
# STATE BOARD FOR COMMUNITY AND TECHNICAL COLLEGES PRESENTATION DATE - TBD STATEMENT OF NEED BACHELOR OF SCIENCE COMPUTER SCIENCE

## *COLUMBIA BASIN COLLEGE*

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# Cover Page — Statement of Need

## Program Information

Institution Name: Columbia Basin College

Degree Name: Bachelor of Science Computer Science

CIP Code: 11.07 “Computer Science”, “11.02 Computer Programing” and 14.0903 “Computer Software Engineering”

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

Degree: Computer Science AA/DTA/MRP

CIP Code: 11.0201

Year Began: Click or tap here to enter text.

Degree: Programming and Software Development AAS

CIP Code: Click or tap here to enter text.

Year Began: Click or tap here to enter text.

Degree: Software Development AAS

CIP Code: Click or tap here to enter text.

Year Began: Click or tap here to enter text.

**Proposed Start Implementation Date (i.e. Fall 2014): Fall 2025**

Projected Enrollment (FTE) in Year One: 18 FTE

Projected Enrollment (FTE) by Year: Fall 2026: 30 FTE, Fall 2027: 38 FTE, Fall 2028: 44 FTE

Funding Source: State FTE

## Mode of Delivery

Single Campus Delivery: Initially, this program will be offered on Columbia Basin College’s main campus, with a mix of in-person and hybrid modalities.

Off-site: Possible coordination with other Eastern Washington CTCs to host instruction.

Distance Learning: The long-term goal is to have two parallel cohorts, one in-person program and one fully-remote program.

## Statement of Need

*Please see criteria and standard sheet.* ***Page Limit: 20 pages***

## Contact Information (Academic Department Representative)

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## Chief Academic Officer signature

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

Dr. Michael Lee
Vice President of Instruction
Columbia Basin College

Feb 2, 2024

Signaure

# Criteria 1

## Relationship to institutional role, mission, and program priorities.

Describe how the proposed program reflects and support the role and mission of the institution and reflect program priorities.

The development of a Bachelor of Science in Computer Science (BSCS) at Columbia Basin College (CBC) reflects and supports the institution's role and mission in multiple ways:

**1. Addressing Workforce Demands:** CBC is responding to the legislative directive from Washington State to close the skills gap in technology. By providing a BSCS, CBC is aligning with state and national priorities to create a workforce that is well-equipped to handle the challenges and opportunities of the technology sector. This aligns with CBC's mission to deliver educational opportunities that promote student success and enhance the vitality of the community.

**2. Building on Established Strengths:** The college has a track record of successful Computer Science programs and experience in offering four-year degrees. Leveraging existing 300 and 400 level classes from related disciplines shows CBC's commitment to efficient resource utilization, reflecting its strategic goal of academic excellence.

**3. Promoting Diversity and Inclusion:** As a Hispanic-Serving Institution, CBC's initiative to increase diversity within the Computer Science field is a direct reflection of its mission to serve its diverse community. The specific strategies to recruit and support students from various backgrounds, including wrap-around services for marginalized and low-income students, exemplify CBC's dedication to inclusive excellence and social responsibility.

**4. Enhancing Educational Accessibility:** Providing an affordable pathway for students with an Associate of Applied Science (AAS) in Computer Science to pursue a four-year degree directly supports CBC's mission to make education accessible. By bridging the gap, especially in areas where opportunities are limited, CBC is acting on its commitment to student success.

**5. Regional Collaboration:** The planned partnerships and articulations with other community colleges such as Walla Walla Community College and discussions with local universities indicate CBC's role as a collaborative and responsive educational leader in Eastern Washington.

**6. Program Outcomes Aligned with Accreditation Standards:** The key outcomes for the BSCS program, including analytical skills, communication, ethical judgment, teamwork, and application of computer science theory, are based on ABET criteria, which ensures that the program meets high-quality standards that are recognized internationally. These outcomes are in direct correlation with CBC's mission to provide quality education that is both relevant and rigorous.

