Books for Reference

The following is a list of books related to algorithms that may be useful for reference. This list, which was largely compiled by Prof. John Casey, contains both introductory texts as well as advanced books. Some of these books may be available on the reserve section at Snell.

Introductory books on algorithms

   Perhaps the most comprehensive textbook on algorithms. The style of coverage is formal. All of the topics covered in our course are also covered in this text. So it is a very useful reference for the course.

   This text is an implementation-oriented study of algorithms. The book also lists a number of sources for good implementations of various algorithms. Also, the book has a CD-ROM full of code, plus practical advice on choosing algorithms for large-scale problems.

   This text is a friendly, undergraduate-oriented book. If the treatment of a topic in the course text doesn’t satisfy you, look here.

   “General reference, although the exposition is sometimes terse or sketchy.” – Leonidas Guibas

   “Good examples and problems. Focus on methods rather than specific problems.” – Leonidas Guibas

   This is a good undergraduate-level textbook on algorithms.

   This book is an in-depth coverage of algorithms from the point of view of a programmer. Volume 1 covers fundamentals, data structures, sorting, and searching. Volume 2 covers string algorithms, computational geometry, graph algorithms, and some advanced topics.

   This book is somewhat outdated; it is still a useful book from a technical standpoint.
   Encyclopaedic work in three volumes: (1) Fundamental Algorithms, (2) Seminumerical Algorithms, (3) Sorting and Searching. A fourth volume is in progress. Knuth had originally planned for seven volumes.
   This set of books is one of the greatest collections in computer science.

    This is a collection of data and actual C programs implementing a variety of graph and related algorithms. It is a useful companion to the portion of the course text devoted to graph algorithms.

    This book has an interesting approach, which minimizes the mathematical machinery used. If your math skills are rusty, Section 1.4 on “Order” is a good review.

    This develops the mathematics needed for analysis.

    It covers data structures, dynamic programming, as well as branch-and-bound, randomized, and parallel algorithms.

    This handbook has a large number of algorithms, with complete code in C and Pascal. It also has formulas for calculating performance, expectation, variance, and other probabilistic measures.

**Basic Mathematics**

   A standard textbook for discrete mathematics.

    Chapter 2 of this text (Proofs, Recurrences, and Analysis of Algorithms) is a useful chapter to look at.

    Another introductory book on discrete mathematics.

    This book covers a lot of the basic discrete mathematics that is useful throughout the course.
   This an old yet quite useful book on elementary discrete mathematics.

   This book provides a more thorough treatment than you probably had in your calculus textbooks.

   This book is an excellent elementary introduction to probability theory.

   This is a readable and intuitive introduction to probability theory.

**A few advanced books**

   This book contains algorithms for the computationally hard problems, with practical advice on what happens on real machines.

   This book describes introductory as well as advanced techniques for analyzing algorithms.

   This is an advanced book with succinct descriptions of lots of good ideas.

**Other fun books**

   This is a fun book to read. It provides a number of techniques for summations and solving combinatorial problems. All of the text is flanked by funny (and often distracting) graffiti.

   It’s just what the title claims. The book originated as a popular TV series.

   Jon Bentley, one of the leading authorities on programming, provides suggestions for improving the code you write.