DOCTORAL (PHD) STUDIES
COURSE DESCRIPTION

Course title	Field of science	Faculty	Institute
Approximation Methods	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
Course aim is to teach methods for estimating the accuracy of probabilistic approximations in total variation, uniform and local metrics. Methods include: the characteristic function method, method of convolutions, Stein's method. Applications of methods are exemplified by the Berry-Esseen theorem, Le Cam's compound Poisson approximation theorem, Poisson approximation theorem via Stein's method.
Main literature
1. V. Čekanavičius, Approximation Methods in Probability Theory, 2016, Springer, Universitext, ISBN 987-3-319-34072-2, 274p.
2. V. V. Petrov, *Limit Theorems of Probability Theory*: Sequences of Independent Random Variables, 1995.

Consulting teacher	Scientific degree	Pedagogical name	Main publications in the field of science of the last 5 year period
Vydas Čekanavičius	Habil. dr.	Prof.	1. V. Čekanavičius, P. Vellaisamy (2021). Compound Poisson approximations in p-norm for sums of weakly dependent vectors. *Journal of Theoretical Probability*, 34 (4), 2241–2264 2. V. Čekanavičius, P. Vellaisamy (2020). Lower bounds for discrete approximations to sums of m-dependent random variables. *Probab. Math. Stat.*, **40**(1), 23–35. 3. V. Čekanavičius, P. Vellaisamy (2019). On large deviations for sums of discrete m-dependent random variables. *Stochastics*, **91**(8), 1092-1108. 4. P. Vellaisamy, V. Čekanavičius (2018). Infinitely divisible approximations for sums of m-dependent random variables. *Journal of Theoretical Probability*, **31**(4), 2432–2445. 5. V. Čekanavičius, P. Vellaisamy (2018). Approximating by convolution of the normal and compound Poisson laws via Stein's method. *Lithuanian Mathematical Journal*, **58**(2), 127–140. 6. N.S. Upadhye, V. Čekanavičius, P. Vellaisamy (2017). On Stein operators for discrete approximations. *Bernoulli*, **23**(4A), 2828–2859.

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Board Chairman – assoc. prof. dr. Kristina Lapin