STATE BOARD FOR COMMUNITY AND TECHNICAL COLLEGES
FEBRUARY 2024

STATEMENT OF NEED
BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CONSORTIUM:
EVERETT COMMUNITY COLLEGE
AND SHORELINE COMMUNITY COLLEGE

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Program Information

Institution Name: Everett Community College and Shoreline Community College

Degree Name: Bachelor of Science in Computer Science

CIP Code: 11.0701

Name(s) of existing associate degree(s) that will serve as the foundation for this program:

Degree: AA-DTA (Shoreline) / AAS-DTA (Everett) (Computer Science Focus)

CIP Code: 24.0101

Degree: Associate in Computer Science DTA/MRP (Shoreline)

CIP Code: 11.0701

Year Began: 2021

Proposed Start Implementation Date (i.e. Fall 2024): Fall 2025

Projected Enrollment (FTE) in Year One: 24

Projected Enrollment (FTE) by Year Three: 48

Funding Source: State FTE

Mode of Delivery

Multi Campus Delivery: Shoreline Community College and Everett Community College

Distance Learning: Primarily hybrid instruction, with some online options, particularly for electives and general education courses.

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Chief Academic Officer Signature

The Statement of Need must be signed. To sign, double click on the signature line below.

X 

Chief Academic Officer

Dr. Lucas Rucks, Acting Vice President of Instruction, Shoreline Community College

X Cathy Leaker

Nov 1, 2023

Chief Academic Officer

Dr. Cathy Leaker, Vice President of Instruction, Everett Community College

Criteria 1

Relationship to institutional role, mission, and program priorities.

Everett Community College (EvCC) and Shoreline Community College (ShorelineCC) are located approximately 20 miles apart along the I-5 corridor north of Seattle. The institutions often have students taking classes at both institutions simultaneously due to time and modality of offerings. Both institutions also share values grounded in equity and collaboration. As institutions with smaller Computer Science programs, these colleges seek to work as a consortium to design and offer a Bachelor of Science in Computer Science, grounded in equity and social justice.

This proposed Bachelor of Science in Computer Science degree will be designed to radically innovate the way CS education is delivered in order to center equity and social justice within the colleges' programs and curricula. As noted in community college and STEM education research (McGee, 2020; Sims, 2018; Sims et al., 2020), the status quo of many educational pathways, particularly in STEM, implicitly hold anti-inclusive design characteristics which perpetuate inequities in STEM graduates and employment. A detailed explanation of the proposed equity-centered design–including programmatic, curricular, and wrap-around design features–is outlined in Criteria 7 and Appendix A.

Faculty leaders at these institutions have been working together since 2021 to understand each other's students and programs, expand their inclusive and equitable teaching practices, and imagine a shared bachelor's program that provides students holistically with robust wrap-around services and multiple entry and exit points.

Below you will find a brief overview of each college and how the proposed program aligns with their institution's academic priorities.

Everett Community College

Everett Community College resides on the traditional and ancestral lands of the Tulalip Tribes, the Sauk-Suiattle Indian Tribe and the Stillaguamish Tribe of Indians.

EvCC was founded in 1941, with the college's first students taking classes at a converted elementary school. The college's main campus moved to its present site in north Everett in 1958. Everett Community College educates more than 15,000 students every year at several locations in Snohomish County, with most students and faculty at the main campus in north Everett.

Everett's mission is to educate, equip, and inspire each student to achieve personal and professional goals, contribute to our diverse communities, and thrive in a global society. The college serves students seeking a wide variety of education options. Students come to EvCC to affordably start their four-year degrees, earn certificates, train for a new job, experience hands-on training in professional and technical programs, learn English, develop

basic skills, finish high school, train for a promotion, or to learn just for fun.

The proposed bachelor's degree will align with Everett's four strategic plan priorities: belonging, student-ready, sustainability, career-connected.

Shoreline Community College

Shoreline Community College is an open-access, public college that sits on the ancestral lands of the Coast Salish Peoples, in particular the Duwamish Tribe. Located 10 miles north of downtown Seattle, Shoreline's campus is one of the most strikingly beautiful college campuses in Washington state.

Founded in 1964, Shoreline Community College offers more than 100 rigorous academic and professional/technical degrees and certificates to meet the lifelong learning needs of its diverse students and communities. Dedicated faculty and staff are committed to the educational success of its more than 5,000 students who hail from across the United States and over 50 countries.

