

**DOCTORAL (PHD) STUDIES
COURSE DESCRIPTION**

Course title	Field of science	Faculty	Institute
Algebra	Mathematics (N 001)	Faculty of Mathematics and Informatics	Institute of Mathematics
Study method	Number of credits	Study method	Number of credits
Lectures	2	Consultations	1
Individual work	7	Seminars	0

Course summary
<p>Group Theory. (Contact hours: 20 academic hours). Groups, subgroups, equivalence relations, factorization, normal subgroups, factorgroups, homomorphisms, isomorphisms, automorphisms, The isomorphism theorems, direct products, normal and composition series. solvable groups, semidirect products, extensions of groups, group actions, The Sylow theorems, the structure of a finite abelian group.</p> <p>Rings and fields. (Contact hours: 20 academic hours). Ideals, factorization, quotient rings, homomorphisms, prime and maximal ideals, Eclidean rings, Dedekind domains, fields, characteristic, finite fields, algebraically closed fields.</p> <p>Galois Theory. (Contact hours: 24 academic hours). Field extensions, finite and algebraic extensions, norm and trace, separable extensions, number fields, normal extensions, splitting field of a polynomial, finite Galois extensions, The fundamental theorem of Galois Theory, solution by radicals.</p> <p>Total number of contact hours: 64 academic hours.</p>
Main literature
1. Minking E., Shou-Te C., <i>A course on abstract algebra</i> , Hackensack, NJ: World Scientific, 2018. (2nd edition)
2. Dummit D. S., Foote R. M., <i>Abstract algebra</i> , Wiley, 2004. (3rd edition)
3. Lang S., <i>Undergraduate algebra</i> , Springer, 2005. (3rd edition)
4. Milne J. S., <i>Group theory (v4.00)</i> , 2021, http://www.jmilne.org/math/CourseNotes/GT.pdf
5. Milne J. S., <i>Fields and Galois theory (v5.00)</i> , 2021, http://www.jmilne.org/math/CourseNotes/FT.pdf
6. Weintraub S. H., <i>Galois theory</i> , Springer, 2006.
7. Vinberg E. B. <i>A Course in Algebra</i> . AMS, Graduate Studies in Mathematics, 56, 2003.
8. Lang S. <i>Algebra</i> . Graduate Texts in Math., 211. Springer, New York, 2002. (revised 3-rd edn.)

Consulting teacher	Scientific degree	Pedagogical name	Main publications in the field of science of the last 5 year period
Paulius Drungilas	Dr.	Prof.	<ol style="list-style-type: none"> 1. P. Drungilas, R. Garunkštis, A. Novikas, On Second Moment of Selberg Zeta-Function for $\sigma=1$, Results in Mathematics 76 (4) (2021) DOI 10.1007/s00025-021-01492-5 2. P. Drungilas, A. Dubickas, Multiplicative dependence of two integers shifted by a root of unity, Proceedings of the American Mathematical Society 147 (2) (2019), 505-511. 3. P. Drungilas, J. Jankauskas, J. Šiurys, On Littlewood and Newman polynomial multiples of Borwein polynomials, Mathematics of Computation, Vol. 87, No. 311 (2018), 1523-1541.
Artūras Dubickas	Habil. dr.	Prof.	<ol style="list-style-type: none"> 1. A. Dubickas, On the smallest integer vector at which a multivariable polynomial does not vanish, Mathematical Communications 25 (2) (2020), 227-235. 2. A. Dubickas, Units in number fields satisfying a multiplicative relation with application to Oeljeklaus-Toma manifolds, Results in Mathematics 76 (2) (2021), Art. 78, 12 pp.

			3. A. Dubickas, Cyclotomic quotients of two conjugates of an algebraic number, Siberian Math. J. 62 (3) (2021), 409-412.
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Approved by the Board of Faculty of Mathematics and Informatics 10/12/2021. Resolution No. (1.5 E) 110000-TPN-42

Board Chairman – assoc. prof. dr. Kristina Lapin