



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Information technologies in logistics

### Course

Field of study

Computing

Area of study (specialization)

Advanced Internet Technologies

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1/2

Profile of study

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

16

Tutorials

Laboratory classes

16

Projects/seminars

Other (e.g. online)

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr inż. Rafał Walkowiak

Responsible for the course/lecturer:

### Prerequisites

Students undertaking this course should have a basic understanding of the methods of optimization: dynamic programming, mathematical programming; mathematics: analysis of monotonicity of the function; tools: the use of spreadsheets.

### Course objective

Provide students with basic knowledge of logistics.

Develop students' problem-solving skills in the field of different logistics' subsystems.



Develop students' teamwork skills in the situation of decision making in the field of logistics.

### Course-related learning outcomes

#### Knowledge

Upon completion of the course the student:

- has in-depth knowledge of the theoretical foundations and methods used to implement information systems for logistics,
- has advanced detailed knowledge of computer science methods (mathematical programming and dynamic programming),
- knows the tools used to solve complex engineering tasks in the field of logistics (i.e. mathematical programming problem solver - lp\_solve applied to the transport problem).

#### Skills

Upon completion of the course the student will be able:

- to integrate knowledge from various fields of computer science when formulating and solving engineering tasks in the field of logistics,
- to assess the usefulness and possibilities of using new methods and tools of computer science to solve problems in the field of logistics.

#### Social competences

Upon completion of the course the student will develop the following attitudes:

- is able to collaborate and cooperate in a team performing different roles,
- is able to correctly assign priorities to own tasks and tasks performed by others.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

- for lectures is based on answers to questions related to the material covered in previous lectures,
- laboratory classes is based on an assessment of the current progress and the results of the ongoing projects.

Total assessment:

- verification of assumed learning objectives related to lectures:
  - assessment of the knowledge and skills on the written test consisting of five tasks of a problematic nature and tasks verifying the knowledge of the key concepts; examples of problematic tasks are solved in the classroom; the concepts and ideas viewed together in the class and required at the examination are available for students in a form of list;



- discussion of the results of the exam;
- verification of assumed learning objectives related to laboratory classes:
- evaluation of student's knowledge necessary to prepare and carry out the lab tasks;
  - monitoring students' activity during classes and rewarding the gain of skills in the usage of the newly acquired principles and methods;
  - assessment of the ability to make the right logistic decisions by evaluating the performance of the "company" ran by the students in a logistic game (10 weeks);
  - evaluation and presentation of the report on the project carried out during the semester.

### Programme content

#### Lectures:

the structure and characteristics of goods distribution systems, logistics processes and the transformation of goods, the scope and definition of logistics, classification of logistics' subsystems, logistics' costs, conflicts of objectives while costs optimizing, inventories - the types and their importance, costs of inventory maintenance, methods of determining the needs, the rules of goods ordering, security supply, the method of re-order point, selective storage, types of storages, dispatch warehouse, order processing warehouse, racks, means of transport in the warehouse, location of the logistic network objects, packaging - features and requirements, logistic units, the choice of the mean of transport, optimization of the transport organization, a chain of transport, modes of transport- evaluation, transport rates, trade rules of Incoterms, IT systems in transportation systems: management of transport, charging points for usage of the infrastructure, digital maps, systems of IT management: of company resources (ERP, SCM), of supplies by provider, of service of warehouse processes.

#### Laboratories:

logistic game - multi-stage game based on the principles of competition – consists of managing a company in the field of production planning and logistics decisions making; case studies of logistic examples: transportation problem (task of mathematical programming), the problem of purchasing strategies with varying deterministic demand and variable costs of the product (dynamic programming), determining the optimal size of the order taking into consideration the ranges of transport rates and the possibility of over declaring (analysis of the progress by sections of the continuous cost function), comparison of inventory management strategies.

### Teaching methods

Multimedia presentation, solving tasks, practical exercises, analysis of logistic cases, logistics game, discussion, teamwork, competition.

### Bibliography



Basic

Logistyka, Beier F.J., Rutkowski K., Oficyna Wydawnicza SGH, Warszawa 1999

Zarządzanie logistyczne, Coyle J.J., Bardi E.J., Langley Jr C.J. PWE, 2002

Additional

Systemy logistyczne, Pfohl H.-Ch., Instytut Logistyki i Magazynowania, Poznań 2001

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	80	4,0
Classes requiring direct contact with the teacher	32	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	48	2,0

<sup>1</sup> delete or add other activities as appropriate