**7. Flexible Program Delivery:** The proposed modalities of course delivery, including online, hybrid, and HyFlex classes, demonstrate CBC's commitment to meeting the diverse needs of its student body, which includes working adults and military veterans. This flexibility reflects CBC's mission to provide learning opportunities that are accessible to all students, regardless of their circumstances.

**8. Program Growth and Institutional Priorities:** The expected enrollment numbers show a clear pathway for growth, highlighting CBC's ambition for continuous improvement and expansion in its educational offerings. This aspect of the program indicates an understanding of the institutional role in regional economic development and innovation.

**Program Priorities:**

- **Educational Excellence:** The BSCS will be rooted in ABET-accredited standards, reflecting CBC's priority for high-quality education.
- **Community Engagement:** Through local partnerships and recruitment efforts, CBC is prioritizing its role as a community-engaged institution.
- **Student Success:** With a focus on supporting diverse and non-traditional students, CBC is prioritizing initiatives that contribute to student success.
- **Inclusivity:** Efforts to specifically recruit and support underrepresented groups in Computer Science align with CBC's priority to foster an inclusive environment.
- **Regional Leadership:** Expanding program offerings in high-demand fields positions CBC as an educational leader in the region.

The development of the BSCS at Columbia Basin College is a strategic move that supports its mission to serve the educational and workforce needs of its community. It reflects a commitment to inclusivity, regional development, and educational excellence that are cornerstones of CBC's institutional priorities.

# Criteria 2

## Support of the statewide strategic plans.

Describe how the program will support the State Board for Community and Technical Colleges (SBCTC) Mission goals outlined in the Mission Study and Washington Student Achievement Council (WSAC) policies and goals for higher education as articulated in the Strategic Master Plan for Higher Education.

The State Board for Community and Technical Colleges (SBCTC) and the Washington Student Achievement Council (WSAC) both have strategic objectives that align with the development of higher education programs that are responsive to workforce needs, accessible to a diverse student body, and maintain high academic standards. Here's how the BSCS program at Columbia Basin College (CBC) supports the mission goals and policies outlined by these bodies:

**SBCTC Mission Alignment:**

1. **Expanding Educational Access:** SBCTC emphasizes expanding access to higher education for underserved communities. CBC's BSCS program, with its commitment to serve the diverse population of its region and specifically the Hispanic community, reflects this goal. The program's flexible delivery methods, including online, hybrid, and HyFlex options, cater to non-traditional students, such as those who are working or have military commitments.

2. **Supporting Student Success:** The BSCS program is designed to support student success through clear learning outcomes, ABET accreditation criteria, and support programs like MESA. This aligns with SBCTC's objective to increase student achievement and completion rates.

3. **Meeting Workforce Needs:** SBCTC's mission includes contributing to the economic vitality of the state by addressing workforce demands. The BSCS program responds directly to the state's need for skilled technology workers, thereby supporting the state's economy and technological advancement.

**WSAC Policy and Strategic Master Plan Alignment:**

1. **Increasing Educational Attainment:** WSAC's strategic goals aim to increase the educational attainment of Washingtonians. The BSCS program at CBC provides a pathway for AAS graduates in Computer Science to obtain a bachelor's degree, thereby contributing to higher education levels in the state.

2. **Improving Quality and Relevance:** The BSCS program's curriculum, developed with ABET criteria in mind, ensures that the quality and relevance of the education provided are in line with industry standards and demands, supporting WSAC's emphasis on quality education.

3. **Driving Innovation and Research:** By creating a program that is responsive to the current technological landscape, CBC is fostering an environment conducive to innovation and research, which is a key component of WSAC's strategic vision for higher education in Washington.

4. **Fostering Equity:** WSAC places a strong emphasis on equity in educational attainment. CBC's targeted efforts to increase diversity in the Computer Science student population and to provide support services tailored for historically marginalized and low-income students are concrete steps towards this goal.

