

Course Title: Numeration, Finite Automata, and Number Theory

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Combinatorics on words is the study of the combinatorial properties of finite or infinite sequences with values in a finite or countable set. It constitutes a natural framework for interaction between various fields, including in particular algebra (group theory), dynamical systems (symbolic dynamics), theoretical computer science, tiling theory, discrete geometry, and of course number theory. In number theory, finite or infinite words naturally occur via the use of numeration systems, that is, as soon as one aims at representing all elements of a given set (integers, real numbers, p -adic numbers, fields of Laurent series, etc.) in a unified way. For instance, decimal expansions, binary expansions, and continued fraction expansions are all different ways of associating with every real number a unique finite or infinite word that corresponds to its sequence of digits. A fundamental recurring theme in these lectures will be the use of numeration systems and finite automata to study problems with a number theoretical flavor.