COURSE DESCRIPTION CARD - SYLLABUS

Course name

Simulation in Logistics II

Course

Field of study

Transport

Year/Semester

2/2

Area of study (specialization)

Logistics of Transport

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Hanna Sawicka, PhD (Eng.)

email: hanna.sawicka@put.poznan.pl

ph. 61 6652249

Faculty of Civil and Transport Engineering

3 Piotrowo street, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

Knowledge: the student has basic knowledge of: inventory management, the functioning of internal and external transport, methods of shaping the distribution network of goods; knows the basics of modeling and simulation in logistics.

Skills: the student is able to: think analytically, interpret the described phenomena and construct simple simulation models based on a verbal description.

Social competencies: the student is aware of the role and importance of making the right decisions and the role and importance of problems related to logistics.

Course objective

The use of knowledge in the field of system modeling and simulation in order to design a complex logistic system and to solve a decision problem.

As part of the project, the ExtendSim object-oriented simulation tool and other analytical tools, such as spreadsheets, will be used.

Course-related learning outcomes

Knowledge

The student has advanced and in-depth knowledge of transport engineering, theoretical foundations, tools and means used to solve simple engineering problems.

The student has an advanced detailed knowledge of selected issues in the field of transport engineering.

The student knows advanced methods, techniques and tools used in solving complex engineering tasks and carrying out research in a selected area of transport.

Skills

The student is able to plan and conduct experiments, including measurements and simulations, interpret the obtained results and draw conclusions as well as formulate and verify hypotheses related to complex engineering problems and simple research problems.

The student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems.

The student is able - when formulating and solving engineering tasks - to integrate knowledge from various transport areas (and if necessary also knowledge from other scientific disciplines) and apply a system approach, also taking into account non-technical aspects.

The student is able to make a critical analysis of existing technical solutions and propose their improvements.

Social competences

The student understands that in the field of transport engineering, knowledge and skills quickly become obsolete.

The student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems.

The student understands the importance of popularizing activities regarding the latest achievements in the field of transport engineering.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Implementation and presentation of logistic systems projects, modeled in the ExtendSim object-oriented simulation tool, along with computational experiments and the analysis of the obtained results.

Programme content

1. Introduction to the subject, including definition of the purpose and the scope of the course. A reminder of the basic information on simulation modeling and model building in the ExtendSim object-oriented simulation tool.

2. Presentation of the concepts of projects implemented by students, including: general characteristics of the modeled logistics systems, definition of decision problems, presentation of the analyzed processes in the form of flowcharts.

3. Presentation of the individual stages of the project implementation - data, simulation model, computational experiments. Discussion of the problems that occur.

4. Final presentations of logistic systems projects - assumptions, simulation model, analysis of research results.

Teaching methods

Project method - individual or team implementation of a large, multi-stage practical task, the result of which is the creation of a work in the form of a simulation model with analyzes.

Bibliography

Basic

1. Leszczyński J.: Modelowanie systemów i procesów transportowych. Wydawnictwo Politechniki Warszawskiej, Warszawa, 1990 (in Polish).

2. Law A.M., Kelton W.D.: Simulation modeling and analysis. McGraw-Hill. Boston, 2000.

3. Sawicka H.: Symulacje w logistyce. Materiały wykładowe, Politechnika Poznańska (in Polish).

Additional

1. Gubała M., Popielas J.: Podstawy zarządzania magazynem w przykładach. Instytut Logistyki i Magazynowania, Poznań, 2005 (in Polish).

2. Krahl D.: ExtendSim 9. In Pasupathy R., Kim S.-H., Tolk A., Hill R., Kuhl M.E. (eds.): Proceedings of the 2013 Winter Simulation Conference: Simulation: Making Decisions in a Complex World, Washington D.C., 8-11 grudnia, 2013, pp. 4065-4072

3. Pfohl H-Ch.: Systemy logistyczne: podstawy organizacji i zarządzania. Instytut Logistyki i Magazynowania, Poznań, 1998 (in Polish).

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	2,0
Classes requiring direct contact with the teacher	15	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	25	1,0

[1] delete or add other activities as appropriate