Presidential Initiative for Artificial Intelligence and Computing (PIAIC)

https://www.piaic.org

Blockchain Specialist Program

Course Syllabus

Quarter II: BC-401 Blockchain Development - Ethereum

Second Quarter 2019 (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

Class Sections:

Sir Adamjee Institute of Management Sciences
Sunday, 9:00 am to 1:00 pm

Sindh Boy Scouts Association
Sunday, 1:15 am to 5:15 pm

Course Description: We start this course by learning how to program using JavaScript. Once we have a firm grasp of fundamentals of programming we will move towards learning how to program Ethereum smart contracts using Solidity. Then we learn to write a smart contract, which is a computer protocol, intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties. These transactions are trackable and irreversible. It introduces everything needed write smart contracts and build applications that interact with them. Participants will learn about the Ethereum and Hyperledger Fabric platforms, the programming language Solidity, how to use web3 and the Truffle framework and lastly, 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)

Textbooks:

1. Learn Version Control with Git: A step-by-step course for the complete beginner by Tobias Günther
2. CBDE Official Exam Study Guide
3. Solidity Programming Essentials by Ritesh Modi
4. Solidity Smart Contracts by Rangel Stoilov
5. Mastering Ethereum: Building Smart Contracts and DApps by Andreas M. Antonopoulos, Gavin Wood
6. Building Ethereum Đapps: Decentralized Applications on the Ethereum Blockchain by Roberto Infante

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. **Fundamentals of Version Control with Git**
   (Videos and reading material available on Student Portal to prepare for Git Quiz, Git will not be covered in class to save class time)
   Chapters 1, 2, 3, and 4 Learn Version Control with Git: A step-by-step course for the complete beginner by Tobias Günther

   We will also covers these readings:
   https://help.github.com/articles/markdown-basics/
   http://stackoverflow.com/questions/5009600/difference-between-fork-and-branch-on-github
   http://stackoverflow.com/questions/3329943/git-branch-fork-fetch-merge-rebase-and-clone-what-are-the-differences
   https://git-scm.com/book/en/v2/Git-Branching-Rebasing
   http://git-scm.com/book/en/v2/Git-Branching-Remote-Branches#Tracking-Branches

   For practice: https://try.github.io/levels/1/challenges/1

   Homework:
   https://www.datacamp.com/courses/introduction-to-git-for-data-science

   Git Quiz in Week 2
   Total Questions: 60, Total Time: 75 minutes

2. **Introduction to Programming using JavaScript** (Week 1, 2, 3, 4 and 5)

   Introduction to Node.js and NPM

   JavaScript Alerts, Variables, Expressions
   Chapters 1 – 7, A Smarter Way to Learn JavaScript by Mark Myers

   Concatenating text strings and Prompts
   Chapters 8 and 9

   If statements
   Chapters 10 – 14

   Arrays
   Chapters 15 – 17

For loops
Chapters 18 – 20

Strings
Chapters 21 – 25

Numbers
Chapters 26 – 30

Data and time
Chapters 31 – 34

Functions
Chapters 35 – 38

Switch, while and do while statements
Chapters 39 – 42

JavaScript Quiz in Week 6
Total Questions: 41, Total Time: 65 minutes

3. **Ethereum Programming Basics** (Week 6)
   Chapters 1 and 2 of Solidity Programming Essentials by Ritesh Modi
   Chapters 1, 2, and 3 of CBDE Official Exam Study Guide

   Solidity Basics (Week 7, 8, 9)
   Chapters 3, and 4 of Solidity Programming Essentials by Ritesh Modi
   Chapters 4 and 5 Building Ethereum Đapps by Roberto Infante
   Chapters 4, and 5 of CBDE Official Exam Study Guide
   Complete Book Solidity Smart Contracts by Rangel Stoilov

   Ethereum Programming Quiz 1 in Week 10

4. **Solidity Advanced** (Week 10, 11, and 12)
   Chapters 5, 6, 7 of Solidity Programming Essentials by Ritesh Modi
   Chapters 6 and 7 Building Ethereum Đapps by Roberto Infante
   Chapter 6 of CBDE Official Exam Study Guide

   Ethereum Programming Quiz 2 in Week 12