

Hand-in problems for the course Graph Theory TATA64 2025

The examination is through five sets of problems from the list below. The dates are deadlines for handing in the solutions, and for the presentations, respectively. All problems are from the collection of exercises, “Exercises for the course Graph Theory TATA64” available on the course web page.

You should be prepared to present your (correct) solutions of the problems at the whiteboard during the seminars (after having got back your graded written solutions). Note that active participation in the seminars is mandatory.

For grade 3, you should (correctly) solve at least half of the exercises in each problem set. For grade 4, you need to solve at least 65% of all exercises, for grade 5 at least 80% of all exercises.

The problems should be solved individually but as long as everybody contributes and one is not just copying each others solutions, collaboration is permitted.

Exercises 1. Basics. Trees

Hand in: 7 Feb. **Presentation:** 19 Feb

Exercises: 1.4, 1.9, 1.10, 1.11, 1.18, 1.19, 1.24, 1.29, 1.34, 1.35, 1.40, 1.43.

Exercises 2. Matchings. Factors. Independent sets and covers

Hand in: 23 February. **Presentation:** 5 March

Exercises: 2.1, 2.2, 2.4, 2.5, 2.7, 2.9, 2.10, 2.12, 2.14, 2.15

Exercises 3. Connectivity. Menger’s theorem

Hand in: 21 March. **Presentation:** 1 April

Exercises: 3.1, 3.3, 3.4, 3.5, 3.7, 3.8, 3.10, 3.12

Exercises 4. Vertex colorings. Planar graphs. Turan’s theorem

Hand in: 25 April. **Presentation:** 7 May

Exercises: 4.1, 4.4, 4.5, 4.6, 4.8, 4.9, 4.13, 4.14, 4.16, 4.23, 4.24, 4.26

Exercises 5. Edge colorings. Hamilton cycles. Ramsey theory

Hand in: 14 May. **Presentation:** 23 May

Exercises: 5.3, 5.4, 5.5, 5.6, 5.12, 5.13, 6.2, 6.4, 6.5, 6.6