

Course Placement Information

Parts of this handout were written by Mehran Sahami.

Computers are everywhere in today's world. The more you know about computers, the better prepared you will be to make use of them in whatever field you choose to pursue. Learning to program computers unlocks the full power of computer technology in a way that is both liberating and exciting. At the same time, programming is an intellectually challenging activity that comes easily to very few people. Taking a programming course requires a great deal of work and commitment on your part, but you will not be able to master programming without putting in that level of work somewhere along the way. The payoffs, however, are quite real. If you make the effort and keep up with the demands of the material, you will be able to make computers do amazing things.

What introductory programming course should I take?

A large percentage of Stanford students take a programming course from the Computer Science Department at some point during their undergraduate career. Because we need to accommodate students with a range of backgrounds and interests, the department offers several different introductory classes:

- 101—Introduction to Computing Principles. This course is offered in the fall and is part of a national effort to develop a new Advanced Placement course in computer science that focuses more on the principles of algorithmic problem solving than on the details of a particular programming language.
- 105—Introduction to Computing. This course is designed as a general-education introduction to what this rapidly expanding field of computer science is all about. It attracts an audience of approximately 500 students a year, most of whom take the course primarily to meet the Stanford General Education Requirement in category DB-EngrAppSci. If your only interest is in meeting that requirement, CS 105 is likely to be the most appropriate course. Like any programming course, CS 105 requires a reasonable amount of work, but not as much as CS 106A. CS 105 is offered every quarter; this winter, the course meets MWF at 1:15 P.M. in 420-040.
- 106A—Programming Methodology. This course is the largest of the introductory programming courses and is currently the largest course at Stanford. CS 106A is explicitly designed to appeal to humanists and social scientists as well as hard-core techies. Most CS 106A graduates end up majoring outside of the School of Engineering. The course requires no previous background in programming, but does require considerable dedication and hard work. CS 106A is offered every quarter; this winter, the course meets MWF at 3:15 P.M. in the NVIDIA Auditorium in Huang.
- 106B—Programming Abstractions. This course is the natural successor to CS 106A and covers such advanced programming topics as recursion, algorithmic analysis, and object-oriented design. It uses the programming language C++, which is relatively easy to learn from a background in either C or Java. While CS 106B is designed primarily to serve as a follow-on to CS 106A, it also makes a good entry point into the sequence for students who have taken AP Computer Science A or some comparable course in high school. This quarter, CS 106B meets MWF at 3:15 P.M. in Hewlett 200.

- **106X—Programming Methodology and Abstractions (accelerated).** CS 106X currently operates as an “honors” version of our CS 106B course. It is taught using the C++ programming language and covers the same topics as CS 106B but with more in-depth coverage in some areas. In order to get through that much material in a quarter, CS 106X moves at a very fast pace. Students are expected to have solid background comparable to our CS 106A course, and should have sufficient maturity and dedication to tackle an intense challenge. If you’ve had previous programming experience, this class is an excellent way to learn C++ and brush up on your skills. If you haven’t done much programming before or don’t feel comfortable with your programming skills, you should take the CS 106A/B sequence instead. Don’t let anyone tell you that “real engineers take CS 106X.” These days, most computer scientists and engineers start with CS 106A, where they do just fine. The last thing you want to do is get in over your head. This year, CS 106X is offered in the fall and spring quarters only.

I already know how to program—shouldn’t I skip the intro courses altogether?

Many students entering Stanford today have had considerable programming experience in high school or from their own independent work with computers. If you are in that position, the idea of starting with a beginning programming course—even an intensive one like CS 106X—seems like a waste of time. Your perception may in fact be correct. In my experience, there are at somewhere between 15 and 20 students in each entering class who should start at a more advanced point in the sequence. For most of you, however, the right place to start is with the CS 106 series. Most high-school computing courses are quite weak and provide very little insight into modern software engineering techniques and effective programming style. By taking CS 106X, you will learn how the CS department at Stanford approaches programming and get a solid foundation for more advanced work. If you’re unsure as to where you should start the programming sequence, please talk to the CS 106 course staff.

Other courses

As computers become more powerful, it is possible to use them for increasingly sophisticated tasks without engaging in programming, at least in a traditional sense. The CS 106 courses teach you about programming, and not about a particular programming language. If your goal is to know more about how to use computers, you should investigate the following courses offered in the dormitories:

- *CS 1C—Introduction to Computing at Stanford.* This one-unit course is offered in the autumn quarter only and makes sure you have a level of “computer literacy” that will allow you to function effectively at Stanford. It does not teach programming at all.
- *CS 2C—Multimedia Production.* This course is a continuation of CS 1C and covers more advanced topics in web-page creation and applications like Photoshop, Dreamweaver, and iMovie.