COURSE DESCRIPTION CARD - SYLLABUS

Course name
Information technologies in logistics [S2Inf1-GiTI>ZILOG]

Course

Field of study
Computing

Year/Semester
1/2

Area of study (specialization)
Games and Internet Technologies

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
20

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

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

1 Provide students with basic knowledge of logistics. 2 Develop students" problem-solving skills in the field of different logistics' subsystems. 3 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:

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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

The program includes knowledge concerning goods distribution systems, logistics processes, classification of logistics’ subsystems, logistics’ costs, the rules of goods ordering, warehousees, packaging - features and requirements and transport issues in logistic.

Course topics

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.
The system of management of the supply chain on the example of the network of supplies of various types of products such as cars, computer parts, multi-series products. Bull whip effect - its characteristics and the way to avoid it in the supply chain management. Problem of multidimensional loading (2D and 3D) on the example of practical applications, important solutions and algorithms. Transportation issues: formulation of the general issues of the transportation question, proposal of mathematical models, proposal of methods of solutions. Micrologistics - logistics solutions within the production system. Analysis of traffic and its impact on the functioning of the delivery and receiving department of the factory. Forecasting the demand and supply on the example of the storage system.
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 system 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. Taking as an example the case of the real logistics system, a multi-faceted analysis are also carried out
in order to find methods of solving logistics problems. The complex logistical issues related to inventory management, location and organization of transport, optimization of means of transport are considered on the example of such practical applications as a sawmill, a grain silo or other production plant.

Teaching methods

Lectures: multimedia presentation, presentation illustrated with examples presented on black board, multimedia showcase.
Labs: solving tasks, practical exercises, analysis of logistic cases, logistics game, discussion, teamwork, multimedia showcase, competitions or case studies.

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
Badania operacyjne dla informatyków, J.Błażewicz i inni, WNT, 1983

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00