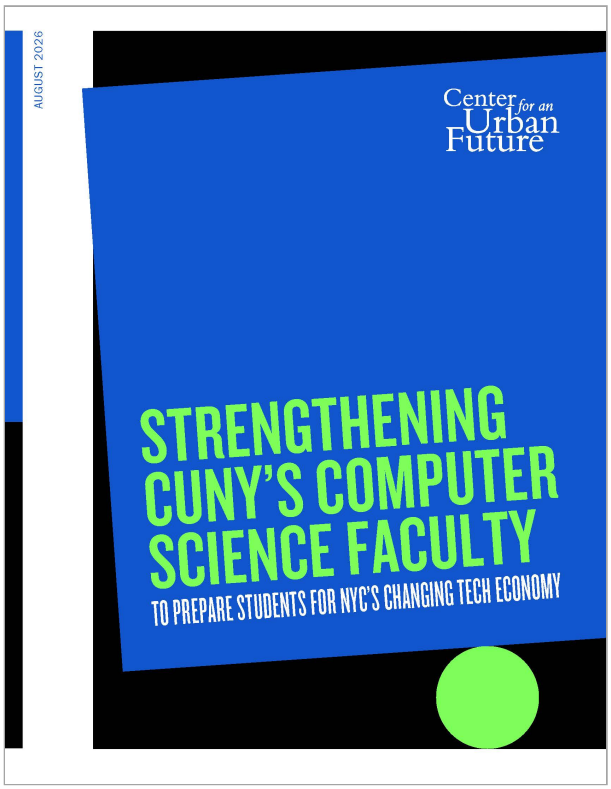
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Strengthening CUNY's Computer Science Faculty to Prepare Students for NYC's Changing Tech Economy

Computer science enrollment at CUNY has more than doubled over the past decade, but faculty capacity has not kept pace. To bolster this vital pathway to the middle class, policymakers should help CUNY recruit and retain enough faculty with applied expertise and industry experience to equip students with the skills and experiences employers increasingly demand.

by Eli Dvorkin, Alejandra Díaz-Pizarro, and Andrew Bauld

- **Read the full report here.**
- **Read the report's recommendations here.**

Over the past decade, computer science (CS) enrollment at the City University of New York (CUNY) has surged—up 146 percent, from 4,639 students in 2014 to 11,431 in 2024, even as overall enrollment declined.[1] That growth has been fueled by a powerful promise: that a CS degree can open the door to a well-paying career and a pathway into the middle class, especially for CUNY's largely low-income and first-generation students.

But that promise is now colliding with a tougher economic reality. Entry-level tech jobs in New York City have fallen by 49 percent since 2022, and the number of traditional coding roles may continue to shrink. At the same time, demand is growing for applied computing skills—especially in areas like artificial intelligence (AI), cybersecurity, and data engineering— across industries. The question is whether CUNY graduates will be prepared to fill those jobs.

For most CUNY students, the answer depends on what happens in the classroom—and the faculty who lead it. But today, CUNY is struggling to hire and retain enough faculty—and the right faculty—to meet this moment.

Faculty growth has lagged far behind the surge in student demand over the past decade, with the number of full-time CS faculty increasing by just 21 percent at senior colleges and declining by 22 percent at community colleges. At some campuses, introductory CS courses now enroll hundreds of students—sometimes more than 700 at a time—while faculty

struggle to keep up.

The result is overcrowded classrooms, excessive course loads, limited access to in-demand courses, and fewer opportunities for mentorship and career-connected learning. At the same time, demand for computing expertise is rising across the university, in disciplines from finance and healthcare to urban planning and beyond, placing new strain on a limited pool of faculty with relevant expertise.

Several factors are driving this challenge. Salaries for CS faculty lag far behind those offered by peer institutions and private industry: Between 2015 and 2025, CUNY advertised by far the lowest median salary among comparable New York City institutions, at roughly $79,000. Research support is also limited: One new faculty member received just $20,000 in start-up funding to support initial research and establish a lab, a small fraction of what other universities offer. And a slow, bureaucratic hiring process frequently causes departments to lose strong candidates before offers can be made, with some searches delayed months past peak hiring season.

