



**Statement of Need for  
Bachelor of Applied Science:  
Cybersecurity**

August 31, 2018

By

**Clover Park Technical College**  
4500 Steilacoom Blvd. SW  
Lakewood, WA 98499  
cptc.edu



**COVER SHEET  
STATEMENT OF NEED**

**Program Information**

Institution  
Name: Clover Park Technical College

Degree Name: Bachelor of Applied Science: Cybersecurity CIP Code: 11.1003  
Name(s) of existing technical associate degree(s) that will serve as the foundation for this program:

Degree:	Computer Networking and Information Systems Security	CIP Code:	Year Began:
<u>AAS-T</u>		<u>11.1003</u>	<u>2010</u>
Degree: _____		CIP Code: _____	Year Began: _____

Proposed Start Implementation Date (i.e. Fall 2014): Fall 2019

Projected Enrollment (FTE) in Year One: 20 at Full Enrollment by Year: 2023

Funding Source: State FTE:  Self-Support:  Other:

**Mode of Delivery**

Single Campus  
Delivery: Hybrid  
Off-site: \_\_\_\_\_  
Distance Learning: \_\_\_\_\_

**Statement of Need:** *Please see criteria and standard sheet FORM B.*  
**Page Limit: 20 pages**

**Contact Information** (Academic Department Representative)

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Mabel Edmonds  
Chief Academic Officer

9/5/18  
Date

*Employment of information security analysts is projected to grow 28 percent from 2016 to 2026, much faster than the average for all occupations. Demand for information security analysts is expected to be very high, as these analysts will be needed to create innovative solutions to prevent hackers from stealing critical information or causing problems for computer networks.<sup>1</sup>*

## Introduction

Cybersecurity is a high-demand field with few training providers in our area. We propose implementing a BAS: Cybersecurity (BAS-C) degree to better prepare our Computer Networking and Information Systems Security (CNISS) associate degree graduates for today's job market. CNISS Associates graduates enjoy an excellent employment record in entry level information technology careers. The Bachelor of Applied Science: Cybersecurity (BAS-C) general education and advanced cybersecurity studies will equip graduates with the skills, knowledge, and abilities demanded by our local employers for entry into more advanced positions as well as mid-career positions.

The BAS-C program outcomes include:

- Develop, coordinate, and implement cybersecurity solutions in a complex enterprise environment.
- Apply critical thinking to solve challenging problems and confront unexpected situations.
- Lead a multidisciplinary team analyzing risk and recommending appropriate controls.
- Plan for and respond to cyber incidents.

We believe that this degree will complement similar offerings in our area without the risk of saturating the market. Our proposal differs from others in both the intended learners served and the content of the offering.

The bottom line is this: in our area, in the IT field, at the Baccalaureate or higher level, demand greatly exceeds supply (11,646 annual openings to 1,888 graduates).<sup>2</sup> This is many more than any local college program could ever scale up to fill.

Our capacity to meet Criteria 1-6 is explained, in order, below.

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<sup>1</sup> Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Information Security Analysts, on the Internet at <https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm> (visited July 11, 2018).

<sup>2</sup> State Board for Community & Technical Colleges Workforce Supply & Demand. Retrieved from <https://cube.nchems.org/views/SBCTCSupplyandDemandVisualization/SBCTCSupplyandOutcomesVisualization?:isGuestRedirectFromVizportal=y&:embed=y> (accessed June 5, 2018).

## Criteria 1

CRITERIA	STANDARD
1. Relationship to institutional role, mission, and program priorities.	Describe how the proposed program reflects and supports the role and mission of the institution and reflects program priorities.

**Institutional Role.** The technical college’s role is to serve the community as an open admission educational resource that is responsive to both student and business needs. The Bachelor of Applied Science: Cybersecurity (BAS-C) program will uniquely serve our local community in this role. As the only local Information Technology applied baccalaureate program, the BAS-C will fulfill the needs of place-bound, working practitioner adults needing a four-year degree to progress in their field. Our Advisory Committee, composed of representatives from local business, has been requesting this degree for several years. They represent major local employers and reflect the “business needs” side of our role. Similarly, our AAS-T students have been asking for an open enrollment local baccalaureate option for years. Until recently, they have had no options. In the past three years, we have been able to refer students away from our local community to Green River College or Highline. This adds an hour or more to their commute each day. University of Washington (Tacoma), while closer, accepts only 45% of applicants and has more of a management and less of a practitioner flavor. A Clover Park Technical College BAS-C would be responsive to our students’ needs and thus fulfill our institutional role.

**Mission.** The Bachelor of Applied Science: Cybersecurity (BAS-C) supports Clover Park Technical College’s mission, “Educating tomorrow’s workforce” by producing graduates with the skills and hands-on experience to maintain, administer, and secure information technology.

The BAS-C degree has the potential to serve the workforce of virtually all local and regional businesses, not-for-profits, and governments. Every entity uses information technology. Accounting, personnel records, and inventory are universally being kept electronically. Nearly every home in America is connected to the Internet.<sup>3</sup> Information technology is the community’s arteries and veins, through which its data lifeblood flows. Searching, ordering, billing, entertaining, and socializing are all done electronically. All of this technology needs to be maintained, administered, and secured. BAS-C graduates will be prepared to fulfill these needs.

