|  |
| --- |
|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | **Faculty of Sciences and Mathematics** |
| **GENERAL INFORMATION** |
| Study program  | **Mathematics** |
| Study Module (if applicable) | **General mathematics, Mathematical Models in Physics** |
| Course title | **Mathematical Logic** |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [ ]  Autumn [x] Spring |
| Year of study  | second |
| Number of ECTS allocated | 6.00 |
| Name of lecturer/lecturers | **Miroslav Ćirić** |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| This is an advanced course in mathematical logic. Within the framework of this course, students should master the main concepts, ideas and the results of formal propositional and predicate logic (propositional calculus, predicate calculus), as well as of non-classical logics (intuitionistic logic, modal logics, fuzzy logics).  |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| * **Introduction to mathematical logic** – basics of mathematical logics, formal calculi, semantics vs. syntax, classical and non-classical logics;
* **Algebraic background** – ordered sets, isotone and residuated functions, lattices, complete lattices, Boolean algebras, Brouwerian lattices and Heyting algebras, orthomodular lattices, ordered algebraic structures, ordered and residuated semigroups, quantales, residuated lattices;
* **Propositional logic** - propositional formulas, interpretation, truth values, tautologies and logical laws, logical equi-valence, truth functions, normal forms, bases of operations on {0,1}, semantic consequences and logical argumenta-tion, Deduction Theorem – semantic version; formal theories, propositional calculus, Deduction Theorem – syntactic version, Completeness Theorem;
* **Predicate logic –** language of predicate logic, terms and predicate formulas, bound and free variables, interpretation and valuations, values of terms and truthfulness of formulas, valid formulas, predicate calculus, Deduction Theorem – syntactic version, Completeness Theorem;
* **Non-classical logics** – an overview of non-classical logics, intuitionistic logic, modal logics, Kripke models, fuzzy logics.
 |
| **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** | **25** |
| **Practical teaching** | **–** | **Oral examination** | **40** |
| **Teaching colloquia** | **25** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |