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| 1. Course title: Abstract algebra | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): seminar | | | |
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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):   * Algebra 2 lecture * Algebra 2 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: | | János Ruff, PhD | | 100 % | |
| László Tóth, PhD | | 100 % | |
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| 12. Language:English | | | | | |
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| 13. Course objectives and/or learning outcomes:  Objectives: It is intended to solve exercises on the basic concepts and properties of abstract algebra.  Learning outcomes: students completing the seminar will have *knowledge* on abstract algebra, and vocabulary in the topic. They will be *able* to apply the algebraic and number theoretic 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. Algebraic structures. Semigroups. A concept of the group. Examples. 2. Dihedral group. Group morphisms. Cyclic groups. 3. Order of elements. Subgroups. Generated subgroups. 4. Cosets, Lagrange’s theorem. 5. Normal subgroups, factor groups, theorems of isomorphisms. 6. Permutation groups, Cayley’s theorem. Constructions of groups, fundamental theorem of finite abelian groups. 7. Midterm exam 1. 8. Rings. Examples. Divisors of zero. 9. Fields. Examples. Ring and field morphisms. 10. Subrings, subfields, characteristics. 11. Generated subrings. Ideals. Factor rings. 12. Theorems of homomorphisms. Quotient field of an integral domain. Divisibility in commutative rings. 13. Midterm exam 2. | | | | | |
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| 15. Mid-semester works  Two midterm exams. | | | | | |
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| 16. Course requirements and grading  Two midterm exams.  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 | | |