This is tomorrow’s workforce. While some information technology administration and user support may move off-shore, security administration is likely to remain close to home. Even when a company moves its information technology infrastructure to the cloud, its

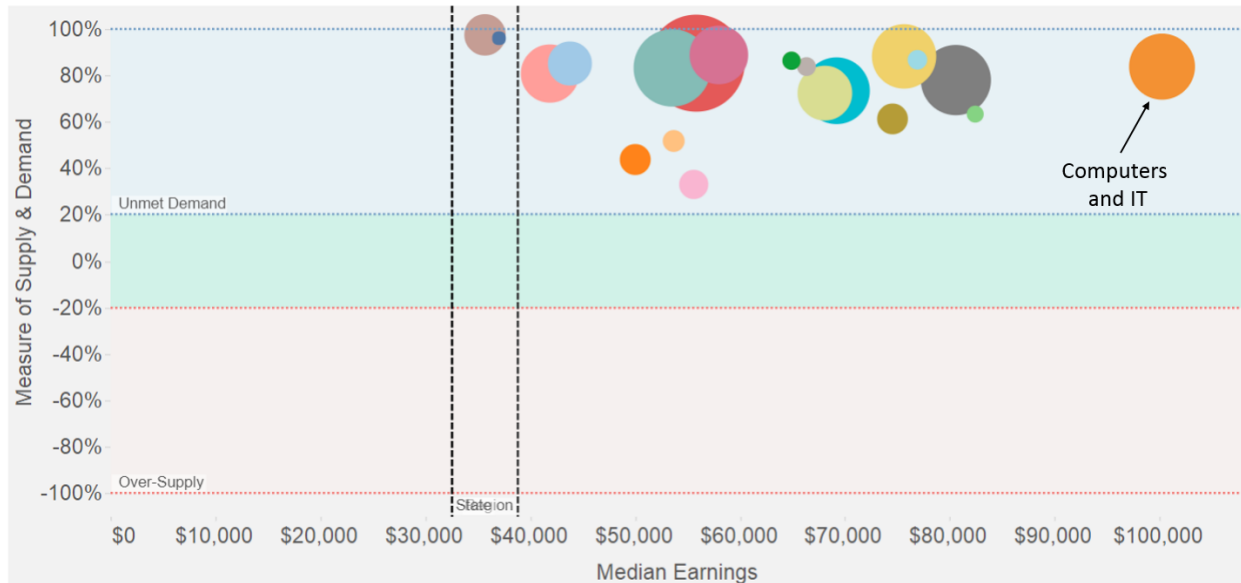
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<sup>3</sup> 98 Percent of Americans Are Connected to High-Speed Wireless Internet.

<https://obamawhitehouse.archives.gov/blog/2015/03/23/98-americans-are-connected-high-speed-wireless-internet> (accessed June 12, 2017).

administration stays local. For medium and large companies, this translates into more local cybersecurity positions. We are also seeing growth in managed security or “security as a service.” In this model, companies large and small pay to have their networks monitored by outside security experts. Clover Park is the training provider for Cyber Business Analytics, a startup in this space. These are good jobs. Many cybersecurity professionals start their career as information security analysts (ISAs). *U.S. News and World Report* ranked ISAs number 8 of the 100 best jobs for 2015 and 2017 and project growth at 36.5% through 2022. In 2017, computer systems analyst was ranked the number 2 job in all STEM fields.<sup>4</sup> Whether today’s job or tomorrow’s challenge, the BAS-C degree will serve our local workforce and business well.

Finally, the unstated mission of a technical college situated in an area with a large population of economically disadvantaged individuals is to raise students from poverty into living wages. The Information Technology field in general and Cybersecurity in particular provide high demand, high wage careers. The State Board for Community and Technical Colleges Workforce Supply and Demand bubble chart for Bachelors+ -level in King-Pierce Counties says it all:



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**Program Priorities.** The Computer Networking and Information Systems program has three priorities: Prepare students to enter the workforce; Assist students in reaching their full potential; and Maintain curriculum and facilities quality equal to industry standards while anticipating the future. The proposed program neatly supports all three priorities.

Graduates awarded the BAS-C degree will be well prepared to enter tomorrow’s workforce. Our Computer Networking and Information Systems Security (CNISS) AAT and AAS-T graduates currently enjoy an excellent employment rate with above living wage compensation. This is in

<sup>4</sup> 100 Best Jobs. (2017) *US News and World Report*. Retrieved from <https://money.usnews.com/careers/best-jobs/rankings>

<sup>5</sup> Washington State Board for Community and Technical Colleges Workforce Supply & Demand bubble chart for King-Pierce Counties Living Wage comparison: <https://cube.nchems.org/views/SBCTCSupplyandDemandVisualization/SBCTCSupplyandOutcomesVisualization?isGuestRedirectFromVizportal=y&:embed=y> retrieved July 9, 2018

part because we use a hands-on approach. Graduates leave understanding a theory because they have actually completed the task. We believe that there is no better workforce preparation than experience. The Bureau of Labor Statistics states that most Information Security Analysts job entrants have baccalaureate-level training and commanded a median salary of \$92K per year in 2016.<sup>6</sup>

BAS-C graduates, while qualified for entry-level jobs, will also qualify for jobs requiring a baccalaureate degree and training in cybersecurity. This should move them up the pay scale initially and position them for future promotion without the need for additional training. The BAS-C program does this by providing complex technical experience but also by equipping graduates with advanced communication, quantitative, and reasoning skills. These general education skills are in high demand at the middle and top of the career path. This speaks to assisting graduates to reach their full potential. The positioning for promotion without additional training is significant and goes to the heart of the word choice “Educating” vs “Training” in the College mission statement. Training is for today’s job. Education does that, but also positions the graduate for tomorrow’s opportunity. The Applied Bachelor’s degree will supply the tools needed for today’s job as well as the next stage in our graduate’s career.

