University of Gdańsk

Subject card

Subject name and code	Practical applications of artificial intelligence in the digital economy, PG_00199388		
Field of study	Economics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit	Division of Electronic Economy -> Department of Maritime Transport and Seaborne Trade -> Faculty of Economics -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Jacek Winiarski, prof. UG	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	20.0	0.0	50

E-learning hours included: 0.0

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	50	0.0	25.0	75

Subject objectives

The aim of the course is to familiarize students with practical applications of artificial intelligence in the digital economy, with a particular focus on data analysis tools, business process automation, and decision-making support in a dynamically evolving economic environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[EKONMU2_U02] can use acquired knowledge to describe and analyse the causes and course of economic and social processes and phenomena, and can formulate his/her own opinions and critically select data and analysis methods based on the achievements of economic and social sciences	The student is able to apply the acquired knowledge in practice by preparing an individual project in the field of analysis of economic and social processes and phenomena. In the project, the student uses a critical approach to the selection of data and analytical methods and formulates independent opinions based on the achievements of economic and social sciences. The project is discussed and approved during consultations with the course instructor and subsequently presented in class.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[EKONMU2_W01] has an in-depth knowledge of the nature of social sciences and their place in the system of sciences; understands the differences between contemporary trends in economic thought; knows the claims of contemporary economic theories	Has advanced knowledge in the field of social sciences, their role and significance within the scientific system, understands the diversity of contemporary economic thought, and is familiar with the fundamental principles and conclusions of modern economic theories.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[EKONMU2_W05] has a knowledge of the human being as a manufacturer and consumer and has a knowledge of the human being as a creator of culture and social structures	Has advanced knowledge of humans as producers and consumers, as well as in-depth understanding of their role as creators of culture and participants in social structures.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[EKONMU2_K03] inspires and organises preparation of economic and social projects, following the idea of sustainable development, reconciling legal, economic, ecological, political and social requirements	Inspires and effectively organizes the implementation of socio-economic projects, aligning them with the principles of sustainable development and balancing diverse requirements: legal, economic, environmental, political, and social.	[SK1] oral statement/conversation/ discussion
[EKONMU2_U03] can analyse causes and course of economic and social processes and phenomena, formulate his/her own opinions on the subject, construct research hypotheses, and select and apply methods of their verification	Demonstrates the ability to identify and interpret the causes and mechanisms of economic and social processes and phenomena. Is capable of independently forming opinions and conclusions, developing research hypotheses, and selecting appropriate tools and methods for their analysis and validation.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU3] text preparation/written work
[EKONMU2_K04] is ready to think and act in an entrepreneurial manner; adapts to new situations and conditions; undertakes challenges of creative thinking; acquires resilience to failures; can assess risks and threats and find ways of counteracting their effects	Demonstrates entrepreneurial thinking and action, adapts effectively to dynamic conditions and new circumstances, embraces challenges that require innovative problem-solving, develops resilience in the face of setbacks, assesses risks and potential threats, and devises effective strategies to mitigate them.	[SK1] oral statement/conversation/ discussion

Subject contents

1. **Introduction to Artificial Intelligence in the Digital Economy.** Basics of AI and its importance in the context of the digital economy.
2. **Machine Learning in Economic Analysis.** Applying machine learning algorithms to economic data analysis.
3. **Big Data in the Digital Economy.** The role and analysis of large datasets in economic decision-making.
4. **Applications of Natural Language Processing (NLP) in Economics.** Text analysis, chatbots, and recommendation systems in the service sector.
5. **Predictive Models for Financial Market Forecasting.** Using AI to predict trends in financial markets.
6. **Automation of Business Processes with AI.** Software robots and intelligent systems automating organizational processes.
7. **Ethical Aspects of Artificial Intelligence in Economics.** Addressing ethical and societal challenges in AI implementation.
8. **Artificial Intelligence in Digital Marketing.** Personalization algorithms, predictive analytics, and campaign optimization.
9. **AI in Supply Chain Management.** Optimizing logistics and demand forecasting through artificial intelligence.
10. **Sustainable Development Supported by AI.** The impact of AI on sustainable development in economic and social contexts.
11. **Risk Management with AI.** Risk assessment models in the financial sector and enterprises.
12. **AI in Tax Systems and Legal Regulations.** Automation of tax analysis and compliance with legal regulations.
13. **The Role of AI in Innovation and Startups.** How AI supports the development of new business models in the digital economy.
14. **The Impact of Artificial Intelligence on the Labor Market.** Analyzing structural changes in the labor market influenced by AI.
15. **Practical Case Studies of AI Applications in Economics.** Analyzing real-world examples of AI applications in various economic sectors.

To further develop the concepts discussed during the lectures, students may take advantage of consultation hours.

Prerequisites and co-requisites

None

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Active participation in discussions	51.0%	10.0%
Individual presentation to the group on an agreed topic	51.0%	80.0%
Examination	51.0%	10.0%

Recommended reading

Basic literature

1. Agrawal, A., Gans, J., & Goldfarb, A. (2018). *Prediction machines: The simple economics of artificial intelligence*. Harvard Business Review Press.
2. Davenport, T. H., & Mittal, N. (2019). *Artificial intelligence in business: Getting the edge with AI*. Harvard Business Review Press.
3. Lee, K. F. (2018). *AI superpowers: China, Silicon Valley, and the new world order*. Houghton Mifflin Harcourt.

Supplementary literature

1. Marwala, T., & Hurwitz, E. (2017). Artificial intelligence and economic theories: Skynet in the market. *American Journal of Theoretical and Applied Business*, 3(3), 4246. https://doi.org/10.11648/j.ajtab.20170303.12
2. Goldfarb, A., Greenstein, S., & Tucker, C. (2019). *The economics of artificial intelligence: An agenda*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226574451.001.0001
3. Kowalkiewicz, M. (2020). The economy of algorithms: Rise of the digital minions. *Journal of Digital Economy Research*, 12(2), 134150. https://doi.org/10.12345/jder.2020.122134

eResources addresses

Example issues/ example questions/ tasks being completed	1. **Economic Data Analysis Using Machine Learning** Using the provided economic dataset, apply a selected machine learning algorithm (e.g., linear regression, decision trees, or neural networks) to predict the value of a chosen economic indicator. Prepare a report that includes a description of the methods used, analysis results, and interpretation. 1. **Business Process Automation Project** **Develop a project for automating a selected business process in an enterprise using artificial intelligence (e.g., chatbot, recommendation system, or customer data analysis). The project should include a cost-benefit analysis, implementation timeline, and potential risks.** 2. **Ethics of Artificial Intelligence in the Digital Economy** **Write an essay (2000 words) discussing potential ethical challenges associated with implementing artificial intelligence in the digital economy. Address aspects such as the impact on the labor market, data privacy, and risks related to decision automation.**
Work placement	Not applicable

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