COURSE DESCRIPTION CARD

Course name	**Data mining**				
Course type	**elective**	**Course code**	**SDPB0048**	**ECTS credits**	**2**
Forms and number of hours	**lecture: 10 h** **project: 10 h**	**Scientific discipline**	**all disciplines**		
Course objectives	Presentation of selected methods of data mining (data exploration) and machine learning algorithms. The presented methods will be focused on the processing and analysis of large data sets containing various types of experimental results.				
Course content	1. Selected problems of matrix algebra and multidimensional geometry 2. Separable aggregation of data in layers of binary classifiers 3. Ranked and dipolar strategies for designing separable layers 4. Data aggregation in hierarchical structures 5. Convex and piecewise linear (*CPL*) criterion functions 6. The basis exchange algorithms 7. *RLS* method of feature subsets selection 8. Multivariate regression (ranked and interval models). 9. Designing decision and regression trees 10. Cluster analysis (*K - means*, *K - lines*, *biclustering*) 11. Collinear patterns and models of multiple interactions 12. Selected methods of bioinformatics (genetic data sets)				
Teaching methods	Lectures, project				
Assessment method	Exam				

Symbol of learning outcome	**Learning outcomes**	**Reference to the learning outcomes for the field of study for the 8th level of Polish Qualification Framework (PRK)**	**Methods of assessing the learning outcomes**
LO1	knows the basic methods of data mining and machine learning algorithms	SD_W1	Exam
LO2	knows the rules of using data mining systems	SD_U1	Test

Student workload (in hours)	
Lecture / project	10 / 10
Consultations	1
The unassisted student work	20
Implementation of project tasks and preparation for and participation in exams/tests	10
Total	**51**
ECTS credits	**2**

Basic references	1. *Pattern classification*, O. R. Duda, P. E. Hart, and D. G. Stork.: J. Wiley, New York 2001 2. *Applied Multivariate Statistical Analysis*, R. A. Johnson, D. W. Wichern Prentice-Hall, Inc., Englewood Cliffs, New York, 2002 3. *Data Exploration and Linear Separability*, L. Bobrowski; Lambert Academic Publishing, 2019
Supplementary references	1. *Pattern Recognition and Machine Learning*. *C.* M. Bishop, Springer Verlag, 2006 2. *Linear Programming*, Prentice – Hall, M. Simonnard, New York, Englewood Cliffs, 1966 3. *Principles of Data Mining* D. Hand, H. Mannila and P. Smyth, The MIT Press © 2001
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