

# 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)<sup>1</sup>

Activity Sheet<sup>2</sup>

**Wed** Brief intro to Java<sup>3</sup>

Lab Assignment 1<sup>4</sup>

**Fri** Continue Lab Assignment 1<sup>5</sup>

Review of Data Structures<sup>6</sup>

## Week 2 (01/15-01/19)

**Mon** Activity Sheet 1<sup>7</sup>

**Wed** Analysis Framework and Asymptotic Notation (2.1, 2.2)<sup>8</sup>

Activity Sheet 2<sup>9</sup>

**Fri** Analysis of nonrecursive algorithms (2.3)<sup>10</sup>

Activity Sheet 3<sup>11</sup>

Lab Assignment 1 due<sup>12</sup>

## Week 3 (01/22-01/26)

**Mon** Analysis of recursive algorithms (2.4)<sup>13</sup>

Homework 1 Due<sup>14</sup>

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<sup>1</sup>[notes/intro.html](#)

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

<sup>3</sup>[notes/java\\_intro.html](#)

<sup>4</sup>[assignments/assignment1.html](#)

<sup>5</sup>[assignments/assignment1.html](#)

<sup>6</sup>[notes/data\\_structures.html](#)

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

<sup>8</sup>[notes/analysis\\_framework.html](#)

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

<sup>10</sup>[notes/analysis\\_nonrecursive.html](#)

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

<sup>12</sup>[assignments/assignment1.html](#)

<sup>13</sup>[notes/analysis\\_recursive.html](#)

<sup>14</sup>[assignments/hwassignment1.html](#)

**Wed** Brute-Force Algorithms (3.1)<sup>15</sup>

Activity Sheet 4<sup>16</sup>

**Fri** Exhaustive Search (3.4)<sup>17</sup>

## **Week 4 (01/29-02/02)**

**Mon** Depth-first search (3.5)<sup>18</sup>

**Wed** Depth-first search cont (3.5)<sup>19</sup>

Activity Sheet 5<sup>20</sup>

Lab Assignment 2: Graph search<sup>21</sup>

**Fri** Breadth-first search (3.5)<sup>22</sup>

Decrease-by-one algorithms: Insertion Sort (4.1)<sup>23</sup>

## **Week 5 (02/05-02/09)**

**Mon** Decrease-by-one algorithms: Topological Sort (4.2)<sup>24</sup>

Activity Sheet 6<sup>25</sup>

Homework 2 Due<sup>26</sup>

**Wed** Decrease-by-one algorithms: Topological Sort (4.2)<sup>27</sup>

**Fri** Decrease-by-constant-factor algorithms (4.4)<sup>28</sup>

Activity Sheet 7<sup>29</sup>

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<sup>15</sup>[notes/brute\\_force.html](#)

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

<sup>17</sup>[notes/exhaustive\\_search.html](#)

<sup>18</sup>[notes/depth\\_first\\_search.html](#)

<sup>19</sup>[notes/depth\\_first\\_search.html](#)

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

<sup>21</sup>[assignments/assignment2.html](#)

<sup>22</sup>[notes/breadth\\_first\\_search.html](#)

<sup>23</sup>[notes/decrease\\_by\\_one\\_insertion.html](#)

<sup>24</sup>[notes/decrease\\_by\\_one\\_topological.html](#)

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

<sup>26</sup>[assignments/hwassignment2.html](#)

<sup>27</sup>[notes/decrease\\_by\\_one\\_topological.html](#)

<sup>28</sup>[notes/decrease\\_by\\_constant\\_factor.html](#)

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

## Week 6 (02/12-02/16)

**Mon** Midterm 1 (Chapters 1-4)<sup>30</sup>

**Wed** Divide-and-conquer algorithms: Mergesort (5.1)<sup>31</sup>  
Activity Sheet 8<sup>32</sup>

**Fri** Discussion of the Master Theorem  
Lab Assignment 3: Topological Sort<sup>33</sup>

## Week 7 (02/19-02/23)

**Mon** Divide-and-conquer algorithms: Quicksort (5.2)<sup>34</sup>  
Activity Sheet 9<sup>35</sup>

**Wed** Binary Tree Traversals (5.3)<sup>36</sup>  
Activity Sheet 10<sup>37</sup>

**Fri** Instance simplification algorithms (6.1)<sup>38</sup>  
Activity Sheet 11<sup>39</sup>

## Week 8 (02/26-03/02)

**Mon** BREAK

**Wed** BREAK

**Fri** BREAK

## Week 9 (03/05-03/09)

**Mon** Balanced Search Trees (6.3)<sup>40</sup>

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<sup>30</sup>[notes/midterm1\\_study\\_guide.html](#)

<sup>31</sup>[notes/divide\\_conquer.html](#)

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

<sup>33</sup>[assignments/assignment3.html](#)

<sup>34</sup>[notes/divide\\_conquer\\_quicksort.html](#)

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

<sup>36</sup>[notes/divide\\_conquer\\_traversals.html](#)

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

<sup>38</sup>[notes/instance\\_simplification.html](#)

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

<sup>40</sup>[notes/balanced\\_search\\_trees.html](#)

**Wed** Balanced Search Trees (6.3)](notes/balanced\_search\_trees.md)

Activity Sheet 12<sup>41</sup>

**Fri** Representation change: Heaps and Heapsort (6.4)<sup>42</sup>

Activity Sheet 13<sup>43</sup>

Homework 3 Due<sup>44</sup>

## **Week 10 (03/12-03/16)**

**Mon** Space-time tradeoffs: Hashing (7.3)<sup>45</sup>

**Wed** Dynamic Programming Algorithms (8.1)<sup>46</sup>

Activity Sheet 14<sup>47</sup>

**Fri** Dynamic Programming: Knapsack, Optimal Binary Search Trees (8.2, 8.3)<sup>48</sup>

Lab Assignment 4<sup>49</sup>

## **Week 11 (03/19-03/23)**

**Mon** Dynamic Programming: All Pairs Shortest Paths (8.4)

**Wed** Greedy Algorithms: Prim's (9.1)

**Fri** Midterm 2 (Chapters 5-7)

## **Week 12 (03/26-03/30)**

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

Lab Assignment 5: String Matching (or Hashing?)

Lab Assignment 6: Greedy Graph Algorithms

**Wed** Greedy Algorithms: Dijkstra (9.3)

Lab Assignment 4 Due<sup>50</sup>

**Fri** Iterative Improvement: Maximum-Flow Problem (10.2)

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<sup>41</sup>[activities/activities12-balanced\\_trees.html](#)

<sup>42</sup>[notes/heaps.html](#)

<sup>43</sup>[activities/activities13-heaps.html](#)

<sup>44</sup>[assignments/hwassignment3.html](#)

<sup>45</sup>[notes/hashing.html](#)

<sup>46</sup>[notes/dynamic\\_programming.html](#)

<sup>47</sup>[activities/activities14-dynamic\\_programming.html](#)

<sup>48</sup>[notes/dynamic\\_knapsack.html](#)

<sup>49</sup>[assignments/assignment4.html](#)

<sup>50</sup>[assignments/assignment4.html](#)

### **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)

### **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)