Daily preparation guide

Study the material listed in the preparation section prior to attending class that day. Try to formulate precise questions concerning the parts you don’t understand or the importance of the material. If you come across some really difficult material, try searching the web for alternative explanations.

Thursday, January 12

Introduction:
- Classes begin
- Review of syllabus
- Review of order notation
- Review of logarithmic identities
- Review of sorting algorithms
- Example prerequisite material questions: http://beastie.cs.ua.edu/concepts/cs/ds/

Tuesday, January 17

Preparation:
- Chapter 3, Growth of Functions

Thursday, January 19

- Chapter 6, Heapsort
- Chapter 7, Quicksort
- Example questions: http://beastie.cs.ua.edu/concepts/cs/ds/sorting.html

Tuesday, January 24

Prerequisite exam

Wednesday, January 25

Programming assignment #0 due

Thursday, January 26

Preparation:
- Chapter 4, Divide-and-Conquer (skip section 4.6)
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/recurrences.html

Tuesday, January 31

Preparation:
- Chapter 12, Binary Search Trees
- Chapter 13, Red-Black Trees (see the best red-black tree pseudocode ever)
- Problem 13-3, AVL trees (see the best AVL tree pseudocode ever)
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/sbtrees.html

Wednesday, February 1

Programming assignment #0, resubmission #1 due
Thursday, February 2
Self-balancing trees, continued

Tuesday, February 7
Preparation:
• Web search, “Binomial Heaps”
• Sections 19.1 — 19.3, Fibonacci Heaps
• Problem 19-2, Binomial Heaps (see the best binomial heap pseudocode ever)
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/heaps.html

Wednesday, February 8
Programming assignment #0, resubmission #2 due
Programming assignment #1 due

Thursday, February 9
Binomial and Fibonacci Heaps, continued

Tuesday, February 14
Preparation:
• Chapter 21, Disjoint Sets
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/disjoint.html

Wednesday, February 15
Programming assignment #0, resubmission #3 due
Programming assignment #1, resubmission #1 due

Thursday, February 16
Preparation:
• Chapter 22, Elementary Graph Algorithms
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html

Tuesday, February 21
First concept exam:
• Solving recurrences
• Self-balancing search trees
• Binomial and Fibonacci heaps
• Disjoint sets
• Graphs and graph exploration

Wednesday, February 22
Programming assignment #0, final resubmission due
Programming assignment #1, resubmission #2 due

Thursday, February 23
• Chapter 23, Minimum Spanning Trees
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html

Tuesday, February 28
Preparation:
• Section 24.3, Dijkstra’s Algorithm
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html
Wednesday, March 1
Programming assignment #1, resubmission #3 due

Thursday, March 2
Preparation:
- Web search: memoization
- Chapter 15, Dynamic Programming
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/dynamic.html

Tuesday, March 7
Dynamic programming, continued

Wednesday, March 8
Programming assignment #1, final resubmission due
Programming assignment #2 due

Thursday, March 9
Preparation:
- Chapter 9, Medians and Order Statistics
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html (questions 1 - 10)

Tuesday, March 14
Spring break

Thursday, March 16
Spring break

Tuesday, March 21
Medians and order statistics, continued

Wednesday, March 22
Programming assignment #2, resubmission #1 due

Thursday, March 23
Preparation:
- Section 8.1, Lower bounds for sorting
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html (question 11 - 16)

Tuesday, March 28
Second content exam:
- Minimum spanning trees
- Shortest paths
- Dynamic programming (including memoization)
- Linear time selection

Wednesday, March 29
Programming assignment #2, resubmission #2 due
Programming assignment #3 due
Last day to drop a class
Thursday, March 30
Preparation:
• Section 8.2, Counting Sort
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html

Tuesday, April 4
Preparation:
• Section 8.3, Radix Sort
• Section 8.4, Bucket Sort
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html

Wednesday, April 5
Programming assignment #2, resubmission #3 due
Programming assignment #3, resubmission #1 due

Thursday, April 6
Preparation:
• Chapter 17, Amortized Analysis
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/amortized.html

Tuesday, April 11
Amortized analysis, continued

Wednesday, April 12
Programming assignment #2, final resubmission due
Programming assignment #3, resubmission #2 due

Thursday, April 13
Preparation:
• Section 34.1 — 34.3, P and NP
• http://beastie.cs.ua.edu/cs201/npc.html
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/pnp.html

Tuesday, April 18
Preparation:
• Section 34.4 — 34.5, NPC proofs and problems
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/pnp.html

Wednesday, April 19
Programming assignment #3, resubmission #3 due

Thursday, April 20
P, NP, and NP-completeness, continued

Tuesday, April 25
Dead week

Wednesday, April 26
Programming assignment #3, final resubmission due
Thursday, April 27
   Dead week, last day of class

Friday, April 28
   Last day to withdraw from the term

Wednesday, May 3
   Final exam (cumulative), 11:30am to 2:00pm