GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	TIME SERIES MODELING, PG_00060691					
Field of study	Economic Analytics					
Date of commencement of studies	October 2023	Academic year of realisation of subject		2023/2024		
Education level	second-cycle 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	1	Language of instruction		Polish		
Semester of study	1	ECTS credits		5.0		
Learning profile	general academic profile	Assessment form		exam		
Conducting unit	Katedra Statystyki i Ekonometrii -> Faculty of Management and Economics					
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Michał Pietrzak				
	Teachers	dr hab. Michał Pietrzak				

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	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	Effectively uses in-depth knowledge of economic time series analysis methods, applying the results of analyzes to formulate forecasts.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U03] formulates research problems and selects appropriate analytical methods for their effective solution, using advanced IT tools, and evaluates the results critically	formulates research problems of complex economic phenomena, the solutions of which uses for forecasting, carrying out a critical assessment of the results	[SU4] Assessment of ability to use methods and tools
	[K7_W04] analyzes complex problems in an in-depth way on the basis of reliable data and properly selected methods, obtaining logical solutions	creates time series models using known methods of their estimation, using advanced statistical software	[SW1] Assessment of factual knowledge

Subject contents	Classical time series analysis (trend, cyclical fluctuations) Stochastic processes and time series Characteristics of stochastic processes Process spectrum autocorrelation functions Study of the stationarity of the time series Autoregressive (AR) processes Moving average (MA) processes Mixed processes (ARMA) Non-stationary mixed autoregression-moving average (ARIMA) processes Identification and estimation of models of stochastic processes Time series testing and forecasting

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	50.0%
	Project	60.0%	50.0%

Recommended reading	Basic literature	T. Kufel, Ekonometria Rozwiązywanie problemów z wykorzystaniem programu GRETL, PWN, 2011 M. Osińska, Ekonometria współczesna, TNOiK, 2007 Box G.E.P. i Jenkins G.M. Analiza szeregów czasowych PWN, Warszawa, 1983 Kot S.M., Sokołowski A., Jakubowski J. Statystyka, Difin, Warszawa, 2007
	Supplementary literature	R. Otnes, L. Enochson, Analiza numeryczna szeregów czasowych, WNT A. Weron, R. Weron, Inżynieria finansowa, WNT C. Ngai Hang, Time series: applications to finance with R and Splus, Wiley
	eResources addresses	Adresy na platformie eNauczanie: Modelowanie szeregów czasowych - Moodle ID: 33608 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33608
Example issues/ example questions/ tasks being completed	What is a stochastic process and a time series? What is time series stationarity (including weak stationarity)? When is an AR(1) autoregression process stationary? What are the consequences of parameter j for the intervals (0;1) and (-1;0) How do we define the AR(3) function? How do we define the MA(2) moving average function? State the stationarity condition of the ARMA process (p;q) In what situations do we use the generalized ARIMA model to model a time series?	
Work placement	Not applicable	