University of Gdańsk

Subject card

Subject name and code	Computation Programming II, PG_00199353						
Field of study	Economics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group 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		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Jakub Kwiatkowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	15.0	0.0	30
	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	30		0.0		20.0	50
Subject objectives	Acquiring knowledge and skills in creating advanced analyzes and data visualizations using Python.						

Learning outcomes			
	Course outcome	Subject outcome	Method of verification
	[EKONMU2_U03] can analyse causes and course of economic and social processes and phenomena, formulate his/her own opinions on the subject, construct research hypotheses, and select and apply methods of their verification	Is able to select appropriate data analysis methods and algorithms for a specific problem and implement data processing algorithms in Python. The results of the analyses carried out as part of the project are discussed and approved during consultations with the lecturer.	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
	[EKONMU2_K01] recognises the importance of knowledge in the field of economics in the process of identifying and solving economic problems and of consulting experts when having difficulties in solving them independently	Recognizes the importance of knowledge in the field of economics and statistics in the process of solving economic problems using Python and seeking the opinion of experts in case of difficulties in solving them on their own	[SK1] oral statement/conversation/ discussion
	[EKONMU2_W06] has an in-depth understanding of statistical and econometric methods and tools for describing and modelling macro- and microeconomic economic structures and public institutions, as well as the processes taking place within them.	Knows and understands data processing methods and algorithms as well as the possibilities and ways of their application in the field of macro- and microeconomic description of economic structures and public institutions and the processes occurring in them	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[EKONMU2_U08] can independently analyse economic and social phenomena and processes, and can perform a theoretically deepened assessment of such phenomena, using appropriately selected research method	Is able to independently analyze economic and social phenomena and processes using Python and present the results.	[SU2] presentation/project/paper/ report
	[EKONMU2_U04] can forecast and model complex economic and social processes using quantitative and qualitative methods and tools developed by economic sciences (including statistics and econometrics)	Is able to perform statistical calculations for the purposes of forecasting and modeling economic and social processes using appropriate Python libraries and present the resutls	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
	[EKONMU2_K02] is aware of the level of their knowledge in the area of solving complex problems in economic,; understands the need to extend and update this knowledge throughout his/her life	Is aware of the level of his knowledge and skills in the field of data processing using Python to solve economic problems, understands the need to deepen and update this knowledge and increase skills throughout life	[SK8] observation of student's independent or team work
	[EKONMU2_U01] can creatively interpret and explain economic and social phenomena and relations between them, using acquired knowledge of economics, finance and management sciences	Is able to process and visualize data using Python for the purpose of explaining economic and social phenomena and the relationships between them and present the results.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
	[EKONMU2_U15] can independently expand and improve acquired knowledge and skills in economics; is open to new ideas and techniques; tends to learn using any accessible method and to interact with other participants of the learning process	Is able to independently supplement and improve acquired knowledge and skills in the field of methods, algorithms and data processing tools for the purposes of analyzing and explaining economic and social phenomena	[SU8] observation of student's independent or team work
Subject contents	Working with the Pandas library.Programming calculations using the NumPy and SciPy libraries.Visualization of calculation results - exercises using the Matplotlib, Plotly, Seaborn libraries. Preparation of own project.		
Prerequisites and co-requisites	Passed subject: Computational programming I		

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>presentation of the project</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>final project</td><td>51.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Johansson R, Matematyczny Python. Obliczenia naukowe i analiza danych z użyciem NumPY, SciPy, Matplotlib, Helion, Gliwice 2021.

McKinney W., Python w analizie danych : przetwarzanie danych za pomocą pakietów Pandas i NumPy oraz środowiska IPython,Helion, Gliwice 2018</td></tr>
<tr><td>Supplementary literature</td><td>Baranowski P., Doryń W., Przetwarzanie danych i uczenie maszynowe w języku Python. Aplikacje w ekonomii i zarządzaniu , Instytut Badań Gospodarczych, Olsztyn 2020.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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