



Subject card

Subject name and code	Time Series Analysis, PG_00049960							
Field of study	Economic Analytics							
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023			
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	Part-time studies	Mode of delivery			at the university			
Year of study	1	Language of instruction			Polish			
Semester of study	2	ECTS credits			3.0			
Learning profile	general academic profile	Assessment form			assessment			
Conducting unit	Katedra Statystyki i Ekonometrii -> Faculty of Management and Economics							
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Stanisław Kot					
	Teachers		prof. dr hab. Stanisław Kot					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM	
	Number of study hours	16.0	0.0	16.0	0.0	0.0	32	
	E-learning hours included: 0.0							
Analiza szeregów czasowych - Moodle ID: 30345 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30345								
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	32		6.0		37.0	75	
Subject objectives	Presentation of the most popular time series models and their estimation methods. Forecasting based on series models. Application of known methods to analyze economic time series. Use of statistical software in the analysis. Smoothing data by appropriate model selection, selection of smoothing methods.							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K7_W10] has an in-depth knowledge of quantitative methods to describe and analyse socio-economic processes using information technology		The student is able to apply the Statistica package to correctly estimate the selected time series model. The student is able to use the estimated model for the forecast and assess the accuracy of the forecast.			[SW3] Assessment of knowledge contained in written work and projects		
[K7_U08] has the ability to implement analytical methods to independently propose solutions to economic problems and verify their effectiveness		The student is able to construct an analytical model to describe the selected time series			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools			
Subject contents	Stochastic processes and time series. Characteristics of stochastic processes. Simple and partial autocorrelation functions. Stationarity and ergodicity. Stationary station testing. AR autoregression processes. Moving average MA processes. ARIMA mixed processes. Identification and estimation of ARIMA processes. Exponential equalization models. Holt linear model, Winters model							
Prerequisites and co-requisites	Probability theory, mathematical statistics							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade		
	Laboratory test		50.0%			100.0%		

Recommended reading	Basic literature	Box G.E.P. i Jenkins G.M. Time series analysis PWN, Warszawa, 1983 Kot S.M., Sokołowski A., Jakubowski J. Statistics, Difin, Warszawa, 2007.
	Supplementary literature	R. Otnes, L. Enochson, Numerical analysis of time series, WNT A. Weron, R. Weron, Financial engineering, WNT
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. What is the stochastic process and time series? 2. What is the time series stationarity? 3. When is the AR (1) autoregression process stationary? 4. What are the consequences of the parameter ρ being in the ranges (0; 1) and (-1; 0) 5. How do you define the AR (3) function? 6. How do we define the moving average function MA (2)? 7. Provide a stationary condition for the ARMA process (p; q) 	
Work placement	Not applicable	