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| **1. Course title:** Calculus II | | | | | |
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| **2. Code:** | | **3. Type (lecture, practice etc.):** lecture + seminar | | | |
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| **4. Contact hours:** 2+2 hoursper week | | **5. Number of credits (ECTS):** 5 | | | |
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| **6. Preliminary conditions (max. 3):**   * Calculus I | | | | | |
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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):**  Dr. Pap Margit (Faculty of Science, Institute of Mathematics and Informatics, Department of Applied Mathematics) | | | | | |
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| **11. Teacher(s) and percentage:** | | András B. Frigyik, 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 world of calculus. The purpose of the course is to provide the students with the basic tools necessary to start comprehending the foundation underlying modern science and technology.  **Learning outcomes:** students completing the course will have familiarity with questions and methods related to that segment of the calculus that they are likely to encounter in their professional life. | | | | | |
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| **14. Course outline**   1. Mean value theorems: Rolle’s theorem, Lagrange’s theorem. Taylor’s and Maclaurin’s theorem. 2. l’Hospital’s rule. Monotonicity, convexity, concavity and inflection points. 3. Analysis of function’s graph: sketching graphs. 4. Basic idea behind integration. Method of Archimedes. Definition of integrability. 5. Properties of definite integrals. The integral function and its properties. Primitive functions or indefinite integrals. Working with primitive functions. 6. Functions with primitive functions. Connection between definite and indefinite integrals: Newton-Leibniz formula. 7. Basic methods of indefinite integration: partial integration, integration with substitution. 8. Basic methods of indefinite integration: integration of racional functions, of trigonometric functions and of rational expressions. 9. Basic methods of indefinite integration: integration of irrational functions. Application of definite integrals: area of a geometric objects in plane, length of a curve, volume and area of a solid of revolution. 10. Definition of improper integrals and their convergence. Useful improper integrals. 11. Separable and first order differential equations. First and second order linear differential equations. 12. Sequences of points in R^2. Limits and continuity of functions in two variable. Partial derivatives of functions. Iterated integrals. Extremal points of functions in two variables. 13. Review of the material | | | | | |
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| **15. Mid-semester works**  There are two midterms: one in the 7th week and one in the 13th week. | | | | | |
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| **16. Course requirements and grading**  The semester ends with an 80 point written exam. The two midterms are worth 40-40 points, 80 points altogether. Depending on the average of these two scores, the grades are the following:  0%–33% fail (F)  34%–49% satisfactory (D)  50%–65% average (C)  66%–81% good (B)  82%–100% excellent (A) | | | | | |
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| **17. List of readings**   1. Stewart, J., Calculus, Cengage Learning, 2015. | | | | | |
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| **18. Recommended texts, further readings** | | | | | |
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| **Date** | 4 May, 2017 | **Prepared by** |  | | |
| András B. Frigyik, PhD  responsible teacher | | |
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| **Endorsed by** | | |  | | |
| program supervisor | | |