

## **B8316: Blockchain Markets Infrastructure and Uses** **Spring 2024, B Term**

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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.

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### **COURSE DESCRIPTION**

The course will begin by reviewing blockchains, and the fundamental building blocks of on-chain activity, stablecoins, tokenized assets, automated market-makers, borrow/lend protocols. It will then cover oracles, bridges, and communication with the real world through hybrid applications and approaches. The course will address the current structure of payments using blockchains (Visa, Paypal, etc.), deployed applications, and tokenized assets on blockchains. It also addresses communication between protocols and blockchains. The course will then cover oracles, bridges, and communication with the real world through hybrid applications and approaches.

Going past the description of the basic tools, the course will shift towards an analysis of these tools, including previous hacks and exploits, risk evaluation, and the long-term potential implications for both crypto and traditional financial markets.

Given the evolving nature of the topics, the content will be modified on the fly to address real-world developments. While not explicitly a class on investment, 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.

The course is intended for students interested in viable applications of blockchains and in payment systems in general. The issues and challenges the course presents offer a crisp, case-like introduction to the financial system.

### **PRE & COREQUISITE COURSES**

- Capital Markets and Investments (B8306/8307) (Can be waived with instructor's consent.)

## 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
- Describe the impact of blockchain on traditional payments and various tokenized real-world assets
- Evaluate the risks, benefits, and trade-offs of key protocol design decisions
- 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](#).

The course is only for registered students.

## METHOD OF EVALUATION

<i>Exercises</i>	20%
<i>Class Participation</i>	20%
<i>Final Presentation</i>	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, Tokenomics, Wallets and Self-Custody	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	Stablecoins, Tokenizing Real Assets	This session will explore various stablecoin models, how to get money on-chain, how assets from the real-world are represented on a blockchain, and what the implications of a global omni-ledger for assets are.
3	Automated Market Makers, Borrow/Lend Protocols, and Transacting on-chain	This session will cover automated market making, the “always-on” nature of decentralized exchanges and the difficulties this creates, borrow/lend protocols, and how transacting on-chain actually works.
4	Cross-Chain Communication	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, and communication between the blockchain and the real world through oracles and other centralized applications.
5	Putting Things Together & Breaking Things Apart	This will be a discussion of composability in the blockchain space and how this impacts projects to create complexity and fragility, as well as an analysis of one of the major hacks that has happened in the space to demonstrate the potential security issues with composability and on-chain development.
6	The Future & Presentations	A final discussion on the future of the space, as well as mostly time for student presentations.