Columbia Business School
AT THE VERY CENTER OF BUSINESS™

B8316: Blockchain Markets Infrastructure and Uses
Spring 2023, B Term

Professor Gur Huberman
E-mail: gh16@columbia.edu

Professor Austin Campbell
E-mail: [TBD]@columbia.edu

Office Hours: By Appointment

Communications from professor and teaching assistants about the course will take place through Canvas. Students should make sure they regularly check for announcements and messaging notifications.

COURSE DESCRIPTION

This course addresses the current structure of deployed applications on the blockchain, as well as the structure of communication across protocols and blockchains. It will begin by covering the fundamental building blocks of on-chain activity: AMMs, borrow/lending protocols, oracles, and bridges. The course will then shift towards analysis of these protocols, including previous hacks/exploits, risk evaluation, and implications for both crypto and financial markets structure.

Given the evolving nature of the topics, the content will be modified on the fly to address real-world developments. While not an investment class, it will touch on important market developments as a lens through which we can revisit first principles. Every class will begin with a quick analysis of recent headlines. There will be speaker presentations throughout the course, as well as live demos.

Students should take this class if they are interested in working in the blockchain/crypto space, want to understand the ecosystem and the potential long-term impact on traditional markets, or if they intend to trade or invest in the space personally.

PRE & COREQUISITE COURSES

- Capital Markets and Investments (B8306/8307)
- Introduction to Blockchain and Cryptocurrencies (B8462)

Learning Objectives

Upon completion of this course, students should be able to:

- Describe the core components of the on-chain crypto ecosystem

- Classify and examine core DeFi protocols and their impact on market structure
- Evaluate the risks, benefits, and trade-offs of key protocol design decisions
- Recount the history of DeFi and evolution of the crypto space to the current date
- Possess a working vocabulary of crypto such that students can converse with crypto natives effectively

CLASSROOM NORMS AND EXPECTATIONS

Core Culture

Students are expected to adhere to CBS Core Culture in this class by being Present, Prepared, Participating.

Inclusion, Accommodation, and Support for Students

At Columbia Business School we believe diversity strengthens any community or business model and brings it greater success. The School is committed to providing all students with equal opportunity to thrive in the classroom by providing a learning, living, and working environment free from discrimination, harassment, and bias on the basis of gender, sexual orientation, race, ethnicity, socioeconomic status, or ability.

Students with documented disabilities may receive reasonable accommodations. Students are encouraged to contact the Columbia University's Office of Disability Services for information about registration.

Columbia Business School adheres to all community, state, and federal regulations as relate to Title IX and student safety. Read more about CBS' policies to support Inclusion, Accommodations and Support for Students here.

Honor Code And Academic Integrity

The Columbia Business School Honor Code calls on all members of the School community to adhere to and uphold the notions of truth, integrity, and respect both during their time in school, and throughout their careers as productive, moral, and caring participants in their companies and communities around the world. All students are subject to the Honor Code for all of their academic work. Failure to comply with the Honor Code may result in Dean's Discipline. Here you can review examples of Academic Misconduct which may result in discipline.

Course Attendance Policies

Students from all programs should review and be familiar with the MBA Core attendance policy here.

METHOD OF EVALUATION

Exercises	20%
Class Participation	20%
Final Presentation	60%

There will be exercises throughout the term to be completed, as well as a final group presentation and paper. The final presentation and paper will be an evaluation of a DeFi protocol or on-chain deployment (oracle, bridge, etc.) along with the strengths and weaknesses of the approach, and any suggestions for improvement.

COURSE ROADMAP/SCHEDULE

Session	Topic(s)	Description
1	DeFi Principles, Self-Custody, Tokenomics	This class will cover the open-access nature of DeFi and the differences vs. the traditional financial system, as well as the economic and control properties of tokens.
2	Oracles, Bridges	This session will explore cross-chain communication, transporting tokens between chains and the various models (Cosmos, Axelar & Layer Zero, Circle APIs, etc.), and the implications for security of these constructs.
3	AMMs and Transacting	This session will cover automated market making, the "always-on" nature of decentralized exchanges and the difficulties this creates, the history of the AMM space (including the Sushi split), and the tools created on top of AMMs to manage their complexity.
4	Borrow/Lend protocols, Stablecoin Leverage Models	This class will cover borrow/lend protocols, which are one of the main sources of on-chain leverage, and the isolated vs. commingled economic models of these protocols. Also covered will be "stablecoins" that are essentially leverage providers (MIM, etc.).
5	When Things Break	This will be a discussion of exploitation of protocols and bridges, either by economic manipulation (Mango markets, etc.), security compromises (Harmony bridge), or other methods.
6	The Future & Presentations	A final discussion on the future of the space, as well as mostly time for student presentations