BAS-C supports our program quality priority with a high-quality, hands-on program vetted by the advisory committee. The program will employ a highly-skilled faculty, state-of-the-art facilities, and the increased student supports already in place for BAS students in the College’s existing applied bachelor’s program. The BAS-C will take advantage of components of the College’s existing accredited BAS program thereby ensuring excellence from the start. The BAS-C degree will be consistent with the National Security Agency’s four-year Baccalaureate National Centers of Academic Excellence program. This as a natural follow-on to our current NSA certification in Information Assurance Education and Training (NSTISSI-4011). We view this proposal as building on our existing high quality.

## Criteria 2

CRITERIA	STANDARD
2. Support of the statewide strategic plans.	Describe how the program will support SBCTC Mission goals outline in the Mission Study and WSAC policies and goals for higher education as articulated in the Strategic Master Plan for Higher Education.

The BAS-C supports the State Board of Community and Technical Colleges (SBCTC) 2008 Mission Study (MS) published in May 2010. It also supports the Washington Student Achievement Council (WSAC) 2017-19 Strategic Action Plan (December 1, 2016) and the Strategic Master Plan Update 2012. WSAC Acquired many of the duties of the Higher Education Coordinating Board when the State abolished the latter and created the former. WSAC also inherited the

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<sup>6</sup> <https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm#tab-5>

2008 Strategic Master Plan for Higher Education in Washington. It published a Strategic Master Plan Update and several Strategic Action Plans as well as Road Maps.

The SBCTC 2008 Mission Study's overarching goal was "to find more and better ways to reduce barriers and expand opportunities so more Washingtonians can reach higher levels of education."<sup>7</sup> It lays out a ten point action plan addressing underserved populations, skills gaps, increasing baccalaureate degrees, pathways, modern learning infrastructure and modalities, and increased efficiency.

The WSAC Strategic Action Plans have as their goal achieving 100% high school graduation or equivalent and 70% of residents achieving a postsecondary credential by 2023.<sup>8</sup> An applied baccalaureate, by its nature, will not move the needle in either of these goals. Applicants will already have a high school and postsecondary credential. The BAS-C will contribute to most if not all of the plan's strategies to increase attainment. These strategies include supporting our education continuum; college and career readiness; supporting access, affordability, and quality; expanding innovative, targeted student supports to increase completion; adult reengagement; and addressing workforce shortages.

The WSAC Strategic Master Plan Update 2012 had as its theme "Raising educational attainment during challenging economic times."<sup>9</sup> Its seven steps to more successful higher education outcomes in Washington State include: increase capacity of higher education to server more students, maintain commitment to access for low-income students, build on efforts to increase transitions and completion, provide a simple funding initiative to increase the number of graduates (and) quality of education, define and develop K-12 to postsecondary program pathways, promote accelerated learning programs for high school students and adult learners, and maintain commitment to the original 2008 degree goals.

The BAS-C supports SBCTC and WSAC goals in many ways. It will promote diversity, access, opportunity, lifelong learning, affordability, increased capacity, bridge the skills gap in STEM, and address workforce shortages.

**Increasing access, opportunity, and diversity.** Clover Park Technical College is located in Lakewood, Washington. Lakewood is poorer and more diverse than Washington State overall. Lakewood's median household income is lower than the State's (\$45,261 vs \$67,106). It is more diverse (52.1% vs 69.3% white).<sup>10</sup> By locating an open enrollment applied baccalaureate in this community, we will increase access and opportunity to place bound adults, economically disadvantaged students, and to students of color. Upon graduation, these underserved populations will enjoy an opportunity to compete for many more jobs than are available at the associate's level and for substantially higher pay. A 2012 Georgetown University Center for

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<sup>7</sup> Mission Study Washington, May 2010, Community and Technical College System Mission Study Task Force, <https://www.sbctc.edu/resources/documents/about/agency/initiatives-projects/sbctc-mission-study.pdf>, retrieved August 27, 2018

<sup>8</sup> 2017-19 Strategic Action Plan, December 2016, Washington Student Achievement Council, <https://www.wsac.wa.gov/sites/default/files/2016.12.01.SAP.pdf>, retrieved August 28, 2018

<sup>9</sup> Strategic Master Plan Update 2012, November 2011, Higher Education Coordinating Board, <https://www.wsac.wa.gov/sites/default/files/SMP2012Update.pdf>, retrieved August 28, 2018

<sup>10</sup> Data USA: Lakewood, WA, DataUSA, <https://datausa.io/profile/geo/lakewood-wa/>, retrieved August 28, 2018



Education study found that new high school graduates were about three times more likely to be unemployed or underemployed than were new bachelor's degree graduates.<sup>11</sup>

	Washington	Lakewood
Median Household Income	\$67,106	\$45,261
White Residents	69.3%	52.1%
Home Ownership	62.4%	43.6%

**Role models and moving the needle in educational attainment.** A less obvious but important influence in increasing educational attainment is the effect of increasing diversity among graduates in the community. By locating the BAS-C in Lakewood, we will be helping to create very influential role models and ambassadors of diversity and success. The attainment of the degree is important, but so is the higher salary and access to more specialized positions in larger companies. We cannot overemphasize the importance of local role models of success. This is true with regards to increasing the attractiveness of STEM in general and with women in particular. It applies to motivating high school students to continue on to college as well as motivating adults to return to college. These all contribute to educational attainment. Nothing can be as influential as meeting a successful person from our town that looks as we do. The BAS-C program will be a strong, though indirect, force in moving the needle on educational attainment.

**Lifelong Learning.** The BAS degree is friendly to life-long learners by its course scheduling and its focus on state-of-the-art knowledge and skills. The degree is designed to accommodate current associate degree holders. We will offer hybrid nighttime, weekend, and online courses. While day classes may be more difficult for working adults to attend, we currently see significant traffic in our associate-level offerings by adults upgrading their IT skills. Some are recently unemployed and available for day classes. Others are adjusting their work schedule to accommodate daytime attendance. The nature of upper-level baccalaureate courses will permit more independent study and online meeting than our associate degree offerings. This should encourage lifelong learning and improve access to place bound adults.

