



Subject card

Subject name and code	Scoring models, PG_00070246						
Field of study	Management, Management						
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		
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	dr Błażej Kochański					
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						
	eNauczanie source addresses: Moodle ID: 3818 Modele scoringowe 2026 https://enauzanie.pg.edu.pl/2025/course/view.php?id=3818						
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	Preparing students for the practical application of methods for building and evaluating scoring models in credit risk assessment processes in banks and other business applications, based on knowledge of data analysis, statistical methods, and principles of machine learning model construction. The aim is also to shape attitudes related to reliable, clear, and responsible communication of scoring analysis results, as well as collaboration during project tasks in the context of business decision-making.						
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	Is able to prepare and deliver a professional presentation of scoring analysis results, using appropriate methods of interpretation, visualization, and communication, in order to clearly explain the proposed solutions to the audience and discuss the key elements of the scoring model.		[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task			
	[K7_W05] takes into account in the analyzes in an in-depth way both the economic, legal and ethical context, being aware of the responsibility for the consequences of its decisions	Knows and understands the types and sources of data used in scoring models, the principles of data preparation, selection, and measurement of predictive power, as well as statistical tools and machine learning methods in the context of building, validating, and applying scoring models in banks and other businesses.		[SW1] Assessment of factual knowledge			

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
	Tests (computational tasks and multiple-choice questions).	60.0%	40.0%
	Project (construction of a scoring model and a report presenting it).	60.0%	60.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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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