Community Colleges of Spokane

Spokane Falls Community College

Bachelor of Applied Science Degree in Cyber Security

Program Proposal

January 2017

Contents

Cover Sheet New Degree Program Proposal

Program Information

Institution Name: Spokane Falls Community College (SFCC)

Degree Name: Cyber Security **CIP Code:** 11.0103

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

Degree: AAS Information Technology **CIP Code:** 11.1006 **Year Began:** 1996

Proposed Start Implementation Date: Fall 2017

Contact Information (Academic Department Representative)

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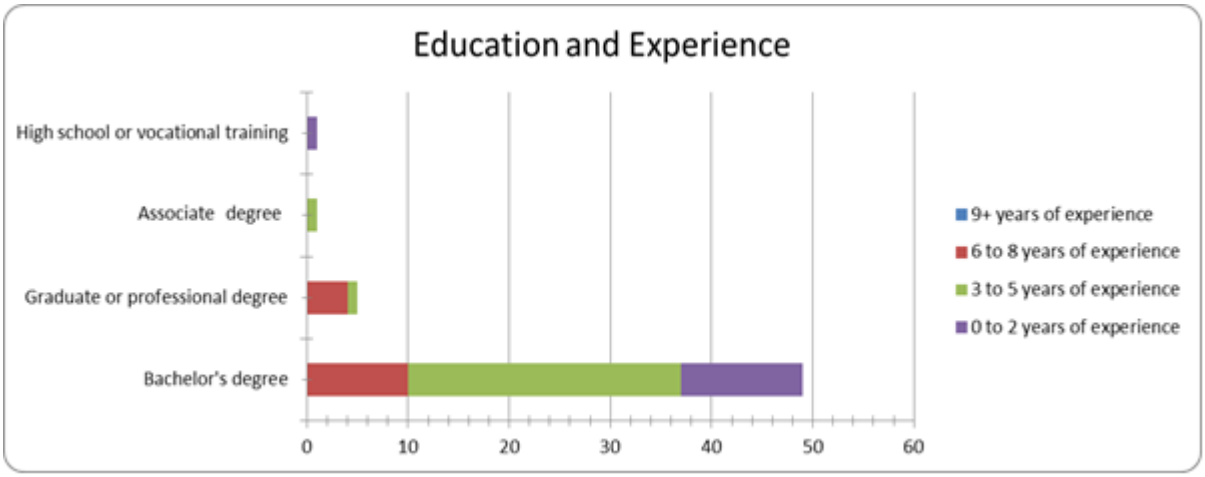
Chief Academic Officer **11/04/2016**
Date

Introduction

Spokane Falls Community College's Bachelor of Applied Science degree in Cyber Security (BAS Cyber) has been developed to meet the growing demand for qualified workers in the field of Cyber Security. Nationally, the Bureau of Labor Statistics considers a bachelor's degree as entry-level education for the following IT/Cyber Security occupations: computer network architect, computer programmer, computer support specialist, computer systems analyst, database administrator, information security analyst, web developer, network and computer system administrator and software developer.[1] In the Spokane region, the expected level of education for most information and cyber security positions is now a four-year degree according to a recent analysis of 56 regionally posted positions in Cyber and Information Security (Table 1). As a result, new and current students looking to enter the field will need to extend their preparation through a baccalaureate program, and many current professionals will need additional baccalaureate level education.

Table 1 Requirements for Regional Cyber Jobs[2]



Spokane Falls Community College's proposed BAS Cyber degree will be designed to meet the needs identified by employers for network and computer systems administrators, information security analysts, data specialists and computer network support specialists by providing a pathway to an applied baccalaureate degree for students with two-year technical degrees in IT. Graduates of the BAS Cyber program will have a broad base of theoretical and technical knowledge, as well as specialized knowledge in areas such as encryption, risk management, compliance and regulation, ethical hacking and security policy.

[1] United States Department of Labor, Bureau of Labor Statistics (2014, January 8). Retrieved from http://www.bls.gov/ooh/computer-and-information-technology/home.htm

[2] Burning Glass, Labor Insight/Jobs (2016, July 8th) Retrieved from http://laborinsight.burning-glass.com/jobs/us#/sharedsavedreports/sharedsaved

Criteria 1: Curriculum Demonstrates Baccalaureate Level Rigor

Program Learning Outcomes

The BAS Cyber builds on technical skills that entering students bring from their associate degrees, adding theoretical knowledge, general education, and advanced technical skills. Successful graduates of the Cyber Security degree will be able to:

- Prepare a security and risk management plan including compliance, law, regulation and business continuity.
- Apply a comprehensive process to ensure the protection and security of assets.
- Compare and contrast different security models and engineering processes including security architectures, designs, systems vulnerabilities and cryptography.
- Employ encryption technologies to protect data transmissions and data storage.
- Develop a comprehensive identity management and access control plan.
- Design security assessment and testing process comprising design, performance and analysis security testing.
- Analyze and formulate security operations approaches related to foundational concepts, investigations, incident management, and disaster recovery.

Admission Requirements

The BAS Cyber has been designed for individuals who have earned a career technical degree in an IT related area. Students who hold technical associate degrees in information systems and technology will typically be able to complete the BAS Cyber in two years of full-time study. It is recommended that AAS coursework include college-level general education courses as 15 general education credits. 15 general education credits will be required prior to being admitted into SFCC's Bachelor of Applied Science in Cyber Security program. Applicants who hold an IT related associate degree from an institution other than SFCC will also be eligible for program admission. Prerequisite core technical knowledge will be assessed through transcripts provided to SFCC or through prior learning assessment (PLA).

Applicants to the BAS Cyber will need to meet the minimum requirements outlined in the following table. These program admission requirements have been designed to ensure that prospective applicants are prepared for success once they enter the program and are aware of the increased general education expectations that accompany a baccalaureate program.

Table 2 Entry Requirements for SFCC BAS Cyber Security

Prerequisites	Explanation
Associate degree in IT related field	From an accredited institution
Cumulative GPA of 2.5	In prerequisite associate degree
Minimum grade of 2.0 in all required courses	IT courses required within associate degree
General education courses	At least 15 credits (see Table 5)

Core Technical Requirements

All applicants to the BAS Cyber program are expected to have core technical skills as a foundation for further study. The next table outlines these expected skills acquired prior to entering the BAS Cyber program, presented as SFCC IT courses. For candidates lacking SFCC-specific coursework, core technical knowledge will be assessed through transcripts or through prior learning assessment if candidates pursue credit by PLA portfolio[3].

Table 3 Core Technical Requirements

Subject	Credits	Course	Level
Unix / Linux Skills	5	CS 121 Unix / Linux or equivalent	Associate
Ethics & Law	5	IS 132 Computer Ethics & Law or equivalent	Associate
Networking Knowledge	5	IS 262 Network Management or equivalent	Associate
Security Knowledge	5	IS 245 Network Security II or equivalent	Associate
Total Required	**20**		

[3] http://www.spokanefalls.edu/admissions/pla.aspx?page=PV3 11.12.2014

Upper Division Coursework - Cyber Security

Central to the program are the courses that support the theory, applications and skills associated with a baccalaureate degree in cyber security. The following table lists the upper division coursework designed to support SFCC's Cyber Security degree.

Table 4 BAS Cyber Security Junior/Senior Major Specific Coursework

Courses	Credits
MMGT 342 Project Management	5
CYBR 350 Risk Management	5
CYBR 410 Cryptography	5
CYBR 320 Ethical Hacking	5
CYBR 330 Endpoint Security	5
CYBR 430 Cyber Security Policies and Management	5
CYBR 440 Security and Compliance	5
CYBR 470 Identity Management	5
CYBR 475 Capstone/Internship	5
CYBR Upper Division Core Classes	**45**

General Education

General education is an important component of all applied baccalaureate degrees, providing graduates with a foundational understanding in composition, quantitative skills, humanities, social sciences and natural sciences. Spokane Falls Community College has planned carefully to ensure that general education credits and courses meet state guidelines for general education in its applied baccalaureate degrees.[4] General education credits will comprise a minimum of 60 credits within the four years of the BAS Cyber. As a result, a graduate of the BAS Cyber will have the balance and breadth of knowledge provided by a foundation in general education complementing and supporting the technical knowledge developed throughout the degree pathway.

[4] http://www.sbctc.edu/college/e_appliedbaccalaureates.aspx 09.17.2014

For a typical student, the expectation is that at least 15 general education credits be satisfied at the associate degree level, confirmed by entrance prerequisites (15 credits of general education are required in SFCC's Information Technology AAS degree). The remaining 45 credits will be satisfied through the applied baccalaureate program. Complete general education requirements and course recommendations for the full four year program are outlined in the following table with the level of expected completion. Most of these classes are offered on-ground and online. Spokane Falls Community College course numbers are used in the table; equivalent courses from other colleges will fulfill requirements as well.

Table 5 General Education Requirements BAS Cyber Security

Subject	Credits	Course	
Communication Skills (must include English Composition)	20	ENGL& 101	English Composition
		ENGL 235 CMST 320 CMST 430	Technical Writing Professional Communication Organizational Communication
Quantitative Skills (college-level math)	5	MATH&107 MATH&141 MATH 300	Math in Society (or) Pre-Calculus (or) Applied Statistics
Humanities (recommended courses)	10	CMST 227	Intercultural Communication
		PHIL 330	Professional Ethics
Social Sciences (recommended courses)	10	PSYC 333	Motivation
		ECON 202	Macro Economics
Natural Sciences (recommended courses)	10	PHYS 100	Introductory Physics (lab course)
		GEOL& 100	Survey of Earth Science
Other	5	5 additional credits of General Education coursework	
Total Required	**60**		

Table 6 Associate of Applied Science in Information Systems

Subject	Credits	Course	Level
BT100	1	Beginning Keyboarding	Associate
ENGL&101	5	English Composition I	Associate
IS101	1	Planning for Information Technology Students	Associate
IS103	5	Information Technology Fundamentals	Associate
IS105	3	Applications for IT I	Associate
IS107	3	Applications for IT II	Associate
IS132	5	Computer Ethics and Law	Associate
IS140	5	Network Support	Associate
IS144	3	Programming Fundamentals	Associate
CS121	3	UNIX/Linux	Associate
ENGL&235	5	Technical Writing	Associate
IS162	3	Data Communications and Networks	Associate
IS210	5	Internet Programming I	Associate
CS223	5	Programming for IT	Associate
IS260	5	Database Theory	Associate
IS262	5	Network Management	Associate
IS234	5	Computer Forensics	Associate
IS244	5	Network Security I	Associate
IS228	5	Internet Servers	Associate
IS245	5	Network Security II	Associate
IS266	1	Cooperative Education Seminar	Associate
IS267	2	Cooperative Education Work Experience	Associate
PHYS100	5	Introductory Physics	Associate

Table 7 Bachelor of Applied Science in Cyber Security

Subject	Credits	Course	Level
ISIT310	5	Routing and Switching in the Enterprise	Bachelor
ISIT344	5	Virtualization and Storage	Bachelor
PSYC333	5	Motivation and Leadership	Bachelor
CMST430	5	Organizational Communication	Bachelor
ISIT332	5	Data Warehousing	Bachelor
Science	5	Natural Science Non Lab Science (AA distribution list)	100/200
CMST 320	5	Professional Communication	Bachelor
ISIT360	5	Database Application Development	Bachelor
Math	5	MATH&107, MATH&141, MATH300	100/200
ISIT444	5	Automation/ Configuration Management	Bachelor
ECON202	5	Macro Economics	100/200
PHIL330	5	Professional Ethics	Bachelor
MMGT342	5	Project Management	Bachelor
ISIT410	5	Enterprise Server Administration	Bachelor
ISIT470	5	System Analysis and Design	Bachelor
CMST227	5	Intercultural Communication	100/200
ISIT475	5	Capstone/ Internship	Bachelor
Gen Ed	5	Additional General Education (AA distribution list)	100/200

90 credits	Associate of Applied Science in Information Systems
90 credits	Bachelor of Applied Science in Cyber Security
180 credits	Total

A student attending full-time with 15 credits per quarter can expect to complete the degree in six quarters over two years, depending on time of entry. A full-time and part-time student sample schedule is shown in the following table.

Table 8 Example Schedules BAS Cyber Security

Full-time schedule			
Fall – Year 1	**Winter – Year 1**	**Spring – Year 1**	**Summer – Year 1**
CYBR 350	CMST 430	CMST 320	
CYBR 410	CYBR 320	CYBR 330	
PSYC 333	Science Course	MATH 300 (or 107, 141)	
Fall – Year 2	**Winter – Year 2**	**Spring – Year 2**	**Summer – Year 2**
CYBR 430	MMGT 342	CYBR 475	
ECON 202	CYBR 440	CMST 227	
PHIL 330	CYBR 470	Gen Ed Course	

Part-time schedule			
Fall – Year 1	**Winter – Year 1**	**Spring – Year 1**	**Summer – Year 1**
CYBR 350	CYBR 320	CYBR 330	
PSYC 333	CMST 430	MATH 300 (or 107, 141)	
Fall – Year 2	**Winter – Year 2**	**Spring – Year 2**	**Summer – Year 2**
CYBR 410	CYBR 440	CMST 227	
ECON 202	Science Course	Gen Ed course	
Fall – Year 3	**Winter – Year 3**	**Spring – Year 3**	**Summer – Year 3**
CYBR 430	MMGT 342	CMST 320	
PHIL 330	CYBR 470	CYBR 475	

The program coordinator, completion coach and faculty will work with each student to develop an academic plan, ensuring that full-time and part-time students are able to efficiently meet their degree goals.

Program Evaluation Criteria and Process

Spokane Falls Community College offers BAS degrees, AAS degrees, AAS-T degrees, and Certificates supporting twenty career technical programs. Each program conducts a regular assessment of program outcomes. The college has established a program review process supported by a Program Review Committee that assesses the achievement of program learning outcomes and goals on a three-year cycle. Individual program reports are summarized by an annual report. All reports are shared with appropriate administrators and planning groups. As with all applied baccalaureate programs at SFCC, the Cyber Security BAS degree will be included in the review process.

In assessing program learning outcomes, faculty design, implement and refine assessment models and measures, ensuring that every program outcome is associated with an appropriate measure and threshold. The expectation is that falling below a threshold warrants action. Each program is also provided with an annual program review that examines retention, graduation, program course scheduling practices, employment data, demand data, student financial aid debt and diversity measures. Finally, feedback surveys are conducted with students early in the program, late in the program and after graduation. The full program review process then informs program faculty, advisory committees, administrators and college planning efforts as these results will be used to inform and implement changes to courses and programs.

A complete program evaluation will be completed every three years, although many components will be evaluated on an annual basis. Working in cooperation with the Program Review Committee and department faculty, the advisory committee's role will be to recommend curriculum improvements, help keep the program abreast of changes in the field, assist in student recruitment and placement and make recommendations for other changes that will keep the program current. Experts from cyber security and higher education will be engaged throughout the full curriculum development and implementation phase to ensure rigor of the content and learning methodologies. Upon implementation, external experts with experience in IT, cyber security and higher education will assess program curriculum and courses to ensure rigor, consistency and quality.

Table 9 SFCC Program Review

Assessment	Cycle	Metrics
Learning Outcome Assessment	Every 3 years	Annually identify outcomes to be assessed, measures and thresholds
Student success measures	Annual report	Course success rates, retention rates, graduation rates, financial aid debt, schedule review, diversity indicators
Employment	Annual Report	Graduate survey, Wage data from DLOA
Demand	Annual Report	Regional data on postings, number employed, mean salary, desired wage and education level

Criteria 2: Qualified Faculty

Spokane Falls Community College expects an enrollment of 16 students during the first operational year of the BAS Cyber, with enrollment increasing to 38 students by 2021. As a result, the program projects a need for additional adjunct support in years one and two and one new full-time faculty in year three. Faculty teaching general education courses will teach these courses as part of their ongoing load, so no additional faculty will be required in areas outside of the primary department. Faculty teaching in the program core will typically be required to hold a minimum of a master's degree. Some requirements may be made based on a combination of baccalaureate degree and industry experience.

Total full-time equivalent faculty (FTEF) assigned to the program is projected to be 2.0, though instructors will typically teach in both baccalaureate and associate degree programs to ensure continuity and consistency across curricula.

Table 10 Faculty Profiles

Faculty Name	Credentials	Status	Courses
Brent Booth	Ph.D.	FT	Business Management
Rick Dubois	MA	FT	Associate, BAS
Max Josquin	MEd	FT, Department Chair	Associate, BAS
Mark Neufville	MEd	PT	Associate, BAS
Brady Nielsen	MBA, MSIA	FT, Program Lead	Associate, BAS
Ron Price	MBA	FT	Associate, BAS
Rick Udlock	MS	PT	Associate, BAS
New FTEF	TBD, Ph.D. preferred	FT – To be hired 2019	Associate, BAS

Table 11 General Education Faculty Profiles

Faculty Name	Credentials	Status	Courses
Britni Weaver	MA Philosophy	FT	Philosophy
Katella DeBolt	MA Counseling Psychology	FT	Psychology
Karl Andreasson	Ph.D. Psychology	FT	Psychology
Mark Wylie	Ph.D. Economics	FT	Economics
Kahlil Islam-Zwart	MA Public Administration, ABD Intercultural and Organization Communication	FT	Communication
Pete Wildman	MS Mathematics	FT	Mathematics
Ryan Simmons	Ph.D. English	FT	English

Criteria 3: Selective Admissions Process Consistent with Open Door Institution

In keeping with the open access mission of the community college, admission requirements have been designed to provide access to the program and to ensure that prospective applicants are prepared for success once they enter the program. The BAS program coordinator will work with SFCC Information Systems faculty and the admissions office to verify that the program admission requirements (including core technical requirements) have been met. In addition to holding a technical associate degree in an IT related area, applicants to the BAS Cyber will need to meet the minimum program requirements outlined in Table 1. These requirements include an overall college GPA of 2.5, a minimum grade of 2.0 in all courses required for the degree, and at least 15 credits of general education. The admissions office will determine whether an applicant has met the prerequisite degree requirement, GPA requirements and affirm that the pre-admission general educations requirements have been fulfilled. If the Core Technical requirements are not met with SFCC courses, SFCC faculty will evaluate student coursework toward the fulfillment of the requirement.

Table 12 Entry Requirements for SFCC BAS Cyber Security

Prerequisites	Explanation
Associate degree in IT related field	From an accredited institution
Cumulative GPA of 2.5	In prerequisite associate degree
Minimum grade of 2.0 in all required courses	IT courses required within associate degree
General education courses	At least 15 credits (see Table 5)

Table 13 Core Technical Requirements

Subject	Credits	Course	Level
Unix / Linux Skills	5	CS 121 Unix / Linux or equivalent	Associate
Ethics & Law	5	IS 132 Computer Ethics & Law or equivalent	Associate
Networking Knowledge	5	IS 262 Network Management or equivalent	Associate
Security Knowledge	5	IS 245 Network Security II or equivalent	Associate
Total required	**20**		

SFCC is dedicated to providing access and promoting success for all students with a focus on students from underrepresented populations. The Information Systems/Computer Science department is active in an SFCC grant awarded by National Science Foundation which includes in its activities the marketing of IT degree opportunities to students from underrepresented populations. The grant has also supported summer information technology camps, one for middle school girls and another for middle school teachers. The department will also take advantage of existing and emerging relationships with regional school districts and the local educational school district to build pathways from K-12 coursework to SFCC's Associate/BAS programs and to recruit students from underrepresented populations. SFCC will work with district partner Spokane Community College and both colleges' multicultural services to identify and recruit potential degree candidates from underrepresented populations to consider pursuing an applied baccalaureate degree in Cyber Security.

Should there be more qualified applicants than there are openings in the program, the college will consider offering additional course sections as feasible. If additional sections are not available, the college will place students on a wait list, based on the following process:

1. Qualified applicants will be admitted based on time of application. If 35 qualified applicants apply by the deadline and there are 24 slots, the first 24 qualified applicants will be admitted.

2. The remaining 11 will be placed on a wait list for admission.

The program will assess this process annually and make changes as warranted, informed by student retention, diversity of program students, and other factors as they emerge. SFCC is aware that veteran and international students have minimum requirements for on-ground instruction. While some general education courses are offered online, Cyber program courses will be offered on-ground or as hybrid courses. The department will work with SFCC student services to balance the needs of all students with the expectation that the program will offered primarily in the evenings to provide access to working professionals.

Diverse Student Population

As expressed by its mission statement, SFCC meets the needs of its community by advancing student achievement through quality, accessible learning opportunities that embrace diversity, promote equity, and foster global awareness. The college has identified Diversity, Equity, and Global Awareness as one of its five core themes. Through this theme, SFCC advances diversity, promotes equity, and prepares students to live responsibly in an increasingly global civilization. In this context, diversity refers to differences and similarities across groups, including, but not limited to race, ethnicity, age, gender identity, sexual orientation, religion, physical and psychological capabilities, learning ability, class and other socioeconomic factors.

The BAS Cyber will employ and take advantage of initiatives advocated for by the college's Core Theme Team Four, devoted to increasing equity, and by the SFCC Diversity, Equity, and Global Awareness Committee to attract a diverse student population to the college and its programs. The recent hire of a Manager of Student Diversity and Equity will provide additional resources. The position is responsible for overseeing the operations of SFCC's MOSAIC Center for Culture, Inclusion, and Community; working collaboratively with Human Resources and campus groups to create programs, trainings, and events that promote diversity/equity; and conduct outreach and assessment of diversity initiatives. Recognizing the value of a diverse faculty and staff in promoting a diverse student population, SFCC has added an equity search advocate to every full-time search committee. An equity advocate is a non-voting member of search committees whose primary purposes are: to assist committees with forwarding the best candidates for each position, to help the committee ensure a fair and equitable selection process in which the selection of candidates is based solely on factors related to job performance and to enhance the success of applicants from underrepresented groups by decreasing unintentional bias and reducing unnecessary barriers.

Criteria 4: Appropriate Student Services Plan

Spokane Falls Community College is one of two community colleges that serve the Spokane area and the eastern region of Washington State. The college and district's commitment to student success is embodied in the services provided by student services personnel and the student support services they manage. SFCC applied baccalaureate students also receive dedicated support from the college's bachelor of applied sciences program coordinator. As SFCC implements additional applied baccalaureate degrees, the college will evaluate the increased workload for departments within Student Services. However, at this time, capacity to serve this new program exists with current staffing and responsibilities pertaining to the applied baccalaureate program have been assigned to specific personnel.

Access to Student Services

Based in part on patterns evident in SFCC's first applied baccalaureate degrees, the expectation is that most students in the BAS Cyber program will be former SFCC AAS Information Technology students and working professionals. These students will primarily be taking hybrid classes scheduled in the evening. A typical full-time student would come to campus two or three times per week. In order to ensure access to program advising, the program coordinator will be available for late afternoon appointments and via

email. The program coordinator is a constant point of contact for BAS students from pre-admission through the completion of the BAS and potential transition to master's degree coursework at a university. Cyber BAS students will benefit from a constant point of contact throughout the program. In addition, SFCC has numerous services available electronically including: online registration each quarter; online tutoring; 24/7 access to librarians through "ask a librarian;" extensive research databases suitable for baccalaureate-level research; and degree audit. SFCC also offers many different services with evening and/or weekend hours, including: the peer tutoring center, counseling, disability support services, testing, and financial aid.

The following services will likely be those most frequently used by Cyber BAS students:

Counseling and Student Advising: Student Achievement is a core value at SFCC and ensuring students complete the educational process is a shared responsibility of the SFCC faculty counselors and academic consultants.

