

Departmental BPC Plan
Department of Computer Science and Engineering,
University at Buffalo



Effective Dates of Plan: 11/14/23 - 11/14/25

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Context

The University at Buffalo (UB) is a premier, research-intensive public university and a flagship in the State University of New York (SUNY) system consisting of 64 educational institutions. It is a member of the Association of American Universities (AAU) and the National Center for Women & Information Technology's (NCWIT) Higher Ed Alliance. The Department of Computer Science and Engineering (CSE) offers two computer science BS (CSBS) degrees, a computer engineering BS (CEBS) degree, and CSE MS and PhD degrees with over 2,000 students enrolled across these programs. In 2022, 15.3% (13.6%) of domestic undergraduate CS (CE) BS students self-identified as women, and 12.6% (22.7%) in CS (CE) identified as belonging to a historically underrepresented racial/ethnic group in computing (HURG). (We define HURG according to the current NSF CISE definition, which includes people who identify as Hispanic, Latina/o/x, Black, African American, Native American, Native Alaskan, Native Hawaiian, and/or Other Pacific Islander.) In the MS CSE program, 9.1% of students self-identified as women and 18.2% as belonging to HURGs; and in the CSE PhD program, 13.3% self-identified as women and 10.0% as belonging to HURGs. Finally, 15.5% of faculty self-identify as women and 1.7% as belonging to HURGs.

Goals

G1: Increase exposure opportunities for K-12 students from HURGs and female students to computing topics by 50% over the next four years.

G2: By 2025, at least 75% of students from HURGs in our department will report feeling they are in an inclusive, supportive environment on the department-wide survey started in 2023.

G3: Support career success of students from HURGs and female students nationally (at and outside UB) through professional development opportunities, with at least 8 such opportunities per year by 2025.

G4: By 2026, increase percentage of female students and students from HURGs who enter into UB with a declared CS/CE major who are still enrolled in the major one year later.

Activities

A1: Outreach to K-12 students with a focus on students from HURGs and female students to ignite interest in computing (G1). [Contact Lukasz Ziarek] Faculty will design age-appropriate demos and games to illustrate key computing concepts to middle-school or high-school students. Faculty can participate by visiting at least one local school per semester, or participating as an instructor in summer camps. School selection will be based on high concentration of students with desired demographics (e.g., Buffalo public school system or female-only high schools).

A2: Teaching computing-related concepts to local K-12 educators to help develop teaching modules for their students (G1). [Contact Lukasz Ziarek] Faculty will work with local teachers to develop CSE education modules for the teachers to use in their classroom. This amplifies middle- and high-school student exposure to computing concepts. The focus will be on teachers from local schools with the desired student demographics.

A3: Mentoring high-school students from HURGs and female students (G1). [Contact Wen Yao Xu] The department will work with local high schools to establish a way to pair HURG and female high schoolers with faculty who adopt best practices to provide inclusive and lasting mentoring with the goal of encouraging students to pursue advanced computing education.

A4: Hosting outreach activities on UB campus (G1). [Contact Lukasz Ziarek] Example activities hosted by the department include CSE Kids' Day and CSExplore, a series of four day summer camps for HURG high-school students that teach the fundamentals of computing. Faculty can participate by engaging with the participating children and students, volunteering to do a demo or another type of activity, or becoming a speaker.

A5: BPC education for faculty and staff (G2,G4). [Contact Marina Blanton] Faculty, teaching assistants, and staff will receive training on BPC using one or more sources, such as [NCWIT self-paced online course on diversifying undergraduate computing programs](#) and by co-developing CSE-specific trainings in collaboration with UB's Center for Equity, Diversity and Inclusion. The department will host a talk on BPC topics in one faculty meeting per semester.

A6: Improving faculty engagement with students from HURGs and female students outside the classroom (G2,G4): [Contact Kenneth Joseph] by participating in events organized by students or student organizations. Faculty can participate by committing to regularly participate in student-organized events (e.g., game nights, hackathons, etc.), especially those organized by diversity student organizations such as DivTech and the Societal Computing Club.

A7: Data collection and analysis to improve students from HURGs and female student experience (G2,G4): [Contact Kenneth Joseph] The activity consists of collecting and analyzing data regarding climate, student retention and success with the goal of identifying weak points and determining directions for improvement. Faculty can contribute by, e.g., extracting and analyzing relevant university data, or creating surveys and conducting student interviews. Conducted in collaboration with UB's Office of Curriculum, Assessment, and Teaching Transformation.

A8: Teaching creative ways to use computing to students in the humanities (G2): [Contact Atri Rudra] The activity consists of designing and offering a set of courses that would appeal to humanities students, which skew towards demographics under-represented in CSE. These courses can permit projects and creative designs that produce new forms of art with the help of basic computing knowledge. This will build on the existing Machine Learning and Society course in the department that was first taught in the Spring 2021 semester.

A9: Enhance professional experience of students from HURGs and female students (G3,G4). [Contact Marina Blanton] Faculty sponsor students from HURGs and female students at UB or in the area (e.g., computing students at Buffalo State, which has a larger percentage of students from HURGs students) attend a professional development, diversity, or research conference. Faculty also encourage and mentor students from HURGs and female students to apply for national scholarships to attend a conference.

A10: Volunteering time for national initiatives to support success of students from HURGs and female students and persons with disabilities (G3): [Contact Shamsad Parvin] Faculty and senior PhD students volunteer to support various national BPC initiatives, such as reviewing students from HURGs' scholarship applications (e.g., the NCWIT Award for Aspirations in Computing and GHC Scholarships and Complimentary Registrations) and mentoring HURG students for their career development (e.g., online mentoring community for the AccessComputing program).

Measurement

The core metrics to be tracked by the department include:

- Post-participation surveys on attitudes towards the self and computing; number and demographics of participants reached (A1-A4)
- Number of trainees and follow-up behavioral measures, as well as surveys of the student population, that establish faculty's increased understanding of students from HURGs and female student concerns (A5-A6)
- Per-semester measures of student application, admission, attendance, and retention rates for students from HURGs and female students, as well as number and demographics of students reached by activities and number of faculty participating (A7-A10)