

## **Guide for Technical Development**

Having a solid foundation in Computer Science is important in being a successful Software Engineer. This guide is a suggested path for Undergraduate students to develop their technical skills academically and non-academically through self paced hands-on learning. The guide is broken down by year to help build your skills as you progress in your studies. You may use this guide to determine courses to take. However, please make sure you are taking courses required for your major or faculty in order to graduate. The online resources provided in this guide are not meant to replace courses available at your University. However, they may help supplement your learnings or provide an introduction to the topic.

## Using this guide

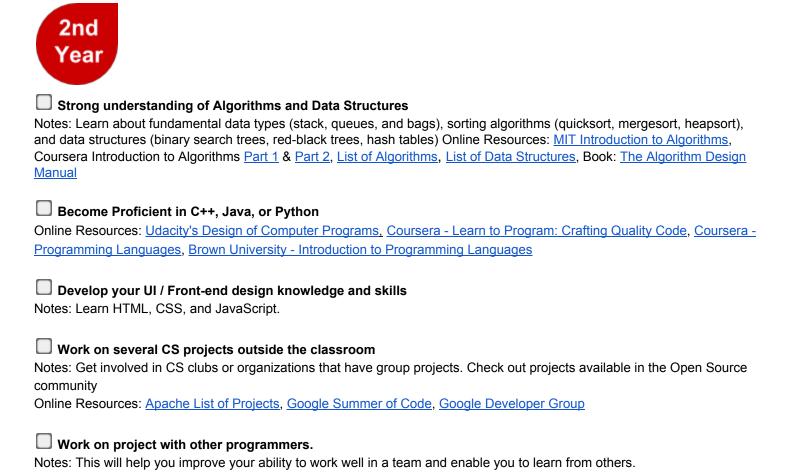
- Please use this guide at your discretion
- This is a suggested timeline and not meant to be a strict timeline you need to follow
- There may be other things you want to learn or do outside of this guide go for it!
- Checking off all items in this guide does not guarantee a job at Google
- This guide will evolve or change check back for updates

Join our Google+ Community to get additional tips, resources, and other students interested in development.

Guide Updated July 2013



☐ Take at least one CS course
Notes: Introduction to Computer Science Course that provides instructions on coding
Online Resources: <u>Udacity - intro to CS course</u> , <u>Coursera - Computer Science 101</u>
Become familiar with and able to code in at least one object oriented programming language: C++, Java, or
Python
Online Resources: Coursera - Learn to Program: The Fundamentals, MIT Intro to Programming in Java, Google's Python
Class, Coursera - Introduction to Python
Learn other Programming Languages
Notes: Add to your repertoire - Java Script, HTML, Ruby, or PHP.
Online Resources: w3school.com - HTML Tutorial
Work on at least one major CS project outside of the classroom.
Notes: Create and maintain a website, build your own server, or build a robot.
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☐ Work on a small piece of a large system (codebase), read and understand existing code, track down
documentation, and debug things.
Notes: Github is a great way to read other people's code or contribute to a project.
Online Resources: Github, Kiln
Develop logical reasoning to derive conclusion
Online Resources: Coursera - Introduction to Logic



Build a solid foundation in discrete math

Online Resources: Coursera - Linear and Discrete Optimization, Coursera - Probabilistic Graphical Models, Coursera - Game

Theory



wait until your

Online Resources: google.com/jobs

☐ Strong proficiency C++ or Java
Online Resources: <u>Udacity - Design of Computer Programs</u>
Strong knowledge of algorithms / data structures: Big O, sorting hashtables, trees, graphs
Notes: Practice your algorithmic knowledge through coding competitions like CodeJam or ACM's International Collegiate
Programming Contest.
Online Resources: CodeJam, ACM ICPC
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Learn other Programming Languages
Notes: Learn C, Perl, Shell. Lisp, or Scheme.
Develop a strong knowledge of operating systems
Online Resources: <u>UC Berkeley Computer Science 162</u>
Crimic Recourses. <u>Ge Barkeley Computer Coloride 102</u>
☐ Test Your Code
Notes: Learn how to catch bugs, create tests, and break your software
Online Resources: <u>Udacity - Software Testing Methods</u> , <u>Udacity - Software Debugging</u>
☐ Internship experience in software engineering
Notes: Make sure you apply for internships well in advance of the period internships take place. In the US, internships take
place during the summer, May-September, and applications are usually open several months in advance. You don't have to



Learn	how	to	build	com	pilers

Online Resources: Coursera - Compilers

Learn cryptography
Online Resources: Coursera - Cryptography

Learn Parallel Programming
Online Resources: Coursera - Heterogeneous Parallel Programming

## \*Thinking about going to graduate school? You can still have an internship before you go.