GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Informatics, PG_00044579		
Field of study	Transport		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Obligatory subject group 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	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Railway Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Roksana Licow	
	Teachers	dr inż. Roksana Licow dr hab. inż. Dawid Ryś	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	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	45	2.0	25.0	72

Subject objectives	The main aim of the course is to showing IT issues used in the transport. In the course, will be discuss issues : - SQL databases, - information technology, - artificial intelligence, - machine learning, - IoT (internet of things), - Big Data (big data sets), - Data Minning.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] has basic knowledge of informatics, electronics, telecommunications, automation and control, information technologies, computer graphics, geodesy and satellite navigation which is useful for understanding how it can be applied in transport	After final the course, the student has knowledge of information technologies supporting the following fields of transport: - transport infrastructure (line, point), - diagnostics, - traffic engineering, - transport security (cybersecurity), - capital and personnel management.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U05] able to use IT and graphic techniques typically used for the design, construction, operation and diagnosis of means and systems of transport	Student can to design the concept of transport database. Student can to transfer the designed concept to a database in SQL. Student can to use the data contained in the database and then it implement in a spreadsheet and conducted analysis using Power Pivot.	[SU1] Assessment of task fulfilment

Subject contents

1. Introduction to SQL databases.
2. Concepts: entity, attribute, record, primary key, foreign key.
3. Computer support in the design of infrastructure and rolling stock.
4. Examples of databases in the transport fields.
5. Traffic engineering using IT technology.
6. IT in transport management.
7. Artificial intelligence, machine learning.
8. IoT (Internet of Things).
9. IT in transport safety.
10. Operations on data sets, the use of the JOIN clause in joining tables.
11. Data Minning is used to solve problems in big data analytics.
12. Data analysis in a spreadsheet using Power Pivot.
13. Architecture of database systems. Storage procedure. Transaction.
14. Repetition to the test.
15. Test.

Prerequisites and co-requisites

The student has knowledge of working in a spreadsheet program, eg MS Excel.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	60.0%	50.0%
Project 2	50.0%	25.0%
Project 1	50.0%	25.0%

Recommended reading

Basic literature

1. Garcia-Molina H., Ullman J., Widom J. Database systems. Complete manual, Helion 2011
2. Sacha K. software engineering, Wydawnictwo Naukowe PWN, Warszawa 2010
3. https://www.postgresql.org/docs/8.3/index.html access: 1.10.2020 r.
4. Ligęza A. Data Aggregation and Grouping. Aggregation Functions. GROUP BY and HAVING options. Lecture materials.

Supplementary literature

1. Dutkiewicz J., Okulewicz J.: Simulation modeling of a suburban railway line. Prace Naukowe Politechniki Warszawskiej z. 119 2017,
2. Kornaszewski M., Sierociński M.: Network IT systems in Polish rail transport in the period of political and technological changes. Prace Naukowe Politechniki Warszawskiej 2014,
3. The process of preparing the train timetable, organization and management. Autobusy 1805 12/2016,
4. Raport Railway Business Forum: Problems of Polish railways in the field of IT 2010 Poznań,
5. Rudowski M.: Contemporary IT solutions and trends versus current challenges at PKP, Problemy Kolejnictwa zeszyt 175, czerwiec 2017.

eResources addresses

Adresy na platformie eNauczanie:

Informatyka sem. III Transport - Moodle ID: 20805
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=20805

Example issues/ example questions/ tasks being completed

Design a date base concept, in transport security, in MS SQL Server Studio.Explain the terms: entity, attribute, record, foreign key, primary key.What is the "having" selection clause used for?

Work placement	Not applicable