

Blockchain & Decentralized Finance

Instructor: Poojan Patel

Email: Poojan.patel001@umb.edu

Pre-requisites: No Prerequisites

Course Description:

This course introduces Blockchain and Decentralized Finance (DeFi), covering core concepts like smart contracts, decentralized exchanges, and cryptocurrencies like Bitcoin and Ethereum. Students will explore the mechanics of crypto assets, proof-of-work vs. proof-of-stake, and innovations like stablecoins, NFTs, and crypto derivatives. Through hands-on data analysis and case studies, the course prepares students to critically engage with DeFi's rapidly evolving landscape

Course Objective:

By the end of this course, students will be able to:

1. Understand the foundational concepts and technology behind blockchain and decentralized finance.
2. Analyze the principles and mechanisms of key cryptocurrencies, including Bitcoin and Ethereum.
3. Compare and contrast proof-of-work and proof-of-stake consensus mechanisms.
4. Explore the structure and functions of decentralized exchanges and smart contracts.
5. Examine the applications and implications of crypto assets such as stablecoins, NFTs, and crypto derivatives.
6. Develop hands-on skills in analyzing blockchain data and DeFi platforms.
7. Critically assess regulatory issues and challenges in the evolving DeFi landscape.

Grading:

Class Quiz	20%
Midterm Exam	25%
Final Project Report and Presentation	45%
Attendance	<u>5%</u>
	100%

In Class Quiz:

Throughout the course, students will complete three in-class quizzes, each featuring ten multiple-choice questions. These quizzes are designed to reinforce key concepts and assess students' understanding in a quick, practical format. The best two scores from the three quizzes will be counted, allowing students the flexibility to perform their best while staying engaged with the material.

Midterm Exam

Students will engage in a hands-on case study that applies blockchain and DeFi concepts to a real-world financial problem. By tackling this practical scenario, students will demonstrate their understanding of core blockchain principles and their applications within finance. The midterm will serve as a valuable opportunity to apply learned skills in a real-world context, building essential skills and preparing students for the in-depth final project.

Final Project

Students will select an application of cryptocurrency or DeFi and pitch it as a venture idea to the class. This project will require students to integrate their understanding of blockchain concepts with entrepreneurial thinking, focusing on developing an innovative solution or improvement in the DeFi ecosystem

Guiding Questions for Project Development and Presentation:

1. What problem are you addressing?
Define the challenge or gap in the current DeFi or cryptocurrency landscape that your venture aims to solve. Explain why addressing this issue is valuable to users or the broader financial sector.
2. How does your solution leverage blockchain or cryptocurrency?
Describe the blockchain or crypto-specific technologies that make your solution possible or effective. Discuss the benefits of using decentralized technology over traditional methods.
3. Who is your target audience?
Identify potential users or customers for your venture. Explain why this audience would benefit from your solution and how you plan to reach them.
4. What is the business model?
Explain how your venture plans to generate revenue. Consider models like transaction fees, subscription plans, or tokenized ecosystems and outline why this model suits your project.
5. What are the real-world implications of your solution?
Highlight how your project could impact the DeFi space, user experience, or broader adoption of decentralized finance. Discuss any unique risks and regulatory considerations.

Presentation & Report Grading Rubrics:

Criteria	Weight
Problem Definition & Relevance	20%
Technical Application of Blockchain/Crypto	25%
Market Potential & Business Model	20%
Practical Implications & Applications	15%
Presentation Quality & Engagement	10%
Q&A Response	10%
Total	100%

This final project challenges students to apply their knowledge of blockchain in finance to ideate and present a venture concept, showcasing creativity, technical understanding, and entrepreneurial insights.

References

1. Andreas M. Antonopoulos and Dr. Gavin Wood, Mastering Ethereum, O'Reilly Media, (2019)
2. Bashir, I. (2020). *Mastering Blockchain: Unlocking the power of cryptocurrencies, smart contracts, and decentralized applications* (3rd ed.). Packt Publishing.
3. De Filippi, P., & Wright, A. (2018). *Blockchain and the law: The rule of code*. Harvard University Press.
4. Bitcoin White Paper
5. UniSweep White Paper

Class Schedule

	BLOCKCHAIN & DECENTRALISED FINANCE	
1	Introduction to DeFi Introduction to BlockChain	
2	Smart Contracts Fundamentals	
3	Decentralised Exchanges Uniswap -White Paper	
4	Introduction to Cryptocurrency	
5	Proof of Stake v/s Proof of Work	
6	Bitcoin Bitcoin- White Paper	In Class Quiz
7	Bitcoin	

8	Midterm Exam	
9	Ethereum	
10	Ethereum	In Class Quiz
11	Crypto Derivatives	
12	CBDC and Stable Coins	
13	NFT's Regulations Sec and Crypto Assets https://www.sec.gov/newsroom/speeches-statements/speech-hinman-061418	In Class Quiz
14	Final Presentation	