Centralia College

Applied Baccalaureate Degree Program

Bachelor of Applied Science in Information Technology in Application Development

Program Proposal
Subitted August 17, 2015

COVER SHEET

NEW DEGREE PROGRAM PROPbSAL

Program Information

Institution Name: **Centralia College**

Degree: **Bachelor of Applied Science IT: Application Development** .CIP Code: _

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

Degree:	AAS Information Technology	CIP Code:	11.0201	Year Began: **Revised 2013**
Degree:	AAS Computer Science	CIP Code:	11.0201	Year Began: **1995**

Planned Implementation Date (i.e. Fall 2014}: **Fall. 2016**

Proposal Criteria: *Please respond to all eight (8) areas listed in proposal criteria FORM D.*

Page Limit: 30 pages

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17 Aug (or)
Date

CRITERIA	STANDARD
1. Curriculum demonstrates baccalaureate level rigor.	Describe curriculum including: (1) program learning outcomes; (2) program evaluation criteria and process; (3) course preparation needed by students _transferring with a technical associate degree; (4) general education components; and (5) course work needed at junior and senior levels in the BAS.

Describe curriculum including:

(1) Program Learning Outcomes

The BAS-ITAD Program outcomes are directly linked to and consistent with the established Centralia College learning themes.

Learning Themes

1. **Reasoning.** The ability to extract information from data, develop ideas and solutions, establish logical progression in thinking,and problem solve using such procedures as literary analysis or the scientific method.
2. **Written, Oral, and Visual Communication.** The ability to make oneself understood in public, interpersonal, professional, artistic, and technical arenas.
3. **Exploration .:.... Self and Others.** An awareness of the values, beliefs, customs, and contributions of persons from one's own and other traditions, ethnicities, classes, and genders.
4. **Resourcefulness.** The ability to adapt to change, such as technological innovations or environmental conditions.
5. **Responsibility.** The ability to be accountable to self, society, and the naturalworld.

Students who successfully complete the Bachelor of Applied Science in Information Technology: Application Development will have demonstrated the ability to:

- Develop effective, secure and efficient code following best practices in data design and software development.
- Communicate effectively with stakeholders to develop software specifications, design and launch systems and troubleshoot and solve problems in existing systems.
- Troubleshoot and problem-solve defects from identification to resolution.
- Write and present technical documentation.

- Use project management skills, such as estimating work effort, assessing risk, analyzing data, and defining project scope.
- Perform software assurance activities.

The coursework for this program has been designed to ensure graduates have a strong technical foundation in application and oftware development and are prepared to work in teams to participate in as developers and designers and to manage IT projects, and to prepare software documentation. Course objectives are aligned with the general program outcomes stated above.

(2) Program evaluation criteria and process

.T he Bachelor of Applied Science in IT: Application Development evaluation process is modeled after existing baccalaureate program assessment at Centralia College and is designed to ensure the following:

- The program remains aligned with the college's mission and stated learning themes.
- The program continues to meet the expectations of the institutions to which our students transfer and with the industries who employ our students.
- Program outcomes are appropriate, clear, and measurable.
- Course outcomes support and comprise the program outcomes.
- Classroom assessments demonstrate successful students' achievement of course outcomes at acceptable levels.
- Student retention and completion statistics indicate students succeed at acceptable levels as determined by institutionally defined benchmarks.
- Faculty are engaged in assessment activities leading to improvements in teaching and learning.
- Human resources, technology, and institutional support are sufficient to ensure the successful executicrn of the program.
- Student admissions and advising are effective in ensuring student preparation and success.
- Program graduates are successful as well as prepared for entry into graduate-level programs.
- Program graduates are successful in securing and retaining employment, and that these jobs provide living-wage incomes commensurate with the prevailing wages for comparable degrees.
- · The program is fiscally efficient.

Program evaluation process

Program evaluation is comprised of three distinct processes:

- Educational program review is conducted on a four-year cycle and addresses all criteria listed above. This process involves administrators and faculty and is fundamental in the continuing evolution of the program and its curriculum with the goal of improving teaching and learning.
- Monitoring reports are created annually by the program administrator and are presented to the Centralia College Board of Trustees. These reports focus on program outcomes (specifically student progression and post-graduation success in job attainment}, retention, and wages.
- Administrative program review focuses on program resources, financial viability, and the linkage to institutional and strategic planning.This review is conducted by the program administrator on an annual basis.

These three evaluation elements will continue on the schedule described unless the normal assessment process is revised at an institutional level.

Course evaluation

Because this program is new and the first cohort is not scheduled to graduate until June 2018, data on post-graduation success will not be available for several years. For this reason, early program evaluation will rely heavily on close monitoring of those criteria that can be obtained in real time. Before courses are offered, they will go through an in-house review using the college's "Quality Matters-like" rubric. Program administration will work closely with the program's Advisory Committee to track program performance on a course-by-course basis using tools that have been developed for that purpose. These include the following:

- . Student evaluations which will be conducted in all courses during each quarter of the first three years. These will be designed to provide information concerning the effectiveness of the pedagogical approach, the usefulness of the course content, and the students' perspective on how well they were prepared for .the course.
- Administrative observations which will be conducted in each course on a quarterly basis for the first three years for both the face-to-face and any online components. These will provide similar information to that which is obtained. from the student evaluations but from an administrative perspective.
- Faculty team evaluations which will be conducted on a quarterly basis · for three years. It is the intent that faculty teaching in this program

operate as a "faculty learning community." As such, there will be a high degree of coordination among the courses to ensure concepts are reinforced and the outcomes are being met. There also will be a high degree of coordination in the way in which the courses are taught. These evaluations will focus on improving the effectiveness of instruction and delivery methods and ensuring course and program outcomes are being met.

Student evaluations, administrative observations, and faculty team evaluations are a normal component of course evaluation for Centralia College's baccalaureate programs.

It is expected that unanticipated issues will _arise during this initial phase of program implementation, and it is incumbent upon the program administration to work with the program faculty, program Advisory Committee, and other appropriate college personnel to resolve problems and ensure the continued improvement of the program.

(3) Course preparation needed by students transferring with a technical associate degree

Students entering the program with an AAS Information Technology degree from Centralia College will have a seamless pathway for transition. The AAS Information Technology degree has been revised to ensure the students are receiving not only the foundation courses needed to perform advanced software and applications courses but also includes thirty to thirty-three credits of general education requirements.
Courses completed in the AAS program include:

CS&	131	C++
IT	101	Intro to Programming
IT	119	Web Scripting I
IT	121	Web Scripting II
IT	123	Desktop OS 1
IT	124	Desktop OS 2
IT	130	IT Apps Internship
IT	205	PHP/SQL
IT	224	Java 1
IT	228	Java 2
IT	230	Java 3
IT	240	Mobile Device OS
ART	130	Computer Graphics

CMST& 220 Public Speaking
ENGL& Ol English Composition I
HLTH 145 Safety & Fitness
HR 110 Human Relations inthe Workplace
MATH& 141 Pre-Calculus I
MATH& 142 Pre-Calculus II
Social Science elective
Natural Science elective

Students entering from other colleges may have to complete additional general education requirements during the BAS-IT:AD program. Although transfer students will not need to complete the courses prescribed in the AAS Information Technology degree from .Centralia College, they will need to have completed an associate degree in a program of study that mirrors the outcomes of the program described above and have . completed a minimum of 30 general education electives in their two year program to be on track. Students who are accepted into the program, with deficiencies will need to remediate these deficiencies while completing the BAS-IT:AD core curriculum. This would likely increase the student's credit load from 15 per quarter and/or necessitate completing coursework during summer in order to graduate in 2 years.

(4) General education components

Sixty credits are required as identified in the proceeding chart. All students are encouraged to complete English Composition I, Pre-Calculus I, Pre-Calculus 11, a humanities course (5 credits), a natural science course (5 credits), and a social science course (5 credits) prior to entering the BAS-IT:AD program. This allows the students to carry a workload of 15 credits as prescribed by the BAS-IT:AD educational planner (Appendix A). Students who do not have thirty credits of general education, upon entering the program, will have to complete additional general education requirements during the program which will require a quarterly workload of up to 20 credits or the use of summer quarter(s) to complete the requirements. Prior to graduation from the BAS-IT:AD program, students will have completed a total of sixty general education courses.

Bachelor of Applied Science in IT Application Development

General Education Requirements (60 credits)	**Credits**
A. **Communication (10 credits}**	
English Composition I	5

BCMST 330 Professional and Organizational Communications	5
B. Humanities (10 credits)	
Humanities elective	5
Humanities elective	5
C. Social Science (10 credits)	
Social Science elective	5
Social Science elective	5
D. Mathematical (15 credits)	
MATH& 141 Pre-Calculus I	5
MATH& .142 Pre-Calculus II	5
MATH& 146 Intro to Statistics	5
MATH 228 Discrete Mathematics	5
E. Natural Science (10 credits)	
Natural Science elective w/lab	5
Natural Science elective	5
Five additional credits in general education in one of the above areas	2.
Subtotal	65

F. Foundation Coursework (60 credits) from Associates Degree

G. IT: Application Development Core Coursework

The **boldface** courses below are the upper-division IT: A.D courses that are considered to be the core curriculum for the program. The three *italicized* capstone courses are those that will be taken throughout year two as they .require the application of learning from prior coursework.

