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| 1. Course title: Analysis 1 discussion | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): discussion | | | |
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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: 40 | | | | | |
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| 10. Responsible teacher (faculty, institute and department):  Margit Pap PhD (Faculty of Science, Institute of Mathematics and Informatics, Department of Mathematics) | | | | | |
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| 11. Teacher(s) and percentage: | | Dr. Margit Pap | | 100 % | |
| Dr. Tímea Eisner | | 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 notions of Mathematical Analysis 1: concepts of real numbers, convergence, limits of sequences and sum of series. The course helps the development of problem solving skills.  Learning outcomes: students completing the course will have *knowledge* on basic concepts and theorems of Mathematical Analysis. They will be *able* to apply the properties of these concepts. They will have a *competence* of evaluating readings in Analysis 1. Their positive *attitude* towards methods calculating limits will increase significantly. | | | | | |
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| 14. Course outline   1. First degree, second degree inequalities and inequalities containing absolute value. 2. Application of mathematical induction in proof of sum formulae and inequalities. 3. Boundedness, limits, upper and lower limits of sets. 4. Monotonicity and boundedness of sequences. Finding the supremum and infimum. 5. Investigating the convergence of sequences applying the definition. 6. Investigating the convergence of sequences applying properties of operations I. 7. Investigating the convergence of sequences applying properties of operations II. The limit of. 8. 1st test 9. Recursive sequences. Upper and lower limit of sequences. 10. Investigating the sum of series applying the sum of the geometric series or applying telescopic sums. 11. Investigating the convergence of series applying the comparison test, the root test and the fraction test. 12. Investigating the convergence of series applying the Leibniz test, the condensation principle of Cauchy. 13. Finding the convergence interval of power series. 14. 2nd test | | | | | |
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| 15. Mid-semester works  Attending the course is compulsory. | | | | | |
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| 16. Course requirements and grading  There are two written tests, both of which should be above 40% in order to pass. The final grade is obtained from the arithmetic mean of the 2 grades.  0–40% fail  41–55% acceptable  56–70% average  71–85% good  86–100% excellent | | | | | |
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| 17. List of readings  Rudin, Walter. Principles of mathematical analysis. Vol. 3. New York: McGraw-Hill, 1964.  Stewart, James. Calculus: early transcendentals. Cengage Learning, 2015.  Stroyan, K. D. "A brief introduction to infinitesimal calculus." University of Iowa (2004).  Lang, Serge. Undergraduate analysis. Springer Science & Business Media, 2013. | | | | | |
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| 18. Recommended texts, further readings  Joel R. Hass, Christopher D. Heil, Maurice D. Weir. Thomas' Calculus, 14th Edition | | | | | |
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| **Date** | 14 May, 2017 | **Prepared by** |  | | |
| **Dr. Margit PAP** responsible teacher | | |
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| **Endorsed by** | | |  | | |
| Dr. László TÓTH program supervisor | | |