



## Subject card

Subject name and code	Forecasting and Simulation, PG_00049643						
Field of study	Economic Analytics						
Date of commencement of studies	October 2021	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	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	Katedra Statystyki i Ekonometrii -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Aneta Sobiechowska-Ziegert				
	Teachers		dr Aneta Sobiechowska-Ziegert				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
Prognozowanie i Symulacje AGII sem3 - Moodle ID: 25765 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25765">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25765</a>							
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		6.0		24.0	75
Subject objectives	The aim of the course is to gain an in-depth knowledge about economic phenomena forecasting with the use of adaptive forecasting techniques and econometric models with elements of simulation, and to gain a knowledge about selection of appropriate forecasting methods and assessment of received forecasts.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U14] can improve oneself through the systematic acquisition of knowledge and skills		The student proposes the use of appropriate forecasting methods depending on the nature of phenomena.		[SU1] Assessment of task fulfilment		
	[K7_W11] has a broadened knowledge of socio-economic phenomena and processes, understanding their determinants and consequences		The student identifies the relationship between the variables in the process of forecasting and simulation.		[SW1] Assessment of factual knowledge		
	[K7_W02] has a broadened knowledge of how to describe economic phenomena using quantitative methods		The student describes economic processes using advanced quantitative methods.		[SW1] Assessment of factual knowledge		
	[K7_U04] can forecast complex socio-economic processes and phenomena using advanced methods and tools for the analysis of quantitative and qualitative data		The student selects appropriate methods and calculates the prediction of complex socio-economic phenomena.		[SU4] Assessment of ability to use methods and tools		
	[K7_U02] can use theoretical knowledge in the field of economics and finance to obtain, analyse and interpret data on economic processes and phenomena and on their basis formulate own opinions		The student collects relevant information, constructs forecasts and verifies their accuracy.		[SU1] Assessment of task fulfilment		

Subject contents	<p>Introduction to the issues of forecasting and simulations - the basic concepts.</p> <p>Evaluation of the quality of forecasting models and forecasts.</p> <p>Adaptive forecasting methods - overview.</p> <p>Forecasting based on linear and nonlinear trend, with and without seasonal fluctuations.</p> <p>Other forecasting methods based on time series data.</p> <p>Assumptions for forecasting based on econometric models.</p> <p>Forecasting based on cause-effect econometric models - conditional forecasts.</p> <p>The use of autoregression models in forecasting.</p> <p>Forecasting under the autocorrelation of the random component.</p> <p>Forecasting in conditions of instability of structural parameters.</p> <p>Introduction to artificial neural networks and their use in forecasting.</p>											
Prerequisites and co-requisites	Statistics, Econometrics											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>case study + presentation</td> <td>55.0%</td> <td>50.0%</td> </tr> <tr> <td>written test + quiz during the semester</td> <td>55.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	case study + presentation	55.0%	50.0%	written test + quiz during the semester	55.0%	50.0%
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Recommended reading	Basic literature	<p>Zeliaś A., Pawełek B., Wanat S., Prognozowanie ekonomiczne, teoria, przykłady, zadania, PWN, Warszawa 2003</p> <p>Dittman P., Prognozowanie w przedsiębiorstwie - metody i ich zastosowanie, Wolters Kluwer, Kraków 2008</p> <p>Dittmann, P, Szabela-Pasierbińska, E., Dittmann, I., Szpulak, A. Prognozowanie w zarządzaniu przedsiębiorstwem. Warszawa: Wydawnictwo Nieoczywiste 2017</p> <p>Błaszczuk D., Wstęp do prognozowania i symulacji, PWN Warszawa 2012</p> <p>Maciąg A., Pietroń R., Kukła S., Prognozowanie i symulacja w przedsiębiorstwie, PWE Warszawa 2013</p>										
	Supplementary literature	<p>Cieślak M., Prognozowanie gospodarcze - metody i zastosowania, PWN Warszawa 1997 i nowsze</p> <p>Radzikowska B. (red.), Metody prognozowania. Zbiór zadań, AE Wrocław 2004</p>										
	eResources addresses											

Example issues/ example questions/ tasks being completed	On the basis of monthly data on cash in monetary financial institutions' vaults derived for the period Jan 2017 Jul 2020 (Narodowy Bank Polski <a href="https://www.nbp.pl/home.aspx?f=/statystyka/statystyka.html">https://www.nbp.pl/home.aspx?f=/statystyka/statystyka.html</a> ) create all available historical forecasts as well as a forecast for Aug 2020 with the use of following techniques: naive method, moving average method with smoothing parameter $k=3,4,5$ ; weighted moving average method and simple exponential smoothing with $\alpha=0,7$ and $h=1$ . Compute simple forecast errors for Aug 2020 and RMSE.
Work placement	Not applicable