University of Gdańsk

Subject card

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| Subject name and code | AI in logistics , PG_00198992 | | | | | | |
| Field of study | Economics | | | | | | |
| Date of commencement of studies | October 2026 | | Academic year of realisation of subject | 2028/2029 | | | |
| Education level | Bachelor's studies | | Subject group | Obligatory subject group in the field of study<br>Optional subject group<br>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 | 3 | | Language of instruction | Polish | | | |
| Semester of study | 6 | | ECTS credits | 1.0 | | | |
| Learning profile | academic | | Assessment form | credit | | | |
| Conducting unit | Department of Logistics -> Faculty of Economics -> Rector | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | mgr Dariusz Weiland | | | | |
| | Teachers | | | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15 |
| | 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 | 15 | | 2.0 | | 8.0 | 25 |
| Subject objectives | The aim of the course is to familiarize students with the possibilities of using artificial intelligence tools and methods in modern logistics and supply chain management. The course combines an interdisciplinary approach - combining knowledge from the field of economics, logistics and new technologies.<br>As part of the course, the student will:<br>understand the role and importance of artificial intelligence in the optimization of logistics processes (e.g. demand forecasting, warehousing automation, transport management),<br>learn about basic AI tools (e.g. machine learning, neural networks, recommendation systems) and ways of using them in logistics,<br>acquire the skills to identify areas in logistics where AI implementation can bring added value,<br>analyze real examples of AI use in the activities of logistics and trade companies (e.g. Amazon, DHL, InPost, Allegro).<br>The course also develops competences related to the critical assessment of risks, ethical aspects and barriers in the implementation of AI technology in the logistics sector. | | | | | | |

Learning outcomes

| Course outcome | Subject outcome | Method of verification |
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| [EKONL3_K01] recognises the importance of economic knowledge in identifying and solving economic problems and of consulting experts when difficulties in solving them independently | The student appreciates the importance of interdisciplinary economic and technological knowledge in the analysis and solution of logistics problems using AI. | [SK1] oral statement/conversation/ discussion |
| [EKONL3_U06] uses the knowledge acquired in economics, finance and management to solve economic and social dilemmas arising in the professional context | Student uses knowledge of economics and management to resolve dilemmas related to the implementation of AI in logistics. | [SU1] oral statement/conversation/ discussion<br>[SU4] test/exam - oral or written |
| [EKONL3_U01] can correctly interpret economic and social phenomena and apply knowledge of economics, finance and management sciences to explain economic phenomena | The student is able to analyze and interpret phenomena related to the use of AI in logistics using knowledge of economics and management. | [SU1] oral statement/conversation/ discussion<br>[SU4] test/exam - oral or written |
| [EKONL3_U15] is able to independently supplement and improve his acquired knowledge and skills in the field of economics, is open to new concepts and solutions, and demonstrates a willingness to engage in lifelong learning and to cooperate and exchange knowledge with other participants in the learning process. | Student is ready to independently develop knowledge of AI, learn new technologies, and interact with experts and practitioners. | [SU1] oral statement/conversation/ discussion |
| [EKONL3_W04] knows the types of economic and social ties and the regularities governing them | The student knows the types of connections between participants in digital supply chains and the principles governing them in the context of the use of AI technologies. | [SW4] test/exam - oral or written |
| [EKONL3_W05] has a knowledge of man as a subject who creates social structures and the principles of their functioning and of his action in these structures, knows well the motives of human economic decision-making | The student understands the importance of humans as decision-makers in automated logistics systems and the impact of AI on their behavior and motivations. | [SW4] test/exam - oral or written |
| [EKONL3_W06] has an advanced knowledge of selected methods and tools, including statistical and econometric techniques, for describing economic agents and structures as well as social institutions and the processes taking place in them | The student knows the methods and tools (including statistical and econometric ones) used in the analysis of logistics data and the implementation of AI in logistics. | [SW4] test/exam - oral or written |
| [EKONL3_W10] knows and understands concepts and principles of industrial property, intellectual property and copyright law | The student knows the basic principles of intellectual property protection in the context of the development and implementation of AI tools in the logistics sector. | [SW4] test/exam - oral or written |
| [EKONL3_W08] has an advanced knowledge of the processes of changing elements, enterprises and whole structures of economic organisations, as well as the processes of changing social institutions, knows what their causes, course, scale, consequences are and what the influence of external stakeholders is on them | Student has knowledge of the impact of artificial intelligence on changes in logistics structures and processes in enterprises and organizations. | [SW4] test/exam - oral or written |
| [EKONL3_U02] is able to use the knowledge of theory and data to analyse concrete economic and social processes and phenomena and to analyse these phenomena using methods developed in economics, finance and management sciences | The student is able to obtain and use data to analyze the effectiveness of AI application in logistics processes. | [SU1] oral statement/conversation/ discussion<br>[SU4] test/exam - oral or written |

