



## Subject card

Subject name and code	DATA ANALYSIS, PG_00049640						
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	1	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Economic Sciences -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Karol Flisikowski				
	Teachers		dr inż. Karol Flisikowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	16.0	0.0	0.0	16
	E-learning hours included: 0.0						
Analiza danych (zima 2022/23) - Moodle ID: 24194 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24194">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24194</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	16		7.0		77.0	100
Subject objectives	After completing the subject "Data Analysis" students will acquire basic skills in analytical programming in the R ecosystem - among others the most popular statistical analyzes, loading and cleaning, processing and visualization of data, as well as creating reports in R-Markdown.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U09] has the ability to use advanced mathematical tools to analyse and assess economic phenomena and to make decisions by economic operators		The student has the ability to use advanced raw data processing tools in order to then subject them to appropriate statistical analysis.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information	
	[K7_W07] has an in-depth knowledge on methods of social and economic phenomena description, including market information acquisition techniques and methods of analysis and modelling of economic processes		The student has knowledge of the methods of statistical analysis of data and methods of processing, converting, cleaning raw data.			[SW1] Assessment of factual knowledge	
	[K7_K01] understands the need for continuous learning and, in particular, for advanced and modern tools for data analysis		The student is aware that for the correct data analysis it is necessary to properly format the data, variables, clear observations from outliers, dirty data, etc.			[SK2] Assessment of progress of work [SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice	
	[K7_U06] has a broad knowledge of methods and tools for acquiring and collecting data, as well as analysing, explaining and reasoning on socio-economic phenomena and processes.		The student has the ability to pre-process and process raw data (conversion, change of dimensions, cleaning, etc.).			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information	

Subject contents	<ol style="list-style-type: none"> <li>1. Introduction to R, R-studio. Basic operations. Import of data from various formats. Measuring scales and data types in R (vector, data frame, matrix, list, etc.).</li> <li>2. Basic commands - descriptive and mathematical statistics.</li> <li>3. Basic data processing (new variables, filters, joining frames: reshape, split, combine). Dirty data - missing observations; duplicate; outliers; formatting errors.</li> <li>4. Data cleaning using Dplyr and TidyR.</li> <li>5. Data cleaning - outliers. Transformations and discretization of variables.</li> <li>6. Graphics in R - basic and advanced graphic presentation of data (packages: ggplot2; Lattice; Grid).</li> <li>7. Publishing reports directly from R - introduction to R-Markdown (notebook; presentations - R and Powerpoint; HTML slidy; PDF beamer etc.).</li> <li>8. Final project. Presentations.</li> </ol>		
Prerequisites and co-requisites	Descriptive and mathematical statistics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final project	50.0%	50.0%
	moodle quizzes	60.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Discovering statistics using R, Andy Field, Jeremy Miles, Zoe Field, Sage, 2012.</li> <li>2. Statistics (The easier way) with R, Nicole M. Radziwill, 2016.</li> </ol>	
	Supplementary literature	<ul style="list-style-type: none"> <li>• <a href="https://cran.r-project.org/web/packages/IPSUR/vignettes/IPSUR.pdf">https://cran.r-project.org/web/packages/IPSUR/vignettes/IPSUR.pdf</a> - G. Jay Kerns, Introduction to Probability and Statistics using R, Third Edition, 2018.</li> </ul>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Final project: including preparation of R-Markdown report and presentation after previously pre-processed and analyzed micro-data in R.		
Work placement	Not applicable		