

RTU Course "Methods of Maritime Transport Research Data Processing and Analysis"**OJ000 Latvian Maritime Academy****General data**

Code	JA0180
Course title	Methods of Maritime Transport Research Data Processing and Analysis
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Valdis Priednieks
Volume of the course: parts and credits points	1 part, 3.0 credits
Language of instruction	LV, EN
Annotation	The study course deals with parametric, non-parametric and numerical procedures of statistical analysis of research data with emphasis on their practical implementation using computer programmes Excel and MINITAB.
Goals and objectives of the course in terms of competences and skills	The aim of the study course is to prepare students for the development of research work. Tasks of the study course: - to provide knowledge about data explanatory statistical analysis methods applied in research work; - to develop student's skills in the practical application of data-explanatory statistical analysis methods.
Structure and tasks of independent studies	Independent work includes two tasks: Task Nr. 1: to create skills in the practical application of methods for data relationship analyses of two or more populations (correlation, regression, nonparametric methods, χ^2 -tests, cross-data tables). Task Nr. 2: to develop skills of practical application of methods for numerical data analysis (Bootstrap, Monte Carlo, MS Excel Solver). Organization of work: students independently and, in case of confusion, in consultation with the teaching staff, perform calculations according to the data and conditions of the individual task. The developed works are presented in the final assessment of the study course.
Recommended literature	Obligātā / Obligatory: 1. Bluman A.G., Elementary Statistics: a Step by Step Approach, 10-th edition, McGraw-Hill, 2018 Papildu / Additional: 1. Upītis G., Izdāles materiāli PowetPoint.ppt formātā (tekošā gada versija). 2. David S. Moore D.S., McCabe G.P., Craig B.A., Introduction to the Practice of Statistics, 9-th edition, W. H. Freeman and Company, 2017. 3. Levine D.M., Ramsey P.P., Smidt R.K., Applied Statistics for Engineers and Scientists. Using Microsoft Excel® and MINITAB®, Prentice Hall, 2001. Citi informācijas resursi / Other sources of information: 1. https://www.real-statistics.com/
Course prerequisites	MS Excel and MINITAB computer skills, study course LJA058 "Research Methodology".

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Parametric methods: 1.1. Correlation. Significance of correlation coef. 1.2. Linear regression. Confidence intervals. 1.3. Multiple and nonlinear regression. 1.4. ANOVA.	10	0	3	0
Nonparametric methods: 2.1. χ^2 -tests. 2.2. Contingency tables. 2.3. Sign tests. 2.4. Wilcoxon signed-rank test. 2.5. Wilcoxon rank-sum test. 2.6. Mann-Whitney U-test. 2.7. Kruskal-Wallis test.	12	0	4	0
Numerical methods: 3.1. Bootstrap. 3.2. Monte Carlo. 3.3. Optimization (MS Excel, Solver). 3.4. Simulation (MS Excel, VBA).	10	0	3	0
Independent work task 1	0	24	0	35
Independent work task 2	0	24	0	35
Total:	32	48	10	70

Learning outcomes and assessment

Learning outcomes	Assessment methods
Knowledge: - knows the application areas of statistical data analysis methods, tasks, and implementation algorithms; - understands the statistical nature of analysis results.	Methods: 1. Solution of individual tasks in the form of MS Excel workbook. 2. Presentation of independent works. Criteria: orientation in research data processing methods and results presentation forms.
Skills: - can apply statistical analysis methods using MS Excel and Minitab software in solving specific data processing tasks; - is able to design and verify research results	Methods: 1. Solution of individual tasks in the form of MS Excel workbook. 2. Presentation of independent works. Criteria: ability to independently organize and perform research work data processing and presentation of results.
Competences: - can formulate data analysis tasks and choose appropriate data processing methods independently; - is able to justify and defend the correctness of the chosen approach.	Methods: 1. Solution of individual tasks in the form of MS Excel workbook. 2. Presentation of independent works. Criteria: ability to autonomously formulate problem research tasks, choose appropriate solution methods and defend the results of the work.

Evaluation criteria of study results

Criterion	%
Presentation of independent work No.1	30
Presentation of independent work No.2	30
Solution of individual tasks in form of MS Excel workbook	40
Total:	100

Study subject structure

Part	CP	Hours			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	16.0	16.0	0.0	*		