### **Economic Growth and Innovation.**

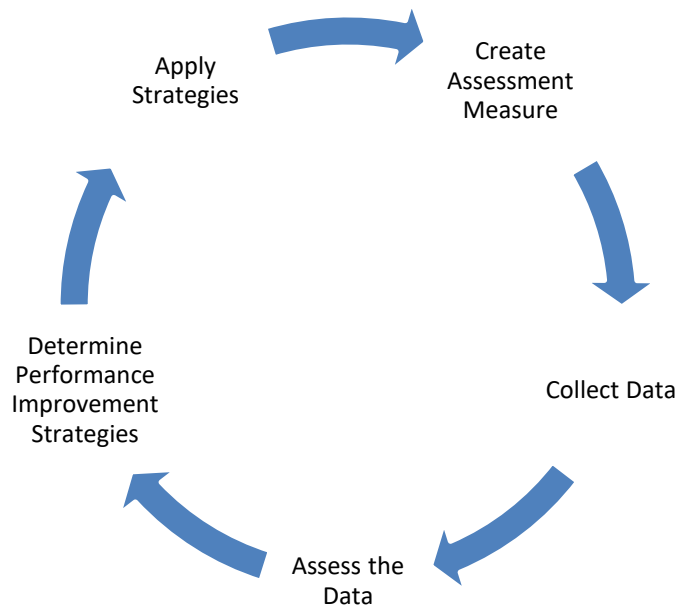
The BAS-C creates graduates to fill “unmet enrollment in high-demand STEM fields.” For our community, it improves STEM accessibility for place-bound adults. The College already has one business partner who has chosen to open a cybersecurity business in our area in part because of the advanced skills our program can bring to their employees. The demand for baccalaureate-level IT professionals greatly outstrips the supply in our area. This, undoubtedly hinders economic growth and will be discussed in the next section.

**Develop Performance-Based Improvement Strategies.** The BAS-C will continue the relationship that the associate's-degree programs already enjoy with a strong advisory committee. Members of the advisory committee provide real-time information to the faculty, who incorporate what they learn into the curriculum. The CNISS program also routinely surveys graduates to assess our success in equipping them for the requirements of their first jobs. All

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<sup>11</sup> The Barriers to a College Degree, February 20, 2013, Population Reference Bureau, <https://www.prb.org/us-college-attainment/>, retrieved July 6, 2018

programs at the College, including CNISS, have adapted the Nichols assessment system, as outlined in Diagram 1.



**Diagram 1. The Assessment Cycle for Program and Course Improvement**

### Criteria 3

CRITERIA	STANDARD
3. Employer/community demand for graduates with baccalaureate level of education proposed in the program.	<ul style="list-style-type: none"> <li>•Employer demand must exceed regional supply of graduates with relevant degrees.</li> <li>•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.</li> </ul>

#### Included Occupational Job Titles

Clover Park’s hands-on approach to learning produces graduates with skills, knowledge, abilities, and experience. We believe that before graduates can secure an information system, they need to be able to plan, install, configure, and administer that system. After all, a security analyst’s recommendations are as important as his/her findings. How can an analyst make recommendations to a system administrator if the analyst doesn’t understand the system? While our associate’s degree graduates are trained system and network administrators, most will start out as PC Technicians and User Support Specialists (Help Desk). Within one to three years, we expect most to be promoted to System Administrator. We expect a similar path to be

true for bachelor’s degree graduates. Most will likely start as System Administrators and be promoted into Cybersecurity.

The “Computers and IT” career area is composed of many career fields. A BAC-C bachelor’s degree graduate will have the communications, analytical, and cybersecurity skills, knowledge, and abilities to perform as an Information Security Analyst (Standard Occupational Code 15-1122). They would also be qualified as Computer Systems Analysts (15-1121), Network and Computer Systems Administrators (15-1142), Computer User Support Specialists (15-1151), Computer Network Support Specialists (15-1152), and finally, Computer Occupations, All Other (15-1199). According to the U.S. Department of Labor, Bureau of Labor Statistics, these occupations account for 45% of the computer related jobs in Washington State as of March 2018.<sup>12</sup> The other 55% of jobs in the “Computers and IT” career area are largely application development (programming) and research. Our graduates would not be trained and educated for those jobs.

SOC	Occupation Title	BAS-C? Opportunity	Employment State-wide	Mean Salary
15-1111	<a href="#">Computer and Information Research Scientists</a>	NO	1,340	\$135,240
15-1121	<a href="#">Computer Systems Analysts</a>	YES	17,660	\$94,470
15-1122	<a href="#">Information Security Analysts</a>	YES	2,200	\$106,040
15-1131	<a href="#">Computer Programmers</a>	NO	10,500	\$121,000
15-1132	<a href="#">Software Developers, Applications</a>	NO	51,540	\$131,430
15-1133	<a href="#">Software Developers, Systems Software</a>	NO	14,640	\$117,810
15-1134	<a href="#">Web Developers</a>	NO	5,640	\$92,260
15-1141	<a href="#">Database Administrators</a>	YES	2,190	\$98,120
15-1142	<a href="#">Network and Computer Systems Administrators</a>	YES	9,200	\$90,290
15-1143	<a href="#">Computer Network Architects</a>	YES	6,570	\$104,890
15-1151	<a href="#">Computer User Support Specialists</a>	YES	16,740	\$61,610
15-1152	<a href="#">Computer Network Support Specialists</a>	YES	3,690	\$76,970
15-1199	<a href="#">Computer Occupations, All Other</a>	YES	10,940	\$90,590
	<b>Total Employed in Washington</b>		<b>152,850</b>	
	<b>BAS-C Opportunities</b>		<b>69,190</b>	
	<b>BAS-C Opportunities %</b>		<b>45.3%</b>	

## Employer Demand and Growth

<sup>12</sup> Bureau of Labor Statistics. (2018) Occupational Employment Statistics, May 2017 State Occupational Employment and Wage Estimates Washington, [https://www.bls.gov/oes/current/oes\\_wa.htm](https://www.bls.gov/oes/current/oes_wa.htm), retrieved August 30, 2018.