Shoreline's mission is to serve the educational, workforce, and cultural needs of its diverse students and communities. Shoreline strives to engage its campus community around equity and inclusion and prioritizes its work to serve the multicultural needs of its diverse student community. The college recognizes that students come from a wide array of lived experiences and is committed to providing the care and support all students need to become successful in their academic endeavors.

EverettCC and ShorelineCC's collaborative degree proposal

Consistent with this mission, EvCC and ShorelineCC seek to expand their academic programs to include bachelor degree offerings leading to high wage, high demand jobs. We seek to offer a bachelor's degree that is affordable, accredited, and designed with/for the communities we serve. Doing so will position our colleges to prepare students with the skills needed to enter the local Technology industry while simultaneously diversifying and growing the Tech economy to represent the diverse citizens of WA state.

Shared Mission

Connection 1: Fostering Equity and Inclusion

EvCC's strategic plan resonates with the spirit of its mission, which states: "We are a public, open-access college where all students, regardless of their background, can achieve their educational and career goals." This echoes EvCC's commitment to creating an equitable campus culture, where "students, faculty, staff, and the larger community are valued, welcomed, and actively supported" (Strategic Plan Goal 1.1). Likewise, Shoreline's commitment to "diversity, equity and inclusion" in its presidential goals aligns with our program's dedication to infusing equity and social justice throughout the curriculum. Shoreline's mission emphasizes "offering high-quality, transfer, technical, professional, basic skills, and continuing education," and the BSCS program's commitment to inclusivity complements this focus on quality education.

Connection 2: Leveraging Existing Programs

The BSCS program's plan to build upon the foundations of existing associate degree programs aligns with EvCC's mission, which emphasizes providing "equitable access and opportunities for all students." Shoreline's mission encourages "students to engage in rigorous educational experiences." The BSCS program's upper-division coursework and peer mentoring opportunities complement the colleges' goals of providing rigorous and accessible education. By expanding on the existing educational offerings, the BSCS program amplifies the opportunities available to students while staying true to the institutions' core missions.

Connection 3: Engaging Students in Real-World Projects

The BSCS program's pledge to empower students to contribute to the community through hands-on projects aligns with EvCC's mission statement's focus on "community building." EvCC's mission encourages students to "be active in their learning and community," and the BSCS program's emphasis on practical, community-oriented experiences embodies this ethos. Shoreline's mission also emphasizes "preparing students to live and work in a changing world," which aligns with the BSCS program's commitment to real-world, dynamic projects.

Connection 4: Serving Diverse Regions and Student Populations

EvCC and Shoreline's reach to students in diverse regions aligns with their missions. Shoreline's mission emphasizes "serving the educational, workforce, and cultural needs of our diverse students and communities." In designing our BCSC curriculum, we intend to provide various entry and exit ramps, which aligns with the colleges' mission to serve a diverse student population and provide access to educational opportunities for all. This approach complements EvCC's mission to "facilitate a seamless transition for students from K-12 to higher education programs" including fostering connections to tribal schools and aligns with Shoreline's dedication to serving the needs of a changing and diverse world. Additionally, EvCC is committed to honoring students' experiences and previous learning using the college’s new framework for academic credit and prior learning policy.

Connection 5: Flexible Pathways to Success

We are committed to providing flexible modalities and multiple entry and exit points, in our BSCS program, which resonates with the mission of EvCC and emphasizes providing "flexible pathways for student success and attainment of educational goals." Shoreline's mission encourages students to "realize their educational goals," echoing the BSCS program's mission to empower students to attain their educational goals. This flexibility accommodates the diverse needs of the student population that both colleges serve.

Connection 6: Industry and Community Collaborations

EvCC's mission of being "a responsive and innovative partner with businesses and the community" will translate to the incorporation of community-oriented and industry-prepared experiences within our BSCS program. The program's focus on

intellectual and cultural vitality complements Shoreline's mission, which emphasizes "cultivating a vibrant campus community." The program not only prepares students for technical success but also equips them with the skills and knowledge to engage with and contribute to their community, strengthening the connection between education and society.

Criteria 2

Support of the statewide strategic plans.

The State Board for Community and Technical Colleges' (SBCTC) mission study notes three areas of focus in finding more and better ways to reduce barriers and expand opportunities so more Washingtonians can reach higher levels of education. The proposed Bachelor of Science in Computer Science (BSCS) program will help further these goals.

