GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	TIME SERIES MODELING, PG_00060791		
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	English
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_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
[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	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Classical time series analysis (trend, cyclical fluctuations)
Exponential smoothing models
Holt and Winters model
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
Project	60.0%	50.0%
Exam	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:
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	