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| 1. Course title: Finite mathematics 2 | | | | | | |
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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): Finite mathematics 1 | | | | | | |
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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):  Péter Csorba PhD (Faculty of Science, Institute of Mathematics and Informatics, Department of Mathematics) | | | | | | |
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| 11. Teacher(s) and percentage: | | | Dr. Péter CSORBA | | | 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 the basic theorems of combinatorics and graph theory.  Learning outcomes: Students completing the course will have basic *knowledge* on combinatorics and graph theory, and they will be *able* use this knowledge. | | | | | | |
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| 14. Course outline   1. Review of important theorems from finite mathematics 1 2. Theorem of Gallai, graph parameters, definitions, properties 3. Matchings, Hall's and Tutte's theorem 4. Flow network. Theorems of Ford-Fulkerson and Menger 5. Spanning tree, smallest cost, Kruskal's and Prim's algorithm 6. Linear recursions, characteristic equation, explicit formula 7. Ramsey theory 8. Generating functions 9. Stirling numbers 10. Symmetric combinatorial structures: Finite geometries, theorem of De Bruin and Erdős 11. Sperner system and theorem. LYM inequality, Erdős-Ko-Rado theorem 12. Extremal combinatorics of set systems 13. Turán's theorem, triangle free graphs, Turán's graph | | | | | | |
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| 15. Mid-semester works  Attending all lectures is highly recommended. | | | | | | |
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| 16. Course requirements and grading  Oral exam: student gets 2 theoretical questions and one exercise to solve. | | | | | | |
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| 17. List of readings | | | | | | |
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| 18. Recommended texts, further readings   1. L. Lovász, J. Pelikán, K. Vesztergombi, Discrete Mathematics: Elementary and Beyond, Springer, 2003 2. Kenneth H. Rosen, Discrete Mathematics and Its Applications, 7th edition, McGraw-Hill, 2012 | | | | | | |
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| **Date** | 13 April, 2017 | **Prepared by** | |  | | |
| Dr. Péter CSORBA  responsible teacher | | |
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| **Endorsed by** | | | | |  | |
| Dr. László TÓTH program supervisor | |