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| Code of course: **BMI-LOTD-326E.02; BMA-LOTD-326.02** |
| Title of course: **Category Theory** |
| Lecturer: **Ildikó Sain** |
| **General aim of the course:**  Category theory looks like just another abstract algebraic discipline at the first glance, but owing to its inner nature, it is much more philosophical than, say, group theory, or the theory of ordered fields. Category theory is relevant to structuralism, and it contributes to the foundation of mathematics. Because it is very abstract, it appears as basic language in several branches of scienece, e.g. theoretical physics.  **Content of the course:**  1. Reasoning via arrows (affects) instead of structures (black box point of view)  2. Definition of a category and basic examples (Set, Mod\_t, Alg\_t, BAO, BA, CA, discrete category, Poset, Monoid, etc.)  3. Mono, epi, iso morphisms. Principle of duality  4. Categorial product, coproduct. Equaliser, coequaliser. Universal property.  5. Limit, colimit.  6. Functor, natural transformation  7. Reflexivity  8. Adjoint situation  9. Factorozation systems  10. Algebroidal categories  11. Cone injetivity, small trees (category theoretical abstract model theory)  **Grading criteria, specific requirements:**  There will be a final written exam, but there will be tests during the semester, too, The results of all the tests will contribute to the final grade.  The students must have background in naive set theory and first order logic. Some background in universal algebra is also useful.  **Required reading:**  I will send you material for reading, written by myself. R. Goldblatt: Topoi: The Categorial Analysis of Logic can be of additional help. |