

Week plan for course 02249 "Computationally Hard Problems", fall 2015 (preliminary)

Tuesday, 01/09-2015 (week 1)

- Administrative issues
- Introduction to the course
- Formal languages, algorithmic problems
- Running times (deterministic and randomized)

Chapters 1-2.2 of the lecture notes are covered.

Exercise sheet 1 is handed out.

Tuesday, 08/09-2015 (week 2)

- Problems SAT and CLIQUE
- Decision problems vs. optimization problems
- Conversion between the two problem variants
- Definition and examples of randomized algorithms

Chapters 2.3-3.2 (3.2 only partly) of the lecture notes are covered.

Hand in (Monday night): solutions to mandatory exercise on sheet 1

Exercise sheet 2 is handed out.

Tuesday, 15/09-2015 (week 3)

Finish Chapter 3 of the lecture notes (randomized complexity classes etc.)

Hand in (Monday night): solutions to mandatory exercise on sheet 2

Exercise sheet 3 is handed out

Tuesday, 22/09-2015 (week 4)

Chapter 4.1 of the lecture notes (the class NP)

Hand in (Monday night): solutions to mandatory exercise on sheet 3

Exercise sheet 4 is handed out.

Tuesday, 29/09-2015 (week 5)

NP-completeness proofs up to and including Theorem 4.19 in the lecture notes

Hand in (Monday night): Solutions to mandatory exercise on sheet 4

Exercise sheet 5 is handed out.

Tuesday, 06/10-2015 (week 6)

Lecture notes until the end of the proof of Theorem 4.25 (NP-completeness of VertexCover)

Hand in (Monday night): solutions to mandatory exercise on sheet 5

Project description is handed out; working groups should be formed during the exercise session.

----- FALL BREAK -----

Tuesday, 20/10-2015 (week 7)

Conclude Chapter 4 of lecture notes (NP-completeness + pseudopolynomial algorithms)

Project work during the exercise sessions (no sheet handed out)

Tuesday, 27/10-2015 (week 8)

Chapters 5.1-5.3 of the lecture notes

Project work during the exercise sessions (no sheet handed out)

Tuesday, 03/11-2015 (week 9)

Chapter 5.4 of the lectures notes

Hand in (Monday night): solution to project

Exercise sheet 6 is handed out.

Tuesday, 10/11-2015 (week 10)

Chapter 5.5 and 5.6 of the lecture notes

Hand in (Monday night): solutions to mandatory exercise on sheet 6

Exercise sheet 7 will be handed out

Tuesday 17/11-2015 (week 11)

Chapters 5.7 and partly 5.8 of the lecture notes

Hand in (Monday night): solutions for mandatory exercise on sheet 7

Exercise sheet 8 will be handed out

Tuesday, 24/11-2015 (week 12)

Chapters 5.8 and 5.9 of the lecture notes

Hand in (Monday night): solutions for mandatory exercise on sheet 8

Tuesday, 01/12-2015 (week 13)

Evaluation, wrap-up, discussion, exam preparation