

**Subject card**

<b>Subject name and code</b>	Introduction to Data Science, PG_00199348						
<b>Field of study</b>	Economics						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	Master's studies	<b>Subject group</b>			Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	2	<b>ECTS credits</b>			4.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			exam		
<b>Conducting unit</b>	Department of International Economics and Economic Development -> Faculty of Economics -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Jakub Kwiatkowski				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	15.0	0.0	30.0	0.0	60
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	60		0.0		40.0	100
<b>Subject objectives</b>	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_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/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
	[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_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_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_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_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_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 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

Subject contents	<p><b>What is data science?</b>  Definition and scope of the field of data science  Key stages of the data analysis process (from collection to interpretation)</p> <p><b>Installation and use of RStudio. Built-in data structures, data import and export</b>  Basic data structures in R (vectors, matrices, data frames)  Methods for importing and exporting data in RStudio (CSV, Excel, databases)</p> <p><b>Basics of statistical libraries</b>  Overview of the most important statistical packages in R (e.g., stats, ggplot2, dplyr)  Applications of libraries for statistical analysis and data manipulation</p> <p><b>Basics of econometric modeling in RStudio. Data cleaning and preparation</b>  The process of preparing data for modeling (handling missing data, transformations)  Basic methods of econometric modeling (linear regression)</p> <p><b>Data visualization</b>  Creating basic charts (bar, line, scatter plots) in R  Using the ggplot2 library for advanced data visualization</p> <p><b>Testing econometric models in RStudio</b>  Methods for assessing model fit (<math>R^2</math>, statistical tests)  Diagnostics and verification of model assumptions (autocorrelation, heteroscedasticity)</p> <p>The student discusses questions from the classes during consultations with the course instructor.</p>								
Prerequisites and co-requisites									
Assessment methods and criteria	<table border="1" data-bbox="448 987 1477 1052"> <thead> <tr> <th data-bbox="448 987 794 1019">Subject passing criteria</th> <th data-bbox="794 987 1141 1019">Passing threshold</th> <th data-bbox="1141 987 1477 1019">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1019 794 1052">Project</td> <td data-bbox="794 1019 1141 1052">51.0%</td> <td data-bbox="1141 1019 1477 1052">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	51.0%	100.0%
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Project	51.0%	100.0%							
Recommended reading	Basic literature	<p>Neusser (2016) Time Series Econometrics. Springer Cham.</p> <p>Wickham, H., &amp; Grolemund, G. (2017). <i>R for Data Science</i>. O'Reilly Media.</p> <p>Wickham, H. (2019). <i>Advanced R</i> (2nd ed.). Chapman and Hall/CRC.</p> <p>Zumel, N., &amp; Mount, J. (2014). <i>Practical Data Science with R</i>. Manning Publications.</p>							
	Supplementary literature	<p>Kwiatkowski (2021) Wpływ luki technologicznej na intensywność wymiany handlowej krajów OECD. Wydawnictwo Uniwersytetu Gdańskiego</p>							
	eResources addresses								
Example issues/ example questions/ tasks being completed									
Work placement	Not applicable								

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