COURSE DESCRIPTION CARD - SYLLABUS

Course name
Digital supply chains [N2Log2-MPTS>CŁD]

Course

Field of study
Logistics

Year/Semester
2/3

Area of study (specialization)
Manager of a Transport and Forwarding Company

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture
10

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
10

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student knows the basics of logistics and supply chain management.

Course objective

The aim of the course is to familiarize students with the idea of digital supply chains and guidelines for the transformation of supply chains aimed at ensuring transparent and intelligent supply chains. Students will learn about the possibilities of digitization and learn about the techniques and tools for managing changes in supply chains in the era of digitization and the fourth industrial revolution.

Course-related learning outcomes

Knowledge:
1. Student knows extended concepts for logistics and its detailed problems and digital supply chain management [P7S_WG_05]
2. Student knows detailed methods, tools and techniques characteristic for digital supply chains [P7S_WK_01]

Skills:

1. Student can collect on the basis of the literature of the subject and other sources (in Polish and English) and in an orderly manner, provide information on the problem within the framework of digital supply chain management [P7S_UW_01]
2. Student can communicate using appropriately selected resources in a professional environment and in other environments as part of logistics and its specific issues as well as digital supply chain management [P7S_UW_02]
3. Student can make a critical analysis of technical solutions used in the analyzed logistics system from the point of view digitalization [P7S_UW_04]
4. Student can assess the suitability and the possibility of using new achievements (techniques and technologies) in the field of digital supply chains [P7S_UW_06]
5. Student can formulate and solve tasks through interdisciplinary integration of knowledge from different fields and disciplines used to design digital logistics systems [P7S_UO_01]
6. Student can identify changes in requirements, standards, regulations, technical progress and the reality of the labor market, and on their basis determine the need to supplement own and other knowledge [P7S_UU_01]

Social competences:
1. Student recognize causal relationships in achieving the set goals and grading the significance of alternative or competitive tasks [P7S_KK_01]
2. Student is aware of responsibility for own work and readiness to comply with the rules of working in a team and taking responsibility for the tasks carried out jointly [P7S_KR_01]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Test, pass mark: 50% points.
Project: Problem tasks Z1, Z2, Z3 - each for 15 points. Presentation for 20 points. Final report for 35 points.

Programme content

Lecture: Changes in supply chain management, Logistics 4.0 / Supply chain 4.0. Digitization of supply chains. Tools and technologies within the Supply chain 4.0. Challenges and threats of digitization of supply chains. Data management in digital supply chains. The essence of blockchain. Cybersecurity in supply chains. Planning and forecasting in digital supply chains. Examples of practical applications of digitization in supply chains.
Project: Analysis of case studies within the digitization of supply chains. Design transforming digital supply chains.

Course topics

1. Changes in supply chains. Digital supply chains – introduction, big data and AI. Examples of AI applications.
2. CEP (courier, express, parcel) industry and last mile. Scope of digital transformation.
3. GPS, Internet of Things – essence, development, areas of application.
4. Cloud systems and edge.
5. Cybersecurity and edge computing.
6. Impact of digital technologies on CO2 reduction.
7. V2X technology, CAV, and the role of ADAS.
8. The essence of blockchain and its application in supply chains.

Teaching methods

Lecture: information lecture, discussion.
Project: work in project groups, brainstorming, design thinking, presentation.

Bibliography

Basic:
1. Agrawal P., Narain R., Digital supply chain management: An Overview, In IOP Conference Series: Materials Science and Engineering (Vol. 455, No. 1, 2018, s. 012074), IOP Publishing, 2018.

2. Cañas H., Mula J., Campuzano-Bolarín F., A general outline of a sustainable supply chain 4.0., Sustainability 12.19 (2020): 7978.
3. Garay-Rondero C.L., Digital supply chain model in Industry 4.0., Journal of Manufacturing Technology Management, 2020.

Additional:
1. Ellefsen A.P.T., Striving for excellence in AI implementation: AI maturity model framework and preliminary research results, LogForum 15.3, 2019.
2. Frederico G.F., Supply Chain 4.0: concepts, maturity and research agenda, Supply Chain Management: An International Journal, 2019.
3. Stachowiak A., Oleśków-Szłapka J., Framework of the Model of Dissemination and Absorption of Logistics 4.0 Solutions - Causal Loop Dynamics of Relations Between Academia and Business, Smart and Sustainable Supply Chain and Logistics-Trends, Challenges, Methods and Best Practices, Springer, Cham, 2020, s. 323-337.
4. Queiroz M.M., Industry 4.0 and digital supply chain capabilities: A framework for understanding digitalisation challenges and opportunities, Benchmarking: an international journal, 2019.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	20	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,50