COURSE DESCRIPTION CARD - SYLLABUS

Course name
Information systems in transport [S1Trans1>SIwT]

Course

Field of study
Transport

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

KNOWLEDGE: Basic knowledge of modern IT techniques, theory of computer science and mathematics SKILLS: Ability to use MS Office office programs (in particular MS Excel spreadsheets) in terms of basic functionality SOCIAL COMPETENCES: The student is aware of the possibility of creating a competitive advantage through the use of modern information technologies

Course objective

To acquaint students with the basics of information and IT systems applicable in transport. Students learn the basics of modern information systems used in transport, theoretical and practical aspects related to the use of information and information systems in various fields of transport.

Course-related learning outcomes

Knowledge:
The student has an extended and deepened knowledge of mathematics useful for formulating and solving complex technical tasks concerning various means of transport.
The student has knowledge of important development trends and the most important technical achievements and of other related scientific disciplines, in particular transport engineering.

The student knows the basic techniques, methods and tools used in the process of solving tasks in the field of transport, mainly of an engineering nature engineering.

Skills:
The student can properly use information and communication techniques, applicable at various stages of the implementation of transport projects.
Student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods.
The student is able to assess the computational complexity of algorithms and transport problems.

Social competences:
The student understands that in technology, knowledge and skills very quickly become obsolete.
The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life.
The student is aware of the social role of a technical university graduate, in particular, he/she understands the need to formulate and transfer to the society, in an appropriate style, information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the transport engineer profession.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Assessment of student activity during laboratory classes; assessment of the degree of implementation of laboratory tasks on the basis of the submitted reports and generated result files.
Assessment taking into account the activity of students during lectures and a test on the material studied (checking the understanding of basic concepts and knowledge of the issues covered by the program of the subject).

Programme content

1. IT systems in transport, computer classification, von Neunmann architecture, PC architecture, operating system, binary coding
2. MS Office, MS Word (automation, styles, equation editor), MS PowerPoint (templates), MS Excel (functionality, modeling decision problems, Solver). Creating a databases in MS Excel, applying advanced formulas, pivot tables, pivot charts.
3. Visual Basic, macroinstructions, macro recorder, macro editor, menu customization in MS Excel, macro security. Subroutines, variables, operators, conditional statements, application of VBA functions.
4. Database, SZDB, transactions, SZBD architecture, relational data model, database for GIS, good practices in database design. MS Access, modeling, tables, relations, forms. Modeling, queries, reports.
5. Computer network, IP addressing, DNS, local computer network. Network structure, IP addressing, Internet access, resource sharing.
6. IT systems, IT system architecture, client-server architecture, peer-to-peer (p2p) architecture, layered architecture.
7. Algorithms, notation methods, step notation, flowchart, examples. Finite automata, Mealy automata, Moore automata, Markov decision processes, decision strategies.

Course topics

none

Teaching methods

1. Lecture with multimedia presentation
2. Laboratories - creating solutions to illustrate the issues discussed during lectures using simple (spreadsheet) and advanced methods of data processing automation and modeling of transport problems (Macros, VBA, APIs)

Bibliography

Basic
1. Bielecka E., Systemy Informacji Geograficznej - teoria i zastosowania, Wydawnictwo PJWSTK, Warszawa 2006
2. Długosz J. : Nowoczesne technologie w logistyce. PWE, Warszawa 2009
3. Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind: GIS. Teoria i praktyka. Wydawnictwo Naukowe PWN, Warszawa, 2006
4. Jacek Januszewski: Systemy satelitarne GPS, Galileo i inne. Wydawnictwo Naukowe PWN, Warszawa, 2006
Additional
1. TransCAD - Routing and Logistics. Caliper, 2003
2. Szapiro T. (red.), Decyzje menedżerskie z Excelem. Wydawnictwo PWE, Warszawa 2000.3. Narkiewicz J. : GPS. Budowa, działanie, zastosowanie. WKŁ, Warszawa 2002
3. Kubicki J., Kuriata A.: Problemy logistyczne w modelowaniu systemów transportowych, Wyd. WKŁ Warszawa 2000

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	2,00