

## Hand-in problems for TATM85 Funktionalanalys HT2025

The examination of this course consists of five rounds of hand-in exercises to be found at

<https://courses.mai.liu.se/GU/TATM85/examination.html>

The **deadlines** for each assignment are marked in the Lecture plan for the course.

The exercises should be **solved individually** but as long as everybody contributes and one is not just copying each others solutions, collaboration is permitted. You must **understand and be able to explain** your solutions and to answer questions about them.

For grade 3 it is enough to correctly solve **6 exercises in each round**. An exercise with several parts is counted as one exercise. For **grades 4 and 5** it is enough with 7 resp. 8 correctly solved exercises in each round, provided that among them there are at least 8 resp. 14 **\*-marked exercises** in total. In addition, for these higher grades, you should have at least 1 correctly solved \*-marked exercise in 4 resp. all 5 sets. (This is to encourage a reasonably even performance throughout the course. Contact me if you feel that you need another chance in some set. The goal is that you learn as much as possible.)

### Instructions for the exercises

- The solutions (on paper, please, unless there are special reasons) should be **handed** into the **course's mailbox**, B-house, top floor, near entrance 21. Swedish-speaking students are encouraged to write their solutions in Swedish.
- It is OK to hand in the solutions the day after the deadline, but not later than at 10.15 (in the morning). If for some reason you are not able to hand in the solutions **in time**, notify me.
- You can use the **hints** at the end of the problem list but try to solve the problems **first on your own**. You do not have to follow the hint and can find your own better solution (this happens!).
- **Collaboration** with the other students taking the course is allowed but you are **not** allowed to just copy someone else's solution. You must **formulate your own solutions, and understand them**. If you collaborate, make a note about it on the cover sheet.
- A good idea is to first solve a problem on a **scrap paper**, and later write it down more carefully on another piece of paper. Put an effort into writing **clearly** and **legibly**, and to carefully **justify** your arguments. Hand in **more** than the minimal number of solutions, in case you fail some problems.
- The exercises should be **numbered and sorted** as in the assignment. Each problem should start with the **statement of the problem**. There should be **enough space for comments** on each page. You may solve several exercises on the same page, and use both sides of the paper, but there should always be space between the solutions. This is where I write **feedback** to you solutions and there is usually a lot of comments. They are there to **help you improve your solutions** and their presentation, so do not get too scared if your solutions are full of red comments.
- Note that the problems are **not** necessarily ordered according to their difficulty. Check yourself first which ones appeal to you and which you can handle. Also, **be not afraid of \*-problems**, some of them are not so hard, but may require longer arguments and more work or more theoretical thinking. You will learn more if you try to solve different types of problems, not just "more of the same".
- There are no problem-solving "Lessons" in the course. So, if you **need help**, come to see me in the B-building (top floor, between Entrances 21 and 23) or send an email. I will help everybody who

puts reasonable effort into the studies (as I did the previous years), but I cannot spend hours and days with each of you, so try to **spend some time first thinking yourself** about the problem. If you collaborate, you can come in groups, this often leads to good discussions.

- You may write your solutions using **L<sup>A</sup>T<sub>E</sub>X** (or some similar program), but this is not at all necessary. If you have time, it is a useful exercise. Do **proof-read your solutions** after you have written them, to avoid misprints and “stupid” errors.
- Each round of exercises should have a separate **cover page** on which you should write your name, personnummer, programme and year. Mark which exercises you have solved, for example in a table of the following form: Write the star for the **\*-marked problems**.

|   |   |   |   |   |   |   |   |    |     |     |     |
|---|---|---|---|---|---|---|---|----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9* | 10* | 11* | 12* |
| x | x | x |   | x | x | x |   | x  | x   |     |     |
|   |   |   |   |   |   |   |   |    |     |     |     |

Leave enough space in the table for me to write the grades. From Assignment 2 it is enough if you write your name and mark solved exercises in the table.

- **Staple** the cover page together with your solutions in the upper left corner. (And make sure that no text is hidden, not even any exercise numbers.) If you do not have a stapler, a needle and a thread will do;-) or put the papers in a folder or at least a folded paper. Or find some other creative solution.
- **Incorrect solutions** (or parts thereof) can be handed in again, within reasonable time after the first deadline (a month or so;-). However, do not rely on this possibility and do your best from the very beginning! To count as a \*-problem, the first handed-in solution should only have **minor defects** (no “nonsense”-solutions, please). If you hand in corrections, **attach also your original** solution with my comments, so that I can see what was wrong the first time. **Minor corrections** can be handed in by email or discussed in person.