Within the BAS Cyber Security degree, a program coordinator will work one-on-one with students to ensure these students are getting adequate support to be successful in the program. The coordinator, in collaboration with faculty counselors, will assist students with their educational planning and progress towards degree completion. Regular audits of progress toward completion will be conducted for every student enrolled in the program. Students who "stop out" will be offered multiple opportunities to re-enter the program and continue toward completion. Each student will have an individualized schedule and advising plan. Program faculty will work with students who need additional assistance to develop personalized student success strategies or work with the tutoring center to ensure students have adequate support to be successful. Historically, the IT faculty have been leaders in adept student advising, not surprisingly using technology as a tool.

Students can also use internet advising services and degree planning worksheets to access their information. An online degree planning tool will help faculty advisors and students evaluate, monitor and track the student's progress toward completion of a degree.

Computer Labs: SFCC provides access to a variety of specialized computer and learning labs. A list of computer labs and instructional labs including, location and hours of operation is located on the college website[5]. In particular, students will have access to dedicated department computer labs.

Credentials Evaluation: SFCC's credentials evaluators have extensive experience evaluating transcripts from accredited institutions. They will evaluate incoming students for compliance with admission requirements and review student records for all degree requirements when students near graduation. Program faculty will evaluate all transfer or prior learning requests for core courses.

Disability Support Services (DSS): The DSS office provides assessment and accommodations for students with documented disabilities. They provide specialized course materials via E-text, braille and closed caption; coordinate alternate testing for students; and assist faculty to provide appropriate accommodations.

[5] http://www.spokanefalls.edu/Resources/OnlineResources.aspx?page=PV4. 11.5.2014

Financial Aid: The financial aid office prepares and disburses federal, state, and institutional aid for all SFCC students. Students can monitor the status of their application online by accessing the student center.

Job Placement: Providing help with career advancement and job placement will be priorities for Cyber BAS program faculty and career center staff. The advisory board, comprised of industry professionals, will keep the department and students abreast of employment trends and needs. SFCC's program review process will monitor demand and employment data. Through the required internship/capstone course, students will have the opportunity to develop potential job contacts. The SFCC Career Center has been successful in helping students find jobs by providing comprehensive career services including career planning and exploration, job search and placement assistance, career fairs, work-study, internships and service learning opportunities.

Multicultural Services: The SFCC MOSAIC Center for Culture, Inclusion, and Community offers assistance with counseling, tutoring and mentoring. These essential services empower students of color to identify, pursue and complete educational and personal objectives aligned with their career and life goals.

Library and Other Online Services: All students have access to a full slate of services and information via the web. The library has extensive research databases, which are able to support the proposed baccalaureate degree disciplines. Cooperative agreements with local baccalaureate institutions allow students access to research materials, which may not be housed within SFCC's library. As a member of WIN (Washington Idaho Network), SFCC students and staff are able to borrow books and other research materials through a cooperative agreement with Gonzaga University, Spokane Community College, North Idaho College, Lewis and Clark State College and Whitworth University. Materials borrowed through the cooperative take one to three days to arrive. The "ask a librarian" online research assistance program allows students access to research and information literacy guidance 24/7. The distance education office provides extensive technology assistance and student services for all online students.

Peer Tutoring Center: The Peer Tutoring Center assists students in successfully completing their college courses through one-on-one and group tutoring, workshops, classes and open labs in a variety of subjects including reading, writing, math, accounting, biology and business technology. Students may also access enhanced services in the center including eTutoring and KHAN Academy. In addition, the center manager has worked closely with program managers to align tutoring services with course curriculum. The tutoring center currently employs students from local baccalaureate institutions who will be available to tutor upper-division students.

Veterans Services: The Veterans Services Office assists prior service personnel, veterans, reservists, dependents, and current active duty personnel. Relevant military credit is awarded once a student has earned 10 college-level credits and has applied for assessment through the established PLA process.

Prior Learning Assessment: The Prior Learning Assessment Coordinator works as a liaison among students, BAS faculty and the BAS program coordinator. Those students who have acquired significant levels of college-level learning based on job training and competencies experienced on the job may

choose to petition BAS faculty for college credit. The Prior Learning Assessment Coordinator will provide instruction in the compilation of the student's prior learning portfolio and will guide the student through the petitioning process. Students interested in developing a prior learning portfolio will be required to enroll in General Studies 105, Prior Learning Portfolio Development (or its equivalent).

Criteria 5: Commitment to Build and Sustain a High Quality Program

On-site applied baccalaureate courses will be offered as hybrid courses and scheduled at times convenient to working professionals. Because of this approach, no new classrooms or labs should be necessary to support the BAS Cyber program, though SFCC is dedicated to sustaining adequate resources for the program as it grows. The Bachelor of Applied Science in Cyber Security has a designated program lead (refer to table 9)

Faculty and Staff: Spokane Falls Community College will support the BAS Cyber program with the current program coordinator. The college plans on adding a new completion coach as enrollments increase, potentially in the second year of the program, sharing the position with the current BAS program in Information Systems and Technology. The program coordinator will serve in a dual capacity until such time as enrollments warrant hiring a completion coach. With the addition of the completion coach, the program coordinator will focus attention on student recruitment, advising and admissions and assist with program evaluation and development.

The BAS Cyber is supported by a tenured department faculty serving as the designated program lead. In the first few years of implementation, the BAS Cyber program will require only additional adjunct support. Assuming the program grows as expected, the department will look to add one full-time faculty position to the Information Systems and Computer Science department in year three.

Curriculum: SFCC will support the development of upper division class courses with stipends of $1,000 dollars for each course, provided the course gains approval through the appropriate curriculum committee processes.

Professional Development: Faculty and administrative personnel are provided professional development opportunities, which prepare them to be more relevant to our students. Each full-time faculty member may access $1,500 every two years and has access to other discretionary faculty development funds through faculty development or foundation grants.

Equipment, Goods and Services: SFCC will set aside funds supporting the implementation of the program. Ongoing hardware, software acquisition and upgrades necessary to teach upper division Cyber BAS courses will be supported through department goods and services budgets, district innovation funds and student technology fee allocations.