Course		Course Title	
BCMST	**330**	**Professional & Organizational Communication**	**5**
IT	**310**	**Advanced Web Applications**	**5**
IT	**320**	**Application Development Methodologies**	**5**
IT	**330**	**Applications/Software Engineering I**	**5**
IT	**340**	**Application/Software Engineering II**	**5**
IT	**350**	**Advanced database Design and Implementation**	**5**
IT	**410**	**Advanced data Access Techniques**	**5**
IT	**420**	**Business Intelligence Applications**	**5**
IT	**430**	**Information Security for Developers**	**5**
IT	*440*	*BAS-IT:AD Internship I*	*5*
IT	*450*	*BAS-IT:AD Internship II*	*5*

IT	*460*	*BAS-IT:AD Capstone*	*2.*
		Subtotal	60
Total Credits Required			180

(5) Course work needed at junior and senior levels in the BAS-IT:AD (see appendix A for educational planner)

The course numbers have been created to demonstrate progression in work leading up to and in conjunction with the identified capstone courses. The courses have been vetted through current computer science faculty and BAS and Workforce administration. The advanced courses are continuations of the foundational coursework obtained in the students' associate degree. The three capstone courses will require the application of the theories and concepts to actual opportunities or challenges of local. businesses, nonprofits, and governmental units.

Year 1, First Quarter

IT 310 Advanced Web Applications

An advanced course in web development. This course covers the full web development stack including client side (HTML, CSS, JavaScript}, server side (ASP.NET}, database layer (MSSQL}, and frameworks (MVC}. Students will use applicable design principles and protocols, and best practices in creating responsive, accessible web applications. Students will be learning on Microsoft stack for labs, but discusions on universal approaches are provided. RESTful architecture and web services are covered in depth.

IT 320 Application Development Methodologies

Students are introduced to formal software engineering methodologies. Coverage of the software development life cycle, division of labor/tasks related to software development work, formal process models for application development, and case studies of software development methodologies are examined. Version management tools such as SVN, GIT, and Team Foundation Server (TFS} are covered.

Year 1 ·second Quarter .

BCMST330 Professional and Organizational Communication

Foundation course in communication principles in an organizational setting including the consideration, analysis, and criticism of the role of communication in organization contexts. Explore various communication topics including public relations and marketing, leadership

functions, dispute resolution, coaching and mentoring,gloal perspectives, and the role of e-communication. Students will learn the steps of a communication audit and techniques for improving organizational communication'.

IT 330 Application/Software Engineering I

An introduction course into software engineering. Scope, software life-cycle models, software development process, teams, and tools are covered. Software modeling and analysis is explored including·Unified Markup Language (UML) diagramming,· and systems (business) analysis. Requirements gathering,analysis, and design are the focus of this course.

Year 1, Third Quarter

IT 340 Application/Software Engineering II

Introduces test-driven development. Coding exercises include building test cases based on the requirements of a project, diagrams, and other development documentation and artifacts generated throughout the software development life cycle An examination of testing, coupling and cohesion, reusability and portability, planning and estimating are covered. Students will implement working software based on the best practices of test driven development. (C#/ASP.NET/SQL).

IT 350 Advanced Database Design and Implementation

Database systems, d_ata models, entity relationship modeling,advanced ·data modeling, database normalization, SQL (structured query language), and database design. This course will explore the leading SQL systems (MSSQL, MySQL, Postgres), and gain exposure to newer technologies such as NOSQL databases (MongoDB). Common characteristics of all SQL systems will provide connections between the vendor specific solutions. Students experience a complete and holistic approach to database design and implementation independent of the proprietary vendor.

Year 2, First Quarter

IT 410 Advanced Data Access Techniques

Students learn to utilize databases to create data driven applications using both proprietary and open source environments. Data driven projects and accessing databases through ODBC connections are covered. Students will explore data access techniques including relational modeling,SQL, and NOSQL databases, data warehouses, dimensional cubes, 'big data', and other advanced database concepts. Special attention paid to transaction and concurrencies, database performance and query tuning, and different database management systems.

IT 440 BAS-IT:AD Internship I

A practical experience in software development. Students enrolled in this internship will h(lve opportunities to serve on a software development team in some capacity. Team based projects will be the focus ofthe internship, although when necessary individual projects or portions of projects c·an be assigned. Projects provided by the instructor or solicited by the students will be used. The full software development life cycle will be reinforced, with best practices demonstrated in accessible, responsive, application development.

Year 2 Second Quarter

IT 420 Business Intelligence Applications

Students learn about practical business intelligence (BI) solutions, and the appropriate application architectures for a variety of scenarios. Common conventional Bl expectations such as reports and dashboards are covered, as well as advanced BI methods including statistical analysis, data mining,and clustering. Students taking this class should have a good understanding of probabilities, statistics, Venn diagrams, and SQL techniques to perform rudimentary operations. Experience with the Microsoft Office suite of BI tools will be gained including Excel, Access, and SQL_reporting services.

IT 450 BAS-IT:AD Internship II

A practical experience in software development. Students enrolled in this internship will have opportunities to serve on a software development team in some capacity. Team based projects will be the focus of the internship, although when necessary individual projects or portions of projects can be assigned. Projects provided by the instructor or solicited by the students will be used. The full software development life cycle will be reinforced, with best practices demonstrated in accessible, responsive, application development.

Year 2 Third Quarter

IT 430 Information Security for Developers

Introduces concepts and issues related to securing information systems and the development of policies to implement information security controls. Topics include security vulnerabilities, threats and defense measures and legal and ethical issues associated with information security. Students will learn how to recognize and apply secure software development best practices.

IT 460 BAS-IT:AD Capstone

This capstone course requires the student to propose and implement a full project which demonstrates mastery of the software development life cycle through delivery of a completed body of work. Upon completion of this course, the student will demonstrate mastery of the following subjects of Software Development: Requirements gathering,systems analysis, system

design, testing, and implementation. Deliverables for the capstone include all appropriate requirements documentation, diagrams graphs, the software project, applicable test cases, and finally a presentation of the work performed.

2. Qualified faculty.	Provide a profile, including education credentials, of anticipated faculty (full-time, part-time, regular, continuing} that will support the program for each year (junior and senior}. Include faculty needed to cover the technical course work, general education courses and electives. In addition, provide the total faculty FTE allocated to the program. Faculty and administrators responsible for technical courses must meet certification requirements for professional and technical administrators and instructors in the Washington Administrative Code.

Faculty teaching in the degree program will be required to hold a minimum of a master's degree. College-level teaching experience and significant teaching/educational experience is preferred. All program personnel will meet the standards established in WAC 131-16-80 and WAC 131-16-91 as applicable; Faculty members are responsible for developing and teaching courses in their areas of expertise. They will work as a team to share best practices with the . goal of continuous improvement in and integration of the program's curriculum. Faculty will also assess student learning outcomes, maintain current knowledge and skills in their areas of assignment, demonstrate a strong commitment to student success, and foster a positive, carling learning environment where diversity and strong leadership are valued.

Current Centralia College Information Technology staff with teach courses in both the BAS-IT:AD and the associate program. In order to succeed with BAS-IT:AD, Centralia College will hire an additional faculty member prior to the launch of the BAS-IT:AD program. Dependent upon enrollment, Centralia College expects to need to hire another instructor prior to the second year of the BAS-IT:AD program. Qualified faculty will be sourced from institutions of higher education, as well as individuals who demonstrate expertise and provide credentials in the information technology and application development industry. When applicable, Centralia College will make use of qualified part-time and adjunct faculty.

