Polish course name	**INFORMATYZACJA PROCESÓW TRANSPORTOWYCH I MAGAZYNOWYCH**
English course name	**COMPUTERIZATION OF TRANSPORT AND WAREHOUSE PROCESSES**
Course code	**WIP-MDL-D1-COTAW-07**
Field of study	**Materials design and logistics**
Level of qualification	**First degree**
Form of study	**Full-time**
Semester	**7**
Number of ECTS points	**2**
Ways of assessment	**Exam**

Number of hours per semester

Lecture	Seminar	Classes	Laboratory	Project
15			30	

TEACHERS:

Dr inż. Rafał Niedbał.

COURSE OBJECTIVES:

› **C1** Introducing students with the principles of computerization of transport and warehouse processes in the enterprise.

› **C2** Introducing students with IT and economic instruments supporting the planning of IT infrastructure in warehouses.

PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES:

1. Basic knowledge of logistics.
2. Knowledge and skills in the field of functioning of enterprises in which there are transport and warehouse processes.
3. Knowledge of the functionality of ERP-class IT systems oriented on the efficiency of logistics processes.

COURSE CONTENT

LECTURE

- **L1** Organizational classes, familiarizing students with work in the e-learning mode.
- **L2** Basic concepts: warehouse processes, transport processes, computerization of warehouse and transport processes, logistic IT system.
- **L3** The use of UML in modeling information systems supporting logistic management in an enterprise - a use case diagram, documentation of use cases.
- **L4** The use of UML in modeling information systems supporting logistic management in an enterprise - class diagram.
- **L5** Sectors determining the development of logistics versus IT in logistics. The use of information and telecommunications technologies in warehouse logistics.
- **L6** Development line of IT systems supporting logistic management in the enterprise. Logistic IT system of MRP class - Material Requirements Planning.
- **L7** Logistics IT system of ERP class - Enterprise Resources Planning.
- **L8** Warehouse Management Systems - WMS. Mobile WMS and WCS systems.
- **L9**, **L10** The selection and implementation of technology in warehouse management on the example of a Warehouse Management System. An example of the functionality of the WMS system.
- **L11** Supply Chain Management systems - SCM.
- **L12** Electronic data interchange.
- **L13** GS1 Global Identification System.
- **L14**, **L15** Directions of using cloud computing in logistics.

LABORATORY

- **Lab1, Lab2** Introductory laboratory classes - making acquainted with conditions of obtaining credit in the subject.
- **Lab3, Lab4** Analysis of the current state of computerization of warehouse and transport processes in the enterprise.
- **Lab5 - Lab10** Analysis of transport and warehouse processes in the enterprise before the implementation of the IT system - creating flowcharts.

- **Lab11, Lab12** Analysis of the possibilities of improving the functioning of warehouse and transport processes in the enterprise with the use of selected IT technologies.
- **Lab13 – Lab16** Designing computerization of warehouse and transport processes of the enterprise. Pre-implementation analysis - analysis of system user requirements, analysis of IT infrastructure.
- **Lab17 - Lab18** Modeling of the IT system supporting the management of warehouse and transport processes - creating a use case diagram.
- **Lab19 - Lab22** Modeling of the IT system supporting the management of warehouse and transport processes - creating documentation of use cases.
- **Lab23 - Lab26** Modeling of the IT system supporting the management of warehouse and transport processes - creating a class diagram.
- **Lab27 - Lab30** Presentation, discussion of projects and their evaluation.

BASIC REFERENCES

1. Ocicka B. (red.) (2018), Technologie mobilne w logistyce i zarządzaniu łańcuchem dostaw, Warszawa: Wydawnictwo Naukowe PWN.
2. Wieczerzycki W. (red.) (2012), E-Logistyka, Warszawa: Polskie Wydawnictwo Ekonomiczne.
3. Wrycza S., Marcinkowski B., Maślankowski J. (2012), UML 2.x. Ćwiczenia zaawansowane, Helion, Gliwice.
4. Szymonik A. (2010), Technologie informatyczne w logistyce, Warszawa, Wydawnictwo PLACET.
5. Ficoń K. (2009), Logistyka techniczna: infrastruktura logistyczna, Warszawa BEL Studio, 2009.

SUPPLEMENTARY REFERENCE MATERIALS

1. Niemczyk A. (2010), Zarządzanie magazynem, Poznań: Wyższa Szkoła Logistyki.
2. Wrycza S., Bartosz Marcinkowski B., Wyrzykowski K. (2005), Język UML 2.0 w modelowaniu systemów informatycznych, Wydawnictwo HELION, Gliwice.
3. Kudelska I., Niedbał R. (2020), Technological and Organizational Innovation in Warehousing Process - Research Over Workload of Staff and Efficiency of Picking Stations, Ekonomie a Management, Vol.23, Iss.3, s. 67-81, URL:

http://147.230.18.117/handle/15240/157481, DOI: 10.15240/tul/001/2020-3-005.
4. Kudelska I., Niedbał R. (2021), The Impact of Organizational Change on the Improvement of the Picking Process in a Logistics Center - a Case Study, European Research Studies Journal, Vol.24, Iss.2B, s. 882-892. URL: https://www.ersj.eu/journal/2297, DOI: 10.35808/ersj/2297.

