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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) | Mathematical models in physics |
| Course title | Group Theory and Applications |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | 2. |
| Number of ECTS allocated | 7.5 |
| Name of lecturer/lecturers | Milica Kolundžija |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Students are trained to solve complex problems requiring the knowledge of group theory.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Group definition, basic properties of groups, examples, definition and properties of power in the group, subgroup, the subgroup generated by the set, order of element in the group, Lagrange theorem, group homomorphism, congruence, normal subgroups, factor groups, the connection between normal subgroups and congruence in the group, isomorphism theorems, definitions and examples of cyclic groups, theorems about generators of finite cyclic group, subgroups of cyclic group, homomorphic image of cyclic group, direct product of cyclic groups, group action on the set, Cauchy theorem, n! -theorem, p-group, Sylow theorems , internal direct products of subgroups, irresolvable groups, direct sums of cyclic groups, finitely generated commutative groups, finite commutative p-groups, finite commutative groups, finite groups of small order, the symmetry group, the rotation group, infinite groups, rings, homomorphisms, ideals, modules , vector spaces, the group of invertible operators, group representations, associative algebras, Lie algebra, Lie groups.** |
| **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** |  | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **50** |
| **Teaching colloquia** | **2 x 25** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |