Schedule of Topics
CSC 301, “Analysis of Algorithms”
Department of Computer Science
Grinnell College
revised November 14, 2016

August 26: The nature and history of algorithms
Reading: Cormen et al., chapter 1 (pages 5–15)

August 29: Resource-use functions
Reading: Cormen et al., chapter 2 from the beginning through section 2.2 (pages 16–29) and chapter 3 (pages 43–64)

August 31 and September 2: Asymptotic notation
Reading: Cormen et al., chapter 2 from section 2.3 to the end (pages 29–42) and chapter 4 from the beginning through section 4.4 (pages 65–93)

September 5: Divide-and-conquer algorithms
Reading: Cormen et al., chapter 4 from section 4.5 to the end (pages 93–113)

September 7: The master theorem

September 9: (pause for breath)
Reading: Cormen et al., chapter 5 (pages 114–145)

September 12: Randomized algorithms
Reading: Cormen et al., introduction to part II and chapters 6 and 7 (pages 147–169)

September 14 and 16: Lab: heapsort and quicksort
Reading: Cormen et al., chapter 8 (pages 191–212)

September 19: Linear-time sorting methods
Reading: Cormen et al., chapters 12 and 13 (pages 286–338)

September 21: Red-black trees
Reading: Cormen et al., introduction to part IV and chapter 15 (pages 357–413)

September 23 and 26: Dynamic programming
Reading: Cormen et al., chapter 16 from the beginning through section 16.3 (pages 414–437)

September 28: File compression
Reading: Cormen et al., chapter 17 (pages 451–478)

September 30: Amortization
Reading: Cormen et al., chapter 19 (pages 505–530)

October 3 and 5: Fibonacci heaps and binomial heaps
Reading: Cormen et al., chapter 21 (pages 561–585)

October 7: Disjoint-set structures
Reading: Cormen et al., introduction to part VI and chapter 22 from the beginning through section 22.3 (pages 587–612)

October 10: Graph search
October 12: Topological sort

October 14: Spanning trees

October 24: Single-source shortest-path problems

October 26: All-pairs shortest-path problems

October 28: Network flows

October 31: Push-relabel algorithms

November 2: Gaussian elimination

November 4: Linear programming

November 7 and 9: Euclid’s algorithm

November 11 and 14: RSA cryptography; primality testing

November 16: String matching

November 18: Intersection of line segments

November 21: Convex hulls

November 23: Closest pair of points

November 28 and 30: Satisfiability

December 2: Approximation algorithms

December 5: Simulated annealing
Reading: (to be announced)

December 7: Genetic algorithms

December 9: Review; student evaluations

December 13, 9 a.m. to noon: Final examination