

Subject card

Subject name and code	Non-parametric Models, PG_00157346						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Arkadiusz Kozłowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	15		10.0		25.0	50
Subject objectives	Learning methods for modeling non-linear relationships between variables, acquiring the ability to use these methods to solve classification and regression problems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.		The student has the ability to work in a team and transfer knowledge to others, acquired during the implementation of a final project in groups.		[SK1] oral statement/conversation/discussion		
	[liEMU2_U07] The student is able to build advanced formal models of complex economic phenomena and processes, estimate them, carry out their verification and apply them to modeling, forecasting and optimization of resources of economic institutions of varying degrees of complexity, their structure and the course of processes in them.		The student is able to assess the nature of the relationship between variables and adjust the appropriate model to it. The student is able to assess the quality of the model and the possibilities of its application in practice.		[SU2] presentation/project/paper/report		
	[liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.		The student knows methods of modeling non-linear relationships for various types of variables.		[SW2] presentation/project/paper/report		

Subject contents	1. Classification and regression trees (CART) (division algorithm, criteria for stopping the division, fit assessment, model validation, edge pruning, model visualization). 2. Aggregation of classification and regression trees (bagging, boosting, random forest). 3. MARS (Multivariate Adaptive Regression Splines) for regression problems.		
Prerequisites and co-requisites	Knowledge of descriptive statistics methods and principles of statistical inference.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	51.0%	100.0%
Recommended reading	Basic literature	Fahrmeir, L., Kneib, T., Lang, S., & Marx, B., Regression. Models, methods and applications, Springer, Heidelberg 2013. Gatnar, E., Nieparametryczna metoda dyskryminacji i regresji, PWN, Warszawa 2001. Gatnar, E., Podejście wielomodelowe w zagadnieniach dyskryminacji i regresji, PWN, Warszawa 2016.	
	Supplementary literature	Hastie, T., Tibshirani, R., Friedman, J., The elements of statistical learning, data mining, inference, and prediction, Springer, 2009.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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