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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | **Faculty of Sciences and Mathematics** |
| **GENERAL INFORMATION** |
| Study program  | **Mathematics** |
| Study Module (if applicable) |  |
| Course title | **Selected Topics in Algebra** |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [ ] Spring |
| Year of study  |  |
| Number of ECTS allocated | 12.00 |
| Name of lecturer/lecturers | **Snežana Ilić** |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The purpose of course is to master the basic ideas, concepts and methods of universal algebra, the theories of groups, rings, fields and modules. Upon completion of the course, the student should gain a thorough knowledge of the basic ideas, concepts and results of universal algebra, theories of groups, rings, fields and modules, and to be able to independently apply this knowledge in other mathematical and scientific disciplines.  |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Algebraic operations and structures, language, terms, algebraic laws, homomorphisms, subalgebras, direct and subdirect products of algebras, generating sets, kongruences and quotient algebras, varieties and free algebras, groups, sub-groups, homomorphisms of groups, normal subgroups and quotient subgroups, permutation groups, representation of groups, direct product of groups, cyclic groups, abelian groups, finitely generated abelian groups, Sylow theorems and finite groups of small order, free groups, free product of groups, rings, subrings, homomorphisms of rings, congruences on rings, ideals, quotient rings, fields, characteristics of a field, polynomial rings, algebraic extensions, finite fields, separable extensions, perfect fields, simple extensions, normal extensions, Galois extensions, the basic elements of the theory of Galois, solving algebraic equations in radicals, modules, submodules, free modules, dual modules, homological algebra, linear algebras, composition algebras, non-associative linear algebras.  |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[ ] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **Points** |
| **Activity during lectures** | **10** | **Written examination** | **–** |
| **Practical teaching** | **20** | **Oral examination** | **70** |
| **Teaching colloquia** | **–** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |