COURSE DESCRIPTION CARD - SYLLABUS

Course name

Location analysis for logistics systems

Course

Field of study

Logistics

Area of study (specialization)

Logistics Systems

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

English

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

30

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

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3 Piotrowo St., 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student has a basic background in logistics, management and operations research. He/ she can carry out analytical tasks and manage projects as well as apply basic quantitative tools and methods. He/ she is able to perform a team work.

Course objective

To familiarize students with the basic concepts and terms associated with location analysis in logistics. Presentation of rules and tools/ methods allowing to define a desirable location of logistics objects (point infrastructue) as well as principal decision models leading to the definition of the optimal location of warehouses, distribution centers, terminal, etc.

Course-related learning outcomes

Knowledge

1. Student knows issues in the field of production engineering and its connections with the field of transportation and logistics [P7S_WG_02]

2. Student knows issues of process mapping, process orientation in logistics and process simulation [P7S_WG_03]

3. Student knows extended concepts for logistics and its specific issues and supply chain management [P7S_WG_05]

4. Student knows extended issues in the field of management characteristic for logistics and supply chain management [P7S_WG_08]

5. Student knows the detailed methods, tools and techniques characteristic of the studied subject in logistics [P7S_WK_01]

6. Student knows best practices within logistics and its specific issues [P7S_WK_04]

Skills

1. Student can make a critical analysis of technical solutions used in the analyzed logistics system (in particular with regard to devices, objects and processes) [P7S_UW_04]

2. Student is able to design, using properly selected means, an experiment, analytical process or scientific research project/ program solving a problem within logistics and its specific issues as well as supply chain management [P7S_UK_01]

3. Student can identify changes in requirements, standards, regulations, technological development and behaviour of the labor market. Based on their recognition he/she is able to determine the needs to extend and enhance his/ her own and others' knowledge [P7S_UU_01]

Social competences

1. Student is responsible for his/ her own work and ready to comply with the rules of working in a team and taking responsibility for the tasks carried out jointly [P7S_KR_01]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE:

- formative assessment: homeworks, discussions summarizing individual lectures, giving the student the opportunity to assess the understanding of the problem, active participation in lectures

- final grade/ assessment: written exam in the subject

PROJECT:

- formative assessment: assessment of class activities, active participation in classes

- final assessment: grading the project in the field of location analysis in logistics, evaluation of the student's skills in mathematical modeling of the location problem and his/ her ability to perform computational experiments

Programme content

1. Introduction to the topic. Definition of the location problem and presentation of basic terms. Examples of location problems in logistics, the essence of location selection for warehouses, distribution centers, passenger's and freight terminals, airports and sea ports. Content of the lecture and characteristics of the projects.

2. Classification of logistics infrastructure (linear and point). Characteristics of point infrastructure in logistics systems: warehouses, distribution centers, passengers' and freight terminals, airports, sea ports, railway stations, border crossing points, transportation hubs, parkings.

3. System Approach for Location Problem Analysis. Location of a technical object in a system. Logistics examples.

4. Location problem in logistics systems at strategic, tactical and operational levels. Solving a location problem of logistics objects as a strategic planning problem.

5. Major approaches to location analysis in logistics: expert-based (heuristic) planning combined with simulation; location selection with an application of optimization methods; hybrid (mixed) approach.

6. Location analysis based on single- and multiple criteria approach. Location problem as a single- and multiple criteria optimization (mathematical programming) problem and/or multiple criteria ranking problem. Adaptation of different location decision models to a specific character of logistics systems.

7. Case study analysis. Location selection for: logistics/ distribution centers, airports and airport terminals, parking lots, warehouses, passengers' and freight terminals, sea ports, railway stations,

border crossing points, transportation hubs. Solving real life location probems in logistics systems within projects.

Teaching methods

Lecture: conversatory lecture; interactive discussion; case studies

Project: project method. Practical analysis of the decision problem. Computational experiments.

Bibliography

Basic

1. Eiselt H., Marianov V.: Foundations of location analysis. Springer, Heidelberg, 2011.

2. Farahani R., Hekmatfar M. (Eds.): Facility Location: Concepts, Models, Algorithms and Case Studies. Physica-Verlag, Heidelberg, 2009.

3. Rushton A., Craucher P., Baker P.: The Handbook of Logistics and Distribution Management. Kogan Page, London – Philadelphia, 2006.

Additional

1.Daganzo C.: Logistics System Analysis, Springer Verlag, Berlin 1996.

2. Drezner Z., Hamacher H.: Facility Location: Applications and Theory, Springer, Berlin, 2002.

3. Żak J., Węgliński S.: The selection of the logistics center location based on MCDM/A methodology. Transportation Research Procedia, Vol. 3, 2014, pp. 555–564.

4. Hillier F., Lieberman G.: Introduction to Operations Research. McGraw Hill, Boston - New York - London, 2005.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	5,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	105	3,5

[1] delete or add other activities as appropriate