Annex No. 9
to the Rector's Decision No. 35/19
as amended by Decision No. 12/22

COURSE SPECIFICATION

Course code	full-time:	**B1-4-406**
	part-time:	**BN1-4-406**
Course title in Polish	**Statystyka matematyczna**	
Course title in English	**Mathematical Statistics**	
Valid from academic year	**2023/2024**	

CURRICULAR ALIGNMENT

Programme	**CIVIL ENGINEERING**
Level	**first-cycle**
Programme profile	**academic**
Mode of attendance	**full-time; part-time**
Specialism	**all**
Academic unit responsible for the course	**Department of Transport Engineering**
Course coordinator	**dr hab. inż. Grzegorz Mazurek, prof. PŚk**
Approved by	**prof. dr hab. inż. Grzegorz Świt**

COURSE DESCRIPTION

Teaching block		**core**
Course status		**required**
Language of instruction		**Polish**
Semester of delivery	full-time	**semester IV**
	part-time	**semester IV**
Prerequisites		**Applied Mathematics, Theory of Probability**
Exam (YES/NO)		**No**
ECTS		**2**

Mode of instruction		**lecture**	**class**	**lab**	**project**	**other**
No. of hours per semester	full-time	**15**	**15**			
	part-time	**10**	**10**			

Learning outcomes

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Students have knowledge of mathematical statistics including probability distributions, estimation, statistical tests.	B1_W01
	W02	Students have fundamental knowledge of regression model structure.	B1_W06
Skills	U01	Students know how to use mathematical tools for planning of construction projects.	B1_U01
	U02	Students supplement and expand their knowledge independently.	B1_U29
	U03	Students are able to carry out an analysis of laboratory and field test results.	B1_U23
Competence	K01	Students are able to work independently	B1_K01
	K02	Students can describe the obtained results and formulate conclusions.	B1_K04
	K03	Students comply with professional ethics code.	B1_K07

COURSE CONTENT

Teaching mode*	Topics covered
lecture	Discrete and continuous random variables: probability density function, cumulative distribution function, functions, and numerical characteristics of a random variable.
	Basic probability distributions: normal, standard normal, X2, F. Limit theorems.
	Elements of descriptive statistics: histogram, detailed and distributive range, quartiles, central and dispersion values of data.
	Point and interval estimation, confidence intervals, problems with the minimum number of samples
	Parametric and non-parametric tests. Statistical hypothesis test: error type, critical set.
	Linear regression, correlation coefficient, significance of parameters.
class	Discrete and continuous random variables, numerical characteristics.
	Basic probability distributions.
	Elements of descriptive statistics (series, quartiles, measures of central tendency and dispersion).
	Point and interval estimation.
	Statistical hypothesis testing.
	Linear regression.

METHODS OF LEARNING OUTCOMES VERIFICATION

Learning outcome	Verification methods					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
U01			X			
U02			X			
U03			X			
K01			X			
K02			X			
K03			X			

ASSESSMENT

Teaching mode	Assessment type	Assessment criteria
lecture	mark-based	*Obtaining at least 50% of the points from the written test.*
class	mark-based	*Obtaining at least 50% of the points from the in-class written tests.*

STUDENT WORKLOAD

ECTS weighting												
	Activities	Student workload										
		full-time					part-time					
1.	Scheduled contact hours	W	C	L	P	S	W	C	L	P	S	
		15	15				10	10				
2.	Other (office hours, exams)	2	2				2	2				h
3	**Total number of contact hours**	**34**					**24**					h
4.	**Number of ECTS credits for contact hours**	**1,4**					**1,0**					ECTS
5.	**Independent study hours**	**16**					**26**					h
6.	**Number of ECTS credits for independent study**	**0,6**					**1,0**					ECTS
7.	**Practical hours**	**25**					**25**					h
8.	**Number of ECTS credits for practical hours**	**1,0**					**1,0**					ECTS
9.	**Total workload**	**50**					**50**					h
10.	**ECTS credits for the course** *1 ECTS credit =25 student learning hours*	**2**										ECTS

READING LIST

1. Greń J.: Statystyka matematyczna. Modele i zadania, PWN, Warszawa 1976.
2. Krysicki W., Bartos J. i inni: Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach część 1 i 2, PWN, Warszawa 2000.
3. Snarska A.: Statystyka, ekonometria, prognozowanie. Ćwiczenia z Excelem, Warszawa 2007.