

Math 182: Algorithms Spring 2011

General Information

Instructor: Sebastien Roch (Office: MS 6228; Office hours (tentative): M 9:00-9:50am, W 1:00-2:50pm)

TA: Pietro Carolino (Office: MS 2903; Office hours: TBA)

Class schedule: MWF 11:00-11:50am in 5127

Section schedule: R 11:00-11:50am in 5127

Midterm exam (tentative): Friday, April 29, 2011, 11:00am-11:50am in class

Final exam: Wednesday, June 8, 2011, 3:00pm-6:00pm

Webpage: Google “UCLA Math 182”

Textbook

The required textbook for the course is:

[KT] Kleinberg and Tardos, “Algorithm Design.”

I will also occasionally refer to the following supplementary textbook (available online):

[DPV] Dasgupta, Papadimitriou, and Vazirani, “Algorithms.”

Some may prefer the more concise style of the latter. The two books cover essentially the same material, at the same level.

Tentative outline

We will cover the first half of [KT] which provides a general introduction to basic algorithms design, emphasizing mostly combinatorial and graph-theoretic problems. Time permitting, we may also cover some number-theoretic applications. These are discussed in the first chapter of [DPV]. Here is a tentative list of topics:

1. Basics: Tractability, data structures, graphs. Sections 1.1, 2.1-2.5, 3.1-3.6 in [KT] (3 weeks).
2. Technique I: Greedy algorithms. Section 4.1-4.8 in [KT] (2 weeks).
3. Technique II: Divide and conquer. Sections 5.1-5.5 in [KT] (1 week).
4. Technique III: Dynamic programming. Sections 6.1-6.8 in [KT] (2 weeks).
5. Technique IV: Network flow. Sections 7.1-7.12 in [KT] (2 weeks).
6. Further applications: Cryptography. Sections 1.1-1.4 in [DPV] (if time permits).

Grading

Homework: There will be weekly homework assignments, mostly taken from the textbook. The lowest homework score will be dropped. **No late homework will be accepted.**

Final grade: The final grade will be the maximum of:

- Homework 20%, Midterm 30%, Final 50%
- Homework 20%, Final 80%

No make-up midterm will be given. Requests for re-grading must be made no later than one week after the midterm is returned. The final exam must be taken in order to receive a passing grade. All exams are closed books. Grades will be recorded in the MyUCLA gradebook.

Section

Attendance in section is expected. Solutions to homework assignments and midterm exam will *not* be posted online. Instead they will be discussed in section as needed.