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| 1. Course title: Analysis 3 discussion | | | | | |
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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): Analysis 2 lecture+ seminar | | | | | |
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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 3: concepts of **indefinite integral, Riemann integral and their applications**. 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. Primitive function, indefinite integral. 2. Evaluating indefinite integrals. Integration by parts. Integration by substitution I. 3. Integration by substitution II. Integration of rational functions, integration by partial fractions. 4. Integration by trigonometric substitution. Tangent half-angle substitution. 5. Integration of some exponential function types. Integration of irrational functions. 6. 1st test 7. Evaluating definite integrals using the definition and using the Newton-Leibniz-theorem. 8. Computing limits of sequences. Geometrical applications of the definite integral 1: area ( in cartesian coordinate system and with polar coordinates), area given by parameterization. 9. Geometrical applications of the definite integral 2: length of curve, volume of solids. 10. Geometrical applications of the definite integral 3: surface area. 11. Improper integrals. Evaluating improper integrals. Integral test. 12. Further applications of the differential and integral calculus: the Wallis formula, the Stirling formula. The Newton algorithm for finding roots. 13. 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 | | |