Description of course	
Code of course	**1160-TR000-MSA-0101**
Name of course	**Statistics in Engineering Work**
Version of course	2021/22
A. *Place of the course in system of studies*	
Level of education	*Second-cycle degree*
Form and mode of studies	*Full-time studies*
Field of studies	*Transport*
Profile of studies	*General academic profile*
Specialization	*Subject common to the course of study*
Place of teaching of course	*Warsaw University of Technology, Faculty of Transport, Division of Transport Systems Engineering and Logistics*
Place of realization of course	*Not applicable*
Coordinator of course	*Mariusz Izdebski, associate professor, Division of Transport Systems Engineering and Logistics, Faculty of Transport, Warsaw University of Technology*
B. *General characteristic of the course*	
Group/*Block of courses*	*Basic subjects*
Level of course	*Intermediate level*
Type of course	*Compulsory subject*
Language of course	*English*
Location of the course in the study plan – nominal semester	1
Location of the course in the academic year	*Winter semester*
Preliminary requirements - formal	*Lack*
Limit of students	*100 students -lectures, 35 students - exercises*
C. *Effects of education and manner of teaching*	
Purpose of course	Acquiring knowledge and skills in the field of mathematical statistics, including the development of the ability to solve problems described using statistical analyzes.

Effects of education with reference to the learning outcomes for the area and field of study

No. effect	***Description of the effect***	***Reference to the characteristics of learning outcomes***	***Reference to the learning outcomes in the program***
	Assumed learning outcomes in terms of knowledge		
W01	*Knows and understands basic statistical concepts.*	I.P7S_WG.o	Tr2A_W01
W02	*Knows and understands the rules of verification of statistical hypotheses.*	I.P7S_WG.o	Tr2A_W01
W03	*Knows and understands the concept of regression and correlation.*	I.P7S_WG.o	Tr2A_W01
	Assumed learning outcomes in terms of skills		
U01	*Can evaluate the data set and generalizations about it with the use of descriptive statistics.*	I.P7S_UW.o III.P7S_UW.o	Tr2A_U03 Tr2A_U06
U02	*Can verify a given statistical hypothesis*	I.P7S_UW.o III.P7S_UW.o	Tr2A_U03 Tr2A_U06
U02	*Can check the fit of the empirical distribution to the theoretical one.*	I.P7S_UW.o III.P7S_UW.o	Tr2A_U03 Tr2A_U06
	Assumed learning outcomes in the field of social competences		
KS01	–	–	–

Form of didactic studies and number of hours	*Lecture*	*Exercise*	*Laboratory*	*Project*	*Other*
On a weekly plan	1	1	0	0	0
Throughout the semester	15	15	0	0	0

Contents of education -	*Lecture:*

separately for each form of didactic studies	*Basic concepts: population, sample, sampling, descriptive statistics. Estimators, search methods and properties of estimators, interval estimation. Verification of statistical hypotheses - general concepts (null hypothesis, alternative hypothesis, construction of a statistical test, critical area). Sample statistical tests on parametric hypotheses (expected value and variance) and non-parametric hypotheses (chi-square test, Kolmogorov-Smirnov test). Regression and correlation analysis. Fitting empirical to theoretical distributions.* *Exercise:* *Population identification - basic measures. Verification of statistical hypotheses - computational examples. Regression and correlation analysis - computational examples. Fitting empirical to theoretical distributions (conducting compliance tests).*
Teaching methods	*Lecture:* *Lecture with the use of MS PowerPoint multimedia presentations.* *Exercises:* *Problem solving. Brainstorm.*

Methods of verification of effects of education

No. effect	***Methods of verification***
	Assumed learning outcomes in terms of knowledge
W01	*Multiple-choice test: getting 50% correct answers allows you to pass the lecture*
W02	*Multiple-choice test: getting 50% correct answers allows you to pass the lecture*
W03	*Multiple-choice test: getting 50% correct answers allows you to pass the lecture*
	Assumed learning outcomes in terms of skills
U01	*Colloquium with tasks: 50% of correctly solved tasks allows you to pass the exercises.*
U02	*Colloquium with tasks: 50% of correctly solved tasks allows you to pass the exercises.*
U03	*Colloquium with tasks: 50% of correctly solved tasks allows you to pass the exercises.*
	Assumed learning outcomes in the field of social competences
KS01	–

Methods of evaluation	*Lecture:* *Multiple-choice test: getting 50% correct answers allows you to pass the lecture.* *Exercises:* *Colloquium with tasks: 50% of correctly solved tasks allows you to pass the exercises.* *Integrated assessment:* *The total score is the average of the positive partial grades. In a situation where at least one of the component ratings is equal to 2, the total rating is 2.*
Exam	*No*
Literature	*Basic literature*: 1) *Neil A. Weiss, Introductory Statistics, Global Edition, 10th Edition, Arizona State University 2017.* 2) *D. C. Montgomery, Sixth Edition Introduction to Statistical Quality Control, Arizona State University, John Wiley & Sons, Inc 2009.* 3) *Neil J. Salkind ,Statistics for people who hate statistics, University of Kansas, 2017 by SAGE Publications, Inc.* *Supplementary literature*: 1) *Seymour Lipschutz, John Schiller, Schaum's Outline of Introduction to Probability and Statistics, 1998.*
Website of the course	–

D. ***Student's activity***

Number of ECTS credits	*2*
Number of hours of student's work to achieve effects of education	*60 hours, including: work during the lecture 15 hours, work on classes 15 hours, reading the literature on the subject 15 hours, consultations 2 hours, preparation for tests 13 hours.*

Number of ECTS credits on the course with direct participation of academic teacher	*1.5 points ECTS (32 hours, including: work during the lecture 15 hours, work on classes 15 hours, consultations 2 hours)*
Number of ECTS credits on practical activities on the course	0
E. *Additional information*	
Notes	*As long as it does not cause changes in the relationship of a given subject with the directional effects in the content of education, changes may be introduced on an ongoing basis, taking into account the latest scientific achievements.*
Date of last edition	*2021-02-21 14:55*