Information Technology Faculty Profiles

Faculty Name . .,	**Credentials**

Allison, Patrick	**Education** Associate ofScience Logistics, Community College of the Air Force Bachelor ofScience Management/Computer Information Systems, Park University Master of Public Administration, University of Alaska - Anchorage Postbaccalaureate Certificate in Geographic Information Systems, Pennsylvania State University
Small, Sam	**Education** Associate of Art Science – DTA, Yakima Valley Community College Bachelor.of Science Computer Science, Heritage University **Industry Certifications** ASP.NET/MVC 4 Advanced SQL Server 2014 Programmer
Carlson, · Chris	**Education** Doctorate in Mathematics – University of California Riverside Masters in Secondary Education in Math, minor Computer Science Bachelors in Math, minor Computer Science
Kiekel, Preston	**Education** Doctorate in Engineering Psychology - New Mexico State University Masters in Experimental Statistics - New Mexico State University **Publications** Human factors aspects of team cognition. *Handbook of Human Factors in Web Design, 2nd ed.* (pp. 107-124)
Current Opening	**Full-time, tenure track p.osition.** The minimum qualifications for this position include: Master's degree from a regionally accredited

Computer Science Assistant Professor	institution in Applied Technology or a related Information Technology field. Substantial, recent full-time experience in the industry and/or teaching experience in software development. Experience with programming languages. Vocationally certifiable by the State Board for Community and Technical Colleges. Preferred qualifications include: Certification in CompTIA A+, N+ and Security +. Microsoft certifications (MCSE, MCSA, MCPD, MCSD). Cisco certifications; CCNA, CCNP

Faculty Professional Development

Due to the in-depth level of education required to instruct upper division courses, continual professional development will be required of all faculty mem.bers teaching in the BAS-IT:AD program.

New certifications are developed annually to accommodate new technology being used in the industry and relevant training will be acquired for BAS-IT:AD faculty

One of the courses are part of Centralia College's existing management program below is the faculty profile as they pertain to that course:

Management Faculty Profiles

Faculty Name	Credentials	Course
McQuarrie, Jeff	MS, Corporate and Organizational Management (July 2012)	BCMST 330 Professional & Organizational Communication

A number of faculty are qualified to teach many of the courses being offered. The assignment of courses in a given quarter will be determined by the area dean in consultation with program specialist and the faculty.

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Selection and admission process

Admission

The college will initially accept twenty students into the program and from the second year forward, admit thirty students annually in the fall quarter operating with the cohort model that has been highly effective with the Bachelor of Applied Science in Applied Management program at Centralia College and indeed the experience across the set of BAS programs. A two-year track will be offered with application forms available on the college Web site. Students can submit application materials electronically or in hard copy, deliverable to the BAS Program Specialist.

Selection

Selection into the program is merit based with a strong academic threshold for entrance into the admissions pool. In order to be placed into the admissions pool, applicants must complete or submit the following:

- An earned associate or higher degree in information technology, application development, or equivalent degree and transcripts from a regionally accredited college or university with a minimum cumulative GPA of 2.5 Associate degree equivalence will be judged by the BAS administration and the program faculty.

The following courses must be completed prior to bachelor degree obtainment. The courses can be included in the two year degree or be completed during the bachelor's program in addition to the required courses. Students who have completed the requirements at the time of application will receive preferred entrance consideration.

Successful completion of each of these required courses with a minimum 2.0 grade:

- ENGL& 101 - English Composition I (5 credits).
- Any college level MATH requiring MATH 099 as a prerequisite, such as MATH& 141 (5 credits)
- A social science course (5 credits)
- A humanities course (5 credits)
- A natural science course (5 credits)
- An additional 5 credits of general education

The selection process will be conducted by a committee that includes the area dean, BAS Program Specialist and at least one faculty member from the program. The admissions department will also be involved in screening and reviewing information to ensure minimum admissions criteria have been achieved for placement into the admissions pool.

Because it is anticipated that the number of academically qualified applicants will exceed space 'availability, the selection committee will then proceed to a process of evaluating the individual applicants on specific criteria - reducing the admissions pool to spaces available. This process will include:

- A thorough review of each application, including transcripts, admissions forms, essays, resumes, and other available documentation.
- Qualified ratings for each applicant by each member of the selection committee based upon predetermined specific dimensions. These dimensions will include the number of recommended classes taken and may include relevant work experience, strength of the personal statement, and diversity of work experience. Prior to selection of an initial cohort, these selection dimensions will have been identified, definitions developed, a rating scale developed, and committee members trained to use the dimensions in a reliable and valid manner.
- Review and discussion of the ratings of each applicant by the committee. The ratings of the reviewers are averaged to reach the final result. Where significant disagreement exists regarding the ratings for an applicant, the committee will review the applicant's data and reach a consensus on the rating.
- Identification of the top candidates, based on the ratings, sufficient to fill available spaces. A waiting list of candidtes also will be developed in case not all of those selected subsequently enroll in the program.
- . Students, who wish to take only one course per quarter, may be allowed to register for that course if the student meets the minimum admissions criteria and there is space available. This decision will be made each quarter and only on a space available basis.

Space availability

The Bachelor of Applied Science in IT: Application Development will be designed around the principle of "high tech-high touch" and will target an incoming class of 20 students.

For purposes of enrollment management and conservative fiscal projections, an incoming class of 20 students per enrollment year with an attrition rate of 10 percent was assumed. The program, however, is geared to minimize attrition through a selective admissions process, orientation, and ongoing retention services.

Table 1: **Projected Enrollments by Annualized FTE**

	2016-17	2017-18	2018-19	2019-20	2020-21
2016 17	20				
2nd year		18			

2017-18		30			
2nd year			27		
2018-19			30		
2nd year				27	
2019-20				30	
2nd year					27
2020-21					30
Total FTE	**20**	48	**57**	**57**	**57**

Recruitment

As members of the Washington Council for High School-College Relations (WCHSCR) program for college fairs, Centralia College will staff a table at these college fairs and conduct on-campus presentations, similar to other four-year programs which provide information in accordance with the rules and guidelines of WCHSCR.

The program administrators of the BAS-IT:AD program plan to meet with the professional advising staffs of SPSCC and LCC to explain the program and to set up two-way communications to ease the transition of students through the admissions process. Print and electronic information will be available to assist these advising professionals and students.

In all print and electronic communications, specific information about admissions requirements, financial aid processes, and admissions and financial aid deadlines will be provided. In addition, professionals and students at tese colleges will have the direct phone number and email address of the·program administrators.

Student groups from which we will primarily recruit students for this program, and the college's plan for outreach to these groups of students:

Major Target Markets	**Outreach Tactics**
Currently enrolled Centralia College students.	Postcards, online course management system, Website, email, Facebook, in-person presentations, faculty advisors, posters, college and job fairs.

Previously enrolled students and graduates of Centralia College	Postcards through alumni association, Website, local media, college fairs, job fairs.
Latino Community	Direct mail to students who attended the Latino Youth Summit, contacts with Latino Community through the Hispanic Roundtable, Hispanic community organizations, churches and non-profits, Website.
Other traditionally underserved populations, e.g.,displaced homemakers, unemployed, and people with disabilities.	Collaborate with WorkSource Centers, the colleges' Worker Retraining Office, the Pacific Mountain Workforce Development Council, other local government agencies to promote the program and to obtain referrals.
Graduates of Lower Columbia Community College, South Puget Sound Community College	Radio and TV media mix, newspaper, college fairs, job fairs, print media in the perspective colleges' advising/counseling/admissions centers.
Veterans	Local veteran organizations, education center at Joint Base Lewis McCord, Vet Corps outreach, Website, job fairs.

Articulation

Articulation is provided through the usual and customary process for transfer of courses and recognition of degrees within the community college system. Centralia College recognize the degrees and courses from the neighboring community colleges and will transfer in all applicable coursework consistent with SBCTC policies and the accreditations standards of the Northwest Commission of Colleges and Universities.

Serves a diverse population

In order to reach place-bound students, instructional delivery will be via face-to-face and hybrid pedagogy which will deliver lecture, class materials, and other information on a Web-based learning management system. The format will permit working students to pursue their academic goals while meeting work and personal obligations.

The following actions will take place to assure as a diverse a population as possible:

- See target markets in the recruiting section above
- Recruit people of color and other traditionally under-represented populations who are Centralia College graduates or graduates from nearby community colleges.
- Engage in .targeted marketing,working with diverse organizations on our campuses as well as organizations in nearby colleges.
- Work with OSPI, ESD, and school districts to develop additional strategies to attract a diverse student body from workers in their employment ranks.
- Regularly assess recruitment/retention efforts with regard to under-represented populations and continually monitor the level of participation and report to the Board of Trustees through annual monitoring reports.
- Work with the colleges foundations to create scholarships to support diverse students in the BAS-IT: Application Development program.

4. Appropriate student services plan.	Describe services that will be needed by the students admitted to the degree program and the college plan for providing those services. Include a description of financial aid services and academic advising for students admitted into the program.

As a community college, one of Centralia College's strengths isthe variety of student-focused support services that help students achieve success in accomplishing their goals. Students in the BAS program will be supported by the same high-quality student services that all students receive.

The following services will be those most frequently used by baccalaureate students.

