STUDY MODULE DESCRIPTION FORM

Name of the module/subject **IT in Transportation II**		Code **1010611261010615211**

Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 6**

Elective path/specialty **Logistics of Transport**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**

Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**

No. of hours				No. of credits **3**
Lecture: **2**	Classes: **-**	Laboratory: **1**	Project/seminars: **-**	

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art **technical sciences**	ECTS distribution (number and %**)** **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge about the up-to-date information techniques, computer science and mathematics
2	**Skills**	Ability to make use of the basic functionality of MS Office (especially, MS Excel)
3	**Social competencies**	Ability to make use of the computer in order to communicate with others

Assumptions and objectives of the course:

-Acquainting students with the basics of computer information systems in transport. In the first semester, students learn about the operation of the contemporary computer systems applied in transport. The second semester is devoted to theoretical and practical aspects of applying computer information systems in various areas of transport.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Knows the theoretical basis of artificial intelligence ? ideas and possible applications - [K1A_W06]

2. Knows the basis of safety and confidentiality of data stored on a computer or in a computer network - [K1A_W06]

3. Knows the basic types and methods of data decryption - [K1A_W06]

4. Knows the basis of data validity checking, incl. checksums and hashing functions - [K1A_W09]

5. Knows the rules of automatic object identification, incl. RFID, barcodes, 3 of 9 code - [K1A_W09]

6. Knows the basic notions within information theory and data compression - [K1A_W10]

7. Knows various techniques of text data compression - [K1A_W17]

8. Knows the basic of creating and functioning of GIS systems, incl. WebGIS - [K1A_W17]

9. Knows the basic of mobile technology, geopositioning, satellite navigation and cellular telephony - [K1A_W17]

10. Knows the idea of conventional, modern and intelligent navigation and remote communication with/between vehicles - [K1A_W18]

11. Knows the most popular systems for vehicle fleet management, incl. vehicle monitoring and navigation - [K1A_W18]

12. Knows the basic simulation models of traffic flow, especially computer techniques for simulation and visualisation of traffic flow - [K1A_W18]

13. Knows the theoretical basic of functionality of computer information systems for enterprise management, incl. logistics information systemsKnows the basic of functioning and applying of CAN networks - [K1A_W21]

14. Knows the basic of applying computer systems for creation of intelligent systems in vehicles - [K1A_W21]

15. Knows the basic of functioning and applying of CAN networks - [K1A_W21]

Skills:

1. Can apply the basic methods of artificial intelligence - [K1A_U01]

2. Can carry out data compression according to Huffman?s algorithm - [K1A_U05]

3. Can determine the basic checksums (e.g. for PESEL, bank account numbers, credit card numbers) - [K1A_U06]

4. Can make use of the basic functionality of GIS systems - [K1A_U07]

5. Can apply the basic models of traffic flow to its simulation - [K1A_U17]

Social competencies:

1. Understands the risk of making use of unsecured computers and other resources - [K1A_K01]

2. Understands the need for technological development, especially in the economy - [K1A_K01]

3. Understands the need for using modern computer systems on a daily basis - [K1A_K01]

4. Understands the need for using computer tools according to the law and ethic norms - [K1A_K01]

Assessment methods of study outcomes

-Lectures: written exam

Laboratories: individual reports

Course description

-Intelligence, artificial intelligence, fields of AI, applications of AI, evolutionary algorithms, artificial neural networks, fuzzy logic

Cryptography, simple ciphers, key encryption, symmetric encryption, asymmetric encryption, digital signature.

The correctness of the data, algorithms for data validation checking, automatic identification of objects, RFID, barcodes, Code 3 of 9, checksum.

Information, redundancy, compression, types of compression, information theory, Huffman algorithm.

GIS, modelling, application, WebGIS, the comparison of the WebGIS systems available on the market, overview of desktop systems (TransCAD, ArcReader, ArcGIS, MapInfo).

Mobile technologies, satellite navigation (GPS), cellular systems.

Traditional navigation, dynamic navigation, intelligent navigation, vehicle control, V2V communication, the future of navigation systems.

Fleet management, levels of fleet management, scheduling tasks, fleet navigation and monitoring TeleArtom, GPS Buddy.

Traffic flow models, microscopic models, comparison, visualization, application, emission and dispersion of exhaust, examples of microscopic simulation systems.

Computer information systems, management information systems, integrated management systems, logistics information systems (LIS), architecture and functionality of LIS.

CAN network, basics, applications in the automotive industry.

Vehicle control systems, passive and active safety, environmental solutions, examples (cruise control, automatic transmission, (semi-) active suspension).

Basic bibliography:

1. 1.   Ewelina Szajba, Urszula Jarmuszkiewicz: System zarządzania bazą danych ACCESS 2.0. Wydaw. Akademii Ekonomicznej, Poznań, 1998.

2. 2.   Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind: GIS. Teoria i praktyka. Wydawnictwo Naukowe PWN, Warszawa, 2006.

3. Jacek Januszewski: Systemy satelitarne GPS, Galileo i inne. Wydawnictwo Naukowe PWN, Warszawa, 2006.

4. TransCAD ? Routing and Logistics. Caliper, 2003.

5. Transims Overview (www.transims-opensource.org).

6. Ciesielski Marek, Długosz Jan, Gołembska Elżbieta: Zarządzanie przedsiębiorstwem transportowym. Wydaw.Akademii Ekonomicznej, Poznań, 1996.

Additional bibliography:

1. 1.   Douglas E. Comer: Sieci komputerowe TCP / IP. 1, Zasady, protokoły i architektura. Wydawnictwa Naukowo-Techniczne, Warszawa, 1997.

2. 2.   Jeffrey D. Ullman, Jennifer Widom: Podstawowy wykład z systemów baz danych. Wydawnictwa Naukowo-Techniczne, Warszawa, 1999.

3. Vivek Kale: SAP R/3: przewodnik dla menadżerów. Wydaw. Helion, Gliwice, 2001.?

Result of average student's workload

Activity	Time (working hours)
1. Preparation for lectures	4
2. Participation in the lecture	30
3. The consolidation of the lecture	4
4. Consultation - lecture	2
5. Exam Preparation	15
6. Participation in the exam	2
7. Preparation for laboratory	2
8. Participation in laboratory exercises	15
9. Consolidation of laboratory, report	6
10. Consultation - laboratory	2

Student's workload

Source of workload	hours	ECTS
Total workload	82	3
Contact hours	51	2
Practical activities	25	1