

KARTA PRZEDMIOTU

Nazwa przedmiotu: Operational Research (ZIPAOZ>SI6OR19O)

Nazwa w języku polskim:

Nazwa w jęz. angielskim: Operational Research

Dane dotyczące przedmiotu:

Jednostka oferująca przedmiot: Wydział Organizacji i Zarządzania

Przedmiot dla jednostki: Politechnika Śląska

Domyślny typ protokołu dla przedmiotu:

EGZ

Język wykładowy:

angielski

Strona WWW:

<https://platforma2.polsl.pl/roz/course/view.php?id=916>

Skrócony opis:

The aim of the course is to understand by the student the basic concepts as well as the main theoretical and practical issues in operational research (OR).

Opis:

Lecture

1. Operational research - essence, genesis, development.
2. Linear optimization models.
 - 2.1. Graphical method
 - 2.2. Computer support in solving linear programs
 - 2.3. The dual problem
 - 2.4. Sensitivity analysis
3. The transport issue
4. Nonlinear optimization models.
5. Network programming.
6. Methods of making decisions with multiple goals.
7. Elements of game theory making decisions in conditions of uncertainty
8. Dynamic programming

Laboratory

1. Construction of linear optimization models, solving decision problems expressed in linear form.
2. Solving problems of network programming.
3. Determining optimal decisions for games with nature and two-person zero sum games.

Project

1. Collecting and discussing the data needed to implement the project.
2. Selecting methods and tools to solve the decision problem.
3. Solving a decision problem, analysis and interpretation of the obtained solutions.

Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students

Contact hours

Lecture: 15h

Laboratory: 15h

Project: 15h

Student's own work

Preparation for lecture (exam) credit: 10h

Project preparation: 5h

Total workload: 60

Number of ECTS credits: 2

including

Number of ECTS credits covered by the study programme to be earned as part of the courses taught with the direct participation of academic teachers or other persons teaching courses and students: 1.5

Literatura:

1. STACHO, J. (2021). Introduction to operations research. <https://www.cs.toronto.edu/~stacho/public/IEOR4004-notes1.pdf>
2. Lieberman, G. J., & Hillier, F. S. (2005). Introduction to operations research (Vol. 8). New York, NY, USA: McGraw-Hill. <http://www.mim.ac.mw/books/Introduction%20to%20Operations%20Research%209th%20edition.pdf>

Efekty uczenia się:

Knowledge

Student knows and understands:

K2P_W07 selected issues related to operational research (OR) and numerical methods useful for formulating and solving simple engineering tasks.

Skills

Student is able to:

K2P_U13 in identifying and formulating specifications of engineering tasks and solving them:

- use analytical, simulation and experimental methods,
 - see their systemic and non-technical aspects, including ethical aspects,
 - make a preliminary economic assessment of the proposed solutions and undertaken engineering activities.
- K2P_U19 independently plan and implement one's own lifelong learning.

Social competences

Student is ready for:

K2P_K02 recognition of the importance of knowledge in solving cognitive and practical problems and consulting experts in the event of difficulties in solving the problem

Metody i kryteria oceniania:

Lecture (exam)

Written test with open questions or multiple choice questions.

Passing criteria: minimum 50% of correct answers.

Laboratory

Performing tasks during classes and written tests with open questions or multiple choice questions.

Passing criteria: passing all tasks and minimum 50% of correct answers in tests.

Project

Documented project work.

Passing criteria: providing and presenting the project work in accordance with the specified requirements of the project task.

Przynależność do grup przedmiotów w cyklach:

Opis grupy przedmiotów	Cykl pocz.	Cykl kon.
Przedmioty obowiązkowe ang. semestr 6 (ZIPAOZ>SI-6-19-O)	2021/2022-L	

Punkty przedmiotu w cyklach:

<bez przypisanego programu>

Typ punktów	Liczba	Cykl pocz.	Cykl kon.
Europejski System Transferu Punktów (ECTS)	2	2021/2022-L	