- **BAS-IT:AD specific support.** The area dean and the program specialist for BAS programs will provide coverage immediately prior to class periods. This will provide students ready access at a time where they are already on campus without the need to schedule a meeting.
- **Student advising, retention and success:** The program's faculty will advise and assist students with their educational planning and progress toward degree completion. Each student will have an individualized schedule and advising plan. Students can use degree planning worksheets to assess their progress. Student retention and student success are the college's top priorities. Centralia College was commended by th.e NWCCU accrediting association in October, 2010 – "The College is to be commended for its student-centered focus toward retention and success as exemplified in the faculty-led advising model." Students appreciate and respond to having a specific person they can

go to for assistance. Program faculty will work with students who need additional assistance to develop personalized student success strategies.

- Credentials evaluation: Credential evaluators with extensive experience will evaluate transcripts from accredited institutions. They will evaluate incoming students for compliance with admission requirements and student records for all degree requirements when students near graduation. The college's credentials evaluators, in consultation with program faculty, will evaluate all transfer or prior learning requests for core courses.
- Center for Disability Services (CDS): The CDS provides accommodations for students with documented disabilities. It provides course materials in alternate formats, reduced distraction-testi ng,adaptive technology aids, and assists faculty in providing appropriate accommodations.
- Financial aid: The Financial Aid office prepares and disburses federal, state, and institutional aid for all Centralia College students. Students can monitor the process of their applications online. Eligible students will be able to apply for student employment.
- TRiO: Students who are first-generation college, low-income, or have a documented disability receive academic and personal support. Services include tutoring,study skills, and advocacy; The Department of Education has approved extension of this program to all bachelor's degree students who fit eligibility criteria.
- Veteran's Administration programs: The Veterans Affairs Office assists all eligible veterans, reservists, dependents, and VA chapter 31 students. The BAS-IT:AD degree will be eligible for VA-approved student funds.
- Tutoring: On-campus tutoring services are available for mathematics, statistics, English, and accounting. Online tutoring is available 24 hours a day, seven days a week. See https://www.etutoring. org/login.cfm?institutionid=193 and http://owl.waol.org.
- Internet access: The college has computer labs, staffed with assistants, which are available Monday through Thursday through 8 p.m. The campus is Wi-Fi enabled and students can access the Wi-Fi from any location on campus using personal laptops. The two major academic buildings on campus are open evenings until 10 p.m. and have Wi-Fi access.
- Library support: The library has a two-pronged vision in support ofthe college mission. One, provide access to information and technology resources that support teaching and enhance student learning. And two, foster an environment in which students acquire the information literacy skills and computer competencies that support independent inquiry and lifelong learning.

To fulfill this vision, the library provides multiple services for students, faculty and staff. These include development and maintenance of collections in support of the college curriculum, information literacy instruction, reference service, circulation services, course

reserves, inter-library loan, instructional equipment, student technology support, college archives, and copyright guidance. Library instruction and collection development is conducted by professional librarians, each with a specific liaison area in the college's academic and technical programs.

The library's collections consist of both print and online resources. The monograph collection alone includes over 70,000 titles, half of which are in e-book collections. The library collections budget to support the BAS-IT:AD includes initial funding to augment the current monograph collection and purchase additional online databases.

In addition to collections, the library provides instruction and reference support. Reference service is available 24/7 through a state and national cooperative. Professional librarians, including librarians in university settings, assist in providing this service.

5. Commitment to build and sustain a high quality program.	Provide a financial- plan for the first five years of program operation. This plan should include (1) types of funds to be used to support the program; (2) projected program expenses; (3) appropriate facilities to be used; (4) equipment, technology, and instructional resources needed for the program. Document the college's ability to sustain the program over time.

Below are tables and brief descriptions illustrating the financial plan of Centralia College's proposed BAS-IT:AD program. This table has been generated based on the financial needs required for the program to be successful. The Board of Trustees have made the startup of BAS-IT:AD a priority as well as the commitment to supplying needed facilities for the space, equipment and training investments.

Table 2 Projected Program Revenue

	Startup 2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Projected Enrollment		20	48	57	57	57
Tuition*		$121,260	$247,824	$294,291	$294,291	$294,291
Lab fees		$3,000	$7,200	$8,550	$8,550	$8,550
Total Revenue		$124,260	$255,024	$302,841	$302,841	$302,841
Total Expenses	$33,702	$121,108	$203, 147	$208,611	$214,239	$220,037
Net Revenue	(33,702)	$3, 152	$51,877	$94,230	$88,602	$82,804

* Tuition is based on the 5% reduction in tuition established by the legislature effective 2016 arid an additional reduction of 15% in 2017

1. Tuition projections are based on a rate of $2,024 for 15 credit hours in a quarter. There is a reduction in tuition the following year of 15%. Therefore, tuition for 2017-2018 is calculated at $1,721 for 15 credit hours in a quarter. Since we are not anticipating a tuition increase beyond that tuition was calculated with a zero increase each year to conservatively reflect revenue expectations.

2 Lab fees ($50 per quarter per student) Lab fees will be assessed to students upon the consumables and equipment used in each course. These fees will support course supplies, not generate net revenue for the college.

Table 3 Projected Program Expenses

	Startup 2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Program Specialist 25%	$13,202	$13,598	$14,006	$14,426	$14,859	$15,305
Faculty w/benefits		$63,690	$131,685	$135,635	$139,704	$143,896
Adjunct facu_lty		$20,820	$36,456	$37,550	$38,676	$39,836
Program Development & Review	$4,500	$4,500	$2,500	$2,500	$2,500	$2,500
Faculty Development & Training	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Marketing/Recruitment	$3,000	$1,500	$1,500	$1,500	$1,500	$1,500
Equipment/Software	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
External Reviewers	$1,000					
Travel		$2,500	$2,500	$2,500	$2,500	$2,500
Library Databases/Material		$2,500	$2,500	$2,500	$2,500	$2,500
Total Expenses	$33,702	$121,108	$203, 147	$208,611	$214,239	$220,037

3. The Program Specialist's salary is allocated to each BAS program. Twenty-five percent is allocated to the BAS-IT: AD with a calculated 3% annual increase. The program specialist is a full-time employee dedicated to BAS programs. There are currently four BAS programs and we are assuming equal division of time.

4. Faculty {67% FT in year 1,and 2 @ 67% in year 2 and subsequent years) with 3% per year increase.

The BAS-IT:AD will require two pro-rata faculty members for the information technology specific courses. The financial plan allows for initially one pro-rata position at the inception of the program in the fall of 2016 and the addition of a second pro-rata faculty in the fall of 2017. It is expected that the current faculty in the associate's program will teach some upper-division courses.

This program will require the additiqn of faculty. Due to the high demand and generous wages currently in the information technology industry, it is not feasible to expect to find qualified adjunct faculty to teach the upper division courses. It is likely that full-time, tenured track positions will be required with the upper division instructors also instructing in the lower division courses to accommodate full-time workloads while continually building the two-year feeder programs.

5. Adjunct faculty

- The BAS-IT:AD will require the use of adjunct faculty or moonlight contracts to support additional sections of the general education courses required. The program contains seven general elective courses for a total of 35 credits. The budget calculation is based on the current negotiated pay scale at step 4 with a 10% differential for upper division courses and benefits.

6. Program development and review

- Qualified faculty will collaborate to develop BAS-IT:AD curriculum. Faculty members that develop a course will be compensated $750 for each course developed and successfully taken through Instructional Council as per Centralia College policies. All eleven new upper division application developm'ent courses will be developed by Centralia College faculty.
- Centralia College will pay $375 per course for any course that requires extensive modifications and approval from Instructional Council. It is assumed that many courses will require some level of modification after being instructed the first time as well as a number of modifications due to the rapidly changing technological environment in the industry.

7. Faculty development and training

Due to the concepts and technology that will be taught in the BAS-IT:AD, it will be necessary for current faculty to receive additional training prior to implementation of some courses. Faculty will be expected to attend training courses or conferences deemed relevant to the BAS-IT:AD courses that they will be teaching.

Faculty teaching the BAS-IT:AD will be required to maintain their certifications and attend new relevant training opportunities as they arise.

8. Marketing/Recruitment

Recruitment will be vital to the enrollment of the program. Assigned faculty and/or college representative will need to recruit and advertise for the BAS-IT:AD program which could include local travel.

9. Equipment/Software

Updated computers and software are necessary to support provide students the relevant experience for today's workplace. The field of information technology and application development are continually involving which will require the computer labs to be upgraded as new software becomes available.

10. External Reviewers

Centralia College will request the review of the proposed curriculum by other institutes of higher education that offer similar degrees.

11. Library databases/materials

Collections/databases that are program.specific.

6. Program specific accreditation.	Indicate whether the institution will seek specialized program accreditation. If so, describe plans for accreditation and.identify appropriate accrediting body.

The college will not seek specialized program accreditation. There is no program specific accreditation for this occupational degree.

7. Pathway options beyond baccalaureate degree.	Describe opportunities and articulation agreements for the place-bound BAS graduates to continue their education onto a graduate (Master's) degree program.