Economic Demand: Strengthening state and local economies by meeting the demands for a well-educated and skilled workforce.

The proposed BSCS program will help to reduce the supply/demand gap for software developers and related positions by producing more industry-ready college graduates to expand access to the high-demand field of computer science through a cost-effective community college program (Forbes, 2023), in accordance with SB 5401. More detailed information regarding local industry needs can be found in Section 3.

Student Success: Achieving increased educational attainment for all residents across the state.

The proposed BSCS program will provide more opportunities for students to earn a bachelor's degree, which will need higher-levels of individualized support. Set in the community college system, students will benefit from low class size, high engagement teaching strategies, and specialized wrap-around services. This approach is intended to support the state's most vulnerable populations with a holistic, participatory, and intersectional program design which centers the experiences of low-income students and students of color, in accordance with SB 5401.

Innovation: Using technology, collaboration and innovation to meet the demands of the economy and improve student success.

The proposed BSCS program will utilize technology and collaboration to allow both colleges to better serve students in their areas. As individual institutions with a relatively small capacity for work to be spread across our tenured CS Faculty, this consortium will allow the institutions to collaborate on program development and curriculum design, as well as to engage in course-sharing. Additionally, the proposed program will benefit from the experiences of other CS consortiums in the state (e.g., AppConnectNW) and will incorporate lessons learned By working closely with other

stakeholders (e.g., students, SBCTC staff, industry partners, and community organizations) the program will be designed to meet the demands of the local Tech economy while providing increased opportunities for financial mobility for local populations and in particular those who have been historically underserved.

Overall the proposed program will address these items of the SBCTC's 20-year mission study action plan (SBCTC, 2021):

- Serve more people, including groups who have been underserved in the past.
- Close the statewide skills gap for technically trained workers.
- Contribute more to the production of baccalaureate degrees.

Criteria 3

Employer/community demand for graduates with baccalaureate level of education proposed in the program.

According to the Washington Skilled and Educated Workforce Report 2021-2022 "the greatest workforce demand at the baccalaureate level is in computer science and information technology, with jobs primarily going to software developers, programmers, systems analysts, information security analysts, and web developers." While the report acknowledges that there has been a large increase in CS and IT educational capacity, the employment demand is still significant especially as the employer workforce demands are also increasing and demand is not met.

Table 1: Washington State Employment Security Department labor market supply and demand report.

SOC 15 - Computer and Mathematical Occupations			
Year	**Total Online Job Postings**	**Supply**	**Gap**
2019	158,920	16,779	142,141
2020	131,993	53,088	78,905
2021	178,977	43,123	135,854
2022	215,702	12,549	203,153
2023	68,287	26,766	41,521
Average			120,315

To assess the needs for filling the demand for computing degrees, we surveyed employers that either work with the EvCC or ShorelineCC or employ our respective students. With regards to a new Bachelor's degree, we collected the following comments:

> "Most existing CS programs have a massive amount of math that doesn't translate to interviewing for a corresponding job." - Antonio Galvan, Enterprise Security Architect
>
> "what can the college do to help make these students "job ready"? Including a robust internship would help these students get what they need to be successful." - Bryan Terry, Director of IT
>
> "Having the skill to use resources to enhance your learning will always be a great skill to have. I think, as SDE [Software Development Engineer], the use of AI to enhance your learning of the subject matter can greatly improve learning and also productivity." -Brad Hawk, Software Development Engineer I
>
> "Excluding specialized fields which require specific math (game development is a good example), you don't need it. And isn't that kind of what bootcamps do? Get rid of the filter classes and teach the practicalities." -CS professional
>
> "the venn diagram of what you need to know to do well at a job and what you need to know to **get** that job looks like a snowman." - CS professional

These comments highlight the disconnect that is often present between computer science education and the demands of a career in computer science. Our proposed degree will be built around project-based learning, centering industry needs, which will also address the opportunity gap. Project-based learning experiences have been shown to increase belonging, retention, and success in historically marginalized students. The BSCS program will produce highly trained developers ready to assume roles such as software developer responsibilities in their employment context to specifically meet regional needs.

Criteria 4

Baccalaureate program builds from existing professional and technical degree programs offered by the institution.

