PIERCE COLLEGE

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STATE BOARD FOR COMMUNITY AND TECHNICAL COLLEGES
OCTOBER 2021
PROGRAM PROPOSAL
BACHELOR OF APPLIED SCIENCE
CONSTRUCTION MANAGEMENT

PIERCE COLLEGE

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Cover Page — Program Proposal

Program Information

Institution Name: Pierce College

Degree Name: Bachelor of Applied Science in Construction Management

CIP Code: 52.2001

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

Degree: Associate in Applied Science (AAS) in Construction Management

CIP Code: 52.2001

Year Began: 2006

Proposed Start Implementation Date (i.e. Fall 2014): Winter 2022

Projected Enrollment (FTE) in Year One: 20

Projected Enrollment (FTE) by Year: By 2023 the annual enrollment would be 57

Funding Source: State FTE

Mode of Delivery

Distance Learning: The program will be primarily online as all of the construction management courses will be offered online. The general education courses can be taken online, hybrid, or in the classroom.

Contact Information (Academic Department Representative)

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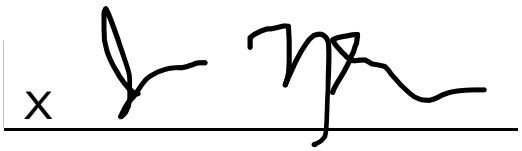
Chief Academic Officer signature

The Program Proposal must be signed. To sign, double click on the signature line below.



Chief Academic Officer

Ilder Andres Betancourt Lopez

Vice President, Learning & Student Success

Pierce College Fort Steilacoom

9/22/2021

Introduction

The construction industry is an important part of the national economy and is defined as a primary sector engaged in the preparation of land development, alteration of structures, and repair of building structures. The construction industry is an important part of Washington State's and Pierce County's economic viability.

During the 2005-2006 academic year, the Associate of Applied Science (AAS) in Construction Management that is currently offered by Pierce College (in response to what construction employers in Pierce County identified as a critical need). At that time, Pierce College's goal was to build a program that provided the skills and knowledge necessary to move construction trade workers up the ladder from the applied work of roofing, carpentry, HVAC, electrical, etc. to work within the construction management team. The associate degree was developed by Pierce College through a Designing a Curriculum (DACUM) process with industry employers, the University of Washington (UW), and the Center of Excellence for Construction (COE),with the intent of providing pathways for incumbent workers. The associate degree was also designed to serve students who were place bound and could not enroll in more traditional, university programs. Over time, the construction management sector has become very complex, requiring professionals to have new skill sets and to understand the multifaceted nature of the industry. Construction management's origins can be traced to several forerunners, and its development, although short, has seen many changes of both practice and attitude. Indeed, the move toward the professionalization of the construction manager role has led to the development of national accrediting bodies and an expectation of higher degree credentials. This expansion of skills and roles has led to employers approaching Pierce College about working collaboratively to develop and eventually offer a Bachelor of Applied Science in Construction Management (BAS CM).

Construction management has specific characteristics and requires a wide variety of skill sets that are different from other types of management. Construction managers work on projects located across many geographic locations with unique site conditions. These projects often have limited durations, operate under a set budget, utilize local labor forces, and must meet specific quality requirements. Project budgets can extend into the hundreds of millions of dollars, and durations can average anywhere from 6 months to 5 years. Throughout those extensive timeframes, construction manager must negotiate, create, and execute prime subcontractor, labor, and supplier contracts. The construction managers must also generate project estimate packages; build project schedules; project overall and annual project costs and profits; understand local, state, and federal taxes; compile and approve progress billings and payments; hire and fire employees; travel; utilize a variety of software programs to manage document control and track project changes; and collaborate and conduct business in person and virtually with multiple stakeholders including clients, architects, and engineers. A successful project should finish on time, be built to quality standards, meet or exceed profit projections, and not have any lingering liability (claims or lawsuits). In the 21st Century, the work of a construction manager is multifaceted and complex, and there is need to train or education project managers differently and with greater rigor than ever before. There is both need and demand for educational opportunities like the proposed Bachelor of Applied Science in Construction Management.

Students at Pierce College who complete the associates degree in construction management are still in demand. However, the highly-skilled nature of the field has resulted in the preferred or required qualification for construction management applicants to hold a four-year degree. Pierce College's proposed Bachelor of Applied Science in Construction Management (BAS CM) would provide a pathway to a four-year degree that more fully represents current standards of the industry. Additionally, the construction industry is moving into a future that relies more heavily on advancing technology, such as using drones for mapping and 3D modeling to identify design conflicts. The construction manager is responsible for making all of these things happen on the job site. Businesses are seeking employees with the academic underpinning to utilize these technologies. Pierce College's faculty are experienced construction managers who specialize in this multifaceted industry and will ensure students have a quality education with relevant, marketable skills, and the credentials that are critical for success. The proposed Bachelor of Applied Science in Construction Management would ensure that Pierce College graduates are prepared and able to embrace this technology-enhanced future.

Multiple sources of employment data reflected high demand within the construction management sector. State growth in job openings for construction managers outpaced the nation. This greater demand for construction managers in Washington state results in construction managers in Washington state receiving compensation higher than the national median. Tables 1 and 2 illustrate the long-term and short-term projections for the construction management labor market as well as the average wage.

