Szkoła Doktorska
Politechniki Białostockiej
15-351 Białystok, ul. Wiejska 45a
tel. +48 85 746 92 14
www.pb.edu.pl

COURSE DESCRIPTION CARD

Course name	**Multi-criteria decision support**				
Course type	**optional**	**Course code**	**SDPB0028**	**ECTS credits**	**1**
Forms and number of hours	**lecture: 10 h**	**Scientific discipline**	**civil engineering and transport** **environmental engineering, mining, and power engineering**		
Course objectives	The aim of these lectures is to introduce the main issues and the algorithmof selected multi-criteria methods and to present their application potential in civil engineering and transport as well as in environmental engineering.				
Course content	1. Introduction to decision theory. Decomposition of decision problems. 2. Classification of multi-criteria methods (American and European school of multi-attribute decision support). 3. Selected multi-criteria methods and their algorithms. 4. Review of applications of multi-criteria methods in civil engineering and transport and in environmental engineering. 5. Multi-criteria analysis of selected decision problems in the field of civil engineering and transport and environmental engineering - case studies.				
Teaching methods	The lectures will be enriched by both discussion and case studies.				
Assessment method	Exam.				

Symbol of learning outcome	**Learning outcomes**	**Reference to thelearning outcomes forthe field of study for the 8th levelof Polish Qualification Framework (PRK)**	**Methods of assessing the learning outcomes**
LO1	knows the theoretical basis of multi-criteria decision support methods,	SD_W1	Exam
LO2	knows the previous applications of multi-criteria methods in civil engineering and transport and environmental engineering, as well as knows the development trends in thesedisciplines,	SD_W2	Exam
LO3	is able to use knowledge of multi-criteria methods to solve complex decision-making problems in the field of civil and transport and environmental engineering,	SD_U1	Exam
LO4	is able to interpret and evaluate the results of multi-criteria analysis.	SD_U2	Exam

Student workload (in hours)

Lecture / classes / project / laboratory / seminar	10
Consultations	1
The unassisted studentwork	10
Implementation of project tasks and preparation for and participation in exams/tests	5
Total	**26**
ECTS credits	**1**

Basic references	1. S. Greco (Ed.), Multiple Criteria Decision Analysis: State of the Art Surveys, Springer-Verlag New York, 2005. 2. S. Greco, M. Ehrgott, J. R.Figueira (Eds.), Trends in Multiple Criteria Decision Analysis, Springer US, 2010. 3. T. L. Saaty, L. G. Vargas, Models, Methods, Concepts & Applications of the Analytic Hierarchy Process, Springer US, 2012.
Supplementary references	1. J. Malczewski, C. Rinnner, Multicriteria Decision Analysis in Geographic Information Science, Springer-Verlag Berlin Heidelberg, 2015. 2. D.Geneletti, Multicriteria Analysis for Environmental Decision-Making, Anthem Press, 2019.
Author of the programme	prof. dr hab. inż. Andrzej Kobryń dr inż. Karolina Ogrodnik
Date of issuing the programme	15.03.2021