CUNY has taken some promising steps in recent years, launching new efforts to strengthen computing and AI capacity, invest in faculty development, and expand proven initiatives like the Practitioners-in-Residence Corps. But much more will be needed to ensure that CUNY can keep pace with rising student demand and a rapidly evolving tech economy.

Going forward, city and state leaders should invest in rebuilding and expanding faculty capacity in high-demand computing fields, from AI to cybersecurity, and better align funding with the higher cost of educating CS majors. CUNY should pair these investments with a systemwide effort to accelerate hiring and research processes, reducing delays that cost departments strong candidates. At the same time, deeper partnerships with industry and philanthropy can help support competitive research funding, start-up packages, and stronger connections to the workforce. Taken together, these actions can help ensure that CUNY has the faculty capacity and industry alignment needed to prepare students for an increasingly AI-driven economy.

Over the past decade, the technology sector has been one of the most reliable engines of new middle- and high-wage job growth in New York City—and CUNY has responded in kind. Since 2016, CUNY has expanded its CS offerings, adding new degree programs across multiple campuses as student demand has surged.

That demand reflects the powerful role CUNY plays as the city's primary engine of economic mobility. "Many of the students we serve come from low-income backgrounds," says Ping Ji, chair of the CS department at Hunter College. "With computing offering one of the largest and fastest-growing job markets, computer science provides one of the most powerful pathways to advancing CUNY's mission of social mobility."

But as the tech sector evolves, that pathway is becoming more difficult to navigate. Entry-level tech hiring has dropped sharply in recent years, and employers are raising expectations for new hires. Students increasingly need not just foundational knowledge, but hands-on experience and the ability to apply computing skills in real-world context—opportunities that faculty are critical to providing.

This report examines whether CUNY is positioned to meet this moment, and what it will take to strengthen the system's faculty capacity in CS. Supported by a grant from the Alfred P. Sloan Foundation, it draws on more than 75 interviews with CUNY leaders, department chairs, faculty, students, tech industry leaders, higher education policy experts, and leaders from other major public university systems. The report also includes an extensive analysis of CUNY data on enrollment, faculty hiring, course offerings, budgets, and student outcomes. The report concludes with seven concrete recommendations for strengthening CUNY's faculty capacity in CS to bolster student outcomes.

For most CUNY students, gaining experience outside the classroom is not a realistic option. More than half of CUNY students are working while in school, and many juggle family responsibilities alongside their studies. As a result, the classroom is often

the only place where they can build the skills needed to launch a career in tech. Faculty play a central role in this process, shaping not only what students learn, but how well they are prepared to enter the workforce.

Students know this, and consistently turn to faculty as a critical resource. While relatively few CUNY students engage with formal career services or internships—for instance, just 12 percent report participating in a paid internship—all students interact with faculty. And surveys show that students trust faculty more than any other source of advice.[2]

But across CUNY, the student experience—especially in CS—is increasingly shaped by a shortage of faculty.

At Hunter College, introductory CS courses regularly enroll hundreds of students. One recent graduate, Oluebube Onwuamaegbu, described taking a Python course with 750 students—so large it had to be taught online—followed by a C++ course with 300 students. Even advanced courses often enroll more than 100 students, leaving little opportunity for interaction with instructors.

“You can’t really excel in that kind of environment,” Onwuamaegbu says. “There’s not really one-on-one time with that professor.” Over time, she found it harder to stay engaged: “If I feel like my professor doesn’t know me, I can’t ask questions…I’m not going to want to engage any further.”

With too few instructors to meet rising demand, many faculty are teaching well above their expected course loads, managing hundreds of students and struggling to provide meaningful mentorship or career guidance outside the classroom. Faculty cannot be required to teach above their required course loads, but many do for several reasons: a sense of duty to students, the difficulty of finding adjuncts, or the additional compensation for teaching extra classes. At Lehman College, 6 out of 10 faculty members in the CS department are currently teaching above their required load; the department chair, whose role typically requires teaching one course per year, is teaching eight. “No one is forced to teach the extra classes for which they receive adjunct pay,” says Brian Murphy, the chair. “However, it would be very difficult to offer the students the courses they need if they didn’t.”