SBCTC Workforce Supply & Demand data by region for King and Pierce Counties indicates that the “Computer and IT” supply meets demand at the sub-baccalaureate level. That is, supply and demand are balanced at 798 unique announcements for 722 graduates at the sub-baccalaureate level. However, the same data indicate that at the baccalaureate or higher level, demand greatly exceeds supply (11,646 to 1,888).<sup>13</sup> Out of that 9758 person shortage in our local area, our graduates would be in a career track to fill 45% or about 4400 open positions annually (see the Occupation Title chart above).

<b>Pierce and King Counties</b>	<b>Job Announcements</b>	<b>Graduates</b>	<b>Gap</b>
<b>Sub-baccalaureate</b>	<b>798</b>	<b>722</b>	<b>76</b>
<b>Baccalaureate +</b>	<b>11,646</b>	<b>1,888</b>	<b>9758</b>

The Washington State Employment Security Department is projecting 1,169 openings per year from 2014-2019 in the fields of Computer Systems Analysts, Information Security Analysts, and Network and Computer Systems Administrators.<sup>14</sup> They project the number of openings in those fields to increase by 10% for 2019-2024 period.

Between 2007 and 2013, cybersecurity jobs grew 63 percent in the Seattle area. It was ranked in the top ten cities in the US for cybersecurity employment.<sup>15</sup> The same study projected the number of jobs in cybersecurity to increase tenfold nationally between 2015 and 2025.

### **Regional Supply**

The National Center for Educational Statistics reports 1,551 bachelor’s degrees conferred by postsecondary institutions in Washington State in the computer sciences during the 2015-2016 academic year.<sup>16</sup> Integrated Postsecondary Education Data System (IPEDS) as reported in the State Board for Community and Technical Colleges “Workbook: SBCT Supply and Demand Visualization” reports 1,888 graduates in the “Computer and IT” career area in Pierce and King counties alone.<sup>17</sup>

<sup>13</sup> State Board for Community & Technical Colleges Workforce Supply & Demand. Retrieved from <https://cube.nchems.org/views/SBCTCSupplyandDemandVisualization/SBCTCSupplyandOutcomesVisualization?isGuestRedirectFromVizportal=y&:embed=y> (accessed June 5, 2018).

<sup>14</sup> Employment Security Department. (2017) Employment Projections. <https://fortress.wa.gov/esd/employmentdata/reports-publications/industry-reports/employment-projections> (accessed March 3, 2017).

<sup>15</sup> Setalvad, Ariha. (2015). Demand to fill cybersecurity jobs booming. Peninsula Press, Stanford Journalism. Retrieved from <http://peninsulapress.com/2015/03/31/cybersecurity-jobs-growth/>

<sup>16</sup> Table 319.30. Bachelor’s degrees conferred by postsecondary institutions, by field of study and state or jurisdiction: 2015-16, National Center for Educational Statistics, 2017, [https://nces.ed.gov/programs/digest/d17/tables/dt17\\_319.30.asp](https://nces.ed.gov/programs/digest/d17/tables/dt17_319.30.asp) , retrieved August 30, 2018.

<sup>17</sup> State Board for Community & Technical Colleges Workforce Supply & Demand. Retrieved from <https://cube.nchems.org/views/SBCTCSupplyandDemandVisualization/SBCTCSupplyandOutcomesVisualization?isGuestRedirectFromVizportal=y&:embed=y> (accessed June 5, 2018).

A more focused search within a 30 mile radius of CPTC has resulted in the following list of universities and colleges that offer BS or BAS degrees in some form of Information Technology

<b>Pierce and King Counties Universities &amp; Colleges</b>	<b>Degrees Offered</b>	<b>2016-2017 Graduates (IPEDS data)</b>
Green River College	BAS, Information Technology	52
Highline College	BAS, Cybersecurity & Forensics	8
University of Washington, Tacoma	BS, Information Technology	258
Central Washington University (Pierce County)	BS, BAS, Information Technology & Administrative Management	95*

\* CWU's BS and BAS graduates include both the Administrative Management concentration and the Cybersecurity Concentration. The degrees could be completed in Pierce County, Ellensburg, or entirely online.

### **Extra-Regional Supply**

According to the Workforce Training and Education Coordinating Board, Washington ranked sixth in the Top 10 States for H-1B Visa Petitions in 2010.<sup>18</sup> Of those workers, 75% were in the Computer and Mathematical Occupations career field. This means that instead of producing graduates within our own state to supply our IT needs, colleges supplied so few graduates that employers were forced to recruit from abroad.

### **Regional Employer Demand Greatly Exceeds Supply**

Any way that we divide or project the numbers, the regional demand greatly exceeds supply. If we assume no growth in the field in the last two years, there would still be 11,646 baccalaureate job announcements in Pierce and King Counties. With unemployment at a generational low and the economy growing at a generationally high rate, this is a conservative number indeed. We'll use the higher of the two baccalaureate supply numbers: 1,888. If every program grew by an astonishing 30% in each of the last two years, we would see 3191 graduates this year. We are still 8455 people short in Pierce and King Counties. Even if we double the number of programs and assume the same high growth rate, we will be short people to fill jobs. Clearly, the regional demand greatly exceeds supply.