Both EverettCC and ShorelineCC have existing computer science associate degree programs aligned with current computer science transfer programs. Table 2 shows our degrees awarded over the past five years.

Over recent years, both programs have undergone several curricular changes to make the programs and curricula more equity-centered. For example, EvCC has restructured their

entrypoint courses for the STEM pathway to make programs, including their CS program, more interdisciplinary, real-world situated, and focused on identity and community. ShorelineCC has restructured curriculum to embrace OER (Open Educational Resources) and low-cost textbooks, collaborative and labor-based grading classroom practices, and introduced a Computing & Society ethics course. These recent structural changes lay the groundwork and showcase the ability for our college CS programs to embrace continuous improvement and flexibility in building a shared program that is both student- and equity-centered.

Table 2: Five year completion of computer science degrees at EvCC and ShorelineCC.

Institution	**Degree**	**Count per Academic Year**				
		2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Everett Community College	AAS - DTA (Computer Science Focus)	59	61	65	53	43
	Annual Headcount	473	486	481	257	173
Shoreline Community College	AA - DTA (Computer Science Focus) or AA - MRP Computer Science	99	106	89	174	202
	Annual Headcount	366	303	228	266	287

The proposed Bachelor of Science Computer Science degree will be structured as a 4-year program with the flexibility for students to transfer into the program by building on the existing foundation of the associate degree programs listed in Table 2.

Furthermore, the program proposal will encompass community-oriented and industry-prepared experiences, such in-program internships and community projects with a focus on equity and social justice. This empowers students to apply their practical technical skills for the betterment of society. This initiative aligns with the courses that EvCC and ShorelineCC have introduced in recent years.

Criteria 5

Student demand for program within the region.

Student demand for computer science and related computing programs remains strong even as enrollment at colleges and universities have declined over recent years. In general, higher education institutions are not well equipped to connect historically underserved students to their educational pathways, personal goals, and career aspirations. However, the proposed program will be designed with features which intend to support a pipeline of students in our colleges seeking to fill the demand for computing degrees. The program is intended to purposefully guide students through entry into the program and exit into industry to lessen attrition which often occurs at institutional change points. The program will provide a guided path for students coming from the colleges' K-12 partner institutions, draw on lessons learned from local transfer programs (WTIA, 2023), and expand opportunities for students who may have never considered computer science as an option in the first place due to societal and industry bias (Sims, 2018; McGee, 2020).

Current state of transfer

The capacity of higher education within the Puget Sound region remains relatively low in meeting the demand for computer science bachelor's programs compared with the jobs noted in Criteria 4. Additionally, many students within EvCC and ShorelineCC are either place bound or need access to a degree within a short distance of their home. Table 3 lists the current programs that exist for students within 25 miles of ShorelineCC and EvCC campuses.

Table 3: IPEDs data aggregated by US Department of Education of public institutions offering computer science and related degrees within a commuting distance of either ShorelineCC or EvCC.

Institution	Bachelor's Degree	Number of Graduates
Bellevue College	Computer Science	40
Lake Washington Institute of Technology	Computer Programming	16
North Seattle College	Computer Science	*
Skagit Valley College	Computer Science	*
University of Washington-Bothell Campus	Computer Science	171
University of Washington-Bothell Campus	Computer and Information Sciences, General	24
University of Washington-Seattle Campus	Computer Science	378
Washington State University - Everett	Software Engineering	12**

*New program with no current graduate data.
**This program is not disaggregated from WSU's program in Pullman. This number is based on 12 graduates Spring 2022

Most of these options have a high barrier to entry due to several factors. All locations ofUniversity of Washington remain very popular transfer choices. The University of Washington in Seattle, which encompasses Computer Science and Computer Engineering programs, accepts only approximately 25-35% of applicants through the current UW student pathway. The transfer rate for CTC students into UW Seattle's CSE program is 20% (or about 69 total students across SBCTC) (Allen School Transfer Students, 2023). UW-Bothell is quickly becoming the top choice for many transfer students, however, this program also has a low acceptance rate at only 34% acceptance for all applicants, including, but not only, CTC transfer students (UW Bothell Undergraduate Admissions, 2023).