These pressures result not only from rising demand, but also from what college administrators say are deeper structural barriers to hiring and retaining faculty. “When we do a search for professors, there’s dozens of people that we could potentially hire,” says Murphy. “It’s just a matter of we’re not fast enough, and we’re not offering enough money sometimes.”

While it is possible for CUNY to approve salaries above base for new hires, CS departments have been reluctant to do so out of a sense of fairness to senior faculty. However, as the focus of a CS degree shifts from the theoretical to the applied, departments may have to reconsider hiring above base if they want to attract top candidates in applied CS, where industry salaries pose stronger competition.

These constraints are already affecting both learning and career outcomes, and their consequences are especially visible in today’s more challenging job market. According to the Center for an Urban Future’s analysis of the U.S. Census Bureau’s postsecondary employment outcomes data, 12 percent of CUNY students who earned a bachelor’s degree in CS between 2019 and 2021 were working in retail or food service one year after graduation.[3] And between 2019 and 2025, just over 40 percent of CUNY CS graduates were working in a computing field one year after graduation.[4]

“CUNY grads are on the edge of the table,” says Elise Harris, faculty director of Hunter College’s Daedalus Scholar Program. “If you went to MIT or Carnegie Mellon or an Ivy League school, you’re going to be on the table. My students are on the very edge—and when there’s a bad job market, they fall off.”

In response to both surging enrollment and these emerging challenges, CUNY has taken important steps. In 2024, CUNY appointed an inaugural university dean for technology and computer and information sciences to oversee computing programs across the university. It has also launched several initiatives to strengthen faculty preparedness, including the Faculty Fellows professional development program, and grown the Practitioners-in-Residence Corps, which brings industry

professionals into the classroom. Since 2016, CUNY has added five new CS degree programs across four colleges. In 2024, the university received a historic $75 million gift from the Simons Foundation to advance research computing and AI and hire up to 25 new faculty members. And CUNY recently launched Tech Futures, a $5.3 million city investment in new AI degree programs and experiential learning opportunities across 12 CUNY campuses.

These efforts are promising, but they are not yet enough to meet the scale of student demand or the pace of change in the tech economy.

Without new investment from city and state leaders, faculty shortages are likely to persist, with consequences that extend well beyond the classroom. Faculty who are stretched thin have little time to organize extracurricular programming, support research opportunities, or build partnerships with employers. At Lehman College, a once-thriving hackathon that connected students directly with companies like Goldman Sachs and JPMorgan—often leading to on-the-spot job offers—has been discontinued due to a lack of faculty capacity.

At the same time, the demands on faculty are evolving. Students increasingly need exposure to applied computing skills, industry practices, and emerging fields like AI. But many faculty lack the time, resources, or industry experience to adapt their courses accordingly, leaving gaps between what students learn and what employers expect.

Taken together, these challenges point to a central constraint. Without enough faculty—and the right faculty—CUNY cannot fully deliver on its promise to serve as a pathway into computing careers.

To read the full PDF of the report go here.

7 Ideas for Strengthening CUNY's Computer Science Faculty

No other institution plays a more important role for low-income New Yorkers to access high-paying jobs jobs in tech than CUNY. But that economic engine is at threat of stalling as the path to those jobs has become less clear-cut. CUNY grads are increasingly facing stiffer competition from grads of other New York City educational institutions, not to mention the increasing pool of laid-off New Yorkers with years of work experience.

While the city and CUNY will have to find multiple ways to address the challenges facing its CS students, one of their core objectives should be to strengthen CUNY's CS faculty, who remain the principal resource in many students' journeys towards a tech career.

Our recommendations offer ways CUNY can ensure it has enough—and the right—faculty to prepare its students for the job market of the future.

1. Expand faculty capacity in high-demand fields, starting with CS. CUNY should establish a clear, systemwide plan to rebuild and expand its faculty—particularly in high-demand fields like CS—after several years of contraction. The university remains down roughly 500 full-time faculty positions compared to 2021, and in CS, losses in part-time instructors have further reduced instructional capacity. At the same time, many faculty are already stretched thin, teaching well above expected course loads—sometimes managing hundreds of students or taking on multiple additional courses. Without adding faculty, these conditions will continue to undermine both student outcomes and long-term faculty retention.

