THE INTERNATIONAL UNIVERSITY OF LOGISTICS AND TRANSPORT IN WROCLAW

SYLLABUS

Teacher					
Course	Computer science and data analysis in logistics				
Module	Compulsory subjects	ECTS	4	Course code	23SM.P.L.A.8.1

Major	Speciality	Academic year
LOGISTICS	Industrial systems engineering	2023/2024

Semester	First	Year of studies	First

Type of studies	Full-time				Extramural			
Type of classes	Lecture	Exercise	Laboratories	Project	Lecture	Exercise	Laboratories	Project
Amount of hours	30	30						
TOTAL	60							

Course objectives	**The main goal of the course is becoming familiar with IT tools which support supply chain management networks in times of e-economy.**

Minimum knowledge required from the student before the classes beginning
Knowledge in the field of logistics as well as management information systems and computer science basic tools (MS Office package)

Recommended literature to study before the classes beginning
Shmueli G., Bruce P.C., Yahav I., Patel N.R., Lichtendahl K.C., Data Mining for Business Analytics: Concepts, Techniques, and Applications in Python, Wiley, 2020

LEARNING OUTCOMES			KEK	METHODS OF ASSESSMENT	
KNOWLEDGE	K01	**Present and explain various data collection techniques; proficiently explain the importance of IT systems in logistics management**	**K2_W04_L_P**	EM1 EM9	Oral exam. Written test with computational tasks
	K02	**Demonstrate proficiency in knowledge and understanding of IT tools which support supply chain management networks in times of e-economy**	**K2_W08_L_P**	EM1 EM9	Oral exam. Written test with computational tasks
	K03	**Proficiently identify describe and analyse IT tools for support logistics processes**	**K2_W05_L_P**	EM1 EM9	Oral exam. Written test with computational tasks
	K04	**Explain selected methods of IT support logistic processes and systems and methods and techniques used in logistics planning. Proficiently explain them in English**	**K2_W04_L_P K2_W08_L_P**	EM1 EM9	Oral exam. Written test with computational tasks
SKILLS	S01	**Utilize integrated knowledge from various logistics fields, as well as to select appropriate methods and tools for identify, interpret, describe and analyse problems and areas of logistics and its conditions**	**K2_U01_L_P**	EM1 EM10	Oral exam. Written test in the form of open tasks. Project evaluation
	S02	**Demonstrate proficiency to initiate and manage logistics projects using IT tools. Utilize ability to formulate and present in English the general and functional strategies for enterprises and logistics services on the domestic and international market**	**K2_U03_L_P K2_U09_L_P**	EM10 EM15	Project evaluation Evaluation of activity in the class-room
	S03	**Student gather the basic skill in the area of database design and implementation**	**K2_U04_L_P K2_U09_L_P**	EM1 EM8	Oral exam. Written test in the form of open tasks
	S04				
SOCIAL COMPETENCE	SC01	**Demonstrate proficiency to the independently and critically acquisition of knowledge and skills regarding the implementation of IT tools for logistics management**	**K2_K03_L_P**	EM16	Assessment of the work, students co-operation in the classroom
	SC02	**Utilize ability to think and act in an entrepreneurial way and is prepared to create and organize economic projects**	**K2_K03_L_P**	EM15 EM16	Evaluation of activity in the lab. Project evaluation Evaluation of activity in the classroom
	SC03	**Demonstrate proficiency to cooperate for the preparation of economic projects, taking into account legal, economic and technical aspects and understand the effects of the actions taken, including their impact on the environment and the related responsibility for the decisions made.**	**K2_K05_L_P**	EM15 EM16	Evaluation of activity in the lab. Project evaluation Evaluation of activity in the classroom

Course contents	Lecture	• Logistics management • Logistics system • Information system vs. IT system • Conditioning of IT support for logistics 2.The organization of data and databases • Basic concepts of databases • The architecture of database systems • Basic models of databases (hierarchic, network, object, relational) • Issues of relational databases design • Data warehouses • The presentation and discussion on rules governing model databases (data warehouses) in ORACLE system 3. The organization of data and databases • Database design for a part of logistics chain support system (ERD diagram) • Converting of a prepared model to a relational database • Preparing an invoice sheet with the usage of database and 'search' function 4.Expert models in logistics systems • Introduction to methods of artificial intelligence and to expert systems • Presentation of concepts (neuron networks, genetic algorithms, fuzzy systems, algorithms based on the theory of mathematical evidence, minimum-distance algorithms) • Designing of expert systems for logistics support • Practical application of expert methods in logistics systems and the possibility to develop these systems
	Laboratories	1. Expert models in logistics systems • Designing an expert system which supports intelligent management of a supply chain and production planning with the usage of combination rule of Dempster-Shafer, fuzzy sets and k-NN algorithm. • Practical checking of the correctness of a designer model. 2. Computer networks. The Internet • Basic concepts connected with networks • Computer networks design • The Internet. 3. E-signature • Introduction • E-documents protection • E-signature • Methods of information encoding • Digital certificates • Public key infrastructure 4. E-signature – exporting a certificate • Acquiring a qualified certificate for information protection and exporting it to a certificate warehouse. • Protection of an e-mail box by means of a certificate 5.Automatic identification of marketed products • Basic concepts connected with barcodes • Types of barcode : EAN-13, EAN-8, EAN-128, CODE 39, CODE 128, ITF.

Teaching methods	**TM2 TM11**	**A lecture with a multimedia presentation, topic-related films, discussions**
	TM14	**Laboratories – experiment and laboratory analysis**
	TM8	**Project method**

Obligatory literature	1	Chopra S., Supply Chain Management: Strategy, Planning, and Operation, Pearson, 2019
	2	Sanders N.R., Big Data Driven Supply Chain Management: A Framework for Implementing Analytics and Turning Information into Intelligence, Pearson, 2019
	3	Min H., Global Business Analytics Models: Concepts and Applications in Predictive, Descriptive and Prescriptive Analytics, Springer, 2018

Additional literature	1	Tan P.N., Steinbach M., Karpatne A., Kumar V., Introduction to Data Mining, Pearson, 2018
	2	Kernighan B., *Understanding the Digital World. What you need to know about computing, the Internet, privacy, and security*, Princeton University Press 2017
	3	Waller M.A., Fawcett S.E., Data Science, Predictive Analytics, and Big Data: A Revolution That Will Transform Supply Chain Design and Management, Pearson, 2018

Requirements to pass the course
The lab grade is composed of the following elements: 40% grade from practical classes, 60% a project of a system that supports sales, warehouse, production and logistics designer in Q-TORAGA 3000 system of QBS company. The lecture is completed with an oral exam which refers to subject-matter of the course. To get a satisfying mark for the exam, the student must get 50% of the points from the base sum. The share of each assessment in the final mark in the Assessment part is as follows: 50% assignment, 50% exam.