Consulting and Accreditation Fees: These one-time fees will be paid to the NWCCU for evaluating substantive changes to SFCC's program and degree offerings.

Library Support: Subscription and e-book collections are currently adequate to meet the expected

demands of the BAS Cyber program as library resources have been expanded to support the BAS programs. Additional subscriptions and e-book collections will be added to support students' information and research needs. Library support and resources will be expanded to allow students to access resources online allowing additional flexibility for students working full-time and attending evening courses.

The following tables indicate the projected student enrollment, estimated program expenses and revenues.

Table 14 Student Enrollment Projections

Year	1 2017-18	2 2018-19	3 2019-20	4 2020-21	5 2021-22
Headcount	16	30	32	34	38
FTES	14	26	28	30	33
Graduates	0	10	19	20	21

Table 15 Estimated Program Expenses

	Year 0 (FY 16-17)	Year 1 (FY 17-18)	Year 2 (FY 18-19)	Year 3 (FY 19-20)	Year 4 (FY 20-21)	Year 5 (FY 21-22)
Administrative Salaries (50% FTE) – Completion Coach		23,738	23,738	23,738	24,165	24,165
Faculty Salaries (adjunct support in years 1 and 2 only, annualized full-time position beginning in year 3)		16,983	30,570	47,449	47,449	48,825
Curriculum Development Stipends	9,000					
Benefits		13,660	17,057	28,395	31,234	34,357
Goods and Services		1,000	1,000	1,000	1,000	1,000
Library Support		1,000				
Travel/Prof Dev		1,000	1,000	1,000	2,000	2,000
Computer Systems		30,000	5,000	5,000	5,000	5,000
Computer Software/Hardware		10,000	3,000	3,000	3,000	3,000
Marketing		600	600	800	600	600
Indirect Administrative Costs (8% each year)		7,758	6,557	8,191	8,516	8,876
Total Costs	**9,000**	**104,739**	**88,522**	**110,573**	**114,964**	**119,823**

Table 16 Projected Program Income

BAS in Cyber Security: Projected Program Income & Total Expenses (Profit/loss)						
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program Revenue -Tuition and Fees (excluding Lab/Course Fee) – w/o S&A, Bldg., & Innovation Fees)		72,367	135,465	168,244	182,922	201257
Program Expenses		(104,739)	(88,522)	(110,573)	(114,964)	(119823)
Revised Net		(32,372)	46,943	57,671	67,958	81,434
Balance to Re-invest (25% Percentage of Net)			11,736	14,418	16,990	20,359
Lab and Course Fee		1,215	2,228	2,329	3,038	3,443
Program Reinvestment after Expenses						
			11,736	14,418	16,990	20,359

In the estimated program expenses for SFCC's BAS program in ISIT launched in fall of 2015, the college budgeted $1750-1900 dollars each year for Goods and Services and Library Support in years 2 through 5. Those funds will be pooled with the corresponding Goods and Services and Library Support expenses given in this budget. The CS/IS department has sustained an ongoing conversation with Library faculty in the development of both programs regarding appropriate support. If the existing approximations are insufficient to maintain adequate library resources, SFCC will dedicate re-investment funds to address the need.

Criteria 6: Program Specific Accreditation

At this time, the college does not plan to seek specialized program accreditation. The regional accreditation for SFCC was reaffirmed by the Northwest Commission on Colleges and Universities (NWCCU) on January 31, 2014, on the basis of the Fall 2013 Year Seven *Mission Fulfillment and Sustainability* Evaluation. The college's mid-cycle accreditation report was submitted October 2016 and addressed our two current Bachelor of Applied Science programs candidacy status. Spokane Falls Community College will seek candidacy status for the Bachelor of Applied Science in Cyber Security through the Northwest Commission on Colleges and Universities upon SBCTC approval.

Criteria 7: Pathway Options beyond Baccalaureate Degree

Graduates of the BAS Cyber program who are interested in obtaining a graduate degree will have several options. As our local demand indicates, 12% of the Cyber Security positions required a graduate degree.

Western Governors University (WGU) Washington offers three Information Technology related degrees[6]: M.S. Information Security and Assurance, M.S Information Technology Management and MBA

[6] College of Information Technology at WGU Washington 09.29.2014

Information Technology Management. Admission to these programs requires a bachelor's degree from a regionally accredited institution and demonstrated IT networking experience through certifications, job related experience or a bachelor's degree in information systems or information technology such as the BAS Cyber Security degree described in this documentation. WGU has agreed to accept SFCC's BAS in Cyber Security to enter WGU's M.S. in Cybersecurity and Information Assurance as well as the M.S. Information Technology Management with a 5% tuition discount for the first year.[7]

Bellevue University offers several Information Technology degrees[8] including a Master of Science in Cyber Security, Master of Science in Computer Information Systems, Master of Science in Management Information Systems and a Master of Science in Business Analytics. Bellevue University has agreed to accept our Bachelor of Applied Science Degrees in Cyber Security and Information Systems and Information Technology as a pathway into their Masters programs.

In addition, emerging collaboration conversations with Washington State University – Tri Cities include discussion of creating a pathway to a proposed master's degree from WSU that is currently in development/planning stages. They will keep us updated as their degree develops.

Criteria 8: External Expert Evaluation of Program

Spokane Falls Community College selected two experts, Peter A. Tucker and Carl Saiyed, to provide external review of the proposed degree.

Peter A. Tucker has served for the past 13 years as a professor of computer science at Whitworth University, and served six years as department chair for Math and Computer science, stepping down in Fall 2016. His regular course load includes quality assurance, database management, software engineering, and mobile application development. His research interests include computer science education, quality assurance, and data stream management. In addition, Dr. Tucker is a consultant at NextIT in Spokane, WA, where he is exploring QA automation techniques and implementing tests specific to some of their core technology. Dr. Tucker began his career at Microsoft, spending five years as a software design engineer in test, and then three more years as a software design engineer. Dr. Tucker received the Ph.D. degree from Oregon Health & Science University in 2005.

