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| **1. Course title:** Differential Equations | | | | | |
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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):** 3 | | | |
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| **6. Preliminary conditions (max. 3):**   * Analysis 3 lecture and seminar | | | | | |
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| **7. Announced:** ☐fall semester, ☒spring semester, ☐both | | | | | |
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| **8. Limit for participants:** 150 | | | | | |
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| **10. Responsible teacher (faculty, institute and department):**  Tímea Eisner PhD (Faculty of Science, Institute of Mathematics and Informatics, Department of Mathematics) | | | | | |
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| **11. Teacher(s) and percentage:** | | Tímea Eisner, PhD | | 100 % | |
| Margit Pap, PhD, dr. Habil | | 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 differential equations. Learn to recognize and classify various types of ordinary differential equations. Get used to thinking about and working with functions as “variables”. Understand the qualitative nature of solutions to certain classes of differential equations, with emphasis on exponential growth, oscillations, and equilibrium solutions. Learn to solve certain types of elementary differential equations analytically, with an emphasis on first order differential equations and higher order linear differential equations.  **Learning outcomes:** students completing the course will have familiarity with questions and methods related to problems involving differential equations. | | | | | |
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| **14. Course outline**   1. Introduction to Differential Equations; 2. First-Order Equations: Separable Differential Equations 3. First-Order Equations: Linear Equations 4. First-Order Equations: Bernoulli-, Lagrange- and Clairaut - Equation 5. Exact Equations. 6. Higher Order Equations; 7. Second Order Linear Equations; 8. Higher Order Linear Equations with constant coefficient; Euler Equations 9. Existence and Uniqueness Theorems 10. Systems of Differential Equations; 11. Laplace Transforms; 12. Higher Order Linear Equations 13. Partial Differential Equations | | | | | |
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| **15. Mid-semester works**  Attending lectures is highly recommended. | | | | | |
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| **16. Course requirements and grading**  The semester ends with an 100 point written exam. Depending on the score the grades are the following:  0%–41% fail (F)  42%–54% satisfactory (D)  55%–67% average (C)  68%–83% good (B)  84%–100% excellent (A) | | | | | |
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| **17. List of readings**  Abell & Braselton, Introductory Differential Equations with Boundary Value Problems, (3rd edition), **eBook ISBN:** 9780080958453, Academic Press **(**2009) | | | | | |
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| **18. Recommended texts, further readings**  Abell & Braselton, Modern Differential Equations, (2nd edition), Brooks Cole, 2001. | | | | | |
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| **Date** | 4 May, 2017 | **Prepared by** |  | | |
| Tímea Eisner, PhD  responsible teacher | | |
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| **Endorsed by** | | |  | | |
| László Tóth, PhD, Dr. Habil program supervisor | | |