



## RTU Course "Computer Methods for Test Planning and Data Processing"

15E03 Lidaparātu teorijas un konstrukcijas katedra

### General data

Code	TAK511
Course title	Computer Methods for Test Planning and Data Processing
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Transport
Responsible instructor	Paramonovs Jurijs
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN
Possibility of distance learning	Not planned
Maximum auditorium capacity	30
Maximum number of students per semester	30
Abstract	Random variable modelling and processing. Distribution function type testing using different methods. Confidence intervals and hypothesis testing. Survivability regression analysis.
Goals and objectives of the course in terms of competences and skills	To obtain theoretical knowledge of the mathematical statistics methods for the experimental data processing. <ul style="list-style-type: none"> <li>• to study the methods of statistical experiment planning.</li> <li>• to be able to apply the methods of mathematical statistics for processing data using MS Excel.</li> </ul>
Structure and tasks of independent studies	Work with textbook and the internet. Laboratory work and its defence preparation.
Recommended literature	1. Paramonov Ju.M. Metody matem. statistiki v zadačah, svjazannyh s ocenokj i obesp-em ustalostnoj dolgovečnosti aviac. konstrukcij. -Riga, RKIIGA, 1991. 2. Matthew MacDonald. Excel 2007. – POGUE PRESS- «Русская Редакция». «БХВ-Перепбур» 2008.
Course prerequisites	Mathematics, theory of probability, mathematical statistics.

### Course outline

Theme	Hours
Modelling of random variables.	4
Empirical distribution function.	4
Hypothesis testing distribution function type. Graphical method.	4
Hypothesis testing distribution function type. Kolmogorov's test.	4
Matrix of mistakes.	4
Confidence intervals. Hypothesis testing.	4
Regression analysis.	4
Fatigue life and survivability data processing.	4

### Learning outcomes and assessment

Learning outcomes	Assessment methods
Ability to perform modelling of random variables.	Defense of the laboratory work.
Ability to get empirical distribution function using observation data.	Defense of the laboratory work.
Ability to test distribution function using graphical method.	Defense of the laboratory work.
Ability to do hypothesis testing using Kolmogorov's test.	Defense of the laboratory work.
Ability to calculate the matrix of mistakes.	Defense of the laboratory work.
Ability to calculate confidence intervals and hypothesis testing.	Defense of the laboratory work.
Ability to perform regression analysis.	Defense of the laboratory work.
Ability to do processing of fatigue life and survivability data.	Defense of the laboratory work.
To be able to make the plan of the experiment and make processing the obtained data.	Exam.

### Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	3.0	1.0	0.0	1.0		*	