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| 1. Course title: Foundations of mathematics | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): lecture | | | |
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| 4. Contact hours: 2 hoursper week | | 5. Number of credits (ECTS): 2 | | | |
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| 6. Preliminary conditions (max. 3):   * Abstract algebra lecture * Abstract algebra seminar | | | | | |
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| 7. Announced: fall semester,  spring semester, both | | | | | |
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| 8. Limit for participants: | | | | | |
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| 10. Responsible teacher (faculty, institute and department):  László Tóth, PhD (Faculty of Sciences, Institute of Mathematics and Informatics, Department of Mathematics) | | | | | |
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| 11. Teacher(s) and percentage: | | László Tóth, PhD | | 100 % | |
| Tímea Eisner, PhD | | 100 % | |
| Ilona Simon, PhD | | 100 % | |
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| 12. Language:English | | | | | |
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| 13. Course objectives and/or learning outcomes:  Objectives: The lecture intends to introduce students to the concepts of set theory and mathematical logic.  Learning outcomes: students completing the course will have *knowledge* on set theory, mathematical logic, and vocabulary in the topic. They will be *able* to apply the corresponding properties, they will have a *competence* of evaluating new mathematical results. Their positive *attitude* towards innovative methods in mathematics will increase significantly. | | | | | |
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| 14. Course outline     1. Operations with sets, power set. 2. Equivalent sets. 3. Cardinals and their comparison. 4. Operations with cardinals. 5. Ordered sets, well ordering. 6. The axiom of choice. 7. Transfinite induction and recursion. 8. Logical operations, formulas in propositional logic. 9. Conjunctive and disjunctive normal forms. 10. Boole-functions. Deduction. Completeness. 11. First-order logics and structures. 12. Axiomatic theories. 13. Formal and nonformal theories. | | | | | |
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| 15. Mid-semester works  Attending lectures is highly recommended. | | | | | |
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| 16. Course requirements and grading  Written exam is based on lectures, accessible electronic sources and lecture materials.  Grades:  0–39% fail  40–54% acceptable  55–69% average  70–84% good  85–100% excellent | | | | | |
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| 17. List of readings   1. An electronic textbook is available from the lecturer. | | | | | |
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| 18. Recommended texts, further readings   1. R.R. Stoll, Set, logic and axiomatic theories, W.H. Freemann, 1971. 2. Wilder, Raymond Louis. Introduction to the Foundations of Mathematics. 1965. 3. Ramsey, Frank Plumpton. Foundations of mathematics and other logical essays. Routledge, 2013. | | | | | |
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| **Date** | 8 May, 2017 | **Prepared by** |  | | |
| László Tóth, PhD  responsible teacher | | |
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| **Endorsed by** | | |  | | |
| László Tóth, PhD  program supervisor | | |