5. **Collaboration Between Educational Institutions:** The articulation agreements and pathways being developed between CBC and other community colleges as well as discussions with universities demonstrate a commitment to WSAC's policy of fostering collaboration in the higher education system to maximize resources and serve students more effectively.

6. **Accountability:** WSAC values accountability in terms of educational outcomes and fiscal responsibility. CBC's program outcomes are designed to be measurable and in accordance with recognized accreditation standards, ensuring that the program is accountable to students, the community, and the state for its educational effectiveness.

The BSCS program at Columbia Basin College is poised to support the SBCTC's mission by expanding access to education, supporting student success, and meeting workforce needs. Concurrently, it aligns with WSAC's strategic priorities by increasing educational attainment, ensuring the quality and relevance of education, fostering innovation, advancing equity, promoting collaboration, and maintaining accountability. Through these alignments, CBC's BSCS program demonstrates its commitment to fulfilling the broader objectives of the state's higher education system.

# Criteria 3

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

- Employer demand must exceed regional supply of graduates with relevant degrees.
- Demand must be based on data sources including but not limited to local employer survey, traditional labor market data, industry data, trade associated data, and other transactional data. Please provide evidence of the gap between the numbers of program graduates verses the number of job opening locally and regionally. Refer to attached supply/demand gap rubric for additional guidance.

Both employer and community demand for qualified workers with bachelor's degrees exceed the current supply of graduates with relevant degrees in the state and in the Benton/Franklin County region.

For the state, it is projected that from 2020-2025 in Washington State, over 23 percent of jobs will require a bachelor's degree, and projections show that the supply will fall about 5,000 short of the demand. (A Skilled and Educated Workforce: 2017). According to Washington's A Skilled and Educated Workforce: 2017 Update report, "the largest supply and demand gap at the baccalaureate level is in computer science and information technology, with the majority of jobs going to software developers, programmers, and systems analysts". There is a demand for skilled computer science workers at the baccalaureate level, and 52 percent of those openings are for software developers.

This program will provide our local students with knowledge and skills required to access a high wage, high demand career.

This assessment is based on CBC's BSCS Local Employer Survey; ESD Supply Demand Report 2015-2023; ESD Long Aggregated Industry Report, 2023; ESD Projection-Benton Franklin-Programmers report; and ESD Top 20 Job Postings 11.2023 (included with this report).


ESD supply demand Report 2015-2023.xl


BSCS Local Employer Survey.xls


ESD Long Aggregated Industr


ESD Projection-Benton F


ESD Top 20 Job Postings 11.2023.xls

# Criteria 4

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

Describe the existing professional and technical degree program that will be used as the foundation for applied baccalaureate program. Include how long the program has been in existence and the enrollment history of the program over the past five years.

Analysis of the annual program reviews over the past five years reveals the following:

1. **Program Duration and Historical Enrollment:** CBC has an established Associate of Applied Science (AAS) in Computer Science, which has been part of the college offerings since at least 2001, would typically be the foundational degree for the proposed Bachelor of Science in

Computer Science (BSCS). Such a program might have been in existence for several years, if not decades, reflecting the college's commitment to adapting to technological advances and industry needs. The provided data spans from the academic years 2019-2020 to 2023, indicating that the program has been reviewed for at least these four years. It likely has been in existence for longer, though specific data prior to this period is not provided.

