

Программа онлайн курса:

Основы блокчейн / Blockchain Basics

Название высшего учебного заведения, разработавшего сайт	The University of Buffalo
Наименование онлайнплатформы	Coursera
Даты изучения онлайнкурса	1 раз в неделю
Время	58 часов
Формат изучения дисциплины Ссылка на онлайн-курс	https://www.coursera.org/learn/blockchain-basics?

I. ЦЕЛЬ, РЕЗУЛЬТАТЫ ОСВОЕНИЯ КУРСА

Working curriculum of the university in the training direction 38.04.05 "Business-Informatics", training level - Bachelors, 4th course, approved in 2018

Purpose:

- to recognize foundational concepts of blockchain

Results of the course:

- application of blockchain concepts for solving applied tasks

II. СОДЕРЖАНИЕ УЧЕБНОЙ ДИСЦИПЛИНЫ CONTENT OF THE DISCIPLINE

This first course of the Blockchain specialization provides a broad overview of the essential concepts of blockchain technology – by initially exploring the Bitcoin protocol followed by the Ethereum protocol – to lay the foundation necessary for developing applications and programming. You will be equipped with the knowledge needed to create nodes on your personal Ethereum blockchain, create accounts, unlock accounts, mine, transact, transfer Ethers, and check balances.

You will learn about the decentralized peer-to-peer network, an immutable distributed ledger and the trust model that defines a blockchain. This course enables you to explain basic components of a blockchain (transaction, block, block header, and the chain) its operations (verification, validation, and consensus model) underlying algorithms, and essentials of trust (hard fork and soft fork). Content includes the hashing and cryptography foundations indispensable to blockchain programming, which is the focus of two subsequent specialization courses, Smart Contracts and Decentralized Applications (Dapps). You will work on a virtual machine image, specifically created for this course, to build an Ethereum test chain and operate on the chain. This hands-on activity will help you understand the workings of a blockchain, its transactions, blocks and mining.

Main concepts are delivered through videos, demos and hands-on exercises.

Unit 1: Blockchain Defined

We will introduce and define blockchain, explain the structure and operational aspects of Bitcoin blockchain, and compare different types of blockchains.

Unit 2: Ethereum Blockchain

We will discuss the innovation of the Ethereum blockchain, review its protocol, and explore the payment model for code execution.

Unit 3: Algorithms & Techniques

We will discuss the concept of asymmetric key encryption, define the concept of hashing, and explain techniques that use algorithms to manage the integrity of transactions and blocks in blockchain.

Unit 4: Trust Essentials

We will define elements of trust in blockchain and discuss the Consensus protocol.

III. ОЦЕНИВАНИЕ THE FORMATION ORDER OF GRADES FOR THE DISCIPLINE

Unit 1: Blockchain Defined

- 5 practical tasks (150min)

Unit 2: Ethereum Blockchain

- 5 practical tasks (150min)

Unit 3: Algorithms & Techniques

- 5 practical tasks (150 min)

Unit 4: Trust Essentials

- 5 practical tasks (150min)

Forms and Types of control

The course is based on a rather complicated method of grading. Final score consists of:

- score for current work during the classes – O1;
- final exam presentation – O2.

Final score O looks as follow:

$$O=0,6*O1+0,4*O2.$$

The rounding method of the cumulative score of final control is made according to the rules of rounding arithmetic.

IV. LITERATURE

4.1 Core textbooks:

[Swan M. Blockchain: Blueprint for a new economy, O'Reilly Media, Inc., 2015](#)

4.2 Additional supporting articles and conference papers:

1. [Wood G. Ethereum: A secure decentralised generalised transaction ledger, Ethereum project yellowpaper. – 2014. – Vol. 151. – P. 1-32.](#)
2. [Katz J. et al. Handbook of applied cryptography, CRC press, 1996](#)

V. ПЕЧУПЫ

Link to resources: <https://www.coursera.org/learn/blockchain-basics?>

VI. УЧЕБНЫЕ ПОСОБИЯ И ОБЗОРНЫЕ УПРАЖНЕНИЯ

Every course on Coursera is taught by top instructors from the world's best universities and educational institutions. Courses include recorded video lectures, auto-graded and peer-reviewed assignments, and community discussion forums.

VII. ТЕХНИЧЕСКИЕ ТРЕБОВАНИЯ

This course is delivered completely online. Have access to a computer or mobile device that supports the Internet and have constant access to the Internet to view or download the necessary course resources, as well as to conduct any automatic course assessments.