Information Technology positions are generally satisfied with a bachelor's degree. Students who wish to gain upper-level managerial and/or high-level positions within government agencies will benefit from a Master's degree.

Central Washington University offers a Computational Science Master's Degree Program. The entrance requirements for this program include: a 4-year bachelor's degree with a minimum GPA of 3.25 from an accredited college or university. The target audience, for the program, are graduates with a major in computer science.

City University of Seattle offers a Master of Science in Computer Science. The admission requirement for this fully online degree is a bachelor's degree in computer science or related field.

Washington State University offers a Master of Science in Computer Science. The admission requirement is a bachelor's degree from a college or university, accredited by a recognized association and with a cumulative GPA or 3.0.

Centralia College has received initial accreditation to offer baccalaureate programs. Faculty advisors will work with students to ensure the GPA requirements of graduate programs are relayed to all students. Advisors will also work with students who have identified a graduate program to ensure the student understand and/or achieves the entrance requirements and prerequisites specific to their educational goals.

8. External expert evaluation of program.	The institution will select two external experts to review the program. External experts should come from a university level institution, i.e. departmental professor, academic dean or department head. The expert should be a practitioner/instructor from within the content area of the proposal. In a separate document, provide copies of external evaluators' reports or letters. Summarize the institution's responses and subsequent modifications to the proposal based upon evaluator's recommendations. Attach a short bio of the evaluators.

Centralia College selected two external experts to review the program. Reviewers were provided an assessment rubric to complete which addressed the key components of this proposal. The completed rubrics can be found at the end of this. document.

External Review #1 (see appendix B for complete review documents)

Professor Robert Bryant has taught in the Mathematics and Computer Science Department at· Gonzaga University for twenty-eight years. In 2009, Professor Bryant became the Gonzaga Information, Technology and Society (ITEC) Program Director and developed a new program in Information Technology designed to address a growing need for teaching computational thinking to undergraduate students in the liberal arts and other disciplines. In the fall of 2015 he will be the director of the new Bachelor of Arts in Computer Science and Computational Thinking program, an exten.sion of the ITEC program began in 2009. His research interests are in Software Engineering and Computer Science Education. In his 28 at years at Gonzaga, Professor Bryant has received over two million dollars in grants from private and public funding agencies, and has published in both areas of research. From 2008 to 2012, as Co-PI of the Distributed Northwest. Computer Science Department grant from the National Science Foundation (NSF 08-516, CISE – CPATH award # 0829651), Professor Bryant was a liaison with high schools in Washington and Oregon to help coordinate the development of new STEM curriculum. He cun-ently is the principle

lead for a consortium of Spokane area high schools partnering with Code.org. It provides professional development for mathematics, science, and career and technical education teachers in high schools who are teaching a new computing curriculum in schools begun in the fall of 2014. Professor Bryant has served as chair of the Mathematics and Computer Science Department and presently is a Faculty Fellow for the Gonzaga Center for Teaching and Advising to promote technology integration to enhance pedagogy.

Mr. Bryant's overall assessment of the program stated, "The proposed BAS in IT:AD is well designed and very timely for the current needs of local state and national workforce preparation needs. There are a few minor suggestions noted above {see rubric) that I believe would help improve the proposed program. In general, I believe most BAS graduates with a computer science related degree will transition in a few years from an entry level software development position to a software analysis and design/engineering career, where larger software system issues become a core responsibility. These careers focus beyond the specific programming languages and thus their education should prepare them for such advancement. Overall, I believe the BAS in IT:AD program at Centralia College will serve students will in providing an education that prepares them for a rewarding career in a host of fields utilizing software development expertise."

Outlined below are the minor suggestions from Mr. Bryant's review and changes made and/or explanations to address the suggestions:

- IT 440 and 450 .Internship I and II – "I would strongly require students work on a team during their final year projects, both in the internship and capstone courses." "If students are allowed to work only individually, they would not obtain the stated goal of the program regarding working on a team." Response: The course description for IT 440 and 450 were adjusted to demonstrate a team based focus with a caveat for individual work to achieve project outcomes.
- Suggest adding one course on computational/algorithmic theory Response: Information Technology faculty continually work design courses that embed appropriate mathematical components within the core course curriculum. This design provided for better application of the mathematical theory as it relates to specific skills needed in industry. Mathematical theory and application is an area of continual assessment to ensure the correct rigor is reached for optimal student learning and skill development.
- Extending curriculum for IT 460 Capstone to two quarters rather than one. Response: The Capstone course and two quarters of Internship will be aligned to ensure the students receive the depth needed to achieve objectives and demonstrate skill readiness for the workplace.
- Concern that the required mathematics courses do not provide students the probability and statistics knowledge needed for IT 420 Business Intelligence Applications. Recommended adding a basic statistics course to account for the gap. Response:

MATH& 146 Intro to Statistics was added to the program to address this concern. MATH& 146 Intro to Statistics replaced BMGMT 410 Project Management from the original proposal. The concepts of the project management class will be embedded in other courses to focus on project management specific to information technology rather than a general project management theory course. The MATH& 146 course has bee sequenced to be offered the quarter immediate proceeding the IT 420 Business Intelligence Applications course.

- Additional math, particularly statistics would be required for graduate program preparedness. Response: MATH& 146 Intro to Statistics was added to the program to address this concern. MATH& 146 Intro to Statistics replaced BMGMT 410 Project Management from the original proposal. The concepts of the project management class will be embedded in other courses to focus on project management specific to information technology rather than a general project management theory course. The MATH& 146 course has been sequenced to be offered the quarter immediate proceeding the IT 420 Business Intelligence Applications course.
- Arranging internships/projects for up to 20 students each fall will require significant interactions with local businesses. Such time should be accounted for in the budgeting and faculty assignment process. Response: Faculty will work closely with local businesses and students to arrange the internship. This responsibility will fall within the workload of the faculty, in accordance with our faculty negotiated agreement. A line item was added to the budget to address reimbursement for travel that instructors' may have for visiting businesses to establish/evaluate internship sites.

External Review #2 (see appendix C for complete review documents)

Judy Cushing holds undergraduate degree in Math and Philosophy from William and Mary, an M.A. in philosophy from Brown University, and a PhD from Oregon Graduate Institute. She has taught computer science, software engineering,database systems and ecology informatics at Evergreen- since 1983. Before coming to .Evergreen and initiating the *Student Originated Software* program, she worked as a software developer in industry and academia (IBM, Texas Instruments, startups, US Public Health Service, Univ. Bordeaux, Cornell, Univ. Washington, Texas Health Science Center in Dallas).

Recent research involved domain specific software to enable ecologists to conceptualize, design, and implement their own databases and {most recently) to create visualizations. Her current NSF grant is joint with computer scientists, ecologists, and social scientists (mostly at Oregon State University). See http://blogs.evergreen.edu/vistas, http://canopy.evergreen.edu/canopydb

Dr. Cushing's overall assessment of the program stated: "Overall, Istrongly support this program, and would like to see it implemented."

Outlined below are the minor suggestions from Dr. Cushing's review and changes made and/or explanations to address the suggestions:

- Extending recruitment of potential students to individuals in the workforce currently holding a BA, and putting together a modified prerequisite acquiring program for them, and eliminating some of the general education requirements in the program for them. Response: The educational planner indicates that equivalent degree and transcripts approved by BA administration will provide this path for students holding a BA degree. A student who enters the program with an AA or BA degree that fulfills the 60 credit requirement of general education will work with their faculty advisor to develop an alternate route educational plan to eliminate general education and provide additional lower level programing/information technology courses to fill any knowledge gaps.
- Developing a specific plan for coordinating some of the key courses, in particular: a) the two database classes and b) the two internship and capstone courses. Response: Coordination of key courses, using full-time faculty will be part of implementation and curriculum development to ensure program outcomes are achieved. The model of current BAS programs, at Centralia College, foster faculty collaboration through faculty learning communities.
- Paying more attention to lab support and equipment/software coordination for both faculty and students. Response: The budget does address equipment/lab funding. The budget will continue to be adjusted to ensure the program is fully supported and relevant for teaching current industry skills.
- Consider revising the **Written, Oral and Visual Communication,** Purpose,and Program Outcomes in the BASIT Educational Plan, as per my suggestions. Response: The Written, Oral and Visual Communication !earning theme is a cross-campus learning theme established by the college's board. Program outcomes specific to BAS-IT:AD have been updated to capture Dr. Cushing's recommendations.

Appendix A

Advisor _____

Assigned By _____

CENTHALIA COLLEGg

Name· _____

Date _____

EDUCATIONAL PLAN

Bachelor of Applied Science in Information Technology: Application Development

Admission into the BAS-IT:AD program is merit based. Meeting the minimum entrance requirements does not guarantee admission as the number of qualified applicants may exceed the number of amiable enrollment spaces. In order to be placed into the admissions pool, applicants must complete or submit the following:

- Completion of the BAS application materials and
- Proof of an earned associate's degree in information technology, computer science, OR equivalent degree and transcripts approved by BAS administration from a regionally accredited college or university with a minimum cumulative GPA of 2.5.

