

Princeton Computer Science

Academic Expo 2023

Welcome to Computer Science!

The *Computer Science Council*, a body comprised of COS majors who serve as liaisons between the students and the department, has put together a short pamphlet to introduce you to majoring in COS at Princeton.



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COS at a glance

- Prerequisites.** Before you can major in COS, you have to take a few courses:

COS 126: Computer Science: An Interdisciplinary Approach. Introduction to programming fundamentals, including iteration, object-oriented design, recursion, etc.

COS 226: Algorithms and Data Structures. Introduction to classical algorithms and data structures used in nearly all modern computing systems.

COS 217: Introduction to Programming Systems. Introduction to the fundamentals of system design.

Mathematics: Calculus (*MAT 103-104* or AP Calculus BC) and a semester of linear algebra (*MAT 202, 204, 217, or EGR 154*). See back side for AB/BSE.

- Departmentals.** COS majors are required to take 8 COS departmentals. These fall into three categories: foundation, core courses, and electives. *COS 240: Reasoning about Computation* is the foundation course. Core courses must span the following 4 categories: Computer Systems, AI and Machine Learning, Theoretical Computer Science, and Breadth. Three elective courses (COS numbered 300 or higher, or approved courses) must be taken.

- Independent work.** All COS concentrators are required to complete some form of independent work with a COS or COS-affiliated faculty. The exact requirements for AB/BSE candidates differ (see the back side).

Why COS?



Figuring out what you want to study at Princeton is one of the most important decisions you'll make here. With so many options, it can seem difficult to have sense of what your academic path will look like. Rest easy: you have a ton of time to figure it out. In the meantime, though, here are some reasons you might consider concentrating in COS:

Emphasis on problem-solving skills. Every class in the COS department stresses rigorous mathematical and logic-based approaches to solving some of the toughest and most interesting problems. Being a COS major encourages you to hone and sharpen problem-solving skills, helping you develop into a critical, precise thinker.

World-class faculty. Princeton's COS department served as a pioneering force in the early years of computing and continues to do so today. With strong faculty in theoretical computer science, programming language theory and formal verification methods, as well as in hundreds of applications of computing (including networks, machine learning, graphics and much more), majoring in COS at Princeton gives you access to some of the greatest minds in the field.

Career prospects. Studying COS at Princeton prepares you well for whatever career you're interested in, whether it be in industry or graduate study in computer science or some related field.

AB vs. BSE requirements

The COS department offers two ways to approach the major, either through the School of Arts and Sciences (AB) or through the School of Engineering and Applied Sciences (BSE). The requirements are similar, but there are some key differences:

AB

- University AB requirements (language, distribution requirements, etc.)
- Two semesters of independent work junior year
- A thesis senior year

BSE

- University BSE requirements (physics, chemistry, multivariable calculus)
- A single semester of independent work in junior or senior year

Resources

General

Director of Undergraduate Studies (COS majors):

Dave Walker (dpw@cs.princeton.edu)

Director of Undergraduate Studies (first years, sophomores, non-majors, study abroad):

Brian Kernighan (bwk@cs.princeton.edu)

Department Chair:

Szymon Rusinkiewicz (smr@cs.princeton.edu)

Undergraduate Program Manager:

Colleen Kenny (ckenny@cs.princeton.edu)

COS Council

COS Council website

(www.princetoncouncil.com)

COS Council email

(princetoncouncil@gmail.com)

FAQ

I've never coded before. Can I still be a COS major?

Absolutely. A solid number of current and past COS majors had never coded before coming to college. The department offers a ton of resources for beginning programmers, so picking up programming at Princeton is totally doable. While COS 126 may have a steep initial learning curve, you'll find that if you stick with it, some initial hard work will really pay off.

Can I wait until Spring semester to take my first COS class and still concentrate in COS?

If you think you might be interested in majoring in COS, you're encouraged to take COS 126 as soon as you can. However, taking it in the Spring won't set you back in the slightest, and in fact, many current and past majors did just that.

AB or BSE?

There are a lot of factors involved in choosing AB or BSE, and you're encouraged to discuss this with an academic adviser. A short answer is that the AB track exposes you to more opportunities for research and close relationships with faculty (AB students are required to complete four semesters of independent work, including a thesis) although many people on the BSE track will complete the same amount of independent work as those in AB, so it's really just a matter of preference (and prerequisite courses).

Can I switch between AB and BSE?

Yes, and many people do. The overall requirements for each degree are different, and so make sure you consult an academic dean to get the full picture. The COS requirements for each major are virtually the same, so from a COS perspective, switching is quite easy.

You had me at...

```
#include <stdio.h>

int main() {
    printf("Hello, World!\n");
    return 0;
}
```