WSU Everett offers a software engineering program that is on campus for EvCC students; however, this program extends the standard duration for degree completion which in many cases is up to an additional year, for a total of 5 or more years to complete bachelor's level coursework. This is due to extra requirements in mathematics and natural science and the relatively close alignment with the engineering degree pathways. Also, these requirements surpass those needed by similar CS programs at other popular target transfer institutions, such as UW-Seattle and UW-Bothell making it challenging for students to make an academic plan that would give them options to transfer to both institutions.

Additional challenges are that students have a discontinuity of resources especially during the first term of transfer. Both UW-Bothell and WSU Everett currently lack support services such as MESA and TRiO that serve traditionally underrepresented populations. In the case of UW, transfer students are challenged with navigating new resources such as tutoring since they, often, do not have time to transition or establish a sense of belonging at their new institution.

Increased Student Interest

Students often face barriers to persistence on a Computer Science pathway; however, there are also students who do not even consider a BS in computer science as a pathway, particularly those from underrepresented and minoritized populations (McGee, 2020). The proposed program intends to focus efforts specifically to address three areas where this happens: K-12 connections, traditional studies/ESL programs, and professional technical programs and increase opportunities for students to explore computing related careers, especially providing contextualization and project based learning opportunities.

As mentioned earlier, EvCC is partnering with the K-12 sector in Snohomish County to provide a seamless pathway for students in CTE education. This will allow us to reach students earlier in their educational planning to provide direct support and clear pathways.

Currently, EvCC is working to bridge transitional studies and English language learner students to college level coursework. These students often see computer science as a mountain of science and math requirements with minimal institutional support through

these transitions. Our proposed program intends to develop college entry supports to guide students through this transition with intention, love, and care.

Finally, professional technical students in programs such as IT often face a steep ramp in fulfilling degree requirements which are more lengthy than the requirements of credentials like certificates. Given that both ShorelineCC and EvCC have IT and CS within the same area or department respectively, we can provide clear on- and off-ramps for students and more targeted advising and wrap-around support for students.

Proposed Enrollment

Our new BSCS degree would start with a target group of 12 students for the launch of upper division coursework in the 2025-2026 academic year. We intend to bring enrollment up to 20 students in subsequent years. Given our current student population size highlighted in Criteria 4, we can draw a large number of students directly from our respective programs. Table 3 shows our current headcount and anticipated enrollments.

Table 4: Proposed combined enrollment for new BS CS program.

	AY 25-26	AY 26-27	AY 27-28	AY 28-29	AY 29-30
Freshmen	20	20	20	20	20
Sophomores	0	20	20	20	20
Juniors	12	20	20	20	20
Seniors	0	12	20	20	20
Total	*32*	*72*	*80*	*80*	*80*

Criteria 6

Efforts to maximize state resources to serve place-bound students.

EvCC and ShorelineCC serve student populations spanning from the central district of Seattle to Skagit Valley. This broad reach gives our institutions an opportunity to serve a wide range of students and regions. For example, Shoreline is on a main public transit service line that directly connects students from Bothell through the Central District of Seattle, while Everett is uniquely positioned in the North Puget Sound with public transit connecting to the Skagit Valley and rural eastern Snohomish cities such as Monroe, Snohomish, and Sultan.

Similar programs include the App Connect NW, UW Bothell Applied Computing, and WSU Everett Software Engineering. Both UW Bothell and WSU Everett have high barriers to entry

for varying reasons. UW Bothell for example is capacity constrained and has a challenging commute for many placebound students.

We acknowledge that many programs have incorporated projects and hands-on learning components to their curriculum. Some computer science programs offer courses with social justice or equity themes; however, the proposed program will comprehensively weave such themes throughout the program and its outcomes. Additionally, we intend this program to be built around persistent, multi-quarter projects focused on community needs and environmental justice. These projects will be developed in partnership with local communities to engage students in community building.

Community-centered, project-based learning experiences are central to EvCC's recent redesign of their STEM-specific 1st-year experience curricula (STEM 101, 102, and 103). STEM 102 and STEM 103 are both designed to be centered on community projects and were designed with a focus on just in time learning strategies which all but remove the need for prerequisites. As such, these courses offer low barrier opportunities for STEM exploration very early in students' academic career. Moreover students that do not pursue a degree in STEM can use these courses to fulfill natural science requirements within the DTA. STEM 103 was designed to also serve as the entry point course for both CS and ITdegree programs at EvCC.

