



Subject card

Subject name and code	Scoring models, PG_00070285						
Field of study	Modele scoringowe						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group 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	4		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Statistics and Econometrics -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Błażej Kochański				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	0.0	0.0	45
	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	45		4.0		26.0	75
Subject objectives	Applies scoring models in risk and profitability management of the bank and in other relevant contexts.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U04] Prepares and delivers convincing presentations of the results of specialized analyses, providing in-depth interpretations during debates and meetings with diverse audiences.		The student presents a professional presentation of the results of scoring analyses, providing an in-depth interpretation of the proposed assessments.		[SU1] Ocena realizacji zadania [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania		
	[K7_W05] Possesses in-depth knowledge of the principles of integrating economic, legal, and ethical contexts in analyses and applying them in entrepreneurial activities while respecting copyright protection rules		The student identifies variables that enable creditworthiness assessment, their sources, and their predictive power. The student is able to assess the quality of the constructed model.		[SW1] Ocena wiedzy faktograficznej		

Subject contents

Course content – lecture

- Concepts: scoring model and scorecard
- Credit scoring, credit capacity, creditworthiness, risk assessment
- Typology of bank scoring models
- Data used in credit models; credit information bureaus
- Credit scoring: good/bad customer, default, delinquency measurement
- Building scoring models: statistical tools and machine learning methods
- Bayes theorem; naïve Bayes classifier
- Logistic regression; logistic regression based on Weight of Evidence (WoE)
- Scoring models in bank management
- Reject inference methods
- Use of score-based assessment; risk-based pricing
- Process of building and implementing a scoring model; validation and monitoring
- Development of bank scoring models latest trends

Course content – exercises

- Assessing the quality of scoring models: confusion matrix, ROC curve, Gini coefficient, KS, lift
- Transformations of the target variable: probability, frequency, odds, log-odds
- Explanatory variables in scoring models: discretization (bucketing, binning), missing data
- Variable selection for scoring models; measuring the predictive power of individual variables; Information Value, Weight of Evidence
- Building models based on the naïve Bayes classifier
- Building models based on logistic regression and WoE-based logistic regression
- Scaling and calibration of scoring models
- Setting cut-off points

	- Delinquency measurement using the vintage method - Machine learning tools in scoring models; explainable AI methods - Practical aspects of reject inference		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Calculation tasks and test questions	60.0%	40.0%
	Project	60.0%	60.0%
Recommended reading	Basic literature	- Naeem Siddiqi Intelligent credit scoring: building and implementing better credit risk scorecards John Wiley & Sons, 2017. - Raymond A. Anderson Credit intelligence & modelling: many paths through the forest Rayan Risk Analytics, Inc., 2019	
	Supplementary literature	- Lyn Thomas, Jonathan Crook, David Edelman Credit scoring and its applications Society for Industrial and Applied Mathematics, 2017 - Mariola Kapla: O historii kredytowej i scoringu BIK ScoringExpert, 2019	
	eResources addresses		
Example issues/ example questions/ tasks being completed	- Evaluate the discriminatory power of the model based on the data presented. - Build a logistic regression model using the indicated variables. - Determine the cut-off point for a scoring card with the given properties. - Assess the predictive power of individual features and their importance in the model.		
Practical activities within the subject	Not applicable		

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