The following course must be completed prior to bachelor degree obtainment. The courses can be included in the two year degree or be completed during the bachelor's program in addition to the required Gourses. Students who have completed the requirements at the time of application will receive preferred entrance consideration.

- Successful completion of each of these required courses with a minimum 2.0 grade:
  - o ENGL& 101 – English Composition (5 credits)
  - o MATH& 141 -Pre-Calculus I (5 credits)
  - o MATH& 142 - Pre-Calculus II (5 credits)
  - o CMST& 220 - Public Speaking
  - o Social Science - any 100 level or above course that carries Social Science (SS) distribution
  - o Natural Science - any 100 level or above course that carries Natural Science (NS) distribution w/lab

Required course schedule

Fall Quarter, First Year		Credits
IT	310 Advanced Web Applications'	5
IT	320 Application Dev. Methodologies	5
Humanities elective		5
		15

Winter Quarter, First Year		Credits
BCMST&330	Prof & Org Communication	5
IT	330 Application/Software Engineering I	5
Social Science elective		5
		15

Spring Quarter. First Year		Credits
IT	340 Application/Software Engineering II	5
IT	350 Adv. Database Design & Implem.	5
MATH	228 Discrete Mathematics	5
		15

Required course schedule

Fall Quarter. Second Year		Credits
IT	410 Adv. Data Access Techniques	5
IT	440 BAS-IT: AD Internship I	5
MATH& 146	Intro. To Statistics	5
		15

Winter Quarter, Second Year		Credits
IT	420 Business Intelligence App.	5
IT	450 BAS-IT: AD Internship JI	5
Natural Science elective		.Q
		15

Spring Quarter, Second Year		Credits
IT	430 Information Security for Developers	5
IT	460 BAS-IT AD Capstone	5
General education elective**		5
		T5

***Must meet GUR's (General University Requirements/Distribution Requirements) as listed under the Associate in Arts Degree (DTA).

Additional Information on Back

DEGREE: Bachelor of Applied Science in Information Technology: Application Development

Learning Themes: General education outcomes at Centralia College help students, faculty, and the general public identify learning expected when a student has completed a degree or program,. The administration, faculty, and staff have agreed upon the following five Learning Themes which students can expect to encounter in their courses by the completion of any degree.
Reasoning: The ability to extract information from data, develop ideas and solutions, establish logical progression in thinking, and problem solve using such procedures as literary analysis or the scientific methods.
Written, Oral and Visual Communication: The ability to make oneself understood in public, interpersonal, professional, artistic, and technical arenas.
Exploration-Self and Others: An awareness of the values, beliefs, customs, and contributions of persons from one's own and other traditions, ethnicities, classes, and genders.
Resourcefulness: The ability to adapt to change, such as technological innovations or environmental conditions.
Responsibility: The ability to be accountable to self, society, and the natural world.

Purpose: The Bachelor of Applied Science Information Technology: Application Development (BAS-IT:AD) program is designed to ensure graduates have a strong technical foundation in application and software development and are prepared to work in teams to participate in as developers and designers and to manage IT projects, and to prepare software documentation. The program outcomes align with the state Centralia College Learning Themes.

Program Outcomes - Students who successfully this program will have demonstrated the ability to:

A. Develop effective, secure, and efficient code following best practices in data design and software development
B. Communicate effectively with stakeholders to develop software specifications, design and launch systems and troubleshoot and solve problems with existing systems.
C. Troubleshoot and problem-solve defects from identification to resolution
D. Write and present technical documentation
E. Use project management skills, such as estimating work effort, assessing risk, analyzing data, and defining project scope
F. Perform software assurance activities

Estimated Quarterly Program Costs (subject to change without notice)

Resident Tuition (15 credits) and fixed fees*:	$2674
US Citizen Nonresident Tuition (15 credits) and fixed fees*:	$2808
Non US Citizen Nonresident Tuition (15 credits) and fixed fees*:	$6207
*Tuition is subject to change due to State Legislative actions	
Books and supplies (estimate):	$427

Centralia College provides equal opporlunity in education and does not discriminate on the basis of race, gender; color; religion, national origin, age, marital status, sexual orientation, or disability.

Applied Baccalaureate External Review Rubric (!-\ppendix B)

The purpose of this document is to capture the external review of BAS proposals. Please complete and return this document as part of the review process. This document will be submi_tted to SBCTC in conjunction with the proposal. Please do not feel limited in your review by only answering the prom pts asked. Please include in your comments any information that you feel is relevant to this review. We are looking for both things that are really good and things that could be improved. Thank you for your time and providing your expertise and insight.

College Name:	Centralia	As·oe.te title::·>·.···"""	Information Technology: Application Development
Reviewer Name/ Team Name:	Robert Bryant	. Ins,titutic)fIIof erofessi(jnal . " ·1 ···Affiliatloh:·	Gonzaga University
Professional License or Qualification, f any:		.' elahorsfriptO eogram,.. ··ifahy: ·	

Please evaluate the following Spedfit Elrnent

1.	Concept and overview	Overall concept, appropriateness, and placement. The proposed BAS in IT:AD degree is well conceived and targets a much needed enhancement to the college offerings to serve the area businesses and communities. Given the severe shortage of information technology related graduates not only in the region but across the state and country, offering more opportunities for students to achieve education in this field should be a priority for our education system.
2.	Curriculum and Learning Outcomes	Is the curriculum and learning outcomes for program overall and for individual courses, particularly 300AOO level/upper division appropriate? The IT 440 and 450 Internship I and II course descriptions state "Students work as assigned on teams or individually..." If students are allowed to work only individually, they would certainly not obtain the stated goal of the program regarding working on a team. I would strongly require students work on a team during their final year projects, both in the internship and the capstone courses. The learning outcomes for the program are in line with the designed curriculum.
		Does the curriculum align with the positions listed in the statement of needs?

Applied Baccalaureate External Review Rubric (Appendix B)

3. Curriculum Alignment	The proposal provides workforce projections for the region that justify the curriculum. I question the "20" used as the number of students projected to enroll in the program given the current AAS degree has 20 student per year. I believe this to be ambitious since I would think it unlikely such a high percentage of current students would continue with another 2 years of school, presumably at a higher level of rigor. This is true particularly given the current work environment in which even graduates of 2 year IT related degree programs have attractive employment opportunities. A second factor that the proposal includes is a projected retention rate of 90% in the third and fourth years of the program. This rate would be above average and I suspect even harder to achieve in the Centralia area due to economic factors students face provided in the proposal. However, these are minor issues that should not deter from the program goals, and I believe the growth for the program will be positive but at a lower rate given the factors listed above.
4. Academic Relevance	Does the curriculum demonstrate academic relevance and alignment with upper division standards; baccalaureate rigor?
	Overall the curriculum is appropriate for achieving the program objectives. I would suggest adding at least one course on computational/algorithmic theory that provides a more in depth background on the limitations of computational solutions beyond the computational complexity content in the 200 level Java course sequence. This additional rigor would be more in line with most four year CS related.degrees. Logistically I question the ability of students to cover the material listed for the IT 460 Capstone in just one quarter. Generally this is at least 2 quarters in most programs. The capstone course coupled with the two quarters of internship courses may provide the depth sought. However, my experience is that student internships often lack a holistic view of the educational goals targeted in the capstone. The proposal does not provide any details of how the internship and capstone courses are to be run {nor should it}, but perhaps it may be possible to combine the objectives of these 3 courses so that the resulting capstone course utilizes the project experience and artifacts of the internship course content. The IT 420 Business Intelligence Applications course states "Students taking this class should have a good understanding of probabilities, statistics, Venn diagrams, and SQL techniques to perform rudimentary operations." Given the list of required mathematics courses of Math 141, 142, and 228, I do not see where students would obtain the probability and statistics prerequisite knowledge listed. A basic statistics course would be strongly recommended for the program.
	With this BAS degree, would students have the foundation needed to gain acceptance into a graduate programs?

