CMSC398F: Introduction to Blockchain and Cryptocurrency

** (Subject to change)

Course Description

The course will cover the fundamentals of blockchain, cryptocurrency and smart contracts. These three will be the key topics discussed in this course. The last three weeks will be focused more on how this technology is being implemented right now with trendy things such as the metaverse, crypto, and NFTs. The overall learning goal is for students to learn more about blockchain technology and what are the practical implications of this new technology on the world.

Course Details

- **Course**: CMSC398F
- **Prerequisites**: C- in CMSC216 and CMSC250
- **Credits**: 1
- **Seats**: 30
- **Lecture Time**:
- **Location**: CSI 1121
- **Semester**: Fall 2022
- **Textbook**: Bitcoin and other Cryptocurrency Technologies
- **Course Facilitator(s)**: Om Pathak, Nikhil Ghate, Soham Digambar
- **Faculty Advisor**: Jonathan Katz

Topics Covered*

Syllabus may be subject to minor changes, but drastic revisions will require input of students/facilitators, and those involved will be notified immediately

- Unit 1: Blockchain
    - Introduction to Cryptocurrency
    - Hash functions and attacks
    - History of Bitcoin

    - Blockchain Structure
    - Proof-of-Work
    - Mining, Faucets
- Unit 2: Cryptocurrency
    - Bitcoin and other Crypto transactions
    - Wallets & Anonymity
    - Crypto Markets, Market Caps, Investors
    - Bitcoin as a Platform
- Unit 3: Smart Contracts
    - Introduction to Smart Contracts
    - DAOs and ICOs
    - Miscellaneous

Schedule*

Week	Topic	Assignment
1 (8/29)	Syllabus week + Intro to Cryptography	Assigned: Syllabus Quiz
2 (9/5)	More on Bitcoin + Blockchain Structure	Due: Syllabus Quiz Assigned: Quiz #1
3 (9/12)	Hash algorithms + Immutable Ledger + P2P network	Due: Quiz #1 Assigned: Mini-Quiz #2, Project #1 out
4 (9/19)	Proof-Of Work + Mining + Faucets	Due: Mini Quiz #2 Assigned: Quiz #3
5 (9/26)	Bitcoin and other Crypto transactions	Due: Quiz #3

6 (10/3)	Wallets	Due: Project #1 Due Assigned: Quiz #4
7 (10/10)	Anonymity	Due: Quiz #4
8 (10/17)	**MIDTERM**	Due: Nothing Assigned: Project #2, Assignment #6
9 (10/24)	Crypto Markets, Market Caps, Investors	Due: Nothing Assigned: Quiz #5
10 (10/31)	Cryptocurrency Market and ICOs	Due:Quiz #5 Assigned: Nothing
11 (11/7)	Altcoins (focus on Ethereum) and Proof-of-Stake	Due: Project #2 Assigned: Final Project, Assignment #9
12 (11/14)	Introduction to Smart Contracts	Due: Nothing Assigned: Nothing
13 (11/21)	THANKSGIVING	
14 (11/28)	Web3, ETH	Due: Nothing
15 (12/5)	**FINAL**	

Grading

Grades will be maintained on (ELMS/department grade server/etc). You will be responsible for all material discussed in lecture as well as other standard means of communication (Piazza, email announcements, etc.), including but not limited to deadlines, policies, assignment changes, etc.

Any request for reconsideration of any grading on coursework must be submitted within one week of when it is returned. No requests will be considered afterwards.

Your final course grade will be determined according to the following percentages:

We will additionally drop the lowest quiz.

Percentage	Title	Description
10%	Class Participation	
20%	Quizzes	
30%	Projects	Weekly assignments ranging from in-class coding activities, to write- ups about lecture material (200-500 words), to take-home projects. At the end of each unit there will be a mini-project where the student will create something based on the unit.
20%	Midterm	The midterm will be on topics from weeks 1-7. It will consist of only theoretical topics and some practical applications of what we have learned.
20%	Final Project	The final will project will be an original Ethereum Smart Contract. Students may draw inspiration from existing Ethereum Smart Contract applications, such as voting or gambling, but must implement the contract themselves. All students will present their contracts at the end of the semester.

Communicating with course staff

Other means of communication have not been chosen as of now.
Interaction beyond the classroom is encouraged, but should be limited to important or more urgent issues. Topics that need not be addressed immediately can wait till class time.

Instructor(s) Name(s) and Email(s):

- Dr. Jonathan Katz: jkatz@cs.umd.edu

Facilitator(s) Name(s) and Email(s):

- Om Pathak: ompathak@terpmail.umd.edu
- Soham Digambar: sdigamba@terpmail.umd.edu
- Nikhil Ghate: nghate@umd.edu

Excused Absence and Academic Accommodations

See the section titled "Attendance, Absences, or Missed Assignments" available at Course Related Policies**.** Please also note that absences due to internship/job interviews will be excused as long as you notify one of the TAs BEFORE the missed class through email. Please also note that for University Excused absences you will be excused from the participation assignment for that day NOT given credit i.e. that day's participation grade will not count towards your final grade. This will appear as a --- (Dash) on ELMS. If it is an excused absence for an interview you will receive full credit.

Disability Support Accommodations

See the section titled "Accessibility" available at Course Related Policies.

Academic Integrity

Note that academic dishonesty includes not only cheating, fabrication, and plagiarism, but also includes helping other students commit acts of academic dishonesty by allowing them to obtain copies of your work. In short, all submitted work must be your own. Cases of academic dishonesty will be pursued to the fullest extent possible as stipulated by the Office of Student Conduct. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.shc.umd.edu.

Course Evaluations

If you have a suggestion for improving this class, don't hesitate to tell the instructor or TAs during the semester. At the end of the semester, please don't forget to provide your feedback using the campus-wide CourseEvalUM system. Your comments will help make this class better.