

Extended syllabus

This is a sort of extension of the syllabus which hopefully helps you to understand the expectations.

Grading scheme. There will be 5 problem sets each containing 10–12 problems and in some cases, some additional practice problems. On the other hand, I will select 6 problems for you from these problems in a personalized way, and you are allowed to submit only those problems. I will send you the list of problems in an e-mail. You have to collect 18 points for grade 5 and A, 16 points for grade 4, 14 points for grade 3 and B, and 10 points for grade 2 and C. One problem is worth 1 point no matter how hard it is, we will give partial points to incomplete solutions, but don't expect too much. Collaboration is allowed at at most 5 problems, for more details see the section on collaboration. The numbers 18, 16, 14 and 10 are subject to change, but can only decrease.

Explanation to the grading scheme. This is a grading scheme which I call *adaptive* scheme. The point is that if we see that you are doing well and capable of solving hard problems then next time we will choose slightly harder problems for you. On the other hand, if we see that you struggle a bit then we will choose slightly easier problems for you. Our goal is to ensure that everybody can improve their problem solving skills and enjoy the course.

Feel free to comment on the hardness of the problems at your homework. We don't want anybody to be bored or struggle unnecessarily.

You might feel that there is some room for different strategies like not submitting all problems you solved in the hope of getting easier problems in the next turn. These strategies don't really work, because the adjustment happens in small steps: you lose more problems than what you gain at the next turn. The best strategy is to submit all solutions that you have.

Collaboration. One of the goal of this course is to improve on your *individual* problem solving skills. Since some courses encourage collaboration we feel that it might be a too big jump to completely prohibit collaboration, and honestly it wouldn't make much sense as we don't want to punish a healthy conversation about some problem say at a lunch. So we decided to allow collaboration on at most 5 problems. We suggest you the following strategy: try to solve alone as many problems as you can, and only ask help when you really stuck with a problem even though you have tried several promising ideas. Important: you have to write the names of your collaborators to the solution of the particular problem. It is more important to give credit

for those who helped you than to keep the number of collaborations on at most 5. Note that you have to write down the solutions alone with your own words. If you are uncertain that something is allowed or not then talk with me.

A request: don't check with your friend what are the common problems assigned to you. Such a beginning of a story sometimes ends in a not allowed way which I will strictly punish. It might happen that you get in time trouble at the end of semester, because of the commitments of different courses. Please, even in such a case don't ask your friend's homework to copy it. The chance that we will discover it, is much higher than you might guess, especially if the solution is wrong (which you won't know if you just copy it without understanding), wrong solutions are generally unique so we immediately recognize two home works with the same mistake. If we discover copied home works my punishment will be severe.

Practice problems. If you feel that you might need some easier practice problems, please send me an e-mail and I will post some. I encourage you to ask such problems and first solve them, especially if you feel that you don't even know where to start the solutions of the homework problems. You can discuss the solutions of the practice problems with anybody: me, your friends, your landlord...

Participation. I strongly recommend to participate and take notes. Books often fail to give the intuition and insight which can be obtained at such a class. And I have never seen a book answering directly to a question. And this leads us to the next important thing: ask questions! Especially, those stupid questions which you never dared to pose, because you were always too shy. So please, I beg you: ask those stupid questions. I can even tell my strategy: when I'm completely lost, I generally start my question as follows: *This might be a stupid question, but ...* Then somehow people not only forgives me, but they seem to be glad that they have the opportunity to answer. The surprising thing that I behave exactly the same way in these situations when I have to answer. (Probably because I'm always happy when I can answer a question at all, and stupid questions tend to be easier to answer than hard ones.) Sometimes we don't see the validity of some fact immediately, and we feel that it shouldn't be hard. This happens with everybody. Please, ask my help, I can save you a lot of time.

Office hours. I have an office hour posted separately on the website. Besides this we can fix appointment at other time if you send me an e-mail a few days in advance. Sending me an e-mail is a good idea even if you just would like to come to my official office hour.

Submission of the homework. The deadlines of the homework will be posted separately. Don't forget to write your name and the number of problem to the paper. Also don't forget to write up the names of your collaborators to the paper in such a way that we can easily distinguish their names from your name.

Late submission is only allowed once and it should be submitted within 3 days of the original deadline. Note that we cannot determine your next homework problems until we correct your earlier homework problems. Late submission only delays this process.

Note that giving only the final answer is not sufficient, you have to justify and explain all your arguments leading to the answer. You can freely cite everything from the lectures, but you cannot cite any result from books and papers: if you find a solution in a book or paper, you have to understand it and write it down with your own words. When you cite a statement from the lecture then you have to repeat the statement and then you have to explain how you use it in your particular argument. Citations like "we learned in the class that in such a case we have" are completely useless as it is very unclear what "such a case" means.

Advices. People often get in time trouble near the end of the semester. Try to collect at least 16 points from the first 4 problems sets so that you don't have to worry about the last problem set.

The most important advice is that if you have any problem then ask my help immediately. Unfortunately, I'm not really proactive in general, but I'm always happy to help. I know that for some people it is really hard to ask help, but I still would like to ask everyone not to be shy or proud to ask help.