

Curriculum for INF4130, 2018

In addition to what is listed below, we expect that the weekly exercises and the mandatory exercises are well understood. The same is true for the slides used during lectures, but note that some of the slides are explicitly mentioned in the list below (as they contain the main presentations these areas).

Note that you can bring any printed or written material to the exam.

From Berman & Paul: *Algorithms: Sequential, Parallel, and Distributed*

NB: Click at the following URL to obtain the relevant parts of this book:

<https://www.uio.no/studier/emner/matnat/ifi/INF4130/h18/pensumliste/urls-to-textbook-chapters-inf4130-2018.pdf>

NB: Also remember to study the list of misprints (which covers more than “our” chapters!). Some of the listed misprints may have been corrected in later editions of the book. The list can be found at:

<http://www.uio.no/studier/emner/matnat/ifi/INF4130/h15/pensumliste/errata-2008.pdf>

Chapter 8 (Divide-and-conquer):

- The introduction to the chapter and section 8.1 give some background for top-down-recursion and for memoization
- Section 8.6.2

Chapter 9 (Dynamic programming):

- Everything, except 9.3 and 9.4

Chapter 10: (Backtracking and branch-and-bound):

- We used this chapter to sum up some straight-away methods for exhaustive search: Depth-first search (DFS, *Backtracking*) with LIFO, FIFO and priority queues (and this was repetition from INF 2220 (algorithms and data structures) and similar courses). One should know the main points from this chapter, but one need not study the examples, etc.

Chapter 14 (Matching and flow in network):

- Everything except 14.1.3 and 14.2.6.
- The book does to some extent use terminology and formalisms that we did not use at the lectures (see the slides). One need not know the details of these formalisms.
- Concerning the slides: The four slides about “Matchings in graphs that are not bipartite” and “The extended Hungarian algorithm” are explicitly part of the curriculum. You should know the algorithm itself and that it will always find a matching with as many edges as possible (but we do not give any proof for this).

Chapter 20 (String search):

- The whole chapter.

Chapter 23 (A*-search and game trees):

- Everything, except:
 - The *proof* of proposition 23.3.2 (page 724, and some of the slides)
 - Section 23.4

About triangulation:

The curriculum is the set of slides from the lecture.

From M.A.Weiss: *Data Structures and Algorithm Analysis in Java*

(The relevant pages can be fetched from the web-address in the list of lectures, if you don't have the book from INF2220)

Chapter 6 (Priority queues):

- Everything except 6.5 and 6.7.

Chapter 11:

- 11.4 (Fibonacci-heaps): In addition to the algorithm itself, one must understand and know the execution times that are given, but you don't have to know the proofs for these.

On undecidability and complexity theory:

The slides from October 18th, October 25th and November 1st constitute the curriculum. Here the weekly exercises are especially useful to have been through.

Corresponding matter can be found in *Compendium 51*

(www.uio.no/studier/emner/matnat/ifi/INF4130/h10/undervisningsmateriale/in210_komp99.pdf).

[end]