Applied Baccalaureate External Review Rubric (Appendix B)

5. Graduate Preparation and Graduate Program Acceptance	For most Computer Science/Information Technology graduate programs more mathematics, particularly in statistics, would likely be required than the BAS in IT:AD requires. The proposal does not list any pathway options beyond the baccalaureate degree, so I assume this program is not intended to lead to such programs.
6. General Education Requirements	Are the general education requirements appropriate/relevant?
	The general education requirements are appropriate. Since there is no guidance nor restrictions on the specific courses in humanities or social science required, it would be hard to provide the relevance. The lack of a foreign language component certainly distracts from what most consider a bachelor of arts degree, however, it seems to be a growing trerid to reduce such requirements at many universities. Not having such a requirement may prove a challenge for students who may desire to transfer to some four year programs.
7. Faculty	Are the qualifications of faculty appropriate/relevant?
	The faculty appear qualified to lead the program. The provision in the budget to allow for continuing education for the faculty is critical as the computer science field is rapidly changing and faculty will need to continue their own education to stay relevant.
8. Resources	Are there appropriate and relevant resources, including library, student support, and facilities to support the program/students?
	The resources, student support services and facilities appear appropriate to support the program. It is not clear how internships and capstone projects are to be arranged. This will require a time commitment of someone in the department to arrange and manage beyond the standard time for course preparation. This will be especially true prior to the start of the fall term. Arranging internships/projects for up to 20 students each fall will require significant interactions with local businesses. Such time should be accounted for in the budgeting and faculty assignment process.
9. Overall assessment and recommendations	Overall assessment
	The proposed BAS in IT:AD program is well designed and very timely for the current needs of local, state and national workforce preparation needs. There are a few minor suggestions noted above that I believe would help improve the proposed program. In general, I believe most BAS graduates with a computer science related degree will transition in a few years from an entry level software development position to a software analysis and design/engineering career, where larger software system issues become a core responsibility. These careers focus beyond specific programming languages and thus their education should prepare them for such advancement. Overall, I beUeve the BAS in IT:AD program at Centralia College will serve students well in providing an education that prepares them for a rewarding career in a host of fields utiiizing software development expertise.

Applied Baccalaureate External Review Rubric (Appendix B)

Reviewer Bio or Resume .

Professor Robert Bryant has taught in the MatheinaJics artdC9mputer Science Departiilent at Gonzaga University for twenty-eight years. In 2009, Professor Bryant becaniethe Gonzaga nfot!latimi, Technology and Society (ITEC) Program Director and developed a new program inInformation Teclii lol9gy desigiiedtp addtess a.growing rieed for teaching computational thihkil1g to undergraduate students in the liberal arts and other disciplines 1n thef'allof2015 he will be the directot of the ilew Bachelor of Arts in Computer Science and Coinputationarfh.inldiig ptogi;all 1; an extension of the ITEC program began 1ll 2009. His reseafoh interests are in Software Eilgineeririg and Cotnputer Sciehc£Educatiort. In his 28 at yearsat Gonzaga, Professor Bryant has received over two million dollars in grantsJrom private and public' funding agencies;. and has published in both areas bf research. Frmn 2008 to 2012; as Co-PI of the Distributed NorthwestComputer Syience.Departrrierit grant froni the National Science Foundation (NSF 08-516, CISE – CPATH award # 082965l)j Professor Btyajltwas a liaisoh. with high schools irt Washington artd Oregon to help coordinate the development of new STEM curriculum. He cuil'ently .is the pri1lciple lead for a consoiiitm1of Spokfilie area high schools partnering with Code.org. ltprovides pl'Ofessimml developmel1t fohnathel1latics, sciellce, artd career and teclmical educati011teachers in high schools who are teaching a new computing curriculun1in schools begtiilirt the fall of 2014. Professor Btyailt has served as chair of the Mathelnatics and Compute!'Science• Depaiimei}t cliid ptesentJy:is · a Faculty Fellow for the Gonzaga Center.for Teachi1lg and Advising to proniote technology integtationtoerihari.ce.p d@ogy; ·).<:>C

Other documentation provided:

BAS review letter

BAS review rubric

BAS-IT:AD needs assessment

BAS-IT:AD proposal

BAS-IT:AD ed planner

Applied Baccalaureate External Review Rubric – Appendix C

The purpose of document is to capture the external review of BAS proposals. Please complete and return this document as part of the review process. This document will be submitted to SBCTC in conjunction with the proposal. Please do not feel limited in your review by only answering the prompts asked. Please include in your comments any information that you feel is relevant to this review. We are looking for both things that are really good and things that could be improved. Thank you for your time and providing your expertise and insight.

College Name:	Centralia College	**BAS Degree Title:**	BAS-IT
Reviewer Name/ Team Name:	Judith Bayard Cushing	**Institutional or Professional Affiliation:**	The Evergreen State College
Professional License or Qualification, if any:	Ph.D. Computer Science and Engineering, 10 years experience in industry - software engineering ·	**Relationship to Program, if any:**	None

Please evaluate the following Specific Elements	
1. Concept and overview	Overall concept, appropriateness, and placement. **Comment** All excellent. I like that the program is designed as Applied Science/IT, which clearly distinguishes it from existing programs/offerings at other institutions. The proposed program fills a niche not currently addressed in the geographical area. I'd suggest extending the prerequisites to potential students with a BA and some programming courses.
2. Curriculum and Learning Outcomes	's the curriculum and learning outcomes for program overall and for individual cours es, particularly 300-400 level/upper division appropriate 7 **Comment** Overall,Yes. I have made some specific suggestions in the two attached documents.
3. Curriculum Alignment	Does the curriculum align with the positions listed in the statement of needs? **Comment** Yes.
4. Academic Relevance	Does the curriculum demonstrate academic relevance and alignment with upper division standards; baccalaureate rigor?

Applied Baccalaureate External Review Rubric – Appendix C

	Comment Yes, especially if the suggestions I make in the attached documents regarding communication skills, lab support, integrating the internship and capstone courses.
5. Graduate Preparation and Graduate Program Acceptance	With this BAS degree, would students have the foundation needed to gain acceptance into a graduate programs?
	Comment Yes, for graduate programs focusing on IT or SE; probably not for a masters in computer science.
6. General Education Requirements	Are the general education requirements appropriate/relevant?
	Comment Yes, but you might consider waiving those for studens who already have a BA, and allowing them to take preparatory or prerequisite courses in programming or math instead.
7. Faculty	Are the qualifications of faculty appropriate/relevant?
	Comment Yes, but you might find it difficult to recruit faculty. The fact that you require a master's (not Ph.D.) should help immensely, as most BA programs require the Ph.D.,and there are candidates with MA or MS and significant industry experience and expertise who have decided they want to pursue teaching. Consider recruiting through large companies such as IBM, Boeing, etc.
8. Resources	Are there appropriate and relevant resources, including library, student support, and facilities to support the program/students?
	Comment My strongest suggestion is for you to seriously consider adding additional lab support, perhaps requiring students to all purchase the same machine and install the same software. You would need at least a half time lab support technician to support this, but it would pay enormous benefit in learning and in legitimizing the program.

Applied Baccalaureate External Review Rubric – Appendix C

9. Overall assessment and recommendations	Overall assessment

Comment

Overall, I strongly support this program, and would like to see it implemented. I do, however, have some minor suggestions about implementation. These are covered in the two attached documents, and essentially involve:

1. Extending recruitment of potential students to individuals in the workforce currently holding a BA, and putting together a modified prerequisite acquiring program for them, and eliminating some of the general education requirements in the program for them.
2. Developing a specific plan for coordinating some of the key c;:ourses, in particular: a) the two database classes and b) the two internship and capstone courses.
3. Paying more attention to lab support and equipment/software coordination for both faculty and students.
4. Consider revising the Written, Oral and Visual Communication, Purpose, and Program Outcomes in the BASIT Educational Plan, as per my suggestions.

I'd also recommend sending faculty to the CCSC-NW conference: http://www.ccsc.org/northwest/2015/index.html. It's inexpensive and a good way to provide professional development.

Reviewer Bio or Resume

Judy Cushing holds undergraduate degree in Math iitnd Philosophy from William and Mary, an M.A. in philosophy from Brown University, and a PhD from Oregon Graduate Institute. She has taught computer science, software engineering, database systems and ecology informatics at Evergreen since 1983. Before coming fo EVergreenahd initiating the *Student Originated Software* program, she worked as a software developer' in industry and academia (IBM, Texas InstrUmeri t?tsta['tups; US public Health Sefyice, Univ. Bordaux; Cornell, Univ. Washington, Texas Health Science Center in Dallas):

Recent research involved domain specific software to enable ecologists to conceptualize, design; and implement their own databases and (most recently) to create visualizations. Her cUfrer1t NSF grant isjoihtwith computer scientists, ecologists: and social scientists (mostly at Oregon State University). See http://blogs.evergreeh:edu/vistas, http://canopy.evergreen.edu/cahopydb

Other documentation provided:

- BASIT_edplan JBC.docx
- BASITAD comments JBC.docx

Some observations/suggestions (Reviewer Judy Cushing):

Overall Suggestion: Think about your clientele (see below comments on educational plan (1) and competition, e.g.,other 4 year CS degrees in the state. What you propose, for example, does not compete with what is offered at Evergreen, or other 4 year liberal arts institutions. This is GREAT, because students wanting IT do not do well in those more general,and theoretical programs. So, emphasize your strengths: practical, IT and SE education. I'd recommend emphasizing the practical approach that this degree takes. Also, if you attract BA graduates, I'd allow them to forego some ofthe humanities requirements in order to get prerequisite CS or programming courses.

