UNSW Course Outline

FINS5547 Cryptocurrency and Decentralised Finance - 2024

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General Course Information

Course Code : FINS5547
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : UNSW Business School
Academic Unit : School of Banking and Finance
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course will give you an introduction to cryptocurrencies such as Bitcoin and Ethereum and decentralised finance (DeFi). The course begins with a brief history of money before outlining the underlying cryptocurrency principles of blockchains. Ethereum and smart contracts are

introduced, which form the basis of DeFi applications such as automated market makers, decentralised borrowing and lending markets, stablecoins, on-chain derivatives, DAOs and insurance. The course will also give a brief overview of blockchain scalability (layer 2 solutions), the evolution of fundraising, regulation and implications and applications in traditional finance. The course will involve practical activities with cryptocurrencies, trading on a DEX and creating your own cryptocurrency (ERC20 token).

Course Aims

This course aims to introduce students to the essential concepts in cryptocurrencies and decentralised finance. It covers explaining how cryptocurrencies, blockchains and decentralised finance protocols work. It involves a comprehensive team assignment that allows students to apply their knowledge to critically assess a decentralised finance protocol.

Relationship to Other Courses

This is a core course for a major in FinTech.

Course Learning Outcomes

Course Learning Outcomes	Program learning outcomes
CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.	• PLO1 : Business Knowledge
CLO2 : Explain key components of decentralised finance systems and make transactions using smart contracts.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO3 : Collaborate with peers in a virtual environment and apply problem-solving techniques to achieve goals efficiently and effectively.	• PLO3 : Business Communication • PLO4 : Teamwork
CLO4 : Examine key developments of decentralised finance systems and their impact on the global business environment and communicate your findings clearly to non-technical stakeholders.	• PLO1 : Business Knowledge • PLO3 : Business Communication • PLO6 : Global and Cultural Competence
CLO5 : Interpret the ethical implications of decentralised finance systems and applications in the global business context.	• PLO1 : Business Knowledge • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence
CLO6 : Critically evaluate a Decentralised Finance protocol, addressing any technical and institutional limitations and planned proposals to address these.	• PLO1 : Business Knowledge • PLO2 : Problem Solving

Course Learning Outcomes	Assessment Item
CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.	• Individual Tasks • Mini-presentation • Individual Report • Major Project
CLO2 : Explain key components of decentralised finance systems and make transactions using smart contracts.	• Individual Tasks • Major Project
CLO3 : Collaborate with peers in a virtual environment and apply problem-solving techniques to achieve goals efficiently and effectively.	• Individual Tasks • Major Project
CLO4 : Examine key developments of decentralised finance systems and their impact on the global business environment and communicate your findings clearly to non-technical stakeholders.	• Mini-presentation • Individual Report • Major Project
CLO5 : Interpret the ethical implications of decentralised finance systems and applications in the global business context.	• Mini-presentation • Individual Report • Major Project
CLO6 : Critically evaluate a Decentralised Finance protocol, addressing any technical and institutional limitations and planned proposals to address these.	• Individual Report • Major Project

Learning and Teaching Technologies

Moodle - Learning Management System | Zoom

Learning and Teaching in this course

This course will take a theoretical and practical approach to learning. The learning experience will be asynchronous. It will involve a combination of videos, readings, online class discussion and practical activities. Collaborative learning will be a focus of the course.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Individual Tasks Assessment Format: Individual	20%	Start Date: See detailed assessment description Due Date: See detailed assessment description
Mini-presentation Assessment Format: Individual	20%	Due Date: 01/03/2024 05:00 PM
Individual Report Assessment Format: Individual	20%	Due Date: 05/04/2024 05:00 PM
Major Project Assessment Format: Group	40%	Due Date: 29/04/2024 05:00 PM

Assessment Details

Individual Tasks

Assessment Overview

Two quick quizzes and a practical submission.

Assesses: PLO1, PLO2

BCom students: myBcom course points for PLO2

Course Learning Outcomes

- CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.
- CLO2 : Explain key components of decentralised finance systems and make transactions using smart contracts.
- CLO3 : Collaborate with peers in a virtual environment and apply problem-solving techniques to achieve goals efficiently and effectively.

