Cracow University of Technology

Course syllabus

binding for the doctoral students of the CUT Doctoral School commencing their studies in the academic year 2022/2023

Information on the course

Name of the course in Polish	Metody wielokryterialnej analizy porównawczej
Name of the course in English	Multi-criteria analysis methods
Number of the ECTS points	1
Language of instruction	Polish
Category of the course	Choosable
Field of education	Engineering and Technology
Discipline of education	Civil Engineering and Transport
Person responsible for the course Contact	Prof. Edyta Plebankiewicz PhD Eng. edyta.plebankiewicz@pk.edu.pl

Type of course, number of hours in the study programme curriculum

Semester	Credit type (G / NG)*	Lecture	Practical classes	Laboratory	Computer Lab	Project Class	Seminar
2, 3, 4, 5	NG	15	0	0	0	0	0

*G – graded credit, NG – non-graded credit

Course objectives

Code	Objective description
Objective 1	Expanding knowledge in the field of decision making taking into account many factors
Objective 2	Acquiring the ability to apply methods of multi-criteria analysis

Learning Outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT SD	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	A PhD student has knowledge of the methods used to solve multi-criteria problems	E_W01, E_W02	Involvement in class activities, a presentation
OUTCOMES RELATED TO SKILLS			
EUU1	A PhD student is able to solve complex problems that require taking into account many evaluation criteria	E_U01	A presentation
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	A PhD student is able to think and act creatively	E_K01, E_K03	A discussion

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			
W1	Assessment criteria in the decision-making process (measurable, non-measurable, two-state classified features; stimulants, destimulants, nominants; methods of determining the weighting of criteria).	EUW1	2
W2	Decision support algorithm by multi-criteria comparative analysis	EUW1, EUU1, EUK1	2
W3	Mathematical methods: coding methods (standardization, normalization, Neuman - Morgenstern coding, Pattern coding); synthetic evaluation formulas)	EUW1, EUU1,	2
W4	ELECTRE methods.	EUW1, EUU1,	3
W5	Analytical hierarchical process - AHP.	EUW1, EUU1,	3
W6	Methods using elements of fuzzy logic.	EUW1, EUU1,	3

The ECTS points statement

WORKING HOURS SETTLEMENT	
Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH AN ACADEMIC TEACHER	
Hours allotted in the syllabus	15
Consultations	1
Examination / course credit assignment	2
HOURS WITHOUT THE PARTICIPATION OF AN ACADEMIC TEACHER	
Independent study of the course contents	8
Preparation of a paper, a report, a project, a presentation, a discussion	4
ECTS POINTS STATEMENT	
Total number of hours	30
The ECTS points number	1

Preliminary requirements

No.	Requirements
1	Not specified

Course credit assignment conditions / method of the final grade calculation

No.	Description
COURSE CREDIT ASSIGNMENT CONDITIONS	
1	80% attendance in class. Presentation of a paper.
METHOD OF THE FINAL GRADE CALCULATION	
Assessment the presented work, taking into account the attendance	

Additional information

Not specified

The course reading list

1	Szwabowski J., Deszcz J.: Metody wielokryterialnej analizy porównawczej - podstawy teoretyczne przykłady zastosowań w budownictwie", Wydawnictwo Politechniki Śląskiej, Gliwice 2001.
2	Trzaskalik T.: „Wprowadzenie do badań operacyjnych z komputerem", Polskie Wydawnictwo Ekonomiczne, Warszawa 2008.
3	Tułecki A., Król S.: „Modele decyzyjne z wykorzystaniem metody ANALYTIC HIERARCHY PROCESS (AHP) w obszarze transportu", Problemy Eksploatacji, Kraków, 2-2007, s. 171-180.
4	Trzaskalik T. (red.): Wielokryterialne wspomaganie decyzji. Metody i zastosowania. PWE, Warszawa 2014.
5	Nowak M.: Interaktywne wielokryterialne wspomaganie decyzji w warunkach ryzyka. Metody i zastosowania. Wydawnictwo Akademii Ekonomicznej w Katowicach, Katowice 2008.