



COURSE UNIT (MODULE) DESCRIPTION

Course unit title	Code
Fundamentals of Data Analytics	

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

Study cycle	Type of the course unit
First	Mandatory

Mode of delivery	Semester or period when it is delivered	Language of instruction
Mixed learning	Autumn / Spring	Lithuanian / English

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

Number of ECTS credits allocated	Student's workload (total)	Contact hours	Individual work
5	133	53	80

Purpose of the course unit
<p>The course aims to master the core principles of using specialized software to solve specific real problems in Economics: developing skills in the systematization, processing, and analysis of data; enabling students to perform calculations using appropriate mathematical methods and software tools/functions; and cultivating the ability to critically evaluate and reasonably interpret obtained results, as well as to present well-founded conclusions and recommendations.</p> <p>This course is designed for students of the Bachelor's Program in <i>Economics and Investment</i>.</p>

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
Students will be able to apply standard spreadsheet functions for modeling and solving economic problems, prepare scenarios, select values of parameter for appropriate formula, find optimal solutions, and present generalized conclusions and recommendations.	Formal lectures, Workshops, Problem-based learning, Simulating of real-life situations, Consultations.	Practical Tasks (PT ₁).
Students will be able to use specialized data analysis tools to analyse large data sets, including sorting and filtering data, performing summary calculations, creating pivot tables, and generating interactive reports and visualizations.	Formal lectures, Workshops, Problem-based learning, Simulating of real-life situations, Using of special software packages, Individual consultations,	Practical Tasks (PT ₂).
Students will be able to summarize, analyze and systematize data independently; make predictions based on data analysis, evaluate possible decision alternatives, analyse and reasonably interpret the results.	Formal lectures, Workshops, Problem-based learning, Modelling of real-life situations, Individual consultations.	Exam

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. Storage and sharing of various types of data on "clouds"/remote servers. Using of open source software.	1			2			3	2	Studying literature and solving self-control tasks (according to the specified sources and descriptions given in <i>Moodle</i> platform, Chapter I). Solving practical tasks (detailed information is provided in <i>Moodle</i> platform, Chapter I).
2. Basics of using the main <i>MS Excel</i> functions for solving real economic problems (Date and time, Math, Logical, Lookup and reference functions).	1			4			5	6	
3. Automated selection of function argument values, preparation of scenarios, solving optimization problems.	1			2			3	4	
4. Database functions.	1			2			3	4	
<i>Practical Tasks (PT₁)</i>		1		2			3	8	
5. Data collection, coding, selection criteria. Quantitative and qualitative variables. Scales.	1			2			3	4	Studying literature and solving self-control tasks (according to the specified sources and descriptions given in <i>Moodle</i> platform, Chapter II). Solving practical tasks (detailed information is provided in <i>Moodle</i> platform, Chapter II).
6. Managing large lists of data: selection of records, filtering, subtotal calculations, preparation and presentation of Pivot tables and graphs.	2			4			6	4	
7. Basics of data modelling using PowerPivot.	2			2			4	6	
<i>Practical Tasks (PT₂)</i>		2		2			4	8	
8. Data Analysis and Visualization with Power BI: login user interface. Data types, data sources, importing data.	2			2			4	4	Studying literature and solving self-control tasks (according to the specified sources and descriptions given in <i>Moodle</i> platform, Chapter III). Solving practical tasks (detailed information is provided in <i>Moodle</i> platform, Chapter III).
9. Transforming, filtering, appending, merging, splitting, grouping and aggregating data.	1			2			3	4	
10. The simplest reports and visualizations (tables, matrices, charts).	2			3			5	8	
11. Publishing reports and creating dashboards.	2			3			5	6	
<i>Exam</i>		2					2	12	
Total	16	5		32			53	80	

Assessment strategy	Weight %	Deadline	Assessment criteria
Practical Tasks (PT ₁)	30	During the semester	The package of tasks consists of 8 practical tasks. The tasks are performed only on the computer, the results and their analysis are presented in the same file. 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 (appropriate selection of problem solving methods, functions and tools; submission of data and results according to requirements). These practical tasks are mandatory. In order to achieve the highest possible level of learning outcomes, students are given the opportunity to retake these exercises repeatedly (once).

Practical Tasks (PT ₁)	30	During the semester	<p>The package of tasks consists of 10 practical tasks. The tasks are performed only on the computer, the results and their analysis are presented in the same file. The results and the conclusions presented are evaluated according to the detailed requirements given in the task's description with an accuracy of 0.25 points (appropriate selection of problem solving methods, functions and tools; submission of data and results according to requirements).</p> <p>These practical tasks are mandatory. In order to achieve the highest possible level of learning outcomes, students are given the opportunity to retake these exercises repeatedly (once).</p>
Exam	40	During the Exam session	<p>The package of practical tasks consists of 10 short tasks (0.5 point for each) and 4 extensive tasks (1-1.5 points each). The tasks are performed only on the computer, the analysis of the results is presented in a separate document. The exam results are evaluated according to the detailed requirements presented in the task's description with an accuracy of 0.25 points (appropriate selection of problem solving methods, functions and tools; submission of data and results according to requirements).</p>

Author	Publishing year	Title	Issue of a periodical or volume of a publication; pages	Publishing house or internet site
Required reading				
R. Macaitienė	2024	Fundamentals of Data Analytics		Methodological material prepared by teacher (<i>Moodle</i> platform: emokymai.vu.lt)
Dan Clark	2020	Beginning Microsoft Power BI. A practical guide to self-service data analytics.		link
Udemy group	2022 2024	Microsoft Power BI: The Complete Guide // Microsoft Power BI - The Practical Guide 2024		link , link
H. Evans	2020	Over 100 Free Excel Spreadsheets - Excellence in Financial.		link
Recommended reading				
Chris Webb	2018	Power Query for Power BI and Excel		link
Deckler, Greg. Learn	2020	Power BI : A Beginner's Guide to Developing Interactive Business Intelligence Solutions Using Microsoft Power BI.		link
-	2022	Power BI Tutorial for Beginners		link