

Subject card

Subject name and code	Introduction to Data Science, PG_00171443						
Field of study	Economics						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2025/2026	
Education level	Master's studies		Subject group			Obligatory subject group in the field of study Specialty subject group	
Mode of study	full-time studies		Mode of delivery			at the university	
Year of study	1		Language of instruction			Polish	
Semester of study	2		ECTS credits			2.0	
Learning profile	academic		Assessment form			exam	
Conducting unit	Department of International Economics and Economic Development -> Faculty of Economics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Jakub Kwiatkowski				
	Teachers		dr Jakub Kwiatkowski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		10.0		25.0	50
Subject objectives	The subject allows students to learn the basics of data science using the RStudio package. During the semester, the most important packages and tools used by business intelligence analysts are presented. As a result, students will gain practical knowledge combining previously acquired knowledge and analytical skills with actual economic analyzes carried out in business.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	can independently supplement and improve acquired knowledge in the field of data science economic skills, is open to new ideas and techniques, has a tendency to learning by any method and the tendency to interact with other participants of the learning process, while any doubts discusses during the office hours.	[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 forecast and model complex economic and social processes using the RStudio package	[SU2] presentation/project/paper/report
	[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 ability to theoretically in-depth assessment of these phenomena, with appropriate application selected research method and the RStudio package	[SU2] presentation/project/paper/report
	[EKONMU2_U01] can creatively interpret and explain economic and social phenomena and relations between them, using acquired knowledge of economics, finance and management sciences	can creatively interpret and explain economic and social phenomena and relationships between these phenomena, using their knowledge in the field of economics, finance and management sciences using the RStudio package	[SU2] presentation/project/paper/report
	[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	can analyze the causes and course using the Pandas and NumPy packages economic and social processes and phenomena, formulate their own opinions on this subject, formulate research hypotheses and select and use methods to verify them	[SU2] presentation/project/paper/report
	[EKONMU2_W06] knows statistical and econometric methods and tools for description and macro- and microeconomic modelling of economic structures and public institutions and processes occurring in them	knows statistical and econometric methods and tools for macro description and modeling microeconomic economic structures and public institutions and processes in taking place using the RStudio package	[SW2] presentation/project/paper/report
	[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 economics and data science knowledge in the identification process and solving economic problems and seeking expert opinions in cases difficulties in solving them on your own	[SK2] presentation/project/paper/report
	[EKONMU2_K02] is aware of the level of his/her knowledge in the field of economics; understands the need to extend and update this knowledge throughout his/her life	is aware of the level of his/her knowledge in the area of economics and data science, understands the need to deepen and update this knowledge throughout life	[SK2] presentation/project/paper/report

Subject contents	What is data science? Definition and scope of the field of data science Key stages of the data analysis process (from collection to interpretation)		
	Installation and use of RStudio. Built-in data structures, data import and export Basic data structures in R (vectors, matrices, data frames) Methods for importing and exporting data in RStudio (CSV, Excel, databases)		
	Basics of statistical libraries Overview of the most important statistical packages in R (e.g., stats, ggplot2, dplyr) Applications of libraries for statistical analysis and data manipulation		
	Basics of econometric modeling in RStudio. Data cleaning and preparation The process of preparing data for modeling (handling missing data, transformations) Basic methods of econometric modeling (linear regression)		
	Data visualization Creating basic charts (bar, line, scatter plots) in R Using the ggplot2 library for advanced data visualization		
	Testing econometric models in RStudio Methods for assessing model fit (R^2 , statistical tests) Diagnostics and verification of model assumptions (autocorrelation, heteroscedasticity)		
The student discusses questions from the classes during consultations with the course instructor.			
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	51.0%	100.0%
Recommended reading	Basic literature	Neusser (2016) Time Series Econometrics. Springer Cham. Wickham, H., & Grolemund, G. (2017). <i>R for Data Science</i> . O'Reilly Media. Wickham, H. (2019). <i>Advanced R</i> (2nd ed.). Chapman and Hall/CRC. Zumel, N., & Mount, J. (2014). <i>Practical Data Science with R</i> . Manning Publications.	
	Supplementary literature	Kwiatkowski (2021) Wpływ luki technologicznej na intensywność wymiany handlowej krajów OECD. Wydawnictwo Uniwersytetu Gdańskiego	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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