Additionally, EvCC is currently developing comprehensive and career connected pathways through CTE dual credit. The objective is to facilitate a seamless transition for students from K-12 to higher education programs. In particular, the current program is expanding and developing K-12 pathways in IT and CS that align with CTC pathways such as cybersecurity, data analytics, and computer science. This creates entry points into the BSCS degree for students within the region who otherwise may not have pursued a computer science or information technology careers.

Moreover, Shoreline CC and EvCC both offer information technology certificates and associate degrees that offer a track to career, but do not usually offer a path to traditional computer science bachelor programs. Our Bachelor's degree will offer multiple entry and exit ramps such as an exit ramp for CS students to earn certifications.

We intend to offer multiple modalities for students to provide flexibility to placebound or time-constrained students. We do not, however, plan to offer a fully online program. Our program will have strategic in-person offerings which target specific goals. For example, in-person interactions are crucial to developing students' sense of belongingness and computer science identity early on in their degree coursework specifically at program entry points such as during the first year and the first year of upper division coursework. Likewise, collaborative, work-based learning projects provide students with industry-like experience for honing the durable skills needed to succeed in Tech (WTIA, 2023). Moreover since our program will focus on projects that partner with the local community, we will have needs for in-person networking and connecting for our students to effectively engage with local partners.

The initial work that will be incorporated into this program is the Computer Science Equity

Framework led by Dr. Hess (ShorelineCC Faculty), and additionally includes conversations and ideas about radically rethinking the process of internships. These ideas for internships are supported by local companies and would be incorporated into this program. Our program will focus on fusing equity and social justice topics throughout the curriculum.

Criteria 7

Promoting equitable opportunities for students, including historically marginalized students.

ShorelineCC and EvCC are interested in designing an equity-first Bachelor of Computer Science program. The proposed program will intentionally center equitable opportunities for students, particularly students who come from low-income households and students who have been historically and systematically minoritized due to race/ethnicity. In alignment with SB 5401 (Washington State Legislature, 2021), the proposed degree seeks to fill a need for providing high-demand, living-wage jobs for the aforementioned populations.

In developing our statement of need, ShorelineCC and EvCC faculty began research and conversations with a variety of folks across the SBCTC system to 1. flesh out the needs for radicalized education reform with this degree and 2. to uncover the opportunities for leading with equity. As a result of ongoing conversations, ShorelineCC and EvCC faculty (with other equity-focused faculty across the state) developed an Equity Framework to help drive degree proposals and planning. This framework is the structure by which we are assessing needs and guiding development. See Appendix A for the developed equity framework.

Student recruitment and support implementation plan

Our program will actively recruit historically underrepresented students, including students of color and low-income students, into our local baccalaureate-level program. Our colleges will leverage relationships with K-12 and STEM-focused education programs in our recruitment activities. As examples, ShorelineCC has a high school / running start STEM navigator who works with our local high school system to introduce college pathways, including Computer Science. Additionally, both ShorelineCC and EvCC have outreach and recruiting offices which will produce outreach and recruitment materials featuring our diverse student population and the personalized and equity-focused support they receive at our institutions. Additionally, EvCC hosts an annual Science and Engineering Student Exhibition that showcases EvCC student work and brings local elementary students to campus to participate in science and engineering hands-on activities.

Key benefits for our students include: a significantly lower cost-to-degree compared to four-year universities in the region, the potential for a small cohort model to build belonging and support for individualized needs, and wrap-around support services. Support services, such as academic planning, student success skills development, navigation and advising, tutoring, TRiO, Washington Mathematics, Engineering, Science Achievement (MESA) program, pathway success coaches, and financial aid will increase persistence through the

program.

A Snapshot of Our Colleges' Demographics (Annualized AY 22-23)

As gathered from Enrollment Data at SBCTC, the following table depicts a snapshot of relevant demographics at our colleges.

Table 5: Students of color enrollment data for each institution.

Institution	Students of Color	Received Need Based Aid
Everett Community College	5,651 / 14, 737 (38%)	3,106 / 14,737 (21%)
Shoreline Community College	3,944 / 8,527 (46%)	2,138 / 8,527 (25%)

Barriers and challenges for BIPOC and low-income students

STEM Education has historically excluded BIPOC folks and low-income students due to a variety of systemic practices and structures which are present both in the Tech industry and its gateway educational system (McGee, 2021; Sims, 2018; Sims et al., 2020). As noted by Sims et al. (2020), equitable educational opportunities are rare for students who identify as BIPOC or from low-income households. Further, McGee (2021) points out that underrepresented and minoritized students in STEM education often face the challenges of having to continually prove themselves, racial microaggressions in educational settings, a tremendous amount of internal pressure to succeed, and an expectation to be resilient.