2. **Enrollment Trends**:
    - 2017-2018: The total enrollment was 838 students.
    - 2019-2020: The total enrollment increased to 898 students.
    - 2020-2021: The enrollment slightly decreased to 861 students.
    - 2021-2022: The number further decreased to 809 students.
    - 2022-2023: Enrollment increased to 865 students.
    - These figures suggest that while there was a decline during the three-year period from 2019 to 2022, largely attributable to the COVID pandemic, there was a rebound in enrollment numbers by 2023.
3. **Faculty and Courses**:
    - Over the years, the number of faculty Full-Time Equivalents (FTEs) and the number of courses offered have remained relatively stable, ensuring that the student to faculty ratio has also stayed within a consistent range.
    - Curriculum Structure: The AAS program includes foundational courses in programming, systems analysis, software development, and some elements of cybersecurity and information technology. These courses provide the technical groundwork upon which additional upper-division courses can be built to create the BSCS curriculum.
4. **Industry Partnership and Advisory Committees:** CBC's AAS in Computer Science program has strong relationships with local industry partners, many of whom serve on the program's advisory committee, which ensures that the curriculum stays relevant to current industry standards and needs.
5. **Student Success and GPA**: The percentage of students achieving a course success rate (grade above 2.0) remained high across the years, averaging around 78-80%. The average GPA has stayed above 3.0, which is an indicator of a strong academic program.
6. **Student Demographics**: The program consistently serves a diverse student body with a significant representation of Hispanic students (ranging from 31.5% to 34.7% across the years). The majority of students are White, but there is notable diversity within the student population. There is a clear distribution across socioeconomic statuses, with a considerable portion of students coming from lower-income quintiles.
7. **Section Modality**: The program has adapted to various teaching modalities, including hybrid, online, and web-enhanced courses.
8. **Student Residency**: A consistent majority of the students are from in-state, indicating that the program largely serves the local community.
9. **Student Age**: The average age of students has been around the mid-20s, with the median age slightly lower, indicating a mix of traditional and non-traditional college-aged students.

The data taken from annual program reviews reveals that CBC's AAS in Computer Science program is well-established with a stable enrollment over the past five years. The program has consistently achieved high rates of student success and has served a diverse and predominantly local student population. This foundation suggests that the program has the potential to be expanded into an applied baccalaureate program, building upon its existing strengths and addressing the needs of its student demographics.

# Criteria 5

## Student demand for program within the region.

Evidence of student interest and demand from multiple sources, such as but not limited to: students graduating with technical associate degrees in the region, survey of students within region, demand in excess of opportunity to enroll in related traditional bachelor's programs, and changes in industry standards. Include enrollment projections for each year over the next five years.

To address the development of a Bachelor of Science in Computer Science program at Columbia Basin College and the evidence of student interest and demand, we can draw from the information provided in the screenshots and the context of the growing fields of Computer Systems Engineers/Architects and Computer and Information Systems Managers.

1. **Student Graduating with Technical Associate Degrees**:
    - CBC's data indicates a healthy interest in STEM fields. For example, in the 2021-2022 academic year, 415 students were associated with Information Technology-related meta-majors. This interest is likely to extend to a bachelor's program, especially considering the specific demand for Computer Science roles.
2. **Survey of Students within Region**:
    - While specific survey data is not provided, the enrollment in computer science courses and related programs at the associate level can serve as an indirect survey of interest. The consistent enrollment in these courses over the years provides a positive indicator of interest.
3. **Demand in Excess of Opportunity to Enroll in Related Traditional Bachelor's Programs**:
    - The increase in average GPA within CBC's AAS Computer Science over the years, from 3.01 to 3.12, suggests that the quality and competitiveness of students are rising. This could indicate that students are preparing for more challenging programs, like a bachelor's degree in computer science.
4. **Changes in Industry Standards**:
    - The roles of Computer Systems Engineers/Architects and Computer and Information Systems Managers are becoming increasingly important. Tasks like directing daily operations, setting deadlines, and providing technical support are critical in the modern economy. The growth in this field suggests that students will be seeking educational programs that prepare them for these roles.

**Enrollment Projections for the Next Five Years**: Based on the data provided and the industry growth, enrollment projections can be cautiously optimistic.

- **Year 1**: Initial enrollment could be conservatively estimated at 20-40 students, considering the novelty of the program and the need to build awareness.
- **Year 2**: Initial enrollments may increase by 10-20% from Year 1 as the program gains

recognition and the first students shares their experiences.

- **Year 3**: Projecting a similar growth rate of 10-20%, factoring in retention rates and the growing reputation of the program.
- **Year 4**: Enrollment is likely to stabilize as the program reaches capacity.
- **Year 5**: At this stage, growth is anticipated to level out, with the possibility of incremental increases based on industry changes and program success.

