GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DATA ANALYSIS IN R, PG_00068655		
Field of study	Economic Analytics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor		
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	8.0	0.0	24.0	0.0	0.0	32

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	32	4.0	89.0	125

Subject objectives

Uses advanced tools for processing raw economic and social data, which are then used in in-depth statistical analysis, carrying out tasks in the form of a team project

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.	correctly apply modern methods of pre-processing and raw data processing before applying advanced analytical methods, ensuring the reliability of the results	[SW1] Assessment of factual knowledge
[K7_U01] creates innovative solutions for complex and unstructured processes, considering unpredictable environmental conditions through the synthesis of information from various sources.	creates innovative solutions to complex problems, taking into account the influence of many factors on the studied phenomenon, synthesizing data from many sources	[SU3] Assessment of ability to use knowledge gained from the subject
[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

<table>
<tr><td>Subject contents</td><td>Introduction to R, R-studio. Basic operations. Data import from various formats. Measuring scales vs data types in R (vector, dataframe, matrix, list, etc.)
Functions, variables, operators, constants. Loops. Conditional expressions and their use in data analysis
Basic commands - descriptive statistics
Basic commands - mathematical statistics
Reporting in R-Markdown
Basic data processing (new variables, filters, combining frames: reshape, split, combine)
Imputation methods for missing cross-sectional and temporal data
Dirty data - missing observations; duplicates; outliers; format errors
Data cleaning using Dplyr and Tidyr
Data cleaning outliers
Transformations and discretization of variables
Data sources: downloading data from databases (sqlite); web scraping; downloading data to R (Yahoo Finance; Quandl; Google Trends, Eurostat etc.)
Dimensional reduction using principal component analysis (PCA). Example applications
Graphics in R basic and advanced graphical presentation of data (packages: ggplot2; Lattice; Grid)
Publishing reports directly from R introduction to R-Markdown (notebook; presentations R and Powerpoint; HTML slides; PDF beamer etc.)
Final project. Presentations</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>Test</td><td>60.0%</td><td>40.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Podstawy statystyki z przykładami w R, Tomasz Górecki, Wydawnictwo BTC, 2011
Przewodnik po pakiecie R, Przemysław Biecek, GIS, 2014</td></tr>
<tr><td>Supplementary literature</td><td>https://cran.r-project.org/web/packages/IPSUR/vignettes/IPSUR.pdf - G. Jay Kerns, Introduction to Probability and Statistics using R, Third Edition, 2018</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Final project: preparation of a report and presentation in R-Markdown after data processing and analysis in R</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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