



## Subject card

Subject name and code	Inference and classification in data analysis, PG_00044133						
Field of study	Mathematics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Divison of Differential Equations and Applications of Mathematics -> Institute of Applied Mathematics -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Beata Jackowska-Zduniak					
	Teachers	mgr inż. Katarzyna Tessmer dr inż. Beata Jackowska-Zduniak					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 47630 Wnioskowanie i klasyfikacja w analizie danych 2025/2026 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=47630">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=47630</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	60		5.0		35.0	100
Subject objectives	Preparation for conducting an analysis of observational data in terms of their structure, randomness model, and selection of algorithms for a statistical decision-making scheme, as well as using the appropriate statistical algorithm and interpreting the obtained results. Familiarization with basic statistical methods of data (object) classification, ways to evaluate them, and interpretation of the results obtained through them.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W05	The student knows examples illustrating specific mathematical and statistical concepts, as well as examples of applications of the discussed methods and algorithms.	[SW1] Assessment of factual knowledge
	K6_W08	Students know the mathematical foundations of statistical algorithms. Students know basic statistical methods implemented in R and data analysis and visualisation methods.	[SW3] Assessment of knowledge contained in written work and projects
	K6_U11	Students are capable to analyse the data with respect to their structure, randomness and the applicable statistical algorithm(s). Students are capable to exploit the appropriate algorithm and correctly interpret the results. Students determine the parameter estimators of discrete and continuous probability distributions. Students use the test statistic probability distribution. Students apply central limit theorem to determine the test statistic distribution.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	K6_U12	Students are capable to analyse the data with respect to their structure, randomness and the applicable statistical algorithm(s). Students are capable to exploit the appropriate algorithm and correctly interpret the results. Students demonstrate the ability to present mathematical issues and analysis results to the wider audience.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
K6_K01	Students know how to extend their knowledge in the statistical data analysis and data classification and grouping methods by using the existing and appearing literature - the handbooks as well as the new bibliography.	[SK5] Assessment of ability to solve problems that arise in practice	
Subject contents	<p>Course content – lecture Inference (hypothesis testing) in data analysis: test for the mean, test for two means, test for variance, test for two variances, goodness-of-fit test, test of independence. Classification in data analysis: single classification, double classification.</p> <p>Course content – exercises Inference (hypothesis testing) in data analysis: test for the mean, test for two means, test for variance, test for two variances, goodness-of-fit test, test of independence. Classification in data analysis: single classification, double classification.</p> <p>Course content – project The project develops practical competencies in statistical inference based on empirical data. Students learn how to formulate a research problem in terms of statistical hypotheses and how to select an appropriate analytical method depending on the nature of the data and the research objective. The project includes the calculation of basic descriptive statistics, the computation of a test statistic, and the interpretation of results at a given significance level. Particular emphasis is placed on correctly determining the critical region and making a formal statistical decision accompanied by a clear substantive conclusion.</p> <p>The project also has an implementation component. Students prepare a universal program in R that automatically reads the data, performs the analysis, and presents the complete set of results in a clear and structured form.</p>		
Prerequisites and co-requisites	Courses completed: Probability Calculus.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquim 1	51.0%	30.0%
	Project (1 [20%], 2 [20%])	51.0%	40.0%
	Colloquim 2	51.0%	30.0%

Recommended reading	Basic literature	<i>All of Statistics: A Concise Course in Statistical Inference</i> Larry Wasserman
	Supplementary literature	<a href="https://open.umn.edu/opentextbooks/textbooks/447">https://open.umn.edu/opentextbooks/textbooks/447</a>
	eResources addresses	
Example issues/ example questions/ tasks being completed	During the exercises, students solve tasks from a list provided by the instructor, while others comment and make corrections.	
Practical activities within the subject	Not applicable	

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