ΔΗΜΟΚΡΙΤΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΡΑΚΗΣ

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Sciences		
ACADEMIC UNIT	Department of Informatics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	815SKOE	**SEMESTER**	8th
COURSE TITLE	Blockchain Technology and Digital Currencies		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	5
Tutorial Exercises	1	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized General Knowledge, Skills Development
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course introduces students to the basic concepts, technical principles, and practical applications of blockchain technology and digital currencies. It provides an in-depth understanding of distributed ledgers, consensus protocols, cryptographic mechanisms, and smart contracts that support modern decentralized systems.

Particular emphasis is placed on analyzing real-world applications of blockchain technology in areas such as financial services, digital payments, supply chain, health, digital identities, public administration, and decentralized governance.

Upon successful completion of the course, students will be able to:

1. They explain the basic technological principles of blockchains and the role of cryptographic mechanisms.

2. Recognize the main types of digital currencies and understand the differences in their operation, technology, and regulation. 3. They analyze the architecture and performance of blockchain systems based on consensus mechanisms and scalability. 4. Describe and evaluate the architecture of smart contracts and their use in decentralized applications (dApps). 5. They understand legal and regulatory issues related to the use of digital currencies, as well as the development of blockchain applications. 6. They examine applications of blockchain technology in individual sectors (banking, identity, health, administration, DeFi, etc.) in order to understand technological possibilities and limitations.
General Competences *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?* *Search for, analysis and synthesis of data and information, with the use of the necessary technology* *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas* *Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
Search for, analysis and synthesis of data and information, with the use of the necessary technology Working independently Team work Generation of new research ideas

(3) SYLLABUS

1. Introduction to Blockchain Technology 2. Cryptography and Security in Blockchain Systems 3. Consensus Algorithms and Network Architectures 4. Digital Currencies and Types of Cryptocurrencies 5. Ethereum and Smart Contracts 6. Legal and Regulatory Framework for Digital Currencies 7. Blockchain Applications in Banking and Digital Payments 8. Blockchain in Supply Chains and Public Sector Services 9. Digital Identities and Self-Sovereign Identity (SSI) 10. Blockchain Applications in Health, Education, and Social Services 11. Decentralized Finance (DeFi), DAOs, and Governance through Smart Contracts 12. Climate and Energy Footprint of Blockchain Technology

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Learning process support through the moodle online platform (interaction, assignments, auxiliary material) Announcements via central department website Use email to communicate.

TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Final Grade = Final Exam Grade (50%) + Team Project Presentation (50%)

Activity	***Semester workload***
Lectures	26x2=52
Tutorial Exercises	13x2=26
Team project	25
Independent Study	25
Course total	***128***

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

- Drosatos, G., Mavridis, I., & Rantos, K. (2025). Foundations and Applications of Modern Cryptography [Undergraduate textbook]. Kallipos, Open Academic Editions. https://dx.doi.org/10.57713/kallipos-1067
- Patrikakis, C., Leligkou, H., & Kogias, D. (2023). Blockchain [Postgraduate textbook]. Kallipos, Open Academic Editions. https://dx.doi.org/10.57713/kallipos-171
- Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. Princeton University Press. ISBN: 978-0691171692.
- Verma, S. (2023). Blockchain Technology and Digital Currencies. Barnes & Noble. ISBN: 978-9361528040.
- Bashir, I. (2020). Mastering Blockchain: Unlocking the Power of Cryptocurrencies, Smart Contracts, and Decentralized Applications (3η έκδ.). Packt Publishing. ISBN: 978-1839213199.