To reverse this trend, CUNY should set explicit multiyear hiring targets tied to enrollment growth, course demand, and workforce needs, beginning with CS and adjacent computing fields. This plan should identify how many new faculty lines are needed, where they are most urgently needed, and what mix of expertise is required—from AI and cybersecurity to applied software development. In addition, CUNY should strengthen its pipeline into faculty roles by expanding teaching fellowships, creating clearer pathways from adjunct to full-time positions, and cultivating future instructors from its own graduate programs. Expanding CUNY's capacity to produce PhDs in CS and related fields—particularly in applied and interdisciplinary

areas—will also be essential to building a more sustainable, long-term pipeline of faculty.

While it is important that hiring remains agile at the department level, leaders could consider the strategic approach of cluster hiring, bringing on a set of faculty from different disciplines but with complementary skills as part of one cohort. Cluster-hired faculty could work in their individual departments but also collaborate with each other, boosting faculty capacity to prepare students for increasingly interdisciplinary high-demand fields. CUNY could begin with an “AI cohort,” hiring a cluster of faculty with AI skills across CS, finance, medicine, digital humanities, and other fields.

2. Increase city funding for faculty and modernize state funding formulas to reflect the higher cost of educating CS students. Restoring faculty capacity will require new investment, and both the city and the state have a role to play. While New York State has recently increased funding for CUNY, its existing funding formulas do not adequately account for the higher cost of educating students in fields like CS, which require smaller class sizes, specialized faculty, lab space, and computing infrastructure. Treating all majors equally in per-student funding puts high-cost, high-demand programs like CS at a structural disadvantage.

The city should follow the state’s lead by increasing its investment and earmarking new funding specifically for faculty hiring in high-demand fields. As a starting point, New York City should commit at least $10 million annually to support new faculty lines in CS and related disciplines—enough to begin reversing recent losses and expanding capacity in the highest-demand programs. At the same time, state leaders should update funding formulas to better reflect program costs, ensuring that CUNY has the resources needed to sustain and grow high-opportunity programs that are critical to the state and city economy.

3. Launch a CUNY faculty hiring acceleration initiative to modernize hiring and research processes. Across CUNY, departments identified excessive bureaucracy as one of the most significant barriers to hiring and retaining faculty. In a competitive market where salaries and start-up packages already lag, speed is one of the few advantages CUNY can realistically leverage, but current processes routinely undermine it. Job postings are often delayed by months, offers are approved too late in the hiring cycle, and decisions on start-up funding can stall long enough that candidates accept positions elsewhere. Even when faculty are successfully hired, slow and fragmented procurement systems can delay access to research equipment for months, limiting productivity and undermining recruitment.

CUNY should launch a “Faculty Hiring Acceleration Initiative” to identify and reduce these bottlenecks in both hiring and research processes. Within a defined timeframe, the university should map each step of the hiring and start-up approval process; establish target timelines for posting positions, making offers, and approving funding; and assign clear responsibility for meeting those benchmarks at both the campus and system levels. The initiative should also streamline research procurement and provide administrative support to help faculty access start-up funds and equipment more quickly. The goal should be a measurable reduction in time-to-hire and faster activation of research resources, ensuring that existing investments translate into successful recruitment, retention, and research productivity.

4. Make faculty capacity central to CUNY's AI strategy and expand applied AI expertise across the system. As demand for AI skills grows across industries, CUNY has an opportunity to lead in preparing students for an AI-driven economy. The university has already secured significant funding, including a $75 million grant from the Simons Foundation, and launched efforts to integrate AI across the curriculum. But these efforts will fall short without sufficient faculty capacity—particularly faculty with applied AI experience who can translate theory into real-world applications.

CUNY should make faculty hiring and development a central pillar of its AI strategy. This includes recruiting new faculty with applied AI expertise, expanding professional development so existing faculty can integrate AI into their teaching, and ensuring that AI instruction reaches students across disciplines—from healthcare and business to urban planning and engineering. Aligning AI investments with faculty capacity will be essential to ensuring that "AI across the curriculum" becomes a reality rather than an aspiration.