Detailed Assessment Description

Weight	Assessment Name	Assessment Due Date / Timing
10%	2 Online Quizzes	Quiz 1: EOW 5 (15/3/24) Quiz 2: EOW 9 (12/4/24
10%	2 practical exercises on live blockchain	Practical 1: EOW 4 (8/3/24) Practical 2:

EOW 10 (19/4/24)

Mini-presentation

Assessment Overview

Short presentation on theories of money to develop presentation skills ahead of group presentation assignment.

Assesses: PLO1, PLO2, PLO3

BCom students: myBcom course points for PLO3

Course Learning Outcomes

- CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.
- CLO4 : Examine key developments of decentralised finance systems and their impact on the global business environment and communicate your findings clearly to non-technical stakeholders.
- CLO5 : Interpret the ethical implications of decentralised finance systems and applications in the global business context.

Detailed Assessment Description

Short presentation on theories of money to develop presentation skills ahead of group presentation assignment.

Due Week 3 – (1/3/24)

Individual Report

Assessment Overview

Individual report in which students discuss differences in blockchain design principles and inherent tradeoffs.

Assesses: PLO1, PLO2, PLO3, PLO6

Course Learning Outcomes

- CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.
- CLO4 : Examine key developments of decentralised finance systems and their impact on the global business environment and communicate your findings clearly to non-technical stakeholders.
- CLO5 : Interpret the ethical implications of decentralised finance systems and applications in

the global business context.
- CLO6 : Critically evaluate a Decentralised Finance protocol, addressing any technical and institutional limitations and planned proposals to address these.

Detailed Assessment Description

Individual report in which you discuss differences in blockchain design principles and inherent tradeoffs.

Due Week 8 – (5/4/24)

Major Project

Assessment Overview

Critically evaluate a Decentralised Finance (DeFi) protocol as an individual report and group presentation.

Assess: PLO1, PLO2, PLO3, PLO4, PLO5, PLO6

BCom students: myBcom course points for PLO6

Course Learning Outcomes

- CLO1 : Appraise the purpose and value of decentralised finance systems relative to traditional finance based on existing research.
- CLO2 : Explain key components of decentralised finance systems and make transactions using smart contracts.
- CLO3 : Collaborate with peers in a virtual environment and apply problem-solving techniques to achieve goals efficiently and effectively.
- CLO4 : Examine key developments of decentralised finance systems and their impact on the global business environment and communicate your findings clearly to non-technical stakeholders.
- CLO5 : Interpret the ethical implications of decentralised finance systems and applications in the global business context.
- CLO6 : Critically evaluate a Decentralised Finance protocol, addressing any technical and institutional limitations and planned proposals to address these.

Detailed Assessment Description

Critically evaluate a Decentralised Finance (DeFi) protocol as an individual report and group presentation.

Due Week 11 – (29/4/24)

General Assessment Information

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

• Achieve a composite mark of at least 50 out of 100

• Engage actively in course learning activities and attempt all assessment requirements

• Meet any additional requirements specified in the assessment details

• Meet the specified attendance requirements of the course (see Schedule section)

