COMP4137 Blockchain Technology and Applications
COMP7200 Blockchain Technology

Lecturer: Dr. Hong-Ning Dai (Henry)

Lecture 0

Overview of Course

General Information

- Course Instructor
  - Dr. Henry Hong-Ning Dai < henrydai@comp.hkbu.edu.hk >
  - Office: DLB643, David C. Lam Building

- Teaching Assistants
  - Ms. WU Jingwen <csjwwu@comp.hkbu.edu.hk>
  - Mr. LI Huiling <cshlli@comp.hkbu.edu.hk>
  - Office: DLB625, David C. Lam Building

- Course Time and Venue
  - Time: 8:30am – 11:20am, Thursday
  - Location: SCT1/FSC 901CD (labs)

Assessment

- Course grades
  - Continue assessment* (40%)
    - Assignments, In-class exercises, and project
  - Final exam (60%)
- Preliminaries for this course
  - Software development skills for labs and project
    - Programming languages: Java, Solidity (a specialized language for Ethereum)
  - Computer network communication and programming
- Blockchain is an integrated technology
  - Including cryptography, data structure, distributed network, programming, etc.
  - Categorized into back-end system development in industry

* COMP4137: assignments 30% + 10% Group Project

Course content

- Permissionless blockchain underpins cryptocurrencies, such as Bitcoin
  - Anyone can participate in the blockchain network and contribute to its upkeep.
- Permissioned blockchain allows a node to join in the blockchain network after authentication
  - Participants are known and trusted (commonly used in business)
- Main topics include:
  - Cryptography
  - Signature and attack
  - Mining scheme
  - Consensus protocol
  - Blockchain applications

Academic Integrity

- “The University staunchly upholds the principles of academic integrity. As one part of HKBU’s effort to prevent plagiarism, the software Turnitin is used to compare all assignments against multiple sources whenever appropriate.”
- “A report on each assignment is generated that includes a percentage similarity and links to specific similar sources.”
- “Turnitin does not conclusively prove whether or not an assignment is plagiarized – the faculty will make this determination.”
- We will also check your assignments/report against the contents generated by Chat-GPT or other AIGC-tools.

Learning Outcomes

- Students are able to describe different types of blockchains and their applications.
- Students are able to explain the concepts and techniques of cryptocurrency and blockchains.
- Students are able to suggest and develop appropriate business solutions with blockchain technology.

Lecture Contents

I. Introduction to Blockchains and Cryptography
II. Cryptocurrency
III. Consensus Protocols
IV. Smart Contract
V. Hyperledger
VI. Advanced Topics on Blockchain

Reference

- Read the paper first to start your Blockchain journey
  - Bitcoin: A Peer-to-Peer Electronic Cash System
- Books
  - Bitcoin and Cryptocurrency Technologies
  - Blockchain Applications: A Hands-On Approach
  - Blockchain Technology Explained
  - Blockchain By Example