SEC-205: Distributed Ledger and Blockchain

Lecture 0 – Competency Overview

Instructed By:

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Artificial Intelligence and Computer
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Competency Description

- This competency offers a comprehensive exploration of distributed ledger and blockchain technology.

- You will gain insight into the design and development of blockchain systems, delving into *their inner workings*.

- Additionally, hands-on lab sessions are incorporated into this competency, providing you with the opportunity to develop your web 3.0 applications through the development of *smart contracts*.

- **Prerequisites:**
  - Just a basic programming skills (e.g., conditional statements, functions, etc.)
  - Basic understanding of cryptographic protocols, e.g., hash functions, encryption.

Competency General Information

- **Competency Period:** March 9, 2026 – April 27, 2026

- **Classroom Location:** CMKL 601

- **Lecture Time:** Every Monday, 15:00 – 16:00

- **Lab/Practical Session Time:** Every Monday, 16:00 – 17:00

- **Office Hours:** Every Monday. 11:00 – 12:00

- **Communication Channel:**

  - **Class Material / Lecture Slides:** https://cmkl.instructure.com/courses/904/modules

  - **Discussion / Q&A:** Canvas Discussion Page / Email via charnon@cmkl.ac.th

  - **Assessment Submission:** https://cmkl.instructure.com/courses/904/assignments

Competency Schedule

Week	Date	Topic
1	Mar 09	**Lecture 0:** Competency Overview **Lecture 1:** Introduction to Distributed Ledger and Blockchain
2	Mar 16	**Lecture 2:** Ethereum Architecture and Smart Contract **Lab 1:** Introduction to Solidity IDE, Simple Calculator Smart Contract
3	Mar 23	**Lecture 3:** Decentralization **Lab 2:** Solidity Fundamentals (Functions, Mapping, Array, Struct), Twitter Smart Contract
4	Mar 30	**Lecture 4:** Consensus Mechanisms **Lab 3:** Front-end Decentralized Application Connection, Twitter Front-End Application (Part I) **Lab 4:** Front-end Decentralized Application Connection, Twitter Front-End Application (Part II)
5	**Apr 6**	**No Class; Chakri Day**
	Apr 13	**No Class; Songkran Festival Day**
	Apr 20	**No Class; Class Cancelled**
6	Apr 27	**Lecture 5-6:** Blockchain Security and Privacy **Lecture 7:** Blockchain Applications (DeFi, NFT, Decentralized Identity)

Recommended Readings / Textbooks

- Imran Bashir, "**Mastering Blockchain: Inner workings of blockchain, from cryptography and decentralized identities, to DeFi, NFTs, and Web3**," https://learning.oreilly.com/library/view/mastering-blockchain/9781803241067/.

- Kevin Solorio, Randall Kanna, and David H. Hoover, "**Hands-On Smart Contract Development with Solidity and Ethereum**," https://learning.oreilly.com/library/view/hands-on-smart-contract/9781492045250/.

- Jitendra Chittoda, "**Mastering Blockchain Programming with Solidity**," https://learning.oreilly.com/library/view/mastering-blockchain-programming/9781839218262/.
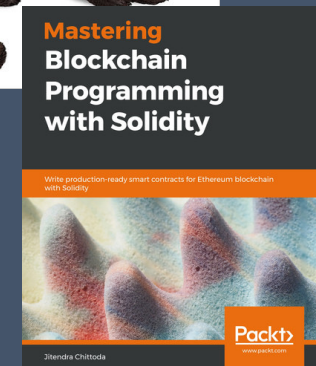
Additional Resources and Materials 📚

- CS 251: Blockchain Technologies – Stanford University

  https://cs251.stanford.edu/syllabus.html

- MIT Open CourseWare: MIT 15.S21 F18 Blockchain and Money

  https://ocw.mit.edu/courses/15-s12-blockchain-and-money-fall-2018/pages/lecture-slides/

- Edureka, Blockchain Full Course (4 Hours)

  https://youtu.be/QCvL-DWcojc?si=t__o5EBHwOGkwIMZ

- Dapp University, Learn Blockchain and Solidity Development – Full Course 2024 (12 Hours)

  https://www.youtube.com/watch?v=jcgfQEbptdo

Assessing Skills

SEC-205:00010:
You understand the concept of Distributed Ledger and Blockchain
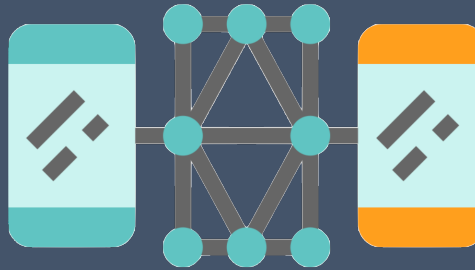
SEC-205:00020:
You can develop Web3.0 applications with smart contracts in Solidity

SEC-205:00030:
You can analyze security and privacy behind the blockchain technology.

Assessment 🚨

- We will have only one assessment task to complete for 3 assessing skill.

- The assessment will ask individual students to design and develop a Web3.0 application with Solidity (both front-end and smart contracts).

- Select **one** of the applications from the following list, but does not limited to:

  - E-Commerce Website

  - Asset Management Website

  - Voting Application

Important Date:
Submission Deadline is on May 1, 2026, before 11:59PM.

- **Assessment Submission:**

  - One **PDF file** to report the design specification of the developed system along with its security and privacy analyses (*The detailed template of this report will be updated on Canvas soon*).

  - One **5-Minutes Video file** (with Narration) to explain the source code and show the executable results. Then upload it on a cloud storage or a streaming platform and provide a link to the video included in the PDF report.

Academic Integrity

- "In any manner of presentation, **it is the responsibility of each student to produce her/his own original academic work**."

- "In all academic work to be graded, **the citation of all sources is required**. When collaboration or assistance is permitted by the course instructor(s) […], the **acknowledgement** of any collaboration or assistance is likewise required. This citation and acknowledgement must be incorporated into the work submitted and not separately or at a later point in time."

- "**Cheating** occurs when a student avails her/himself of an unfair or disallowed advantage […]"

- "**Plagiarism** is defined as the use of work or concepts contributed by other individuals without proper attribution or citation. Unique ideas or materials taken from another source for either written or oral use must be fully acknowledged in academic work to be graded."

- The use of AI tools are **not prohibited** in the competency; however, it is required for students to input their original idea in the deliverables.

End of the Lecture

- Please do not hesitate to ask any questions to free your curiosity,

- If you have any further questions after the class, please contact me via email (charnon@cmkl.ac.th).