Specific to the attainment of a Bachelor's credential, students who have been underrepresented in higher education face numerous obstacles when attempting to access a bachelor's degree program (WTIA, 2023). These challenges often include geographical limitations, the need to balance work and childcare responsibilities, potential lack of knowledge in basic skills and academic planning, as well as financial constraints that hinder their pursuit of a bachelor's degree. The financial burdens are particularly detrimental to student retention, notably affecting those with low incomes, as these constraints frequently serve as the primary impediments to full-time enrollment. Conversely, students who can attend college full-time and take on heavier credit loads tend to have a higher likelihood of degree completion. In contrast, pursuing a degree on a part-time basis tends to have an adverse impact on degree completion, often due to the juggling of school alongside family duties, childcare expenses, and work schedules.

Beyond historical challenges, students of color and those from low-income backgrounds bore a disproportionate and unjust burden during the COVID-19 pandemic. Many have had to make challenging decisions to navigate the intersection of family obligations, employment commitments, and educational pursuits. These factors should be taken into

consideration when deciding program offerings such as course modalities, entry and exit ramps, course designs, and partnerships with other programs (e.g. internships which fit our students' needs and mentorship which addresses their particular challenges in persistence toward a degree).

This program is designed to cater to the specific needs of these demographics by offering an affordable education that acknowledges student responsibilities beyond the classroom. It aims to prepare students for meaningful, adaptable, and fulfilling careers within the expanding knowledge-based economy.

Resources and support

Sims et al. (2020) suggests seven characteristics for developing an equity and justice centered campus or program; these include 1. developing programs which situate, contextualize, and provide critical review of preparation for entering and succeeding in college education, 2. developing student-centered curricula which is teacher-driven to center justice and informed educational research, 3. implementing rigorous course content that encourages, equips, and empowers students to question and critically evaluate issues of power, 4. intentionally providing space for students' identities to exist and persist in the classroom, 5. deliberately engaging in on-going professional development which depowers low-expectations and deficit-thinking in exchange for high-expectations and empowerment, 6. orienting students to their charge to positively affect social transformation through use of their course content, and 7. designing assessment so that it is formative and promotes a student's individual growth.

The proposed BSCS program will allow ShorelineCC and EvCC to build a program plan, including coursework sequencing, professional expectations, and course objectives, which center these practices for equity and justice based education. Because our programs are relatively small and our campuses are heavily invested in equity-based work, the proposed program can be built (rather than the more difficult task of re-building) to provide radical, justice-centered support for our students.

Additionally, the proposed BS in Computer Science will enable students to continue utilizing supports and resources that they may already be using at Shoreline CC and EvCC. ShorelineCC has multiple cultural and identity based support resources on campus, including a Multicultural Center, an AAPI (Asian American and Pacific Islander) Center, a Gender Equity Center, and a Benefits Hub (which provides food, clothing, and other basic needs resources). EvCC offers TRiO's federally funded program that provides academic support services and focuses on personal growth, academic progress, and community development. In addition, EvCC offers a Mathematics, Engineering, Science Achievement (MESA) Program which, similar to TRiO, offers resources and extra support to students (but focuses specifically on STEM). EvCC and ShorelineCC offer robust cost-free academic tutoring which is peer-led by vetted tutors and organized by college staff. Building on these existing resources will provide continuity as students transition to upper division coursework to achieve a Bachelor's degree.

Appendix A

EQUITY FRAMEWORK; BS in CS degree

Equity Clauses in the SB 5401 Bill

- "The legislature finds it essential that Washington students, especially low-income students and students of color, have the necessary credentials to secure the high-demand jobs of the future." (p. 1)
- "the state can do a better job of training Washington residents to secure these living wage jobs" (p. 1)
- "of the 1,883 computer science degrees awarded in Washington during the 2018-19 school year, only 3.8 percent were awarded to African American students, 5.6 percent to Hispanic students, and less than 1 percent to Native Americans" (p. 1)
- "expand access to the high-demand field of computer science, especially to students of color" (p. 2)

"making it cost-effective for students to see the degree" (p. 2)

Mission and Vision

Who is this degree intended to prioritize?

