

Schedule

A week-by-week breakdown of the material.

Week 1 (01/08-01/12)

Mon Introduction to Algorithms (1.1, 1.2, 1.3)¹

Activity Sheet²

Wed Brief intro to Java³

Lab Assignment 1⁴

Fri Continue Lab Assignment 1⁵

Review of Data Structures⁶

Week 2 (01/15-01/19)

Mon Activity Sheet 1⁷

Wed Analysis Framework and Asymptotic Notation (2.1, 2.2)⁸

Activity Sheet 2⁹

Fri Analysis of nonrecursive algorithms (2.3)¹⁰

Activity Sheet 3¹¹

Lab Assignment 1 due¹²

Week 3 (01/22-01/26)

Mon Analysis of recursive algorithms (2.4)¹³

Homework 1 Due¹⁴

¹[notes/intro.html](#)

²[activities/activities1-intro.html](#)

³[notes/java_intro.html](#)

⁴[assignments/assignment1.html](#)

⁵[assignments/assignment1.html](#)

⁶[notes/data_structures.html](#)

⁷[activities/activities1-intro.html](#)

⁸[notes/analysis_framework.html](#)

⁹[activities/activities2-framework.html](#)

¹⁰[notes/analysis_nonrecursive.html](#)

¹¹[activities/activities3-analysis.html](#)

¹²[assignments/assignment1.html](#)

¹³[notes/analysis_recursive.html](#)

¹⁴[assignments/hwassignment1.html](#)

Wed Brute-Force Algorithms (3.1)¹⁵

Activity Sheet 4¹⁶

Fri Exhaustive Search (3.4)¹⁷

Week 4 (01/29-02/02)

Mon Depth-first search (3.5)¹⁸

Wed Depth-first search cont (3.5)¹⁹

Activity Sheet 5²⁰

Lab Assignment 2: Graph search²¹

Fri Breadth-first search (3.5)²²

Decrease-by-one algorithms: Insertion Sort (4.1)²³

Week 5 (02/05-02/09)

Mon Decrease-by-one algorithms: Topological Sort (4.2)²⁴

Activity Sheet 6²⁵

Homework 2 Due²⁶

Wed Decrease-by-one algorithms: Topological Sort (4.2)²⁷

Fri Decrease-by-constant-factor algorithms (4.4)²⁸

Activity Sheet 7²⁹

¹⁵[notes/brute_force.html](#)

¹⁶[activities/activities4-bruteForce.html](#)

¹⁷[notes/exhaustive_search.html](#)

¹⁸[notes/depth_first_search.html](#)

¹⁹[notes/depth_first_search.html](#)

²⁰[activities/activities5-DFS.html](#)

²¹[assignments/assignment2.html](#)

²²[notes/breadth_first_search.html](#)

²³[notes/decrease_by_one_insertion.html](#)

²⁴[notes/decrease_by_one_topological.html](#)

²⁵[activities/activities6-TopologicalSort.html](#)

²⁶[assignments/hwassignment2.html](#)

²⁷[notes/decrease_by_one_topological.html](#)

²⁸[notes/decrease_by_constant_factor.html](#)

²⁹[activities/activities7-DecreaseByConstantFactor.html](#)

Week 6 (02/12-02/16)

Mon Midterm 1 (Chapters 1-4)³⁰

Wed Divide-and-conquer algorithms: Mergesort (5.1)³¹
Activity Sheet 8³²

Fri Discussion of the Master Theorem
Lab Assignment 3: Topological Sort³³

Week 7 (02/19-02/23)

Mon Divide-and-conquer algorithms: Quicksort (5.2)³⁴
Activity Sheet 9³⁵

Wed Binary Tree Traversals (5.3)³⁶
Activity Sheet 10³⁷

Fri Instance simplification algorithms (6.1)³⁸
Activity Sheet 11³⁹

Week 8 (02/26-03/02)

Mon BREAK

Wed BREAK

Fri BREAK

Week 9 (03/05-03/09)

Mon Balanced Search Trees (6.3)⁴⁰
Activity Sheet 12⁴¹

³⁰[notes/midterm1_study_guide.html](#)

³¹[notes/divide_conquer.html](#)

³²[activities/activities8-DivideAndConquer.html](#)

³³[assignments/assignment3.html](#)

³⁴[notes/divide_conquer_quicksort.html](#)

³⁵[activities/activities9-QuicksortAndPartitions.html](#)

³⁶[notes/divide_conquer_traversals.html](#)

³⁷[activities/activities10-TreeTraversals.html](#)

³⁸[notes/instance_simplification.html](#)

³⁹[activities/activities11-Presorting.html](#)

⁴⁰[notes/balanced_search_trees.html](#)

⁴¹[activities/activities12-balanced_trees.html](#)

Wed Representation change: Heaps and Heapsort (6.4)
Lab Assignment 4: heaps (and/or balanced search trees)

Fri Problem reduction techniques (6.6)
Homework 3 Due⁴²

Week 10 (03/12-03/16)

Mon Space-time tradeoffs: Hashing (7.3)

Wed Space-time tradeoffs: B-trees (7.3)
Lab Assignment 5: String Matching (or Hashing?)

Fri Midterm 2 (Chapters 5-7)

Week 11 (03/19-03/23)

Mon Dynamic Programming Algorithms, and Knapsack (8.1-8.2)
Dynamic Programming: Optimal Binary Search Trees (8.3)

Wed Dynamic Programming: All Pairs Shortest Paths (8.4)

Fri Greedy Algorithms: Prim's (9.1)

Week 12 (03/26-03/30)

Mon Greedy Algorithms: Kruskal's, Union-Find (9.2)

Wed Greedy Algorithms: Dijkstra (9.3)
Lab Assignment 6: Greedy Graph Algorithms

Fri Iterative Improvement: Maximum-Flow Problem (10.2)

Week 13 (04/01-04/06)

Mon Iterative Improvement: Maximum Bipartite Matching (10.3)

Wed Limitations of Algorithm Power (11.1, 11.2)

Fri P, NP and NP-Complete Problems (11.3)

⁴²[assignments/hwassignment3.html](https://www.cs.cmu.edu/~15711/assignments/hwassignment3.html)

Week 14 (04/09-04/13)

Mon Backtracking, Branch-and-bound (12.1, 12.2)

Wed Review/Catchup

Fri Review (Final on chapters 8-12)