Subject code	ECTS credits
MAT5004	6

Course title in Lithuanian

EKONOMETRIKA

Course title in English

ECONOMETRICS

Short course annotation in Lithuanian (up to 500 characters)

Šio kurso tikslas yra suteikti studentams teorinių ir praktinių žinių, reikalingų analizuojant ekonominius duomenis matematiniais metodais. Kursas apima paprastąją ir daugialypę regresijas, modelio identifikacijos problemų sprendimą, prognozavimo problemas ir vienalaikių lygčių sistemas.

Short course annotation in English (up to 500 characters)

Course objective – introduce to the most important statistical methods for analysis of economic data. In order to achieve these objectives, the course includes lectures and practical work. The main topics are: simple linear regression; multiply regression; violation of the assumption of the basic model, e.g. heteroscedasticity, autocorrelation, multicollinearity; dummy variables; simultaneous equations.

Prerequisites for entering the course

Probability Theory, Mathematical Statistics, Algebra

Course aim

Course aim is to provide deeper knowledge of simple and multiply regression analysis, develop students' skills in analytical thinking.

Links between study programme outcomes, course outcomes, criteria of learning achievement evaluation, study methods and methods of learning achievement assessment

Course outcomes	Criteria of learning achievement evaluation	Study methods	Methods of learning achievement assessment
1. Develop regression model.	Student demonstrates the ability to perform initial statistical analysis and build regression models	Lectures, practical works, individual work, consulting	Mid-term exam
2. Test models adequacy and parameters statistical significance	Student demonstrates the ability to estimate regression models and models parameters and test statistical significance	Lectures, practical works, individual work, consulting	Mid-term exam
3. Identify developed model problems and solve them	Student demonstrates the ability to identify problems of regression models and find problems solution methods	Lectures, practical works, individual work, consulting	Exam
4. Identify equations of simultaneous equations systems	Student demonstrates the ability to identify equation type and choose appropriate solution method	Lectures, practical works, individual work, consulting	Exam
5. Present report of performed study	Student demonstrates the ability to formulate task, present solution process, justify received results	Individual work, self-study of literature, discussions, consulting	Essay presentations

Links between study programme outcomes and course outcomes

Study programme outcomes	Running number of course outcome				
	1	2	3	4	5
1. Deepen and expand general knowledge of mathematics and apply it in a new non-standard environment	+			+	
3. Broaden and apply the knowledge of reliability analysis and statistical methods for data analysis	+	+	+	+	

4. Identify, select and understand the state-of-the-art literature of mathematics and apply the gained knowledge to specific scientific and practical tasks			+	+	+
5. Develop mathematical models integrating the knowledge from various fields and different mathematical modelling techniques, and analyse the modelling results assessing the model adequacy and accuracy	+	+	+	+	
7. Analyse, understand and use mathematical methods	+	+	+	+	
9. Critically evaluate personal results and professional experience and other persons' activity					+
13. Take moral responsibility for the results of work					+

Content

No	Content (topics)
1.	Purpose of econometrics. Relation with economics.
2.	Linear regression model and least square method.
3.	Gauss–Markov theorem
4.	Parameters estimation.
5.	Maximum likelihood method.
6.	Multiply regression model.
7.	Multicollinearity and dummy variables
8.	Heteroscedasticity and autocorrelation.
9.	Forecasting.
10.	Generalized least square method.
11.	Systems of simultaneous equations

Distribution of workload for students (contact and independent work hours)

Lectures	**45 hours**
Practical work	**15 hours**
Individual students work	**100 hours**
Total:	**160 hours**

Structure of cumulative score and value of its constituent parts

Final written exam (50%), mid-term written exam (25%), and assessments of homework (25%).

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	*Self-study rooms*	*Other libraries*
Basic materials						
1.	2016	R.Krikštolaitis. Ekonometrika (Ekonometrics)	Kaunas, VDU	Free access in VMU Moodle system for students of this study subject		
2.	2007	R.Krikštolaitis. Priklausomybės tyrimas. (Correlation and regression analysis)	Kaunas, VDU	7	2	5
3.	2001	G.S. Madala. Introduction to Econometrics. 3rd ed.	John Wiley & Sons Ltd.		1	
4.	2004	Магнус Я.Р., Катышев П.К., Пересецкий А.А. Эконометрика. (Econometrics)	Начальный курс, М.: Дело		2	
Supplementary materials						
1.	2016	B.E.Hansen. Econometrics		Free online access http://www.ssc.wisc.edu/~bhansen/econometrics/		
2.	2016	Dougherty. Introduction to Econometrics	Oxford University Press.	Free online access		

			Online Resource Centres	http://global.oup.com/uk/orc/busecon/economics/dougherty5e/
3.	2006	A.H.Studenmund. Using Econometrics: practical guide.	Pearson/Addison Wesley	

Course programme designed by

Prof.dr. Ričardas Krikštolaitis