Data structures and algorithms are the building blocks of computer programs. In most modern programming languages, many of the details studied here are somewhat hidden behind powerful abstractions, such as Python's lists and dictionaries and Java's HashMap and Set. Even though you don't normally need to reimplement them, the details of these data structures, and some of the algorithms with them, are extremely important for Software Engineers: if you don't know *what* they do, and *how* they do it, that can have a significant negative effect on the performance of your programs.

This course takes you "under the hood" of basic data structures and algorithms. This is material that all Software Engineers need to know off the top of their heads.

Required Materials

**Textbook**:

* [The Algorithms Design Manual (Links to an external site.)](https://www.amazon.com/Algorithm-Design-Manual-Steven-Skiena-dp-1849967202/dp/1849967202/)

**Online:**

[(Links to an external site.)](https://docs.oracle.com/javase/tutorial/essential/concurrency/index.html)[Supporting materials (Links to an external site.)](http://www.algorist.com/) for the textbook, including [lecture slides and videos (Links to an external site.)](http://www3.cs.stonybrook.edu/~skiena/373/videos/).

**Software**:

* Java or Python
* Your favorite code editor or development environment