



Carnegie Mellon University Computer Science Academy

A robust pipeline of talented high school students trained in computer science would make a powerful impact on a wide array of industries. However, world-class computer science education is not available to many high school students interested in the field. Fewer than half of the schools in the U.S. teach even the basics of programming. Worse still, the teachers of these classes are often not qualified to teach computer science. This chronic and pervasive problem prevents talented, interested high school students — including low-income and underrepresented populations — from fully engaging in computer science.

Approximately 50 percent of the schools using or planning to use our CMU CS Academy curriculum are Title 1 institutions, which means they enroll high numbers of students from low-income families — students who might not receive computer science experience without our curriculum.

DESIGNING HIGH-IMPACT SOLUTIONS

Carnegie Mellon's School of Computer Science (SCS) has the solution: Computer Science (CS) Academy offers a high-quality computer science curriculum for high school students everywhere. Known as a world leader in innovative thinking and game-changing collaborations, Carnegie Mellon also cares deeply about the computer science community. Mark Stehlik and David Kosbie — two award-winning teaching professors at SCS — developed and launched this visionary program.

OUR VISION

CMU CS Academy aims to create an **entirely free**, universally accessible, online, interactive high school computer science curriculum. In addition to the curriculum framework, CMU CS Academy currently offers teacher training, an online interactive textbook, and online technical support from our undergraduate computer science students, available "24/7".

ACCESS FOR ALL

CMU CS Academy offers a quick on-ramp for all teachers who want to teach computer science, including those without any formal training. Teachers can attend free professional development sessions taught by a certified CMU CS Academy trainer and leave ready to use the curriculum in their classrooms. The platform uses autograded graphics (unique to our program) to help students and teachers identify mistakes in each exercise. ▶



Our Reach

CMU CS Academy began with just 14 schools in 2018, and as of 2023 is used in more than 2,000 schools each day. Globally, 40,000 students use our curriculum daily, and since our launch nearly 350,000 total students have participated in our program.

Curriculum

- > **CS1: Introduction to Programming with Python:** Our CS1 curriculum is a deep dive into the fundamentals of programming concepts and teaches text-based coding using Python. It is designed for high school classrooms and no prior programming experience is required.
- > **Exploring Programming with Python** (formerly CS0): Exploring Programming with Python is a lighter version of our CS1 curriculum. It is intended for middle school classrooms, out-of-school programs, and summer camps. Like CS1, no prior coding experience is necessary.
- > **College Programming and Computer Science:** (*Carnegie Mellon University credit available*) A full-year, honors-level course in programming and computer science that prepares students for college studies in computer science and related disciplines. This course re-examines earlier topics (functions, conditionals, loops, strings, lists and more) in greater detail and with increased rigor. The course also covers intermediate data structures (sets, dictionaries), recursion, object-oriented programming, efficiency, style and top-down design, among other topics. Toward the end of the course, students can choose to take a CMU-provided final exam for a \$200 fee. The exam is administered in mid-to-late May at your school by a classroom teacher and then graded in June by CMU CS Academy. Upon passing the exam, students receive transcribed credits for an equivalent CMU course.

Modules

- > **CSP:** In consultation with Code.org, we have developed an alternative option for Code.org's AP CSP programming units: AP CSP (Computer Science Principles). This curriculum is intended for teachers who want to teach the programming units using CMU CS Academy's Python offerings. For these units, students and teachers will work from the CMU CS Academy platform and program in Python. Our curriculum meets the needs of students who have no prerequisites as well as those who have previously taken our CS1 course by providing multiple entry points.
- > **Interdisciplinary Programming** (formerly CS2): The CS2 curriculum is designed for students who have completed our CS1 course. This course builds on the CS1 foundation, covering some additional programming and CS topics, and then applying and extending computational problem-solving skills in a variety of application areas. The sequencing and duration of the units are modular, allowing teachers to customize the course to best suit their students' needs.

Carnegie Mellon University School of Computer Science

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100%

OF TRAINERS REPORTED HIGH AND INCREASED CONFIDENCE AS A PRIMARY CS RESOURCE FOR CLASSROOM TEACHERS



WE ARE IN SCHOOLS
IN 50 STATES
AND 30 COUNTRIES.



100%

OF TEACHERS FELT VERY OR SOMEWHAT CONFIDENT IN EMPOWERING STUDENTS' CREATIVITY



100%

OF TEACHERS FELT VERY OR SOMEWHAT CONFIDENT IN ENCOURAGING ENROLLMENT OR PARTICIPATION OF DIVERSE STUDENTS



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