University of Gdańsk

Subject card

Subject name and code	Cryptocurrencies and artificial intelligence: the future of finance, PG_00144000						
Field of study	Criminology						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2025/2026			
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery	e-learning			
Year of study	1		Language of instruction	Polish Polish			
Semester of study	1		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Law and Administration -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Damian Cyman					
	Teachers	dr Damian Cyman					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 30.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours	Self-study	SUM	
	Number of study hours	30		0.0	20.0	50	
Subject objectives	The aim of the course is to provide students with knowledge about the impact of cryptocurrencies and artificial intelligence on the financial market and finance in general. The course is designed to familiarize students with the regulatory, legal, economic, and technological aspects of applying cryptocurrencies and AI tools within the financial system, including in the areas of payment services, trading in financial instruments, and risk analysis. Participants will develop the ability to analyze technological solutions in terms of their compliance with applicable law and their potential implications for the financial sector and public administration.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
		The student has a structured understanding of the fundamentals of how cryptocurrencies, blockchain technology, and artificial intelligence algorithms function in the financial context. The student is familiar with current and proposed legal regulations concerning the use of cryptocurrencies and artificial intelligence in the financial sector. Skills The student is able to identify legal and regulatory risks associated with the use of cryptocurrency technologies and AI algorithms in financial services. The student analyzes and interprets legal acts and selected case law related to financial technologies. The student can prepare a report or legal opinion on the impact of technological solutions on the compliance of a financial institution with applicable regulations. The student demonstrates awareness of the legal and ethical responsibilities related to the design and application of technological solutions in the financial domain. The student is able to work in an interdisciplinary team and communicate effectively with experts from various fields (law, finance, IT).	

Subject contents

1. Introduction to Digital Technologies in Finance
Characteristics of digital transformation in the financial sector
Overview of fintech, regtech, and insurtech
The role of data and automation in modern finance
2. Cryptocurrencies and Blockchain Technology
Mechanisms of cryptocurrencies and distributed ledger technologies (DLT)
Bitcoin, Ethereum, and other digital assets: functions, differences, limitations
Smart contracts legal functions and practical applications
Asset tokenization and digital property rights
3. Regulatory Aspects of the Cryptocurrency Market
EU legal frameworks: MiCA, AML, PSD2, DORA
Liability of intermediaries: exchanges, wallets, service providers
Legal issues related to taxation, money laundering, and criminal liability
4. Artificial Intelligence in the Financial Sector
Core types and functions of AI: machine learning, NLP, expert systems
Applications of AI in financial services: credit scoring, risk management, compliance
Algorithms and discrimination the problem of automated decision-making
5. Legal and Ethical Frameworks for AI in Finance
AI Act and other EU regulatory initiatives for artificial intelligence
AI ethics: transparency, accountability, oversight, algorithmic auditing
Civil and administrative liability in the context of AI
6. Risk, Supervision, and Regulatory Compliance
Analysis of technological and operational risks (regtech)
Supervision mechanisms for the use of emerging technologies in banking and insurance
Best practices for implementing compliance policies in institutions using AI and/or blockchain
7. The Future of Finance: Trends and Challenges
DeFi, CBDCs, stablecoins emerging monetary models
Regulatory challenges in response to rapid technological change
Development scenarios and responsible oversight models

Prerequisites and co-requisites	Basic knowledge of civil and commercial law (in particular, contract structures, contractual liability, and legal forms of business activity). Understanding of the general principles of the financial system and capital markets. Ability to read and interpret legal texts and use legal terminology appropriately.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	50.0%	100.0%

Recommended reading

Basic literature	**K. Piech (red.)**, *Kryptowaluty i technologie blockchain wyzwania dla prawa i regulacji*, Uczelnia Łazarskiego, Warszawa 2021. **A. Glapiak, M. Królikowski**, *Sztuczna inteligencja w finansach. Uwarunkowania regulacyjne i etyczne*, Wolters Kluwer, Warszawa 2023. **K. Gromek Broc**, *MiCA. Nowe ramy regulacyjne dla rynku kryptowalut w UE*, Wolters Kluwer, Warszawa 2024. **Regulation (EU) 2023/1114 on Markets in Crypto-assets (MiCA)** tekst rozporządzenia wraz z motywami (dostępny online).
Supplementary literature	**J. Brynolf, M. Elsig (eds.)**, *AI and Financial Markets: Challenges, Regulation, and Governance*, Springer, 2022. **B. Casey**, *The Algorithmic Republic: Governing AI in the Financial Sector*, Oxford University Press, 2024.
eResources addresses	

Example issues/ example questions/ tasks being completed	What is blockchain technology and what are its applications in finance? What are the assumptions and legal implications of the MiCA Regulation? Is a smart contract considered a contract under civil law? How does a credit scoring algorithm work, and what legal risks does it entail? Liability for harmful decisions made by AI systems in banking. The limits of automated credit decision-making in light of the GDPR and the AI Act. Is DeFi (decentralized finance) subject to AML obligations? Artificial intelligence and discrimination against loan applicants a practical analysis.
Work placement	Not applicable

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