The following paragraphs are from Mr. Tucker's preliminary review:

College Name:	Spokane Falls Community College	**BAS Degree Title:**	Bachelor of Science – Cyber Security
Reviewer Name/ Team Name:	Peter Tucker	**Institutional or Professional Affiliation:**	Whitworth University

[7] WGU Degree and Program Offerings http://washington.wgu.edu/degrees_and_programs#

[8] http://www.bellevue.edu/degrees/

Professional License or Qualification, if any:	N/A	**Relationship to Program, if any:**	None
Please evaluate the following Specific Elements			
Concept and Overview	Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards? Will the program lead to job placement?		
	Comment **Yes to both questions. Cyber security is a growing field, and the demand for good professionals to protect IT infrastructure and data is high. The specialized knowledge listed in the overview fits these demands well. I'm glad to see that ethical considerations are also considered in this program.**		
Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?		
	Comment **Yes. The outcomes listed are good skills and knowledge for pursuing careers related to networks and cybersecurity, and are consistent with cybersecurity programs at other universities that I have I looked at. I think including coursework in assessment and testing processes are particularly important.**		
Curriculum Alignment	Does the curriculum align with the program's Statement of Needs Document?		
	Comment **Looking through the Core Themes at SFCC, I really think the statement of needs matches well. I particularly think the themes of student achievement, broad access, and responsiveness to community needs align very well. The degree focuses on important outcomes that are essential for students to do well, along with final capstone/internship course. The degree offers broad coverage of cybersecurity, preparing students well for industry and for graduate work.**		
Academic Relevance and Rigor	Do the core and elective courses align with employer needs and demands? Are the upper level courses, in particular, relevant to industry? Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees?		
	Comment **Core Technical**		

	Certainly these four courses will be crucial to any cyber security degree. Unix/Linux, Network Management, and Network Security are foundational, and a course in computer ethics rounds the knowledge at the core well as students move into the upper division courses. **Upper level courses** **The upper division courses also meet many needs in industry for cyber security professionals. The technical courses cover a good breadth in a fast-moving field, so certainly keeping up with changes will be a challenge (though it is a challenge for any degree in technology). I am glad to see the amount of program assessment planned to ensure the degree program keeps up with the field. I'm interested to see how the Capstone/Internship portion works.**
General Education Requirements	Are the general educations requirements suitable for a baccalaureate level program? Do the general education courses meet breadth and depth requirements?
	Comment **Yes. I really like the list of general education courses for this degree, particularly the two communications courses and the professional ethics course. A professional in cyber security will need to be able to work with people from many backgrounds, and especially non-technical backgrounds. These three courses in particular will help.**
a) Preparation for Graduate Program Acceptance	Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs?
	Comment **It appears so. As stated above, the program gives good breadth in the field of cyber security. I reviewed a few Master's degree programs in cyber security, and most look for bachelor's degrees in computer science, computer engineering, or IT. Certainly this degree fits the IT requirements. Further, many offer bridge programs for students without those degrees to get started. I would say that students with this degree would find themselves adequately prepared for entering a Master's program.**
Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?
	Comment **I think the current faculty have good background to do well in many of the courses for this new degree. The initial request for 1-2 adjuncts will need to bring good background in cybersecurity to enhance the**

	degree, and the full-time faculty will also add to that expertise. As a current faculty member at a different institution, I can say that it isn't easy to find good people in high-demand areas such as cybersecurity.
Resources	Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities?
	Comment **Certainly, the college has adequate resources to sustain and advise the program. The student services they have in place and have planned will be very helpful. Further, ensuring that the classes are offered in such a way that working professionals can fit them into their work schedule is very important.**
Membership and Advisory Committee	Has the program received approval from an Advisory Committee? Has the program responded appropriately to it Advisory Committee's recommendations?
	Comment **I have not been informed of approval from advisory, so I cannot comment here**
Overall Assessment and Recommendations	Please summarize your overall assessment of the program.
	Comment **I think there is a clear need and a clear demand for this kind of program. The authors have done a very good job of exploring a good program that fits the needs of this career path and the core themes of the institution. I agree with the assessment that the student demand will be strong for this program, and that students will enroll as soon as it is offered.**

Reviewer Bio or Resume

Peter A. Tucker has served for the past 13 years as a professor of computer science at Whitworth University, and served six years as department chair for Math and Computer science, stepping down in Fall 2016. His regular course load includes quality assurance, database management, software engineering, and mobile application development. His research interests include computer science education, quality assurance, and data stream management. In addition, Dr. Tucker is a consultant at NextIT in Spokane, WA, where he is exploring QA automation techniques and implementing tests specific to some of their core technology. Dr. Tucker began his career at Microsoft, spending five years as a software design engineer in test, and then three more years as a software design engineer. Dr. Tucker received the Ph.D. degree from Oregon Health & Science University in 2005.

Carl Saiyed, CISSP is a Senior Cyber Security Analyst at Avista Utilities and formerly at Spokane Teacher's Credit Union. Carl is responsible for analyzing and preventing cyber security threats, detecting and mitigating malicious activity and other enterprise cyber security operations. Carl has previously worked in development and operations on large scale software service applications such as online banking, core banking and retail systems. Carl has an undergraduate degree in IT: Software Development, holds 15 IT certifications and is a nationally published cyber security author in ISSA magazine.