The state also has a role to play in expanding CUNY's capacity for AI innovation. State procurement policy currently blocks CUNY faculty from doing research with cutting-edge open AI tools. New York State should follow New York City's lead in adopting challenge-based procurement, which would allow CUNY to work with smaller, nimbler vendors in bringing emerging AI technologies into the classroom.

To encourage AI innovation, CUNY should also consider adapting its tenure and promotion guidelines to consider work done outside the traditional scope of a department's responsibilities, including work done cross-departmentally and faculty efforts to integrate innovative technology into teaching and learning.

5. Create a "CS@CUNY Faculty Investment Fund" to offset salary constraints and strengthen recruitment. CUNY faces a significant challenge in recruiting and retaining CS faculty due to uncompetitive salaries, which are constrained in part by systemwide pay structures and pay bands. While raising salaries across the board may be difficult in the near term, strengthening research support—particularly through start-up packages—offers a practical way to improve competitiveness.

CUNY should establish a "CS@CUNY Faculty Investment Fund," supported through a combination of public funding, philanthropy, and industry partnerships, to provide competitive start-up packages and research support. In 2021, the median start-up package for CS faculty at public universities was approximately $250,000, typically deployed over several years. A targeted fund of roughly $5 million over three years could enable departments to offer more competitive packages, helping attract and retain faculty in high-demand areas while supporting research productivity and grant competitiveness.

6. Expand the PiRC and leverage private-sector partnerships to scale impact. The PiRC has demonstrated the value of bringing industry expertise into the classroom, but its reach remains limited. At the same time, New York City's tech sector represents a major untapped resource for strengthening instruction, expanding career exposure, and supporting faculty capacity—especially given the city's constrained fiscal outlook.

CUNY, in partnership with city leaders, should work to recruit private-sector and philanthropic partners to expand PiRC and similar initiatives. Pairing practitioners with faculty in high-enrollment courses would extend industry-relevant instruction to more students, strengthen curriculum alignment, and allow faculty to focus more on advanced coursework and mentorship. Deeper engagement from industry will be essential to scaling these efforts and ensuring that students gain both the skills and connections needed to succeed.

7. Launch "CUNY Industry Fellows" to deepen faculty-industry collaboration. Dual appointments—where faculty split time between academia and industry—offer a promising way to strengthen connections between CUNY and the tech sector. These models are becoming increasingly common nationally: As of 2024, approximately 10 percent of CS faculty held dual appointments, up from about 6 percent a decade earlier. These appointments can help faculty stay current with industry practices while bringing real-world experience directly into the classroom, particularly in rapidly evolving fields like AI and data engineering.

CUNY should pilot a "CUNY Industry Fellows" program in partnership with employers, not just in the city's tech sector but across sectors that require computing knowledge. Under this model, selected faculty would spend a defined portion of their time—such as one day per week or a summer term—embedded with a partner company, supported by cost-sharing agreements between CUNY and participating employers.

While dual appointments depend on industry needs and faculty skill sets, there are a number of ways CUNY could implement a fellowship program. Dual appointments could be structured into the hiring of new faculty members. Lecturers, who tend to have lighter teaching loads than professors, could be embedded part-time in the workplace. Such a program would offer faculty industry experience that they could then integrate into coursework, curriculum development, and student mentorship, strengthening both faculty development and student career outcomes.

Endnotes

1. Center for an Urban Future analysis of CUNY enrollment data 2014–24.
2. City University of New York, FY 2025 University Budget Request, https://www.cuny.edu/wp-content/uploads/sites/4/page-assets/about/trustees/meetings-of-the-board/FY2025-University-Budget-Request.pdf.
3. Center for an Urban Future analysis of data from the U.S. Census Bureau's Post-Secondary Employment Outcomes, https://lehd.ces.census.gov/applications/pseo/state=36&type=flows&specificity=2&institution=00268800&degreelevel=05&gradcohort=3&filter=5&display=count&destination=industry&program=11.
4. Center for an Urban Future analysis of profile analytics data from Lightcast.

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