DOCTORAL (PHD) STUDIES
COURSE DESCRIPTION

Course title	Field of science	Faculty	Institute
Asymptotic Statistics	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
Stochastic convergence: basic theory, stochastic o and O symbols, convergence of moments, delta method. M and Z estimators: consistency, asymptotic normality, maximum likelihood estimators. Contiguality. Local asymptotic normality: expansion of the likelihood, convergence to the normal experiment, distribution with respect to alternatives, local asymptotic normality. Efficiency of estimators: lower bounds for the risk, convolution theorem, local asymptotically minimax estimators.

Main literature
1. A. W. van der Vaart. *Asymptotic Statistics*. Cambridge University Press, 1998.
2. Juan Shao. *Mathematical Statistics*. Springer, New York, 1998.

Consulting teacher	Scientific degree	Pedagogical name	Main publications in the field of science of the last 5 year period
Vytautas Kazakevičius	Dr.	Assoc. Prof.	1. Kazakevičius, Vytautas. Subadditive ergodic theorem for double sequences // Journal of theoretical probability, 2021, vol. 34, p. 307-330. 2. Kazakevičiūtė, Agnė; Kazakevičius, Vytautas; Olivo, Malini. Conditions for existence of uniformly consistent classifiers // IEEE Transactions on information theory, 2017, vol. 63, issue 6, p. 3425-3432.
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