University of Gdańsk

Subject card

Subject name and code	Probability Concepts, PG_00204480						
Field of study	Finance and Accounting						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor'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	English			
Semester of study	3		ECTS credits	5.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Anna Gierusz-Matkowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	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	60		4.0	61.0	125	
Subject objectives	Presentation of basic probability concepts, including types of random variables and their distributions, and development of skills in applying them to economic problems and interpreting results.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FiRL3_U02] Can identify, analyze or design adequate solutions to problems in finance and accounting	Student is able to select appropriate probability distribution to a given problem and calculate probabilities and parameter values using known distributions	[SU4] test/exam - oral or written
[FiRL3_U03] Can obtain data and verify its accuracy from appropriately selected sources and use these data to analyse and evaluate economic processes and phenomena in management and quality sciences, economics and finance	Student is able to use data to calculate probabilities of financial events	[SU4] test/exam - oral or written
[FiRL3_W05] Knows and understands the tools and techniques for obtaining, compiling, and analyzing the data necessary to assess the financial situation of various entities in management, quality sciences, economics, and finance	Student has knowledge on different types of random variables, identifies appropriate probability distribution for a given problem	[SW4] test/exam - oral or written
[FiRL3_U01] Can analyze and interpret socio-economic processes and phenomena – from the finance and accounting perspective – using knowledge and tools from management, quality sciences, economics, and finance	Student is able to employ probability distributions to model financial and investment phenomena	[SU4] test/exam - oral or written

Subject contents

- Probability concepts: an outcome, an event, random variable.
- Definition of probability and calculation of probability.
- Bayes formula.
- Probability trees and conditional expectations.
- Independence of events and of random variables.
- Common probability distributions for discrete and continuous random variables (binomial, poisson, uniform, normal).
- Joint probability function.
- Calculation and interpretation of covariance and correlation.
- Statistical measures of return on a portfolio.
- Simulation methods.

Prerequisites and co-requisites

Knowledge from two subjects:
1. Descriptive Statistics
2. Mathematics for Economics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test 2	51.0%	50.0%
written test 1	51.0%	50.0%

Recommended reading

Basic literature	Aczel, A., Sounderpandian J., 2009, Complete Business Statistics with Student CD, The Mcgraw-Hill/Irwin Series Hansen, B., 2022, Probabilty and statistics for economists, Princeton University Press
Supplementary literature	DeFusco, R.A., McLeavey, D.W., Pinto, J.E., Runkle, D.E., Anson, M.J.P., 2016, Quantitative Investment Analysis, 3rd Edition,Wiley and Sons Black, K., 2011, Applied Business Statistics: Making Better business Decision, John Wiley and Sons Johnson R.A., Bhattacharyya G.K., 2011, Statistics: Principles and Methods, John Wiley and Sons Anderson, D.R.,Sweeney, D.J., Williams, T.A., 2010, Statistics for business and economics, Cengage Learning Gierusz A., 2021, Application of deferred annuities in an occupational pension scheme. W: Pensions today - economic, managerial, and social issues, Chybalski Filip (red.), Marcinkiewicz Edyta (red.), Wydawnictwo Politechniki Łódzkiej, Łódź

	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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