Self Study for Computer Science and Engineering

Self Study Plan

This document organizes resources for self-learning computer science, engineering, electronics, and mathematics, including free and paid platforms.

1. Math (Foundation for Engineering & CS)

- Greenemath.com - Algebra & Precalc practice
- CalcWorkshop.com– Calculus
- https://www.virtualnerd.com/geometry/all/
- https://www.allmath.com/(for help)
- Desmos.com (for help)
- AllTheMath.org / Discrete Math- Logic, sets, graphs, combinatorics
- MathIsPower4U.com - Videos for all math topics (help videos)
- ProPrep.com - Optional paid practice
- Engineer4Free.com - Free math & basic engineering resources(opetional)

2. Programming & Computer Science Fundamentals

- **OSS University Path to a free self-taught education in Computer Science!**
- NeetCode.io- Algorithms, DSA practice (lifetime membership)
- Introduction to parallel programming(in c++)
- Software contruction elements
- csprimer.com

- Java Programming
- CS61A - Intro to CS, Python, Data Structures

- LearnCPP.com
- HackingCPP.com- C++ exercises
- StudyPlan.dev- Structured C++ curriculum
- https://bigmachine.io/courses/ - Self-taught programming exercises
- Sp21.datastructur.es- Data structures & algorithms course
- C++ multithreadingModern C++ Features & Concurrency

3. Systems & Low-Level Programming & intoducton to Engineering

Toptechboy.com(guide for engineering and respberry pi and ardinio)

- Nand2Tetris.org- Computer architecture & logic design
- NandGame.com - Hands-on digital logic
- Advance C++ course
- Introduction to Electricity and Magnetism Specialization
-
- wokwi.com(simulator)
- Linear Circuits 1: DC Analysis

Digital Signal Processing Specialization

-
- Computer Architecture
- Electrical engineering 101
- Teach yourself Electrcity and electronics
- Assembly Language PDFs:
- Learning the art of electronics
- Introduction to 64-bit Intel Assembly Language Programming for Linux
- Assembly Language Step-by-Step Programming with Linux 3rd Edition
- Introduction Operating system
- CS423 Operating System Design- OS concepts
- LabEx.io - Linux virtual lab environment
- FastbitLab.com - Embedded programming
- QT course udemy for c++ beginer course link

Introduction to Engineering Book

Design of Digital Circuits with VHDL Programming

Crash Course Electronics and PCB Design

4. Networking & Telecommunications

- TCP/IP Guide- Networking theory
- Computer Networking: A Top-Down Approach PDF
- Su25 CS168.io- Networking exercises

5. Electronics & AI & Robotics

- DCACLab.com- Online circuits

- CircuitLab.com- Circuit design
- Ohmify.com- Electronics fundamentals
- Kevin Wood Robotics- Robotics projects
- Udacity Robotics Software Engineer- Robotics programming

6. Physics

- FlippingPhysics YouTube- Physics tutorials
- PhysicsLab.app - Interactive simulations
- Quntum Computing(qctrl.com)
- MyPhysicsLab.com- Physics simulations
- PhysicsLab.org- Interactive physics exercises

7. Supplemental / Special Topics

- DevOps: DevOps Bootcamp
- Software Engineering: Coursera, Udemy
- GPU Programming: Coursera GPU specialization
- Parallel / Concurrent Programming: Udemy C++ concurrency courses
- Web Development / Android / Kotlin: Udacity
- AI / Machine Learning: Coursera AIIntro

8. Study & Practice Tools

- Visualgo.net- Visualize algorithms & data structures
- CSVIsTool.com- Interactive algorithm visualization
- OverTheWire.org / Bandit- Cybersecurity practice
- Excalidraw.com- Diagramming & flowcharts
- Timer
- Use PMSS to magange time

- Roadmap.sh - Career learning paths & skill maps
- brain.fm – focus music and relax music

Usage Tips

1. Start with Math, then move to Programming Fundamentals.
2. Parallel-track Discrete Math for logic skills.
3. Continue to Systems & Low-Level Programming, then Networking.
4. Follow with Physics, Electronics & Robotics.
5. Use study/practice tools to reinforce learning and visualize concepts.

Note: Clickable hyperlinks are included for each online resource.

Self Study Plan for Computer Science and Engineering

Additional Information

About Me:
https://antp1997.github.io/about.html

Computer Science Information (OSSU):
https://ossu.firebaseapp.com/

Course Pace:

- Finish in approximately 5 months
- Take only 3 to 4 courses at a time