- PERMSCs - poor ethno-racially minoritized students of color (from Minding the Obligation Gap)
    - Low-income students
    - Racially minoritized students (Black and brown students)

Equity Mission for the BS in CS

- Provide an opportunity for students, particularly from otherwise hyper-marginalized populations, to access family-sustaining wage employment in technology in support of a workforce that is representative of the diversity of citizens in Washington State

Equity-centered degree outcomes for the BS in CS

- Students enrolled represent the diversity of the local community when disaggregated by race.
- Program completion/success rates (by course and program) are equal when disaggregated by race, gender, first-generation status, and SES/pell-eligibility
- Graduates report access to mentorship (spanning their transition to workplace) equally when disaggregated by race, gender, first-generation status, and SES/pell-eligibility

- Graduates find job placement at similar rates and wages as universities in the local community
- Graduates report a sense of belonging in their programs

Opportunities for centering equity

Degree, state-level

- Align on-ramp entry requirements across the state so that student have the opportunity to build the skills needed to enter whichever program best serves their needs
- Create focused pipeline outreach efforts
    - showcase the breadth of CS as a field, take outreach into untapped communities, and bridge K-12 and college
    - partner with external programs such as YouthForce of the Boys and Girls club, MESA
- Create focused job-search scaffolds
    - showcase CTC grad skill set as different but competitive compared to university grads, offer interview skills workshops, capstone days, build power through alumni network
    - partner with external programs e.g., Center of Excellence, WTIA education council
- Inventory and document student support services across the state (i.e., which institutions are offering financial support, paid peer tutoring opportunities, paid internships, etc?)
- Inventory and document modality options across the state (i.e., make transparent which programs are online, in-person, hybrid, weekends, weekdays, etc)

Program-level

- Ensure program development efforts are holistic, participatory, and intersectional
- Review and assess baseline data related to the equity-centered degree outcomes
- Review and assess status-quo courses (at a high level) across the program for: relevancy, mapping to program outcomes, and potential/evidence for the course to be a barrier to prioritized students
- Mandate integrated and equitable advising which prioritizes PERMSCs and first gen college students
- Offer cross-institution cohorts or affinity groups which focus on belonging and shared identity or goals
- Consider an instructor's ability to build and instill confidence, belonging, and advocacy in staffing early sequence course offerings
- Build course sequencing maps to prioritize PERMSCs entering/completing the program
- Explicitly integrate coursework related to advocacy, leadership, and societal/industry challenges

- Facilitate multiple off-ramps (terminal program pathways) that provide students with workforce-ready skills (i.e., if a student needs to leave a 4-year BS/BAS program midway through, will coursework allow an AA or a certificate that carries meaning in industry)

Course-level

- Implement anti-racist teaching pedagogy
    - Name and address whiteness in the academy, Tech/CS, and society
    - Develop culturally responsive/relevant/sustaining coursework
    - Mitigate stereotype threat
    - Increase representation of BIPOC folx in coursework
    - Create partnerships with external programs focusing on justice e.g., Reboot Representation
- Implement equitable and inclusive teaching pedagogy
    - Use rubrics/TILT lessons (Transparency in Learning and Teaching)
    - Create OER materials and use low-cost materials
    - Increase low-stakes formative assessments, while decreasing high-stakes summative assessments
    - Lean into collaborative learning in place of traditionally individualized assignments
    - Consider opportunities for using mastery-based grading, ungrading, and labor-based grading
- Refactor weed-out Math, Physics, and CS courses to support student success
    - Use real world problems for practical applications of learning rather than theoretical problems
    - Develop project-based, client facing development opportunities
- Develop intersectional/cross-disciplinary entry-level courses
    - Consider community-based projects, CS+ style courses, social impact projects
    - Consider dual-enrollment opportunities which prioritize Title I schools

Wrap-around services

- Create “bandwidth” opening opportunities
    - e.g., paid work opportunities, offer childcare, free counseling, laptop checkout, internet access
    - provide pooled success coach/navigator office to help with life needs (time, money, priorities)
- Develop near-peer or peer mentoring opportunities within the institution
- Develop industry-based mentorship (e.g., Mentors in Tech)
- Offer scholarships for tuition, books, and housing

Appendix B

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