The following paragraphs are from Mr. Saiyed's preliminary review:

College Name:	Spokane Falls Community College	**BAS Degree Title:**	Bachelor of Science – Information Technology : Software Development
Reviewer Name/ Team Name:	Carl Saiyed	**Institutional or Professional Affiliation:**	Avista Utilities, ISSA
Professional License or Qualification, if any:	CISSP	**Relationship to Program, if any:**	None
Please evaluate the following Specific Elements			
Concept and Overview	Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards? Will the program lead to job placement?		
	Comment The overall concept of the degree plan is both relevant and appropriate. Employers need candidates with the background that this course will provide. It is very encouraging to see topics ranging from Unix to Risk management to Communication and Science. This coursework includes deep technical concepts and skills along with necessary soft skills and other, non-technical aspects of Cyber Security. The academic standard described in the courses I was able to review are appropriate for this level of degree program.		
Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?		
	Comment The described learning outcome combines technical skills earned within an associates program and sharpens these technical skills while refining the student's critical general education. The listed qualities of what a successful graduate will be able to do demonstrates a thorough learning		

	program.
Curriculum Alignment	Does the curriculum align with the program's Statement of Needs Document?
	Comment The curriculum does align with the Statement of Needs Document and supports all of CCS core themes. Specifically, I would like to point out that Theme 5: Responsiveness to Community Needs is especially satisfied with this program. Employers need graduates with Cyber Security skills in the workforce. The current Information Technology and Computer Science programs available locally do not fully prepare students for these jobs. This program does.
Academic Relevance and Rigor	Do the core and elective courses align with employer needs and demands? Are the upper level courses, in particular, relevant to industry? Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees?
	Comment I will comment on this section in two separate responses, Core technical (Taken from Table 3), Upper level (Taken from Table 4). I did not observe classes described as elective in the proposal but will comment on recommended courses in the General Education Requirements section below as electives. **Core Technical** I was able to review descriptions in the SFCC course catalog for courses described in Table 3 – Core Technical Requirements. These courses cover Unix administration, Computer Ethics and Law, and Network Security basic/advanced. I am especially pleased to see the inclusion of a Unix class (CS 121). Most Cyber Security professionals can expect to engage Unix skills on a daily basis. Employers need candidates ready to work on Unix systems – the bulk of Cyber Security equipment is built on Unix. The course on Cyber Law (IS 132) prepares students to understand the many legal requirements they must work within. This is important for any Cyber Security position and not frequently understood well. The course on Network Security (IS 262) will provide a necessary background in network operations. Cyber Security professionals must be able to relate to their network and system administration counterparts and an understanding of how these pieces operate is critical. The advanced course (IS 245) focuses on understanding network threats and

	learning to defend against them. These skills are very important to employers. **Upper level courses** I was unable to review course descriptions for the upper level courses and therefore can only comment based on the information available in Table 4. The coursework describes a relevant, broad education on in-demand Cyber Security skills. Provided that the technical classes are hands-on and the theory classes require a realistic demonstration of knowledge, this demonstrates a rigorous schedule that supports employer needs and demands.
General Education Requirements	Are the general educations requirements suitable for a baccalaureate level program? Do the general education courses meet breadth and depth requirements?
	Comment The described general education requirements are suitable for this level. I am especially pleased to observe the inclusion of Technical Writing, Professional Communication, and Organizational Communication coursework. Frequently, technology students have incredible technical skills but are unable to communicate complex technical or compliance issues to executive staff on clear, concise, lay terms. Graduates of a baccalaureate program are expected to be able to communicate professionally and this portion of the coursework should provide this required skill. The breadth requirement is met by including other critical coursework such as Statistics, Ethics, Motivation, Sciences, and 5 additional elective credits. Graduates will earn knowledge on a wide array of topics commensurate with the scope of a typical baccalaureate program. I reviewed course descriptions for several of the courses listed in table 5 and the depth in each described class was appropriate.
b) Preparation for Graduate Program Acceptance	Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs?
	Comment I am unable to comment on how another school might interpret this program as suitable for admission into graduate degree programs. However, my opinion based on the subjects covered is that this program will sufficiently prepare a student for graduate level work.

Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?
	Comment The faculty has demonstrated commitment building and maintaining a high-quality curriculum by attending a Community College Cyber Security summit and bringing lessons learned back to the program. This, combined with years of experience teaching and improving Information Technology and Computer Science programs establishes a highly knowledgeable staff, ready and able to teach and unceasingly improve this program. I would like to observe instructors with additional industry-related certifications, where appropriate. Graduates will frequently be asked about their ability or ambition to achieve specific industry certifications and instructions already certified will be more poised to offer this guidance. I was able to review one faculty member's SFCC information page. The information presented demonstrated a detailed level of technical knowledge appropriate to teach and maintain this program.
Resources	Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities?
	Comment The expenses described in table 10 list $30,000 in the first year and $5,000 in the second year for computer systems and $1,000 in the first year with $3,000 in the second year for Computer Software/Hardware. This will likely be sufficient for academic licensing for most software but this budget may need to be increased if the college will try to offer hands-on experience with enterprise-grade network security equipment and is unable to obtain academic licensing. If graduates are able to articulate experience with big name equipment like Palo Alto, Check Point, Juniper, and F5 it will be very helpful to them. The projected income described in table 11 demonstrates an ability for the program to achieve sufficient enrollment to maintain the expenses of the program. The projected student enrollment demonstrates incredible demand such that this program that will be well exercised and continue to provide tuition income.

Membership and Advisory Committee	Has the program received approval from an Advisory Committee? Has the program responded appropriately to it Advisory Committee's recommendations?
	Comment I am not informed on this topic and am unable to comment.
Overall Assessment and Recommendations	Please summarize your overall assessment of the program.
	Comment Overall I am impressed with this program description. It is my opinion that successful graduates will have the foundation required to begin or advance a career in Cyber Security. The courses described will equip students with a broad base of knowledge to meet employer's growing needs. Few fresh graduates come to an interview ready to discuss a broad base of topics like Identity Management, Cryptography, Risk Management, Computer Ethics and Law, and Project Management – but these graduates will be ready. In addition to these frequently overlooked topics, successful graduates are required to complete course on Unix and Network Management. This program will balance the need for employees with the right level legal, conceptual, and technical aspects of Cyber Security. Not only that, these graduates will be able to communicate clearly and professionally – something lacking in the Information Technology industry as much as technical competence. It is my opinion that no other local, accredited, college offers a baccalaureate degree that adequately prepares graduates for positions in Cyber Security fields. Instead, current students must choose another, related, field of study and cross-train for Cyber Security positions while on the job in related Information Technology positions. This program should be an excellent base for a career and graduates should be well prepared for entry-level Cyber Security positions. Graduates already working in Information Technology will be well prepared to quickly and confidently transfer into Cyber Security positions. This curriculum is consistent with my opinion of current industry research, standards, and academics.
Reviewer Bio or Resume Evaluator, please insert a short bio here	