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| Subject contents | 1. Introduction to AI: Basics and Applications in the Economy: Concepts: AI, ML, Big Data, Algorithms, Automation. Overview of AI Applications in Business and Logistics.<br>2. AI in Supply Chain Management (SCM): Process Optimization: Demand Forecasting, Automated Ordering, Risk Analysis in Supply Chains.<br>3. AI in Warehouse and Distribution Logistics: Warehouse Management Systems (WMS) with AI, Robotics, Picking, Route and Transport Optimization.<br>4. AI in Last Mile Delivery and City Logistics: Routing Algorithms, Dynamic Planning, ETA Prediction, Using IoT and GPS Data<br>5. Recommender Systems and Intelligent Customer Service in Logistics: AI in Customer Interaction: Chatbots, Delivery Recommendations, Returns Management, and Customer Behavior Prediction.<br>6. Challenges, Barriers and Ethical Aspects of Implementing AI in Logistics: Data Issues, Privacy, Trust, Dehumanization of Work, Impact of AI on Employment and Responsibility of Decisions.<br>7. Case Study: Amazon, DHL, InPost, Alibaba Analysis of AI Solutions: Case Studies, Discussion<br><br>Any doubts regarding the issues discussed during classes can be discussed during consultations. |
| Prerequisites and co-requisites | The student should have:<br>Basic knowledge of logistics and supply chain management, acquired during previous subjects, i.e. Fundamentals of Logistics<br>Elementary knowledge of economic data analysis, statistics and mathematical economics - enabling understanding of the use of AI algorithms acquired during the subjects: information technologies, methods and tools for describing economic systems. |

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
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| test | 51.0% | 100.0% |

**Recommended reading**

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| Basic literature | Weiland, D., & Wierzbowski, P. (2021). Sprawność procesów logistyki informacji w obliczu rozwoju sztucznej inteligencji. In C. Mańkowski & L. Reszka (eds.), *Modelowanie procesów i systemów logistycznych* (Vol. 22, pp. 259280). Wydawnictwo Uniwersytetu Gdańskiego.<br><br>Weiland, D., & Wierzbowski, P. (2020). *Logistyka informacji w gospodarce 4.0* (p. 173). Wydawnictwo Uniwersytetu Gdańskiego.<br><br>Szymczak, M., (2020). Inteligentna logistyka i inteligentny łańcuch dostaw / Maciej Szymczak. *Technologie cyfrowe w biznesie: przedsiębiorstwa 4.0 a sztuczna inteligencja*. |
| Supplementary literature | Gozdek, Agnieszka, and Emilia Kuciaba. Transportation in the Age of Artificial Intelligence / Agnieszka Gozdek, Emilia Kuciaba. *Przyszłość Mobilności i Logistyki Jako Przedmiot Badań Nauk Społecznych.* N.p., 2020 |
| eResources addresses | |

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| Example issues/ example questions/ tasks being completed | |
| Work placement | Not applicable |

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