## **Criteria 4**

<b>CRITERIA</b>	<b>STANDARD</b>
4. Applied 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.

### **Foundational Program: CNISS**

<sup>18</sup> Workforce Training and Education Coordinating Board. (2011) H-1B Workers in Washington. Helping Fill and IT Skills Gap. October 2011. [http://www.wtb.wa.gov/Documents/H1B\\_2011\\_Report.pdf](http://www.wtb.wa.gov/Documents/H1B_2011_Report.pdf) (accessed June 12, 2017).

For the past seven years, the Computer Networking and Information Systems Security (CNISS) program at Clover Park Technical College has provided students with a solid grounding in Information Technology and Cybersecurity at the associate's level. While the program offers several standalone certificates for both entry-level and returning student study, its most popular offering is the AAT / AAS-T degree.

The AAT / AAS-T curriculum provides robust college-level general education as well as generic computer technology and specialized computer security training. All students qualify as PC Technicians, User Support / Help Desk Technicians, and Junior System Administrators. They then specialize in either Computer and Communications Security or Network Administration and Security. Both options include an internship with a local company to apply what they have learned in information technology.

### **Computer and Communications Security Option**

Computer and Communications Security option students complete hands-on coursework in cyber hacking and incident response. The skills, knowledge, and abilities learned position students for entry-level opportunities as penetration testers and incident responders.

### **Network Administration and Security Option**

Network Administration and Security option students complete the Cisco Networking Academy's Cisco Certified Network Associate (CCNA) in Routing and Switching curricula, as well as CCNA Security curricula. Networking students are qualified for entry network technician, network administration, or systems administration positions.

Throughout the program, all students employ the technologies they study in hands-on laboratories using the most current versions of computer hardware and software. This provides a solid base on which to build the BAS degree.

### **Enrollment History**

The enrollment has maintained 240 and above unduplicated headcount for the last five years. We can trace the 2014-15 to 2015-16 drop in enrollment (below) to two changes. The first is internal. We cut our course offerings by 20 credit hours in an effort to improve our program quality. We used to offer a third option after the core: Microsoft Windows Server Administration. With the recommendation of our advisory board, we replaced some courses in our core with server administration courses. As a result, all students get a thorough grounding in how to administer Microsoft server products. Unfortunately, fewer students opted to take a second or third option at the College. This reduced the student's average stay at the College and hence, headcount. The other change was Green River College opening its BAS program. We began advising our students who could continue their education to matriculate there. The result was, again, fewer students opting to take a second option.

<b>Year</b>	<b>Annual Unduplicated Headcount</b>
2016-17	246
2015-16	240
2014-15	265
2013-14	260
2012-13	254

**Table 3. CNISS Enrollment History**

### **Program History**

CNISS can trace its lineage to the opening of the Electronics and TV Training Department of Clover Park Vocational Training Institute in 1960 in Building 11. Its current home, Building 16, was dedicated on February 9, 1984 as the Electronics Building.<sup>19</sup> In 2010-11 the Computer Information Systems Security and Computer Networking Technology programs combined to

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<sup>19</sup> Clover Park Technical College. The Way It Was. A History of Clover Park Vocational Technical Institute. <http://www.cptc.edu/sites/default/files/old-files/full-history.pdf> (accessed June 12, 2017).

form the current Computer Networking and Information Systems Security Program.<sup>20</sup> The Program now employs six full-time tenured or tenure-track instructors.

### Criteria 5

CRITERIA	STANDARD
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.

#### Graduates in the Region

In addition to our AAS-T students and those that desire a bachelor's program, our program will attract transfers from our sister colleges in the area. Bates Technical College, Tacoma Community College (TCC), and South Puget Sound Community College all offer associate level degrees in information technology but offer no bachelor's degree in cybersecurity. We currently enroll several students each year from nearby colleges who are looking for a hands-on experience. We will seek articulation agreements with all of these nearby colleges for our baccalaureate degree. Those discussions have already begun.

#### Student Demand

Based on industry demand, historical data, and the 2018 survey of CPTC students, we project that student demand will be at least 20 new students per year for a steady state of about 45 total students in the BAS-C. This estimate is also based upon the number of Clover Park AAS-T graduates who have moved to Green River Community College BAS, Highline Community College BAS, and Western Governors University online B.S. programs, as well as anecdotal information of students who choose not to attend Clover Park because we don't offer a bachelor's degree in Cybersecurity.

During winter quarter 2018, Computer Networking and Information Systems Security students in the core of the program were surveyed regarding a proposed BAS. Table 4 shows the high interest in a BAS-C program at CPTC. Students not surveyed include first quarter students (no basis to judge), students finishing their degree and only taking general education courses (not present), students absent, and anyone choosing to not participate.

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<sup>20</sup> 2010-2011 Catalog. Clover Park Technical College. <http://www.cptc.edu/sites/default/files/files/cptc-catalog-2010-2011.pdf> (accessed June 12, 2017).



