NDAB23002U Introduktion til diskret matematik og algoritmer

Last updated Tuesday, April 2, 2024.

Course webpages

Webpage with official information (including schedule): https://kurser.ku.dk/course/ndab23002u/
Absalon course page with all practical information: https://absalon.ku.dk/courses/72552

Course plan

Please note that there might be some minor adjustments in this plan depending on how the course develops, but what is written below is expected to be very close to what will actually happen.

Wk	Date	Time	#	Topic	Reading
6	Mo 5/2	13-15	1	Introduction; RAM model; algorithm complexity	CLRS Chs 1-2
6	We 7/2	10-12	2	Sorting & searching	CLRS Chs 2-3
6	We 7/2	13-15	3	Asymptotic analysis; stacks, queues, lists	CLRS Chs 3, 10
7	Mo 12/2	13-15	4	Sets, sequences, sums, integers	KBR 1.1-1.5
7	We 14/2	10-12	5	Integers (cont.), induction proofs ***1st problem set due***	KBR 1.4-1.5, 2.4
7	We 14/2	13-15	6	Induction proofs (cont.)	KBR 2.4
8	Mo 19/2	13-15	7	Logic, more proofs	KBR Ch 2
8	We 21/2	13-15	8	Logic, more proofs (cont.)	KBR Ch 2
9	Mo 26/2	13-15	9	Combinatorics, counting, probability theory	KBR 3.1-3.4
9	We 28/2	10-12	10	Combinatorics, counting, probability (cont.) ***2nd problem set due***	KBR 3.1-3.4
9	We 28/2	13-15	11	Matrices, adjacency matrices of graphs	KBR 1.5
10	Mo 4/3	13-15	12	Relations, trees, partial orders	KBR Ch 4 (not 4.6 & 4.8), 5.1
10	We 6/3	13-15	13	Relations, trees, partial orders (cont.)	KBR 6.1, 6.2, 7.1, 7.2, 8.1
11	Mo 11/3	13-15	14	Graphs: Intro, trees, graph representations	CLRS 20
11	We 13/3	10-12	15	Graphs: Graph traversal (BFS & DFS), topological sort, strongly connected components ***3rd problem set due***	CLRS 20
11	We 13/3	13-15	16	Graphs: Graph traversal (cont.), topological sort, strongly connected components	CLRS 20
12	Mo 18/3	13-15	17	Graphs: Minimum spanning trees, Prim & Kruskal	CLRS Ch 21 + 19.1 & 19.3
12	We 20/3	10-12	18	Heaps and priority queues	CLRS intro part II, Ch 6
12	We 20/3	13-15	19	Graphs: Shortest paths, Dijkstra	CLRS Ch 22 intro, 22.3, 22.5
14	We 3/4	13-15	20	Course wrap-up; Q&A session ***4th problem set due***	

Textbooks

Kolman, Busby, and Ross: *Discrete Mathematical Structures*, DMA version, University of Copenhagen
Cormen, Leiserson, Rivest, and Stein: *Introduction to algorithms*, 4th edition

Schedule

All times are *cum tempore* with academic quarter (i.e., starting 15 minutes past the hour).

Lectures: The locations for the lectures are as follows:
Mondays afternoons:

- Weeks 6-7 and 11-12 in Store UP1, DIKU, Universitetsparken 1-3.
- Week 8: Online.
- Weeks 9-10: Auditorium 01, H.C. Ørsted Building, Universitetsparken 5.

Wednesdays mornings:

- Weeks 6-7, 9, and 11-12: Auditorium 01, August Krogh Building, Universitetsparken 13.

Wednesdays afternoons:

- Weeks 6-8, 10-12, 14: Auditorium 01, H.C. Ørsted Building, Universitetsparken 5.
- Week 9: Online.

For the online lectures, and in case of emergencies such as major disruptions in train traffic, we will meet at https://lu-se.zoom.us/j/66875624789?pwd=azhpaG1BV1ZEbllZcm13SFNoZVFqQT09.
Exercises: Mondays 15-17 and Wednesdays 15-17 weeks 6-12 and 14. Schedules for the different exercise groups can be found via the webpages with official course information.

Study cafes

There will be study cafes three Mondays at 17-19, with food served afterwards. The dates are:

- February 12,
- February 26,
- March 11.

Examination

Problem sets: In order to take the exam, it is compulsory to pass 4 problem sets. Problem sets will be posted one week before they are due, and should be *submitted before the first lecture on the due date* unless otherwise stated. Handing in a blank submission is not allowed, and implies automatic failure on the course. If a submission does not receive a passing grade, then it is possible to make a resubmission for the problems for which the original hand-in contains an actual attempt at solving the problem in question. See Absalon for the detailed rules.
Due to the tight schedule before the exam, special rules will apply for problem set 4. There is no resubmission for this problem set. It is still compulsory to hand in, and in order to help students prepare for the exam there will be a grading threshold for pass. Students who fail to reach this threshold can still take the exam if the solutions are good enough to reach the threshold applied to the other problem sets for allowing a resubmission.
Ordinary exam: Written exam Wednesday April 10.
Re-exam: Oral exam Monday June 24. This is a 30-minute exam without preparation.

The team

Lecturers:

- Jakob Nordström (main lecturer, jakobnordstrom.se)
- Srikanth Srinivasan (week 8, srikanth-srinivasan.bitbucket.io)

Teaching assistants:

- Frederik van Wylich-Muxoll
- Magnus Aabech
- Mathilde Brinch Sørensen
- Monika Haubro
- Rasmus Pallisgaard
- Shuyi Yan
- Thomas Busk-Jepsen
- Tove Eggert Olsen