LEARNING OUTCOMES

› **EU1** Student has basic knowledge in the field of computerization of transport and warehouse processes in the enterprise.
› **EU2** Student describes IT and economic instruments supporting warehouse management.
› **EU3** Student characterizes the methods of planning the development of IT infrastructure in transport bases and warehouses.
› **EU4** Student has basic knowledge of the effectiveness of logistics processes in terms of processes.

TEACHING TOOLS

› Lecture with the use of audiovisual equipment/E-learning platform.
› Laboratory - desktop computers with access to the Internet.
› Standard Microsoft Office software.
› Free software available at: https://app.diagrams.net/.

WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

› **F1**. Assessment of the implementation of tasks included in the course guide.
› **F2**. Assessment of reports from laboratory classes.

P1. Assessment of the mastery of the teaching material during lectures and laboratories - examination in the form of a test.

STUDENT WORKLOAD

Form of activity	Number of hours	ECTS
Contact hours with the teacher		
Lectures	15	0,6
Seminar		
Classes		
Laboratory	30	1,2
Project		
Test		
Exam	2	0,08
Total contact hours	47	1,88
Student's own work		
Getting acquainted with the indicated literature		
Preparation for seminar		
Preparation for classes		
Preparation for lab		
Project preparation		
Consultation	2	0,08
Preparation for the exam	1	0,04
Total student's own work	3	0,12
Total number of hours/ ECTS points for the course	**50**	**2,0**

ADDITIONAL INFORMATION

Timetable of classes	https://wip.pcz.pl/dla-studentow/plan-zajec/studia-stacjonarne
Information about the consultation (time + place)	https://wip.pcz.pl/dla-studentow/konsultacje-dla-studentow

MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program	Course objectives	Course content	Ways of assessment
EU 1	K_W01, K_W02, K_U04, K_U05, K_K01, K_K02,	C1	L1 - L15, Lab1 - Lab30	P1, F2
EU 2	K_W01, K_W02, K_W07, K_U05, K_U07, K_K01, K_K02,	C2	L1 - L15, Lab1 - Lab30	P1, F2
EU 3	K_W01, K_W02, K_W05, K_U04, K_U05, K_K01, K_K02,	C1, C2	L1 - L15, Lab1 - Lab30	P1, F1, F2
EU 4	K_W01, K_W02, K_W06, K_U04, K_U05, K_K01, K_K02,	C1, C2	L1 - L15, Lab1 - Lab30	P1, F1, F2

FORM OF ASSESSMENT - DETAILS

EU1 Student has basic knowledge in the field of computerization of transport and warehouse processes in the enterprise.

- 2,0 Student has no knowledge of the computerization of transport and warehouse processes in the enterprise.
- 3,0 Student only partially knows the basic knowledge in the field of computerization of transport and warehouse processes in the enterprise.
- 3,5 Student almost knows the basic knowledge in the field of computerization of transport and warehouse processes in the enterprise.
- 4,0 Student knows the basic knowledge in the field of computerization of transport and warehouse processes in the enterprise.

- 4,5 Student knows almost very well the basic knowledge in the field of computerization of transport processes in the enterprise.
- 5,0 Student knows very well the basic knowledge in the field of computerization of transport processes in the enterprise.

EU2 Student describes IT and economic instruments supporting warehouse management.

- 2,0 Student does not know any IT and economic tools supporting warehouse management.
- 3,0 Student partially knows the IT and economic instruments supporting warehouse management.
- 3,5 Student almost knows the IT and economic instruments supporting warehouse management.
- 4,0 Student knows the IT and economic instruments supporting warehouse management well.
- 4,5 Student knows almost very well the IT and economic instruments supporting warehouse management. He is almost very good at independently analyzing processes that improve the functioning of warehouses.
- 5,0 Student knows very well the IT and economic instruments supporting warehouse management. He is able to independently analyze processes that improve the functioning of warehouses.

EU 3 Student characterizes the methods of planning the development of IT infrastructure in transport bases and warehouses.

- 2,0 Student does not know the methods of planning the development of IT infrastructure in transport bases and warehouses.
- 3,0 Student partially knows the methods of planning the development of IT infrastructure in transport bases and warehouses.
- 3,5 Student can almost plan the development of IT infrastructure in transport bases and warehouses.
- 4,0 Student is able to plan the development of IT infrastructure well in transport bases and warehouses.
- 4,5 Student is almost very good at planning the development of IT infrastructure in transport bases and warehouses.
- 5,0 Student is able to plan the development of IT infrastructure very well in transport bases and warehouses.

EU 4 Student has basic knowledge of the effectiveness of logistics processes in terms of processes.

- 2,0 Student has no knowledge of the effectiveness of logistics processes in terms of processes.
- 3,0 Student has a partial knowledge of the effectiveness of logistics processes in terms of processes.
- 3,5 Student has almost knowledge of the effectiveness of logistic processes in terms of processes.
- 4,0 Student has a good knowledge of the effectiveness of logistics processes in terms of processes.
- 4,5 Student has almost a very good knowledge of the efficiency of logistics processes in terms of processes.
- 5,0 Student has a very good knowledge of the effectiveness of logistics processes in terms of processes.