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Lecture 1: Course admin & Introduction Lecture 2: History of money and payment systems origins of cryptocurrencies
Week 2 : 19 February - 25 February	Lecture	Lecture 1: Introduction to Bitcoin 1 • SHA256/Cryptography, PoW & Mining Lecture 2: Introduction to Bitcoin 2 • UTXO, Wallets, Transactions, Mempool, Blocksize, Fees • (Activity) Discovering SHA256 Hashes • (Activity) Transferring Bitcoin
	Lecture	Lecture 1: Special Topics in Bitcoin • Blockchain Forks, • Double Spend (Attacks), • Bitcoin Resiliency Lecture 2: Ethereum & Smart Contracts • Intro to Ethereum • Smart Contracts • EVM & Transaction Scheme • ERC Token Standards • Varieties of ERC20s (Activity) Setup Metamask + Ethereum smart contract interaction
Week 4 : 4 March - 10 March	Lecture	Lecture 1: Ethereum & Smart Contracts 2 • Projects & Implementations (e.g. Dapps) • Ethereum Roadmap PoS Burning Fees - EIP1559 & new gas market developments Scalability (brief summary) Lecture 2: DeFi 1: Exchanges • Fundaments of Exchange Central Limit Orderbooks • CEXs • DEXs CLOB AMM • Uniswap V2 • Uniswap V3 and other AMM designs (Activity) Buy ERC20 via Uniswap
Week 5 : 11 March - 17 March	Lecture	Lecture 1: DeFi 2: Oracles & Lending • Oracle Designs & Trade-offs (decentralization, On vs Off-chain) • Lending Markets Aave: Mechanics, Costs, Incentives, Risks Flash Loans • Dangers & Flaws (Mango Markets example) (Activity) provision UNIV3 liquidity Lecture 2: DeFi 3: Stablecoins, Derivatives & Asset Management • Stablecoins (defining stability, different variations) • Decentralized Derivatives (Options, PERPs, etc.) • Decentralized Insurance • Liquid Staking • Decentralized Fund Management • Assessing DeFi Protocols Metrics & Analytics Degrees of decentralization, oracle reliance, custody, etc.
Week 6 : 18 March - 24 March	Lecture	No class
Week 7 : 25 March - 31 March	Lecture	Lecture 1: Special Topics in Ethereum • Scalability (L1s and L2s) Trilemma Problem L1 sharding L2 solutions • Interoperability Bridging & Wrapped Token variants Ordinals • (Activity) Deploy own ERC20 Lecture 2: Crypto markets, investment & trading 1 • Fundraising (ICO, IEO, IDO, Private Equity, LBP) • Airdrops & “fair launches” • DeFi Yield Mechanisms Sources of yield (borrowing demand, liquidity mining, revenue share) • Liquidity Mining • TVL Metric
Week 8 : 1 April - 7 April	Lecture	Lecture 1: Crypto markets, investment & trading 2 • Protocol Forking & Vampire Attacks • NFTs Markets Tokenization Collectibles & Rarity • Token valuation models • Tokenomics Lecture 2: Privacy & Crime • Privacy in blockchains (pseudonymity) • Privacy Approaches Private Blockchains Zero-Knowledge Mixer Services OFAC and Regulation

		• Criminal Uses Illegal Marketplaces, Insider trading, P&D, ransomware etc.
Week 9 : 8 April - 14 April	Lecture	Lecture 1: Consultation • Designated time for student questions regarding course material, assignments or other. Lecture 2: DAOs • DAOs History Technology Varieties Case Studies • On-chain governance & voting Tools/Platforms Case studies of proposals Types of voting schemes • Smart Contract Auditing
Week 10 : 15 April - 21 April	Lecture	Lecture 1: Future of Finance • TradFi vs DeFi • RWAs • STOs • CBDCs (Types, technologies, impact on monetary policy) • Private/Enterprise Blockchains & Use Cases Lecture 2: Regulation • History of crypto regulation • Existing regulatory framework (AML, wire fraud, securities criteria) • Regulation via Prosecution • Regulatory predictions

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Prescribed Resources

There is no textbook for this course

Course Evaluation and Development

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Lecturer	Alan Robertson					No	No
	Peter O'Neill					No	Yes

Other Useful Information

Academic Information

COURSE POLICIES AND SUPPORT

The Business School expects that you are familiar with the contents of this course outline and the UNSW and Business School learning expectations, rules, policies and support services as listed below:

- Program Learning Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Protocol for Viewing Final Exam Scripts
- Student Learning Support Services

Further information is provided on the key policies and support page.

Students may not circulate or post online any course materials such as handouts, exams, syllabi or similar resources from their courses without the written permission of their instructor.

STUDENT LEARNING OUTCOMES

The Course Learning Outcomes (CLOs) – under the Outcomes tab – are what you should be able to demonstrate by the end of this course, if you participate fully in learning activities and successfully complete the assessment items.

