GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	STATISTICS, PG_00059998		
Field of study	Environmental Engineering		
Date of commencement of studies	February 2026	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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wojciech Artichowicz	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	30.0	0.0	0.0	0.0	45

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	45	5.0	30.0	80

Subject objectives

The aim of the subject is to teach students the basics of statistics, and its practical utilization. During lectures the teorethical background of statistical methods is presented, whereas dirong tutorials practical exercises are performed. The focus of the practice is engineering, business and scientific activity. At the course attendees gain:

- Basics of statistics and probability theory
- Basic skills of working with data
- Basic skills of data science tools: Tableau®, Python, Jupyter Notebook
- Awareness of existence of data science community, f.e.: Analytics Vidhya or Kaggle

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U09	An attendee is acknowledged with sources of tools and knowledge bases allowing for further development in the field of data science and statistics.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[K7_W12] has knowledge of contemporary and useful principles on data acquisition, filtration, processing and analysis	Student is acknowledged with rules and processes of data handling pipelines in data science. Also learns to use tools appropriate for advanced data analyses (Tableau®, Python, Jupyter Notebook)..	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
[K7_U05] can rely on scientific sources for modern methods and technologies, and propose trends in the development of methods and rules for acquiring, filtering, processing and analyzing data	An attendee is acknowledged with sources of tools and knowledge bases allowing for further development in the field of datta science and statistics.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task
K7_W01	The student knows the basic concepts and methods of mathematical and descriptive statistics.	[SW1] Assessment of factual knowledge

Subject contents	Course content – lecture **Lectures and tutorials** 1.Introduction (what is statistics, how do engineers, medicians, biologists use it, tools used for statistical computing) 2. Probability (definitions, interpretations and approaches of computing), combinatorical computation of probability 3. Conditional probability, totla probability, Bayes theorem 4. Random variable (discrete and continuous), examples of random variables (f.e. normal distribution) 5. Sample collection methods and design of experiments 6. Descriptive statistics and graphical data exploration 7. Estimation theory (maximum likelihood method, least squares method, etc.), point and interval estimation 8. Statistical inference, confidence intervals 9. Statistical hypotheses testing, parametric hypostheses, nonparametric hypotheses 10. Pseudo random number generators, permutation tests, bootstrap estimation 11 Regression and correlation 12. ANOVA 13 Regression and correlation - advanced approach 14. Data analysis 15. End test **Workshops:** 1. Data anlysis with Tableau 2. Introduction to Jupyter Notebook for statistical computing
Prerequisites and co-requisites	Basics of advanced mathematics: algebra and calculus Basic computer skills.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project (datase analysis)	80.0%	30.0%
End test	60.0%	70.0%

Recommended reading	Basic literature	Jay L. Devore, Probability and Statistics for Engineering and the Sciences. 8th edition. Norman Lloyd Johnson, Statistics and experimental design in engineering and the physical sciences.

	Supplementary literature	Ven Te Chow, David R. Maidment, Larry W. Mays, Applied hydrology John C. Davis Statistics and Data Analysis in Geology. Third Edition.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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