Question	# of Responses	% of Responses
I am definitely <b>not</b> interested in earning an IT bachelor's degree at Clover Park.	2	2.7%
I'm not sure.	11	14.9%
I would like to earn my bachelor's here <b>at night</b> while I work. I understand that it could take 3 years to finish.	<b>11</b>	<b>14.9%</b>
I would <b>absolutely</b> stay and work another 18 months to earn my bachelor's here in a <b>daytime</b> program.	<b>50</b>	<b>67.6%</b>
Total Positive Responses	66	82.5%

**Table 4. Survey of Current Students**

An August 2015 email survey of Clover Park CNISS graduates revealed that all graduates attending resident on-ground bachelor's programs were attending Green River College. Apart from two students, all other respondents were enrolled in the online baccalaureate program at Western Governors University. This survey went out to all CNISS graduates from the 2013-14 and 2014-15 academic years. Only about 20% of graduates responded. We currently average about 12 of our graduates attending Green River College and two graduates attending Highline Community College. Our students report wait-times to enter Green River of one year or more. We also have graduates enrolled at Western Governor's University. These graduates were not willing to travel the extra 46 miles every day (to either college) or were working when classes met.

### **Projected Enrollment.**

Based on the current and former graduates of Clover Park who have enrolled in BAS programs at regional and online colleges, and the current AAS-T students enrolled in similar programs at neighboring colleges, the projected enrollment is estimated in Table 5, below.

Year	Projected Enrollment
2019-2020	15
2020-2021	25
2021-2022	35
2022-2023	40
2023-2024	45

**Table 5. Projected Enrollments by Year.**

In the first year, we expect most of our enrollment to come from within. Expanded marketing to industry where working adults are found, will increase enrollment in subsequent years. Additionally, in the second year we will retain those rising juniors and begin a new cohort. We expect to create MOU's with neighboring institutions. A local offering with both a hands-on component and convenient scheduling should draw significant numbers of these AAS-T graduates. Further, we will explore the population of separating service members from Joint Base Lewis-McChord. Clover Park already partners with the base in many ways.

## Criteria 6.

CRITERIA	STANDARD
6. Efforts to maximize state resources to serve place-bound students.	<p>Describe how program will serve place-bound working adults.</p> <p>Identify similar program offered by public or independent institutions in the region.</p> <p>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.</p> <p>Describe collaboration with similar CTC BAS programs and related CTC Centers of Excellence.</p> <p>Describe unique aspects of the proposed program that differentiate it from similar programs and/or describe why expansion would be desirable or necessary.</p>

### **Serves Local, Place-Bound Working Adults**

Once running, the Clover Park Technical College BAS-C program will be the only open admission cybersecurity bachelor’s program within a 20-mile radius. In addition to our residents who are place-bound by home and family commitments, we serve the Joint Base Lewis-McChord community. This population includes military members nearing separation from the armed forces and able to attend school, but are place-bound by their responsibilities at the military installation.

Nearby comparable programs include Green River College’s BAS-IT Network Administration and Security, Highline College’s BAS Cybersecurity and Forensics, and University of Washington Tacoma’s Bachelor of Science Information Technology. Of the three, Green River’s program most closely aligns with ours. We have graduates attending all three programs. Green River and Highline are both about 23 miles from our campus. University of Washington’s program is geographically closer but more of a generalist degree: it has more computer application development content and less security content than our proposal. We have had very few graduates enter UW Tacoma. This may be, in part, due to their 45% acceptance rate.<sup>21</sup>

### **Course Schedule**

We will offer online, hybrid, and evening courses that support place-bound working adults. The program will share general education courses with our BAS Operations Management program. This will make running both programs more efficient and provide students with a wider selection of schedule and modalities from which to choose.

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<sup>21</sup>U.S. News and World Report. University of Washington Overview. <https://www.usnews.com/best-colleges/university-of-washington-3798>, retrieved 12/20/17

## **Collaboration**

We have explored articulation with local colleges for our AAS-T graduates. We currently have agreements with 17 colleges. Most significant of these are Green River, Highline, and Western Governors University. We have not found enough in common with UW Tacoma to articulate there. Despite these agreements, we believe that there is an underserved population in Lakewood that would benefit from this program.

We have formally presented proposed course outcomes to our Advisory Committee and incorporated their input. We have also incorporated input from mid and high-level Information Technology managers in our area who are not on our Advisory Committee. These contacts frequently start out as requests for training and turn into “what we really need now” discussions.

We have contacted Green River, Highline, UW Tacoma, Evergreen, South Puget Sound, Pierce College, TCC, Bates, and CWU extension at Pierce regarding our proposal. We see articulation opportunities with South Puget Sound, TCC, Pierce, and Bates. They have associate’s degree offerings that would be compatible with our proposal. We are exploring cross listing opportunities with UW Tacoma, Highline, Evergreen, and CWU for courses in specialized technologies or expertise that CPTC cannot economically offer. An example might be mobile forensics or elements of secure coding. Lastly, we are exploring collaboration opportunities with TCC and CWU for locally offered general education courses with an IT flavor. An example of this would be a project management course using information technology examples.

We have reached out to the four colleges or universities that might be seen as competitors in the BAS-Cybersecurity space. Green River College supports our proposal as they are inundated with applicants and we are outside of their market area. University of Washington Tacoma does not object. Highline College and Central Washington University Pierce County Extension are still studying the proposal. It would not be a surprise to hear objections from either of these institutions as they are all still in a growing phase of their program development. We believe that we are outside of Highline College’s market area. We believe that Central Washington’s offering has a management focus that will differ significantly from our analyst practitioner focus.

Clover Park is a member of Cyberwatch West, The Center for Cybersecurity Education. It is National Training Standard for Information Systems Security Professionals (NSTISSI-4011) certified and will be transitioning into the new National Security Agency / Department of Homeland Security National Centers of Academic Excellence in Cyber Defense model shortly. These programs are not only a platform for collaboration and curriculum sharing, collaboration is a requirement of membership. As CPTC completes its application for the NSA/DHS Center of Academic Excellence designation, we anticipate UW Tacoma to be our sponsor.

