



Subject card

Subject name and code	DATA ANALYSIS IN R, PG_00070322						
Field of study	Economic Analytics						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2026/2027	
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			5.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	Department of Statistics and Econometrics -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Karol Flisikowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	9.0	0.0	27.0	0.0	0.0	36
	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	36		3.0		86.0	125
Subject objectives	preparing students to create innovative analytical solutions and team cooperation in projects based on data analysis, based on knowledge of data processing tools and methods, and to shape attitudes related to responsible cooperation and independence in the context of solving socio-economic problems.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_W03] demonstrates in-depth knowledge of the applications of analytical methods and techniques for formulating and solving socio-economic problems.		knows and understands contemporary pre-processing methods and raw data processing before application advanced methods analytical information in the context of ensuring reliable results			[SW1] Assessment of factual knowledge	
	[K7_U05] collaborates with others in team projects, effectively fulfilling both leadership and team member roles to achieve established goals.		performs analytical work demonstrating the ability to work in a team			[SU2] Assessment of ability to analyse information	
	[K7_K01] is ready to critically evaluate his/her knowledge in economic analytics and seek expert opinions when facing difficulties in solving a problem independently.		is ready to critically evaluate the results of data analyses performed in R, recognize the limits of their knowledge, and seek expert support when facing difficulties in solving a problem.			[SK5] Assessment of ability to solve problems that arise in practice	

Subject contents	Course content – lecture		
	1. Introduction to R, R-studio. Basic operations. Data import from various formats. Measuring scales vs data types in R (vector, dataframe, matrix, list, etc.) 2. Functions, variables, operators, constants. Loops. Conditional expressions and their use in data analysis 3. Basic commands - descriptive statistics 4. Basic commands - mathematical statistics 5. Reporting in R-Markdown 6. Git and version control. GitHub. Team work. 7. Basic data processing (new variables, filters, combining frames: reshape, split, combine) 8. Imputation methods for missing cross-sectional and temporal data 9. Dirty data - missing observations; duplicates; outliers; format errors 10. Data cleaning using Dplyr and TidyR 11. Data cleaning outliers 12. Transformations and discretization of variables 13. Data sources: downloading data from databases (sqlite); web scraping; downloading data to R (Yahoo Finance; Quandl; Google Trends, Eurostat etc.) 14. Dimensional reduction using principal component analysis (PCA). Example applications 15. Graphics in R basic and advanced graphical presentation of data (packages: ggplot2; Lattice; Grid) 16. Publishing reports directly from R introduction to R-Markdown (notebook; presentations R and Powerpoint; HTML slides; PDF beamer etc.)		
	Course content – laboratory		
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Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test as an open test with interpretation of assumptions and data processing results	60.0%	40.0%
	Analytical project in R	60.0%	60.0%
Recommended reading	Basic literature	1. Wickham, H., Çetinkaya-Rundel, M., & Grolemund, G. (2023). R for data science: Import, tidy, transform, visualize, and model data (2nd ed.). OReilly Media. 2. Grolemund, G. (2014). Hands-on programming with R: Write your own functions and simulations. OReilly Media. 3. Bruce, P., Bruce, A., & Gedeck, P. (2020). Practical statistics for data scientists: 50+ essential concepts using R and Python (2nd ed.). OReilly Media.	
	Supplementary literature	https://cran.r-project.org/web/packages/IPSUR/vignettes/IPSUR.pdf - G. Jay Kerns, Introduction to Probability and Statistics using R, Third Edition, 2018	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Final project: preparation of a report and presentation in R-Markdown after data processing and analysis in R		
Practical activites within the subject	Not applicable		

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