

Faculty: Telecommunications and Management
Department: Information Technologies
Professional Field: 5.3 Communications and computer technologies.
Specialty: Cyber security of high technologies
Educational-qualification degree: prof. bachelor

LEARNING COURSE DESCRIPTION

1.Course title:Blockchain Technologies

2.Course code: P.18.042.1

3.Type of the course: *compulsory*

4.Level: prof. bachelor

5.Year of study: 3

6.Semester: 6

7.Number of credits: 4

8.Name of the lecturer: Assist. Prof. Strahil Sokolov, Eng. PhD

9.Course learning outcomes:

The aim of the course is to give students of the University of Telecommunications and Post a systematic form of theoretical and practical knowledge about the role of blockchain, cryptocurrencies and distributed systems based on trust. Students who have completed their training in this subject must have the skills to work with blockchain-based systems and practical skills for working with decentralised applications.

Students who have completed their training in the course must acquire:

Basic knowledge – blockchain; cryptocurrencies; smart contracts; consensus protocols; distributed consistence.

Practical skills for working with modern cryptocurrency technologies and research infrastructure
- Design of distributed systems based on blockchain.

Competencies: after successful completion of the course, students should be able to:

- know the basic tasks and principles of blockchain technologies;
- know the concept of cryptocurrencies;
- work with cryptocurrency programs and systems.

10.Teaching methods:

The method of teaching is through lectures, block or one lesson per week for 15 weeks and practical exercises in block or one lesson per week for 15 weeks.

11. Prerequisites:

Students should have prior knowledge of programming basics, cryptography, computer architectures and computer networks.

12. Course contents:

The discipline explores an introduction to blockchain technology. Cryptocurrencies.

Rules and structure of Bitcoin. Presentation of Ethereum technology. Smart contracts . Sustainability-based programming. Design of decentralized applications.

Blockchain based on rights. Consensus protocols. Distributed consistency.

Possibilities for proving a made norm. Scaling and improving blockchain's speed. Data management.

And a transition from chains to columns. Complexity of calculations in the chain. Blockchain applications. Maintenance and troubleshooting. Decentralised data storage systems using Blockchain.

Decentralized Applications for Internet Services. Utility Tokens concept. Security practices. Course summary. Create a digital wallet and send cryptocurrency. Create your own site with Wordpress.

Decentralized bitcoin-based banking. Distributed P2P networks, immutable digital wallet. A task for the Byzantine generals. Research on Bitcoin. Study of Ethereum. History and role of money. Create your own cryptocurrency.

Cryptoanarchism and modern movements in the field of cybercurrencies. Anonymity. Hash-cryptography, cryptography and consensus methods. Proof of a rule made by consensus. Tokenization and trading of cryptocurrency. Methodology for launching an initial

cryptocurrency offering (ICO). Cryptobors. ICO through a cryptocurrency exchange. Smart contracts

and decentralized applications. A decentralised society. Current state of the Blockchain environment. Business applications and evaluation of blockchain projects.

13. Bibliography

Basic literature:

1. „Bitcoin and Cryptocurrency Technologies“, <http://bitcoinbook.cs.princeton.edu/>.
2. Bashir, Imran. Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained. Packt Publishing Ltd, 2018.
3. Paul Vigna & Michael J. Casey, The age of cryptocurrency, 2015.

Additional literature:

1. Swan, M., 2015. Blockchain: Blueprint for a new economy. " O'Reilly Media, Inc."
2. Antonopoulos, Andreas M. Mastering Bitcoin: Programming the open blockchain. " O'Reilly Media, Inc.", 2017.
3. Sarmah, Simanta Shekhar. "Understanding blockchain technology." Computer Science and Engineering 8, no. 2 (2018): 23-29.
4. Sastry, V. V. L. N. Blockchain Technologies Economics For Information Technology industry. Idea Publishing, 2020

14. Assessment methods and criteria:

The course ends with an ongoing assessment.

1. Requirements for the assessment of the six-point system

The total number of points from the written exam that can be reached is 100. Each of the questions in the final exam carries 3 points, and the answer to the open question can carry up to 10 points.

2. Formation of the final mark

The formation of the final grade is carried out on the basis of a point system as the maximum number of points that students can receive is 100 and can include various activities.

Forming an assessment in the training course at each of the above stages, according to the points obtained and their ranking according to the six-point system is given in Table 1.

Table 1.

Number of points	Assessment According to the 6-point Scale System
0 – 20	Fail 2 (F)
20 – 39	Fail 2 (FX)
40 – 49	Satisfactory 3.00 (E)
50 – 59	Satisfactory 3.00 (D)
60 – 69	Good 4.00 (C)
70 – 84	Very good 5.00 (B)
85 – 100	Excellent 6.00 (A)

15. Language of instruction: Bulgarian/English