TOPOLOGICAL AND CATEGORICAL METHODS IN ALGEBRA

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The course focuses on tools and constructions from category theory and topology with applications in algebra, the theory of languages and logic. The intention is that the course be useful both as a tool kit for students interested in classical algebra and for students interested in the area in its own right.

In category theory, the course will cover such concepts as free constructions, limits and colimits, monads, adjunctions and Kan extensions, as well as various elements of universal algebra such as lattices and Birkhoff's theorem. In topological methods, we will discuss non-Hausdorff spaces, such as spectra of rings, and Stone duality as well as profinite completions, the ultraproduct construction, Boolean products, and sheaf representation of algebras.

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