The College conducts outreach to area high schools and the Pierce County Skill Center. In the past, these events have included providing speakers and workshops at their locations. We also have hosted the Washington Skills USA and Women In STEM events on our campus.

## **Unique Program**

This proposal differs from similar programs in the area by its location and course content. There are no hands-on cybersecurity bachelor’s programs within 20 miles of Lakewood.

Outside of the 20-mile radius, we differ from Highline's offering in that they focus on digital forensics whereas we will focus on risk assessment and incident response. Digital and network forensics are a component of our proposal, but not the focus. Green River's program is currently overloaded with students. Our graduates enrolled at Green River report enrollment wait-times exceeding one year. Opening a nearby program would relieve this pressure and increase student access to education and advancement. Our program should be comparable in content to Green River's but with less application / database development and more incident response content. University of Washington (Tacoma) offers a BS in Information Technology and Application as well as a Master of Cybersecurity and Leadership. Clover Park's program will have less application development content and more cybersecurity focus. It will also provide academic access to our residents who do not meet UW's acceptance criteria. We expect to accept students four times a year versus UW's Fall only model. This is consistent with our AAS--T enrollment cycle. Central Washington University (Pierce County) BAS/BS Information Technology and Administrative Management (ITAM) with a specialization in Cyber Security has more leadership / managership content and less hands-on technical content than our proposal. College Clover Park's intention is to produce a graduate who is first and foremost a skilled practitioner rather than a program manager. This differentiates us from other programs and keeps faith with our vocational / technical heritage.

## **Conclusion**

Cybersecurity is a fast growing, in-demand field with large gaps between Washington job opportunities and graduates produced and much greater gaps across the nation. Our hands-on program with online and evening courses has the potential to increase the income and career growth of our graduates and place-bound working residents of the Lakewood, Washington area. Lakewood, being much more diverse than Washington in general, is an ideal place to anchor a cybersecurity baccalaureate program as a lever to increase inclusiveness and provide opportunity to an underserved population.

## Applied Baccalaureate Degree Supply/Demand Gap Rubric for College

The goal of this rubric is to help you build a program that will meet the needs of your community. We have given you options about the information you can use to support the need for your new program. Also, the guidelines for estimating the supply/demand gap are similar to the ones we use for other program applications. We hope this makes the rubric more familiar to you. If not, contact Joyce Hammer at [jhammer@sbctc.edu](mailto:jhammer@sbctc.edu) for further information.

The application needs to show the information below for program approval:

- employers demand\* the level of technical training proposed within the program, making it cost-effective for students to seek the degree;
- lead to high wage-earning jobs; and
- the proposed program fills a gap in options available for students because it is not offered by a public four-year institution of higher education in the college's geographic area.

<b>College Name: Clover Park Technical College</b>	
<b>Program Name: Computer Networking and Information Systems Security</b>	
Select one: Existing Occupation <input checked="" type="checkbox"/> or Emerging Occupation <input type="checkbox"/>	
<b>If local demand/supply information is available for the specified degree program and target occupation(s),**</b>	
<p><b>For demand:</b> Provide local/regional demand data for the targeted occupation job title(s) from traditional labor market data, industry data, trade association data, or other transactional data. <i>(Provide absolute numbers, not just percentages)</i></p>	<p><b><i>The facts and figures below are documented within the Statement of Need.</i></b></p> <p>National Center for Higher Education Management Systems data for King and Pierce Counties show 11,646 average annual job postings for Computers and IT jobs. The Washington State Employment Security Department projects the number of openings in these fields to increase by 10% for 2019-2024 period.</p>

<p><b>For supply gap:</b> Provide data on the number of programs and the number of annual program graduates for all four-year colleges that supply your region. Is the number of current annual graduates insufficient to meet current and projected demand? (The result of demand minus supply).</p>	<p><b><i>The facts and figures below are documented within the Statement of Need.</i></b></p> <p>The same data shows the average annual graduates at the bachelor's or higher level to be 1,888. The average annual demand – supply gap is 9758 computer and IT openings for the King-Pierce area. We expect our graduates to be on a career track for about 45% of those openings or a supply <u>gap</u> of 4390 openings per year. See table in Criteria 3 for detailed information of similar degree programs in the region.</p>
<p align="center"><b>OR, if demand information is not available or it is a new/emerging/changing occupation, **</b></p>	
<p><b>For demand:</b> Provide employer survey results for local demand for the targeted occupation job title(s) to support the demand and education level for the program. <u>Survey requirements are listed below.</u></p>	
<p><b>For supply gap:</b> Provide employer survey results for local supply for the targeted occupation job title(s) to support that there is a gap in the number of qualified applicants available to fill jobs. <u>Survey requirements are listed below.</u></p>	
<p align="center"><b>OR, if based on a statutory or accreditation requirement, **</b></p>	
<p><b>Select one:</b> Statutory Requirement <input type="checkbox"/> or Accreditation Requirement <input type="checkbox"/></p>	
<p><b>For demand:</b> Provide labor market information on the current education requirements for the job, including evidence of recent openings for requiring or preferring bachelor's degrees or above. Cite the statute or certifying body, your proposed program is based upon that has specified a bachelor's or above in the field is needed.</p>	
<p><b>For supply gap:</b> Provide employer survey results for local supply for the targeted occupation job title(s) to support that there is a gap or that employers anticipate a gap in the number of qualified applicants that will be available to fill jobs with the new requirements. <u>Survey requirements are listed below.</u></p>	

\* Demand is defined by state law as “***an occupation with a substantial number of current or projected employment opportunities.***”

\*\*Applications may include information related to more than one option (i.e., labor market data to support the local demand for the occupation and a local employer survey to support that there is a gap in the number of qualified applicants available to fill jobs).