



Subject card

Subject name and code	Descriptive statistics, PG_00045293						
Field of study	Data Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	first-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	Full-time studies	Mode of delivery			blended-learning		
Year of study	1	Language of instruction			English		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Katedra Statystyki i Ekonometrii -> 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	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 18.0						
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	30		4.0		41.0	75
Subject objectives	The main aim of the course is to acknowledge students with the statistical analysis based on the sample data using R & R-studio and comparison with solutions using Python.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W09] has advanced knowledge of the nature of economic sciences and ways of its description with IT tools		Student has a basic knowledge of descriptive statistics, methods of presenting data of various types and statistical modeling (for cross-sectional and time series data) and syntax of the R and Python programming language.		[SW1] Assessment of factual knowledge		
	[K6_U11] is able to use mathematical and IT tools in economics.		Student selects the appropriate statistical methods to perform the analysis for the selected statistical variable using the R and Python programming languages.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K6_K05] understands the need for self-improvement through systematic acquisition of knowledge and skills.		The student is aware of the diversity of statistical variables and types of data in R & Python environment . The student consistently improves his programming skills.		[SK2] Assessment of progress of work [SK3] Assessment of ability to organize work		

Subject contents	<p>Part 1. Introduction to R & R-studio.</p> <p>1. Types of data, basic programming skills (R)</p> <p>2. Types of statistical variables, basic operations, graphs</p> <p>3. Methods of raw data aggregating</p> <p>Part 2. Describing univariate data</p> <p>4. Measures of central tendency, dispersion, assymetry (skewness) and kurtosis, inequality & concentration + aggregating data (in respect to the type of variable) + graphs</p> <p>Part 3. Describing bivariate data</p> <p>5. Correlation analysis for pair of quantitative variables + graphs</p> <p>6. Rank correlation</p> <p>7. Two-way tables, correlation analysis of qualitative variables + graphs</p> <p>Part 4. Regression analysis</p> <p>8. OLS. Simple regression, multiple linear regression.</p> <p>9. Nonlinear regression.</p> <p>10. Regression analysis for qualitative dependend variable (optional)*.</p> <p>Part 5. Time series</p> <p>11. Describing time series graphs, tables, dynamics & indices.</p> <p>12. Decompositions. Time series models (MA, AR, ARMA).</p>											
Prerequisites and co-requisites	Mathematics, English (intermediate level), basic programming skills.											
Assessment methods and criteria	<table border="1" data-bbox="450 1585 1489 1688"> <thead> <tr> <th data-bbox="450 1585 798 1619">Subject passing criteria</th> <th data-bbox="804 1585 1139 1619">Passing threshold</th> <th data-bbox="1145 1585 1489 1619">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="450 1628 798 1662">Lecture (final exam)</td> <td data-bbox="804 1628 1139 1662">60.0%</td> <td data-bbox="1145 1628 1489 1662">50.0%</td> </tr> <tr> <td data-bbox="450 1671 798 1688">Laboratory - final test and projects</td> <td data-bbox="804 1671 1139 1688">60.0%</td> <td data-bbox="1145 1671 1489 1688">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture (final exam)	60.0%	50.0%	Laboratory - final test and projects	60.0%	50.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>1. Statistics (The easier way) with R, Nicole M. Radziwill, 2016.</p> <p>2. Discovering statistics using R, Andy Field, Jeremy Miles, Zoe Field, Sage, 2012.</p> <p>1. Statistics for Business and Economics, McClave Benson Sincich, Pearson, 2008.</p> <p>2. Using R for Introductory Statistics, John Verzani, Chapman and Hall, 2000.</p> <p>Uzupełniająca Adresy na platformie eNauczanie: Descriptive Statistics 2024 - Moodle ID: 35081 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35081</p>										
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> How can we recognize which model of time series decomposition we analyze - additive or multiplicative? Give one example for each of them. Sketch the bimodal distribution of the discrete variable. How can we deal with a large number of missing cases? List three methods. 											

Work placement	Not applicable
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