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, August 24

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, August 29

Preparation:
- Chapter 3, Growth of Functions

Thursday, August 31

- Chapter 6, Heapsort
- Chapter 7, Quicksort (optional: 7.4.2)
- Example questions: http://beastie.cs.ua.edu/concepts/cs/ds/sorting.html

Tuesday, September 5

Prerequisite exam

Thursday, September 7

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

Programming assignment #0 due

Tuesday, September 12

Preparation:
- Chapter 12, Binary Search Trees (optional 12.4)
- 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

Thursday, September 14 (On-your-own Day)

Self-balancing trees, continued
Monday, September 18
Constitution Day!

Tuesday, September 19 (On-your-own Day)
Preparation:
- Web search, “Binomial Heaps”
- Sections 19.1 — 19.3, Fibonacci Heaps (postponed - amortized analysis of operations)
- Problem 19-2, Binomial Heaps (see the best binomial heap pseudocode ever)
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/heaps.html

Thursday, September 21 (On-your-own Day)
Binomial and Fibonacci Heaps, continued

Tuesday, September 26
Preparation:
- Chapter 21, Disjoint Sets
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/disjoint.html

Thursday, September 28
Preparation:
- Chapter 22, Elementary Graph Algorithms
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html

Tuesday, October 3
First concept exam:
- Solving recurrences
- Self-balancing search trees
- Binomial and Fibonacci heaps
- Disjoint sets
- Graphs and graph exploration

Thursday, October 5
Preparation:
- Chapter 23, Minimum Spanning Trees
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html

Programming assignment #0, resubmission #1 due

Tuesday, October 10
Preparation:
- Section 24.3, Dijkstra’s Algorithm
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/graphs.html

Thursday, October 12
Preparation:
- Web search: memoization
- Chapter 15, Dynamic Programming
- Example questions: http://beastie.cs.ua.edu/concepts/cs/al/dynamic.html

Programming assignment #0, resubmission #2 due
Programming assignment #1 due
Tuesday, October 17
Dynamic programming, continued

Thursday, October 19
Preparation:
• Chapter 9, Medians and Order Statistics
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html (questions 1 - 10)

Programming assignment #0, resubmission #3 due
Programming assignment #1, resubmission #1 due

Tuesday, October 24
Medians and order statistics, continued

Thursday, October 26
Fall break

Programming assignment #0, final resubmission due
Programming assignment #1, resubmission #2 due

Tuesday, October 31
Preparation:
• Section 8.1, Lower bounds for sorting
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html (question 11 - 16)

Wednesday, November 1
Last day to drop a class

Thursday, November 2
Second content exam:
• Minimum spanning trees
• Shortest paths
• Dynamic programming (including memoization)
• Linear time selection

Programming assignment #1, resubmission #3 due
Programming assignment #2 due

Tuesday, November 7
Preparation:
• Section 8.2, Counting Sort
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html

Thursday, November 9
Preparation:
• Section 8.3, Radix Sort
• Section 8.4, Bucket Sort
• Example questions: http://beastie.cs.ua.edu/concepts/cs/al/lsort.html

Programming assignment #1, final resubmission due
Programming assignment #2, resubmission #1 due
Programming assignment #3 due
Tuesday, November 14
Preparation:
- Chapter 17, *Amortized Analysis*

Thursday, November 16
Amortized analysis, continued
Programming assignment #2, resubmission #2 due
Programming assignment #3, resubmission #1 due

Tuesday, November 21
Preparation:
- Section 34.1 — 34.3, *P and NP*
- [http://beastie.cs.ua.edu/cs201/npc.html](http://beastie.cs.ua.edu/cs201/npc.html)

Thursday, November 23
Thanksgiving

Friday, November 24
Programming assignment #2, resubmission #3 due
Programming assignment #3, resubmission #2 due

Tuesday, November 28
Preparation:
- Section 34.4 — 34.5, *NPC proofs and problems*

Thursday, November 30
*P, NP, and NP*-completeness, continued
Programming assignment #2, final resubmission due
Programming assignment #3, resubmission #3 due

Tuesday, December 5
Dead week

Thursday, December 7
Dead week, last day of class
Programming assignment #3, final resubmission due

Friday, December 8
Last day to withdraw from the term

Thursday, December 14
Final exam (cumulative), 11:30am to 2:00pm