T-79.5103 Computational Complexity Theory (5 cr) P

Autumn 2007

Weekly Sessions and Course Personnel

Lectures: Mondays 10-12 and Wednesdays 10-12, TB353 (*See exceptions in the program*).

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Tutorials: Mondays 14-16, TB353 (*See exceptions in the program*).

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General Goals

- Identification of computationally hard problems
- Classification of problems according to their complexity
- Choosing appropriate algorithmic approach w.r.t. complexity of the problem

Topics

- Central complexity classes (P, NP, PSPACE, NC, polynomial hierarchy, ...) and related methods for complexity analysis
- Randomized computation
- Parallel computation
- Cryptography

Material: C. Papadimitriou, *Computational Complexity*, Addison-Wesley, 1994. Ch. 1–4, 7–20

Prerequisites: T-79.1001 Introduction to Theoretical Computer Science

Course Requirements

In order to pass the course one is supposed to

1. pass the first quarter exam (Oct 3).
2. do homework (3 rounds; 1st round submission deadline Oct 24)
3. pass the final exam (Dec 10)

- The course cannot be taken just by the **final exam** but all three parts need to be passed.
- The grade of the course (0–5) is determined by the respective grades of (i) the first quarter exam (20%), (ii) homework (40%) and (iii) the final exam (40%).
- Homework points are translated into grades as follows:

Grade:	1	2	3	4	5
Lower bound:	50%	58%	66%	74%	82%

Homework Practice

- The homework assignments published after the first quarter exam.
- The submission deadline for the first homework round is Oct 24.
- The schedule is based roughly on the following pattern:
  1. After the submission deadline it is possible to get feedback at the tutorial about one week after the deadline.
  2. Thereafter if you wish to revise your answer, revisions are accepted until the resubmission deadline.
- Each exercise is graded using the scale 0–2 at first.
- A reduced scale 0–1.5 is used for revised exercises.