DOCTORAL (PHD) STUDIES
COURSE DESCRIPTION

Course title	Field of science	Faculty	Institute
Econometrics	Mathematics (N 001)	Faculty of Mathematics and Informatics	Institute of Applied Mathematics

Study method	Number of credits	Study method	Number of credits
Lectures	0	Consultations	1
Individual work	4	Seminars	0

Course summary

1. **Simple regression model**: least squares method; Gauss-Markov theorem; statistical analysis.
2. **Multivariate regression model:** least squares method; Gauss-Markov theorem; statistical properties of least squares estimator.
3. **Some aspects of multivariate regression:** multicollinearity; dummy variables; partial correlation; model specification problems; stochastic regressors; heteroskedasticity; time varying correlation.
4. **Generalized least squares method.**
5. **Maximum likelihood method for regression models.**
6. **Forecasting with regression models:** unconditional forecasting; conditional forecasting; forecasting in the case of correlated errors.
6. **Simultaneous equations model.**
7. **Time series models:** distributed lag models; dynamic models; unit roots and cointegration; ARIMA models; GARCH models.
8. **Discrete dependent variable models.**
10. **Panel data analysis.**

Main literature
1. Peracchi F. *Econometrics*. Wiley, New York, 2001.
2. Baltagi B. H. *Econometric Analysis of Panel Data.* John Wiley & Sons Ltd, New York, 2002. 2nd edition.

Consulting teacher	Scientific degree	Pedagogical name	Main publications in the field of science of the last 5 year period
Remigijus Leipus	Habil. dr.	Prof.	1. Skorniakov V., Leipus R., Juzeliūnas G., Staliūnas K. Group testing: Revisiting the ideas. *Nonlinear Analysis: Modelling and Control*. 2021. **26**. 534-549. 2. Jokubaitis S., Celov D., Leipus R. Sparse structures with LASSO through Principal Components: forecasting GDP components in the short-run. *International Journal of Forecasting*. 2021. **37**. 759-756. 3. Leipus R., Philippe A., Pilipauskaitė V., Surgailis D. Estimating long memory in panel random-coefficient AR(1) data. *Journal of Time Series Analysis*. 2020. **41**. 520-535.
Alfredas Račkauskas	Habil. dr.	Prof.	1. A. Račkauskas. Asymptotic normality of sums of Hilbert space valued random elements. *Georgian mathematical journal.* 28(3):459–469, 2021. https://doi.org/10.1515/gmj-2019-2075 2. R. Norvaiša, A. Račkauskas. Uniform asymptotic normality of weighted sums of short-memory linear processes. *Journal of applied probability*, 57(1):174–195, 2020. https://doi.org/10.1017/jpr.2019.86

			3. A. Račkauskas, M. Wendler. Convergence of U-processes in Holder spaces with application to robust detection of a changed segment. *Statistical papers*, 61(4):1409–1435 https://doi.org/10.1007/s00362-020-01161-9
			4. A. Račkauskas, Ch. Suquet. On Bernstein-Kantorovich invariance principle in Holder spaces and weighted scan statistics, *ESAIM: probability and statistics,* 24:186–206, 2020 https://doi.org/10.1051/ps/2019027
			5. R Norvaiša, A. Račkauskas. Uniform asymptotic normality of self-normalized weighted sums of random variables *Lithuanian mathematical journal,* 59(4): 575–594, 2019 https://doi.org/10.1007/s10986-019-09461-w

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| Board Chairman – assoc. prof. dr. Kristina Lapin |