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| 1. Course title: Algebra 1 | | | | | |
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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): 3 | | | |
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| 6. Preliminary conditions (max. 3): | | | | | |
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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: | | János Ruff, PhD | | 100 % | |
| András Frigyik, 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 basic concepts and properties of algebra and number theory.  Learning outcomes: students completing the course will have *knowledge* on basic algebra and number theory, and vocabulary in the topic. They will be *able* to apply the algebraic and number theoretic properties, to solve equations, 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. Natural numbers, integers, rational numbers. Real numbers. 2. Elementary algebraic identities. 3. Powers with rational exponents and their properties (with proofs). 4. Quadratic equations. Equations with absolute values. 5. Irrational equations. Systems of equations with two and three unknowns. 6. Divisibility of integers, primes, greatest common divisor, least common multiple. 7. Operations and their properties. 8. Basic algebraic structures: groups, rings, fields. Examples, applications. 9. Polynomials and rational fractions. Partial fractions. Polynomial division. 10. Multiple roots. Special equations of degree three and four. 11. Complex numbers. Operations. 12. Roots of complex numbers, roots of unity. 13. Applications to geometric problems. | | | | | |
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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. Norman, Christopher W. Undergraduate algebra: a first course. Oxford University Press, USA, 1986. | | | | | |
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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 | | |