# Criteria 6

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

- Describe how program will serve place-bound working adults.
- Identify similar program offered by public or independent institutions in the region.
- Describe options that have been explored for collaboration with other public baccalaureate institutions, businesses, and /or community organizations considered in the development of the proposal and include a brief description of initial conversations.
- Describe collaboration with similar community and technical colleges (CTC) baccalaureate programs and related community and technical colleges Centers of Excellence.
- Describe unique aspects of the proposed program that differentiate it from similar programs and/or describe why expansion would be desirable or necessary.

1. **How the Program Will Serve Place-Bound Working Adults:** The program will offer classes in various modalities, including online, hybrid, and HyFlex classes, which allows students who may be employed full-time to attend classes at times that are most convenient for them. This flexibility is particularly beneficial for working adults who cannot relocate for education and need to balance their studies with work and other responsibilities.
2. **Similar Programs Offered by Public or Independent Institutions in the Region:** Within the region, Washington State University Tri-Cities (WSU-Tri Cities) offers a four-year degree in Computer Science. Heritage University also provides a Computer Science program, but at a higher tuition cost. Other similar programs are available at community and technical colleges in the western part of the state, which may be geographically inconvenient for students in CBC's service district.
3. **Collaboration with Other Institutions:** CBC has initiated partnerships with other institutions like Walla Walla Community College (WWCC) to create pathways and articulations for AAS students in Computer Science to transition into CBC's BSCS program. They are seeking to establish similar agreements with Spokane Community College, Spokane Falls Community College, Yakima Valley College, Big Bend Community College, and Wenatchee Valley College, and to coordinate with their AAS programs. There are also plans to discuss coordination with WSU-Tri Cities and Heritage University.
4. **Collaboration with Community and Technical Colleges (CTC) Baccalaureate Programs:** CBC is

working to create articulation agreements with other CTCs to enable students from a broader geographic region to access the BSCS program. By aligning with AAS programs from these colleges, CBC is facilitating a seamless transition for students who wish to pursue their baccalaureate degrees after completing their associate degrees.

5. **Unique Aspects of the Proposed Program:** CBC's BSCS program is set to complement its existing BAS programs in Software Development and Cybersecurity, leveraging its position as the largest School of Computer Science among CTCs in Eastern Washington. The program is specifically designed to increase diversity in Computer Science, with proactive recruitment and support for Hispanic students, reflecting the demographics of the service area. Furthermore, the college is responding to the need for technological skills as directed by state legislation and is building on its proven success in delivering Computer Science education.

6. **Expansion Justification:** Expansion is justified by the demand for affordable Computer Science education in the region, the need to fill the skills gap in technology as identified by state legislation, and CBC's ability to provide a relevant, flexible program that accommodates the diverse needs of its student body, including place-bound working adults and underrepresented populations.

# Criteria 7

## Promoting equitable opportunities for students, including historically marginalized students.

Create an implementation plan to recruit and support students of color and low-income students into the bachelor degree program. Within the implementation plan, provide data that reflects the college's student demographics and highlight demographics for students of color and low-income students. Identify barriers/challenges that students of color and low-income students may face at the college, and reflect upon how these barriers/challenges or others may impact students of color and low-income students interested in applying to the bachelor degree program. In the Implementation Plan, describe resources, supports, or other processes to recruit and support students of color and low-income students.

### Data on Student Demographics

- Columbia Basin College (CBC) is a federally designated Hispanic-Serving Institution. A significant portion of the student body identifies as Hispanic, and this informs a large part of the services it provides to its students.
- The student demographic data shows a growing number of Hispanic students, with Hispanic students outnumbering non-Hispanic students in computer science programs.
- As CBC serves a region where the percentage of Hispanic citizens exceeds the white non-Hispanic population, it is imperative to tailor recruitment and support services that reflect this demographic reality.
- There should also be considerations for other students of color and low-income students who may not be well represented but are equally in need of support.

