POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

badania operacyjne i teoria optymalizacji (translation: operations research and optimization theory

Course

Field of study	Year/Semester
logistics	I/II
Area of study (specialization)	Profile of study
logistyka łańcuchów dostaw (supply chain logistics)	general academic
Level of study	Course offered in
Second-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
14		
Tutorials	Projects/seminars	
14		

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Phd. Tomasz Brzęczek, Faculty of Engineering Management, 2 J.Rychlewski Str., room 331, tel. 61 665 33 92 tomasz.brzeczek@put.poznan.pl

Responsible for the course/lecturer:

dr hab. inż. Jacek Żak, Wydział Inżynierii Zarządzania, Piotrowo 3, pokój 713, tel. 61 665 22 30, jacek.zak@put.poznan.pl

Prerequisites

Student knows basics of statistics and probability calculus

Course objective

To teach student planning decisions to optimize inputs or outputs under resouces constraints. To explain ideas of optimization methods and algorithms.

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

Course-related learning outcomes

Knowledge

1. Student knows typica problems of logistics that can be solved using operation research [P7S_WG_05].

2. Knows graphical method and simplex for linear programming [P7S_WG_04].

3. Knows the methods of multicriteria descrete tasks solving [P7S_WK_01].

4. Knows examples of concave or network programming [P7S_WG_04].

Skills

1. Student can solve optimization tasks using Excel Solver add-in [P7S_UO_01].

2. Understands solving idea of graphical method and simplex, network and transportation algorithms [P7S_UW_04].

3. Solves multi criteria decision tasks with appropriate method [P7S_UO_01].

4. Explains optimum solution and how to achieve and implement it in practice [P7S_UU_01].

Social competences

Assesses solutions observed in practice and explains to logistician how to optimize them [P7S_KR_02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Partial assessment is done at:

a) lectures informally in questions about current topic,

b) tutorials as adnotation about student's work over current topic and his progress.

Pass grades are:

a) lecture grade comes from theory test and problem questions.

b) tutorials grade comes from solving tasks test and fulfiled workcards.

Programme content

1. linear programmes (LP) formulation: product assortment, blending problem, transportation and transshipment, multiperiod scheduling,

2. linear programming. simplex, graphical methods, sensitivity analysis,

3. transportation and transshipment problem, balanced, unbalanced supply-demand,

4. descrete multigoal tasks and methods, multigoal optimality, ranks, optimization degree, AHP,

5. decisions under uncertainty and risk: strategies, news boy, decision tree, spare parts stock,

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

6. chosen tasks from: CPM, PERT, Gantt, time-cost analysis, minimum spanning tree, the shortest way, maximum flow, non-linear revenue, salesman problem, assignment problems.

Teaching methods

lecture focused at problem, tutorial in solving tasks, case study

Bibliography

Basic

1. Anholcer M., Gaspars H., Owczarkowski A., Ekonometria z Excelem, Wyd. UEP, Poznań 2010.

2. Brzęczek T., Gaspars-Wieloch H., Godziszewski B., Podstawy badań operacyjnych i ekonometrii, Wyd. PP, Poznań 2010.

3. Przykłady i zadania z badań operacyjnych i ekonometrii, Sikora W. (red.), Wyd. UEP, MD, Poznań 2005.

Additional

1. Józefowska J., Badania operacyjne i teoria optymalizacji, Wydawnictwo PP, Poznań 2011.

2. Sikora W. (red.), Badania operacyjne, PWE, Warszawa 2008.

3. Trzaskalik T. (red.), Wprowadzenie do badań operacyjnych z komputerem - CD, PWE, Warszawa 2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	28	1,0
Student's own work (literature studies, preparation for tutorials, preparation for tests) [1]	47	2,0

---

[1] delete or add other activities as appropriate