Course Title: BLOCKCHAIN and CRYPTOCURRENCY

Course Number and Section: FRE-GY 6981: Fintech: Blockchain and Crypto

Instructor Information: Frederic Siboulet, fsiboulet@nyu.edu

Course Information: The course provides the foundation for the understanding of Blockchain technology and the economics of Tokens, Cryptocurrencies, digital currencies, and NFTs. It covers the high-level networking to the specifics of encryption, immutability, hashes, etc. It covers the major encryption algorithm, such as Proof of Work, Proof of Stake, and goes through the nuances of Bitcoin (and Bitcoin Cash), Ethereum, and other more specialized cryptos such stable coine. We link the findings to economic implications of blockchain and it leads into possible evolution of financial markets:

1. General purpose technology (GPT), the journey to Web 3, Distributed Ledger Technology (DLT)
2. Blockchain technology, core components, type of blockchain, block, hashes, chain, immutability
3. Mining and validation, consensus algorithms, Byzantine Generals, Proof of Work, Proof of Stake, Delegated PoS, Unique Node List, Proof of Authority
4. Incentives and risks, bootstrapping the network, cost of verification, cost of networking, intensive margin, extensive margin, smart contracts
5. Coins (e.g. Bitcoin, Ethereum, Ripple/XRP, Stablecoin, tokenization and NFTs)
6. Last mile and Oracles, exchanges, asset managers, market makers,
7. Uses cases for buy side and sell side, specialized coins

Co-requisite or prerequisite:
None required, other the Bachelor level (engineering, physics, math, economics, accounting, etc)

Requirement:
Five weekly team assignment (10% of the grade each)
One final individual assignment (50% of the grade)

Class time: half semester, second half, Monday 18:00-20:30

Classroom Number and Building Location: TBC

Suggested readings
- Full class decks
- Blockchain Wars, by Evan McFarland
- Cryptoassets, by Chris Burniske
- DeFi and the Future of Finance, by Fred Ehrsam
- Bitcoin, Satoshi Nakamoto 2008-10-14
- Smart-Contracts-12-Use-Cases-for-Business-and-Beyond_Chamber-of-Digital-Commerce

Sample links:
- https://101blockchains.com/
- https://www.gemini.com/cryptopedia/glossary
- https://builtin.com/blockchain/blockchain-platforms
- https://blockchain.ieee.org/technicalbriefs/december-2018/open-execution-the-blockchain-model
- https://cepr.org/publications/books-and-reports/geneva-21-impact-blockchain-technology-finance-catalyst-change
- https://dig.watch/topics/cryptocurrencies#central-bank-digital-currency-cbdc
- https://services.hbsp.harvard.edu/api/courses/976056/items/H06ITL-PDF-ENG/sclinks/a7f390bb8ac9d2cdeea4509aea4622a2
- https://www.bis.org/publ/bppdf/bispap101.htm
- https://www.finra.org/investors/investing/investment-products/digital-assets#overview
- https://ethereum.org/en/developers/docs/smart-contracts/
- https://www.isda.org/a/4RJTE/Private-International-Law-Aspects-of-Smart-Derivatives-Contracts-Utilizing-DLT.pdf
- https://coinmarketcap.com/alexandria/article/what-is-smart-contract-risk
- https://www.coinbase.com/learn/crypto-basics/what-is-a-smart-contract
- https://georgetownlawtechreview.org/wp-content/uploads/2017/05/Raskin-1-GEO.-L.-TECH.-REV.-305-.pdf
- https://www.researchgate.net/publication/322231850_Place_of_Smart_Contracts_in_Civil_Law_A_Few_Comments_on_Form_and_Interpretation
- https://books.google.com/books?id=HhQqDwAAQBAJ&pg=PA17#v=onepage&q&f=false
- https://bitcoin.org/en/
- https://ethereum.org/en/
- https://ripple.com/
- https://www.coinbase.com/
- https://www.binance.com/en
- https://blog.uniswap.org/uni
- https://www.weforum.org/agenda/2021/11/what-is-a-dao-cryptocurrency-group/
- https://chain.link/whitepaper
- https://builtin.com/blockchain/blockchain-platforms
- https://www.coincenter.org/
- https://river.com/learn/
- https://www.ibm.com/blockchain
- https://www.digitalasset.com/use-cases/clearing-settlement
- https://corda.net/
- https://www.dtcc.com/news/2022/august/22/project-ion
- https://blockworks.co/news/state-street-sees-significant-opportunity-in-tokenization
- https://www.ibm.com/products/blockchain-platform-hyperledger-fabric?mhsrc=ibmsearch_a&mhq=
- https://hyperledger-fabric.readthedocs.io/en/latest/blockchain.html
- https://www.gemini.com/cryptopedia/explore#cryptocurrencies
- https://philippsandner.medium.com/comparison-of-ethereum-hyperledger-fabric-and-corda-21c1bb9442f6
- https://philippsandner.medium.com/blockchain-iot-and-ai-a-perfect-fit-c863c0761b6

Disability Disclosure: Academic accommodations are available for students with disabilities. Please contact the Moses Center for Students with Disabilities (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

Inclusion Statement: The NYU Tandon School values an inclusive and equitable environment for all our students. I hope to foster a sense of community in this class and consider it a place where individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. It is my intent that all students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. If this standard is not being upheld, please feel free to speak with me.