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| Study programme(s): Mathematics | | | | |
| Level: doctoral studies | | | | |
| Course title: Universal algebra 1 (AL-18) | | | | |
| Lecturer: Petar V. Marković | | | | |
| Status: elective | | | | |
| ECTS: 10 | | | | |
| Requirements: Universal algebra (MA-18) | | | | |
| Learning objectives: Acquainting the students with basic concepts, results and proof techniques of Universal algebra. | | | | |
| Learning outcomes: The student will acquire understanding of basic concepts and methods which allow conducting research in the area of universal algebra. | | | | |
| Syllabus: Examples of commutators in groups and rings. Congruence modular varieties and Day terms. Shifting Lemma and its applications. Several definitions of a commutator: centralizer, $[\alpha, \beta]$, $[\alpha, \beta]_s$, $M(\alpha, \beta)$. Basic properties of the commutator. Abelian, strongly Abelian, nilpotent and solvable congruences. Commutator in congruence modular varieties: equivalence of various definitions. Residuated lattice of congruences. Generating $[\alpha, \beta]$ in A^4 . Abelian and affine algebras in congruence modular varieties. Difference term. Permutability. Gumm terms and congruence modularity. Nilpotent algebras, decomposition and congruence regularity. Rings associated with varieties. Structure of algebras in congruence modular varieties. | | | | |
| Literature 1. R.Freese, R.N.McKenzie, Commutator Theory for Congruence Modular Varieties, Cambridge University Press, 1987. 2. R.N.McKenzie, G.F.McNulty, W.F.Taylor, Algebras, Lattices, Varieties, I, Wadsworth and Brooks/Cole, Monterey, 1987. 3. S.Burris, H.P.Sankappanavar, A Course in Universal Algebra, Springer-Verlag, 1981. | | | | |
| Weekly teaching load | | | | Other: 0 |
| Lectures: 2 | Exercises 0 | Other forms of teaching: 0 | Student research: 6 | |
| Teaching methodology Lectures are presented using classical teaching methods. The students are given homework problems which are discussed in class throughout the semester. On one colloquium the students demonstrate their ability to independently solve problems related to the course material. The final exam is oral and the student is supposed to demonstrate a general understanding of the presented theoretical material. | | | | |
| Grading method (maximal number of points 100) | | | | |
| Pre-exam obligations | points | Final exam | Points | |
| Colloquium | 30 | Oral exam | 70 | |