facebook Group:** <https://www.facebook.com/groups/piaic/>

**Course Facebook Group:** <https://www.facebook.com/groups/cryptowitai.blockchain/>

**Portal for online and onsite students:**

<https://portal.piaic.org/>

**Grading:**

Students will be graded based on Percentile

<https://en.wikipedia.org/wiki/Percentile>

<https://en.wikipedia.org/wiki/Percentile_rank>

A-Grade: 78- 99 Percentile

B-Grade: 41- 77 Percentile

C-Grade: 23- 40 Percentile

D-Grade: 1 - 22 Percentile

F-Grade: Anyone who did not appear in two or more exams

Note: Anyone who receives a F-Grade will be removed from the program. Students who receive a D-Grade will be put on probation, and be required to earn a grade of C or above in the next quarter, to remain in the program.

**Course Outline:**

1. **HTML**

(**Videos and reading material available on Student Portal to prepare for HTML Quiz, HTML will not be covered in class to save class time)**

HTML Structure and Text

Chapters 1, and 2, HTML and CSS by Jon Duckett

Lists, Links and Images

Chapters 3, 4 and 5

Tables

Chapter 6

Forms

Chapter 7

Extra Markup

Chapter 8

**HTML Quiz in Week 4**

Total Questions: 50, Total Time: 75 min

1. **CSS**

**(Videos and reading material available on Student Portal to prepare for CSS Quiz, CSS will not be covered in class to save class time)**

Introducing CSS

Chapter 10

Color and Text

Chapters 11 and 12

Boxes

Chapter 13

Lists, Tables, & Forms

Chapter 14

**CSS Quiz in Week 6**

Total Questions: 55, Total Time: 75 min

1. **Solidity Advanced** (Week 1 - 4)

Chapters 6, 7, 8 of Solidity Programming Essentials by Ritesh Modi

Chapters 6 and 7 Building Ethereum Đapps by Roberto Infante

Chapter 5, 6 of CBDE Official Exam Study Guide

Token Development ERC20 and ERC721

**Ethereum Programming Quiz 3 in Week 5**

1. **Web3.js Development (Week 5-6)**Chapters 8 Building Ethereum Đapps by Roberto Infante  
   Web3.js Documentation  
   <https://web3js.readthedocs.io/>

1. **React and Advanced JavaScript (Week 7 - 12)**

Advanced JS Topics Covered Before starting React:

Object Oriented ES6

Arrow function, This keyword in Arrow function

Advance array functions like filter, find, and map

The React Book up to “Learn Render props pattern”

<https://softchris.github.io/books/react/>

Advanced JS Topics Covered When Required in React:

Variable Hoisting

Function Hoisting

Let

Const

Template Literals

Destructuring (Array and Object)

Rest operator

Spread operator

Object Literal Shorthand

For in Loop

For of Loop

Object.keys

Object.values

Object.assign

Default Values

Set

Local storage

Session storage

Try, catch and throw

Conditional (Ternary) Operators

Short circuit evaluation ( && || )

Async JS (promises, async/await, callbacks)

Additional Reading Material

<https://medium.com/simply/state-management-with-react-hooks-and-context-api-at-10-lines-of-code-baf6be8302c>

<https://blog.logrocket.com/use-hooks-and-context-not-react-and-redux/>

<https://www.freecodecamp.org/news/state-management-with-react-hooks/>

**React Quiz in Week 13**

Total Questions: 45, Total Time: 75 minutes

1. **Dapp Development (Week 13)**

**The speed of the class will depend on how much students are able to absorb the material. If some material is left after the end of the third quarter it will be taught in the fourth quarter but the sequence will remain exactly as above.**