COURSE UNIT (MODULE) DESCRIPTION

Course unit title	Code
Statistical Data Analysis	

Academic staff	Core academic unit(s)
Coordinating: prof. Renata Macaitienė	Vilnius University Šiauliai Academy

Study cycle	Type of the course unit
First	Optional

Mode of delivery	Semester or period when it is delivered	Language of instruction
Face to face	Autumn / Spring	Lithuanian, English

Requisites	
Prerequisites: basic courses of Mathematics	**Co-requisites (if relevant):** -

Number of ECTS credits allocated	Student's workload (total)	Contact hours	Individual work
5	133	56	77

Purpose of the course unit
To acquire the main principles for selection and application of statistical methods; to solve real problems using specialized software for data processing and modelling; to be able to evaluate and interpret the results and to present generalized reasonable conclusions.
The course is intended for students studying in undergraduate study programs that do not belong to the group of mathematical sciences study programs.

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
Will know, understand and be able to explain the methods of mathematical statistics used in the research of dependent and independent samples, the techniques of results presentation and interpretation.	Formal lectures, literature analysis, problem-based learning, modelling of real-life situations, seminars.	Reports on the results of the practical-laboratory tasks. Report on the results of Exam tasks.
Will be able to solve classical tasks, selecting and applying the methods of descriptive statistics, regression and hypothesis testing using specialized software tools.	Workshops, practical exercises, modelling of real-life situations, seminars, application of special software packages.	Reports on the results of the practical-laboratory tasks. Report on the results of Exam tasks.

Content	Contact hours							Individual work: time and assignments	
	Lectures	Tutorials	Seminars	Workshops	Laboratory work	Internship	Contact hours, total	Individual work	Tasks for individual work
1. Software selection. Data collection, coding, selection criteria.	1		2		2		**5**	4	Studying literature (according to the specified sources and descriptions of specialized tasks
2. Parameters of descriptive statistics.	1				2		**3**	4	
3. Normal distribution.	1				1		**2**	2	

4. Point estimates and confidence intervals.	2				1		**3**	**2**	indicated in the *Moodle* platform).
Preparation to realize the practical-laboratory tasks. Completion of PL₁.		2			2		**4**	**10**	Solving of given self-control tasks using specialized software.
5. Hypothesis testing.	1		2				**3**	**4**	Studying literature (according to the specified sources and descriptions of specialized tasks indicated in the *Moodle* platform). Solving of given theoretical self-control tasks and practical tasks using specialized software.
6. Nonparametric hypotheses for compatibility of distributions	1				2		**3**	**4**	
7. Correlation and regression analysis. Linear and nonlinear models. Prediction.	2				2		**4**	**5**	
8. Parametric hypotheses. Hypotheses for correlation coefficient.	1				2		**3**	**4**	
Preparation to realize the practical-laboratory tasks. Completion of PL₂.		2			2		**4**	**10**	
9. Parametric hypotheses for one sample.	2				2		**4**	**4**	Studying literature (according to the specified sources and descriptions of specialized tasks indicated in the *Moodle* platform). Solving of given theoretical self-control tasks and practical tasks using specialized software.
10. Parametric hypotheses for two (or more) independent and dependent samples.	2				6		**8**	**6**	
11. Univariate and multivariate analysis of variance.	2		2		4		**8**	**6**	
Exam.		2					**2**	**12**	
Total	**16**	**6**	**6**		**28**		**56**	**77**	

Assessment strategy	Weight %	Deadline	Assessment criteria
Practical-laboratory tasks (PL₁)	30%	During the semester	The package of practical tasks consists of 6-8 tasks, all tasks must be solved by computer. The results and the conclusions presented are evaluated according to the detailed requirements given in the task's description (selection of methods, functions and tools, explanation of results) with an accuracy of 0.5 points.
Practical-laboratory tasks (PL₂)	30%	During the semester	The package of practical tasks consists of 8-10 tasks, all tasks must be solved by computer. The results and the conclusions presented are evaluated according to the detailed requirements given in the task's description (selection of methods, functions and tools, explanation of results) with an accuracy of 0.5 points.
Exam	40%	During the exam session	The package of Exam tasks consists of 8 tasks, all tasks must be solved by computer. The results and the conclusions presented are evaluated according to the detailed requirements given in the task's description with an accuracy of 0.5 points.

Author	Publishing year	Title	Issue of a periodical or volume of a publication; pages	Publishing house or internet site
Required reading				
R. Macaitienė	2024	Statistical Data Analysis		Methodological material prepared by teacher (*Moodle* platform: emokymai.vu.lt)
Ūdemy group	2024	Statistics for Data Scienc. On-line course.		link.
A. Garth	2018	Analysing data using SPSS	Sheffield Hallam University	link

Recommended reading				
Üdemy group	2023	Statistics for Data Analysis Using Excel. Statistical Data Analysis for beginners: Descriptive a Inferential statistics, Hypothesis testing		link
	2023	PSPP for Beginners		link