- CBC's Strategic Plan and existing programs such as the DEI office, MESA, the Academic Success Center, and the Equity Center (opening Spring 2014) provide a strong foundation for understanding and addressing the needs of students of color and low-income students.
- Detailed demographics should be gathered from these resources to identify not just ethnicity and income levels, but also patterns of program participation and academic performance.

### Barriers/Challenges

1. Financial Constraints: Tuition and associated educational costs can be prohibitive for low-income students.
2. Accessibility and Flexibility: Working students and those with family obligations may struggle with traditional class schedules.
3. Cultural and Language Barriers: Non-native English speakers may face challenges in academic readiness and comprehension.
4. Lack of Representation: Students might feel isolated if they do not see themselves represented in the faculty, staff, or student body.
5. Awareness and Perception of the Program: Potential students may not be aware of the BSCS program or might perceive it as unattainable due to a lack of role models or success stories.
6. Underutilization of Resources: Despite available resources like MESA and the Academic Success Center, students may not be fully aware or may not take advantage of these supports due to various reasons, including stigma or lack of information.
7. Integration and Coordination Across Services: There may be challenges in ensuring the services offered across the DEI Office, MESA program, Academic Success Center, and Equity Center are cohesive and synergistic.

### Recruitment Strategies

1. Community Outreach: Engage with local high schools, community centers, and community organizations to host informational sessions about the BSCS program, specifically targeting students of color and low-income families.
2. Financial Aid Information: Offer workshops on financial aid, scholarship opportunities, and tuition assistance programs, ensuring materials are available in multiple languages as needed.
3. Role Models and Mentorship: Develop a mentorship program linking prospective and current students with successful alumni and professionals from similar backgrounds.
4. Marketing and Communication: Utilize multilingual marketing materials and target media outlets that cater to communities of color and low-income households.
5. Leverage MESA Program: Use the MESA program as a recruitment platform by showcasing success stories and providing tailored guidance for BSCS prospects.
6. Academic Success Center Partnerships: Collaborate with the Academic Success Center to

host workshops that focus on the skills needed for success in the BSCS program.

7. Equity Center as a Recruitment Hub: Utilize the Equity Center to host events and fairs that promote the BSCS program to a diverse student body.

### Support Structures Aligned with CBC's Strategic Plan

1. Academic Support Enhancement: Expand the MESA program's wrap-around tutor services to include BSCS-specific subjects.
2. Cultural and Community Engagement: Use the Equity Center to facilitate community-building events and peer-mentoring programs that link BSCS students with mentors from industry and academia.
3. Coordination of Bilingual and Cultural Resources: Ensure all resources, including those at the Academic Success Center, are available in the primary languages of the CBC student body and are sensitive to cultural nuances.
4. Financial Planning and Literacy: Partner with the MESA program and Financial Aid office to create a financial planning curriculum tailored to the needs of BSCS students.
5. Adaptive Learning Environments: Build on the flexible delivery models in the Strategic Plan to provide BSCS students with a range of learning options to accommodate their diverse needs. Continue and expand flexible course delivery options such as online, hybrid, and HyFlex models to accommodate various schedules.

### Evaluation and Adaptation

1. Implement a system for tracking the success of recruitment and support initiatives, using data to continuously adapt and improve strategies.
2. Solicit feedback from students regularly to understand their needs and adjust support services accordingly.
3. Regular assessments will be conducted in partnership with the DEI office, MESA program, Academic Success Center, and Equity Center to gauge the effectiveness of recruitment and support efforts.
4. Utilize feedback mechanisms already in place within these centers to refine and tailor the BSCS program services.

The proposed implementation plan draws upon the strengths of CBC's existing programs and strategic objectives. It also recognizes the unique barriers faced by students of color and low-income students. By employing targeted recruitment strategies, creating robust support systems, and committing to ongoing evaluation and adaptation, CBC can enhance the accessibility and appeal of the BSCS program for these populations. It aims to not only recruit but also to fully support students of color and low-income students within the BSCS program by creating a seamless network of services and support systems that align with the college's broader commitment to diversity, equity, and inclusion.