

## Subject card

Subject name and code	Scoring models, PG_00070246								
Field of study	Modele scoringowe								
Date of commencement of studies	February 2025		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	3		ECTS credits			3.0	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 Teachers		dr Błażej Kochański						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
Loodon typos	Number of study hours	15.0	30.0	0.0	0.0		0.0	45	
	E-learning hours inclu	ıded: 0.0	0.0						
Learning activity and number of study hours	Learning activity	Participation in classes include 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 presents convincing, professional presentations of the results of its activities, with their in-depth interpretation		professional presentation of the			[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania [SU1] Ocena realizacji zadania			
	[K7_W05] takes into the analyzes in an in both the economic, le ethical context, being responsibility for the consequences of its	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				

Data wygenerowania: 25.11.2025 08:19 Strona 1 z 3

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.					
	Machine learning tools in scoring models; explainable AI methods.					

Prerequisites and co-requisites						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	Project	60.0%	60.0%			
	Calculation tasks and test questions	60.0%	40.0%			
Recommended reading	Basic literature  Supplementary 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  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 activites within the subject	Not applicable					

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Data wygenerowania: 25.11.2025 08:19 Strona 3 z 3