Computational Complexity Theory

Prof. Dr. Nitin Saxena

Course Name:
Computational Complexity (MA-INF 1302)

Classes:
From 20th October 2008.
Lectures: Mon 11-13 & Fri 14-16.
Exercises: Fri 16-18
At: Römerstraße, Seminar room N327

Instructor:
Prof. Dr. Nitin Saxena

Outline:

We will start this course by mathematically formalizing computation and algorithms. Our approach in the course would be then to look at various famous concrete problems and prove theorems about their uncomputability or if computable then how fast can they be computationally solved. The problems we will cover in this course are: the halting problem, Hilbert's tenth problem, boolean formula satisfiability (the P!=NP question), permanent, graph isomorphism, polynomial identity testing, parity problem and undirected graph reachability. While studying these computational problems we will develop various tools used in modern complexity theory - pseudo-random generators, expanders, extractors and probabilistically checkable proofs.