CLOs also contribute to your achievement of the Program Learning Outcomes (PLOs), which are developed across the duration of a program. PLOs are, in turn, directly linked to UNSW graduate capabilities. More information on Coursework PLOs is available on the key policies and support page. For PG Research PLOs, including MPDBS, please refer to the UNSW HDR Learning Outcomes.

Academic Honesty and Plagarism

As a student at UNSW you are expected to display academic integrity in your work and interactions. Where a student breaches the UNSW Student Code with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To assure academic integrity, you may be required to demonstrate reasoning, research and the

process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the Working with Academic Integrity module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Submission of Assessment Tasks

SPECIAL CONSIDERATION

You can apply for special consideration when illness or other circumstances beyond your control interfere with your performance in a specific assessment task or tasks, including online exams. Students studying remotely who have exams scheduled between 10pm and 7am local time, are also able to apply for special consideration to sit a supplementary exam at a time outside of these hours.

Special consideration is primarily intended to provide you with an extra opportunity to demonstrate the level of performance of which you are capable. To apply, and for further information, see Special Consideration on the UNSW Current Students page.

Special consideration applications will be assessed centrally by the Case Review Team, who will update the online application with the outcome and add any relevant comments. The change to the status of the application immediately sends an email to the student and to the assessor with the outcome of the application.

Please note the following:

1. Applications can only be made through Online Services in myUNSW (see the UNSW Current Students page). Applications will not be accepted by teaching staff. The lecturer-in-charge/ course coordinator will be automatically notified when your application is processed.
2. Applying for special consideration does not automatically mean that you will be granted a supplementary exam or other concession.
3. If you experience illness or misadventure in the lead up to an exam or assessment, you must submit an application for special consideration, either prior to the examination taking place, or prior to the assessment submission deadline, except where illness or misadventure prevent you from doing so.
4. If your circumstances stop you from applying before your exam or assessment due date, you must apply within 3 working days of the assessment or the period covered by your supporting documentation.

5. Under the UNSW Fit To Sit/Submit rule, if you sit the exam/submit an assignment, you are declaring yourself well enough to do so and are cannot subsequently apply for special consideration.
6. If you become unwell on the day of – or during – an exam, you must stop working on your exam, advise your course coordinator or tutor and provide a medical certificate dated within 24 hours of the exam, with your special consideration application. For online exams, you must contact your course coordinator or tutor immediately via email, Moodle or chat and advise them you are unwell and submit screenshots of your conversation along with your medical certificate and application.
7. Special consideration requests do not allow the awarding of additional marks to students.

Further information on Business School policy and procedure can be found under "Special Consideration" on the key policies and support page.

LATE SUBMISSION PENALTIES

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the 'wrong' assignment has been submitted.

For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

FEEDBACK ON YOUR ASSESSMENT TASK PERFORMANCE

Feedback on student performance from formative and summative assessment tasks will be provided to students in a timely manner. Assessment tasks completed within the teaching period of a course, other than a final assessment, will be assessed and students provided with feedback, with or without a provisional result, within 10 working days of submission, under normal circumstances. Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Faculty-specific Information

PROTOCOL FOR VIEWING FINAL EXAM SCRIPTS

UNSW students have the right to view their final exam scripts, subject to a small number of very specific exemptions. The UNSW Business School has set a protocol under which students may view their final exam script. Individual schools within the Faculty may also set up additional local processes for viewing final exam scripts, so it is important that you check with your School.

If you are completing courses from the following schools, please note the additional school-specific information:

- Students in the **School of Accounting, Auditing & Taxation** who wish to view their final examination script should also refer to this page.
- Students in the **School of Banking & Finance** should also refer to this page.
- Students in the **School of Information Systems & Technology Management** should also refer to this page.

COURSE EVALUATION AND DEVELOPMENT

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

QUALITY ASSURANCE

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

TEACHING TIMES AND LOCATIONS

Please note that teaching times and locations are subject to change. Students are strongly advised to refer to the Class Timetable website for the most up-to-date teaching times and locations.