COMP 2028 CRYPTOGRAPHY, CRYPTOCURRENCIES AND BLOCKCHAIN

Credit Points 10

Coordinator Rhys Tague (https://directory.westernsydney.edu.au/search/name/Rhys Tague/)

Description Blockchain and cryptocurrency form the backbone of emerging technology systems to secure transactions. The design of blockchain involves cryptographic technology to secure data and ensure confidentiality, authenticity and integrity. Students are introduced to the concepts of blockchain, cryptography and cryptocurrency, and learn how these technologies are transforming online transactions, and solving some of the most important issues in trust, resilience, reputation and transparency. Students also learn about the risks and challenges involving cryptocurrencies, exchanges and wallets as well as money-laundering and criminal enterprises. Students develop practical experience in building blockchain systems and develop smart contract solutions.

School Computer, Data & Math Sciences

Discipline Environmental Studies

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 2 subject

Pre-requisite(s) COMP 2027

Learning Outcomes

After successful completion of this Subject, students will be able to:

1. Analyse the different types of cryptography and their use in blockchain
2. Examine how blockchain is used in cryptocurrencies and other emerging applications
3. Apply programming skills to build a blockchain
4. Analyse different types of cryptocurrencies and how they function within the online transaction ecosystem
5. Visualise cases and flow of cryptocurrency for transaction identification and tracing
6. Analyse the threats and legal aspects related to cryptocurrency management and operations
7. Communicate the technologies to a non-expert audience in a range of formats

Subject Content

- Essential aspects of blockchain including distributed ledger technology
- Immutable records and consensus algorithm
- Smart contracts
- Asymmetric, Symmetric and Hybrid key algorithms
- Hash Functions
- Public and Private Keys
- Encryption and Decryption
- Centralised and decentralised cryptocurrencies
- Sovereign cryptocurrency
- Cryptocurrency mining
- Cryptocurrency exchanges, wallets, and mixers/blenders
- Traceback
- How blockchain and crypto make transactions transparent, trusted and resilient allowing for wider adoption in the business community
- How the structure of cryptocurrency exchanges, wallets and other also make them the most readily hacked along with used as major mechanisms for money-laundering and crime

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task
Practical	Programming code	40	N	Individual
Applied Project	1500 words/5-7 min presentation	20	N	Individual
Final Exam	2 hours	40	N	Individual

Teaching Periods

Spring (2024)

Melbourne

On-site

Subject Contact Rhys Tague (https://directory.westernsydney.edu.au/search/name/Rhys Tague/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=COMP2028_24-SPR_MB_1#subjects)

Parramatta - Victoria Rd

On-site

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