How you are organize and coordinate the software engineering, internship and capstone experiences for the students is key. As you launch the program, I suggest you prepare examples that will give students a good idea of what to expect and how to prepare, and to faculty on how to plan for and manage these activities. The short course descriptions in the Proposal give an idea of what these will involve, but I encourage you to think about making the courses project-oriented. For example, consider IT 350 AND 410: while talking about different techniques and systems is good, students need both concepts and in-depth practice (even at the BA level); maybe doing the same problems in MSSQL, MySQL and Postgres, and NoSQL, but still designing and implementing a database and database application. Finally, you might consider integrating 440, 450, and 460. 460 calls for "propose and implement a full project which demonstrates mastery of the software development life cycle through delivery of a completed body of work", but one quarter seems too short for an entire lifecycle. .

You might consider requiring students to purchase a new laptop (all the same, with software installed by the college IT) so that the students are prepared. Similarly, IT support for faculty would include at least a half time lab tech -to install and maintain faculty machines, help students with software installations, support project oriented courses, and labs. Page 23 addresses t.his (as do the budget numbers), but. specifics are somewhat lacking. This is not a show-stopper, but a successful program will need lab/equipment support.

As a 4-year college faculty member who has taught students coming to a 4-year degree from 2-year IT Associates' degrees (not necessarily from Centralia!) I find the following lack of preparation among many of those students. Addressing these will be critical to the success of your program, i.e., how your graduates are viewed.

1. Student preparation in programming has been rote; i.e.,they are able to code but only from very explicit program specifications, but unable to design programs themselves, or to write specifications. Thus, the students in the BA should learn these abilities.
2. Students often have difficulty mastering concepts, abstractions or theory; these are key for future learning; One place to do this in a BASIT degree is in the database class with SQL....
3. Student communication ability is sometimes lacking. They have poor English language skills, in writing, speaking and listening. Each course in the BA should have some component that emphasizes communication.

I very much like what you say (p. 5 of proposal) "coordination among the courses to ensure concepts are reinforced and the outcomes are being met…[and] coordination in the way in which the courses are taught". How will this coordination be carried out? Will you be paying faculty to interact? Will you be training them in coordinated studies?

You also mention (p. 6): "Student evaluations". Can you be more specific about what is meant by this term?

Re: Educational Plan:

1. Prerequisites: I'd accept students who have an associate's degree and experience, OR a bachelors' degree in an unrelated field and experience or coursework in programming (see my suggestions)
2. Course plan looks good. I would like to see more detail on what is included in certain key courses, who will teach these and how they will be coordinated.
    a. Application/Software Engineering
    b. Internship
    c. Capstone
3. on page 2, I really like the *Reasoning* Section see highlights See also suggestions entered using track changes.

Advisor ______________________ ______

Assigned By ___________________________

CENTRALIA COLLEGE

Name ______________________________

Date ______________________________

EDUCATIONAL PLAN

Bachelor of Applied Science in Information Technology: Application Development

Admission into the BAS-IT:AD program is merit based. Meeting the minimum entrance requirements does not guarantee admission as the number of qualified applicants may exceed the number of amiable enrollment spaces. In order to be placed into the admissions pool, applicants must complete or submit the following:

- Completion of the BAS application materials and
- Proof of an earned associate's degree in information technology, computer science, OR equivalent degree·. and transcripts approved by BAS administration from a regionally accredited college or university with a minimum cumulative GPA of 2.5. an Associates' or Bachelors degree in anv [illegible] or teachers. AND successful comoletion of a\est of oroarammina ski!: inone of the followino oroarammino ianouaoes: Java. C. C++, Pvthon. SOL. BASIC.*R

The following course must be completed prior to bachelor degree obtainment. The courses can be included in the two year degree or be completed during the bachelor's program in addition to the required courses. Students who have completed the requirements at the time of application will receive preferred entrance consideration.

- Successful completion of each of these required courses with a minimum 2.0 grade:
  - ENGL& 101 - English Composition (5 credits)
  - MATH& 141 -Pre-Calculus I (5 credits)
  - MATH& 142 - Pre-Calculus II (5 credits)
  - CMST& 220 - Public Speaking
  - Social Science - any 100 level or above course that carries Social Science (SS) distribution
  - Natural Science - any 100 level or above course that carries Natural Science (NS) distribution w/lab

Required course schedule

Fall Quarter, First Year		Credits
IT	310 Advanced Web Applications	5
IT	320 Application Dev. Methodologies	5
Humanities elective		_Q
		15

Winter Quarter. First Year		Credits
BCMST&330	Prof & Org Communication	5
IT	330 Application/Software Engineering I	5
Social Science elective		5
		15

Spring Quarter, First Year		Credits
IT	340 Application/Software Engineering II	5
IT	350 Adv. Database Design & Implem.	5
MATH	228 Discrete Mathematics	_Q
		15

Required course schedule

Fall Quarter, Second Year		Credits
IT	410 Adv. Data Access Techniques	5
IT	440 BAS-IT: AD Internship I	5
Natural Science elective		5
		15

Winter Quarter, Second Year		Credits
BMGMT 410	Project Management	5
IT	420 Business Intelligence App.	5
IT	450 BAS-IT: AD Internship II	_Q
		15

Spring Quarter, Second Year		Credits
IT	430 Information Security for Developers	5
IT	460 BAS-IT AD Capstone	5
General education elective**		5
		15

***Must meet GUR's (General University Requirements/Distribution Requirements) as listed under the Associate in Arts Degree (DTA).

Additional Information on Back

DEGREE: Bachelor of Applied Science in Information Technoiogy: Appiication Deveiopment

Learning Themes: General education outcomes at Centralia College help students, faculty, and the general public identify learning expected when a student has completed a degree or program. The administration, faculty, and staff have agreed upon. the following five Learning Themes which students can expect to encounter in their courses by the completion of any degree.

Reasoning: Theability to extract information from data, develop ideas and,solutions, establish lpgical progression ,in thinking, and problem ·solve using suchprocedures·as literary analysis orthe scientific methods.

Written, Oral and Visual Communication: The ability to make oneself understood in public, interpersonal, professional, artistic, and technical arenas. The ability to !isten attentive!v to others and be able to articulate their needs; some capacity to resolve di'fl'erences and work in a team situation.

Exploration-Self and Others: An awareness of the values, beliefs, customs, and contributions of persons from one's own and other traditions, ethnicities, classes, and genders.

Resourcefulness: The ability to adapt to change, such as technological innovations or environmental conditions.
Responsibility: The ability to be accountable to self, society, and the natural world.

Purpose: The Bachelor of Applied Science Information Technology: Application Development (BAS-IT:AD) program is designed to ensure graduates have a strong technical foundation in application and software development and will be prepared to work in teams, iQ...Q?..IT!.9.l.Qs i§J rr.as Qt?.Y.?.!f?P.i?..C§..9J:lfJ. Q§.§jgoE m .§.QQJo manage IT projects, and Q._prepare software documentation. The program outcomes align with the state Centralia College Learning Themes.

Program Outcomes - Students who successfully this program will have demonstrated the ability to:

A. A.P..UJ!Y.J.9. qDevelop ?ITi?..9.l.i\!.?. (j:.§..'"".Y.!9J:Ki.!.19...J9 §p..§g)f!_Qfiil9.!J.&..§.?.-!IEL..\\!.!JLefficient code following best practices in data design and software development
B.):ff..Q.cti\,!f_.gGommunicatjgJJ.e effeetively·with stakeholdersJg_Ji?..Y.§.19P §Qfl:..W.?..!!2.-$J?§CificatiQ!.1LQ.§.sian a.DJi?.1!.!EtL systems and troubleshoot and soive problems in existing systems
C. Demonstrated ability to troubleshoot and problem-solve defect§ from identification to resolution
D. Write and present technical documentation
E. Project management skills, such as estimating work effort, assessing risk, analyzing data, and defining project scope
F. Ability to plderform software assurance activities
F-·G. Q.U!y j.Q._.§.§§§.§f\.JDJ;i..lB.?..m.JJ.§.1".:'.l?.Ch.0.919.ffi'_§KHl.l'i

Estimated Quarterly Program Costs (subject to change without notice)

Resident Tuition (15 credits) and fixed fees*:	$2674
US Citizen Nonresident Tuition (15 credits) and fixed fees*:	$280 8
Non US Citizen Nonresident Tuition (15 credits) and fixed fees*:	$6207
*Tuition is subject to change due to St[illegible] re actions	
Books and supplies (estimate):	$427

Centralia College provides equal opportunity in education and does not discriminate on the basis of race, gender, color, religion, national origin, age, marital status, sexual orientation, or disability.