Blockchain and its application to finance

Module 4, 2017-2018
Colleagues and Oleg Shibanov

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Course description

The core of this course is blockchain, its usage and applications. Students will study both technical side of blockchain and most important components of its current development. Bitcoin and ICO will also be covered. The course does not require

Course requirements, grading, and attendance policies

Statistics, econometrics, financial markets.
The course grade is based on two home assignments (40%) and final exam (60%).

Course contents

Week	Date	Topic	Reading
1		**Introduction to blockchain (Sergey Prilutsky)** 1. Symmetric cryptography 2. Asymmetric cryptography	[1]
2		**Blockchain and consensus (Sergey Prilutsky)** 1. Blockchain, Bitcoin and standard schemes 2. Consensus algorithms, attacks, decentralization	[2], [3]
3		**Ethereum - different approach (Alex Vlasov, Bankex Foundation)** 1. Ethereum blockchain structure 2. Efficient smart contracts 3. Token as an example of a smart contract	to be posted
4		**Problems and solutions (Alex Vlasov, Bankex Foundation)** 1. Privacy 2. Scaling (State channels, Plasma, sharding, DAGs)	to be posted
5		**System of economic incentives as integral part of the blockchain (Alex Vlasov, Bankex Foundation)** 1. Why PoS is not free 2. Let's build a Plasma	to be posted
6		**Business models and ICO (LAToken)** 1. The future of automated capital markets and banking 2. Assets tokenization and trading details 3. Crypto research and risk management 4. Next generation of Blockchain: LA Decentralized Acyclic Graph 5. Tips on ICO	[6]
7		**Funds and investment in crypto (Maxim Ulyanov)** 1. Investment approach to cryptocurrencies 2. Mining 3. Funds, how they choose projects, and inflows/outflows	[5]

Course materials

1. "Bitcoin and Cryptocurrency Technologies", Chapter 1 (https://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf)
2. "Bitcoin and Cryptocurrency Technologies", Chapter 2
3. "Bitcoin and Cryptocurrency Technologies", Chapter 3
4. "Bitcoin and Cryptocurrency Technologies", Chapter 4
5. "Bitcoin and Cryptocurrency Technologies", Chapter 5
6. "Bitcoin and Cryptocurrency Technologies", Chapter 6
7. "Bitcoin and Cryptocurrency Technologies", Chapter 7
8. "Bitcoin and Cryptocurrency Technologies", Chapter 8
9. "Bitcoin and Cryptocurrency Technologies", Chapter 9
10. "Bitcoin and Cryptocurrency Technologies", Chapter 10
11. "Bitcoin and Cryptocurrency Technologies", Chapter 11

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.