Table 1: Long Term Labor Market Projections for Construction Managers 2016 - 2026

Area	Title	Base	Projected	Change	% Change	Avg. Wage /Hr.	Avg. Annual Earning	Avg. Annual Openings
Washington	Construction Manager	15,750	18,950	3,200	20.3	46.53	96,317	1,510
United States		403,800	448,600	44,800	11.1	45.80	94,806	33,200

Source: www.projectionscentral.com/Projections/Long

Table 2: Short Term Labor Market Projections for Construction Managers 2019 - 2021

Area	Title	Base	Projected	Change	% Change	Avg. Wage /Hr.	Avg. Annual Earning	Avg. Annual Openings
Washington	Construction Manager	19,190	19,910	720	3.8	46.53	96,317	1,770

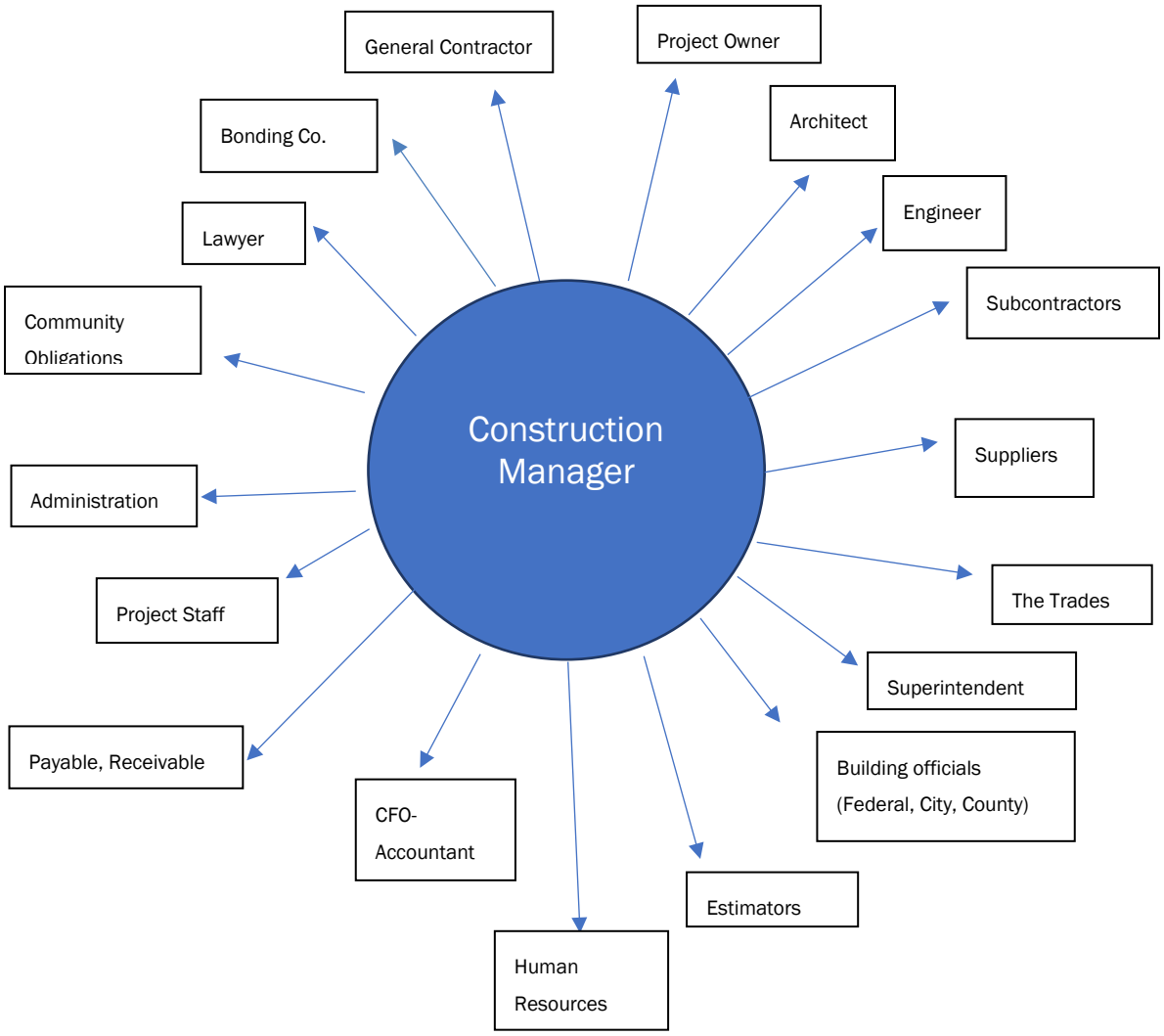
Source: www.projectionscentral.com/Projections/Short

To meet the projected growth in the construction industry and the need for additional degrees and training, Pierce College seeks approval to offer an online Bachelor of Applied Science in Construction Management beginning Winter 2022.

Pierce College's proposed Bachelor of Applied Science in Construction Management would provide a pathway to a four-year degree that advances training and prepares graduates to successfully compete for high-demand, high-wage jobs in the construction sector.

Figure 1 below illustrates the scope of practice for construction managers and the complexities of skills necessary.

Figure 1 Construction Management Scope of Practice



Criteria 1

Curriculum demonstrates baccalaureate level rigor.

Standard 1: Program Learning Outcomes

In order to address the wide scope of work performed by construction managers, Construction Bachelor of Applied Science in Construction Management (construction industry employers who volunteer to provide program guidance) have identified six broad category areas that graduates would need from the proposed Bachelor of Applied Science in Construction Management degree. Those broad areas of emphasis were identified as: professionalism; safety and accident prevention; communication; analysis and problem solving; planning and organization; and sustainability. The program learning outcomes that support these categories will be designed to elevate the foundational work that students perform in during the associate degree-level to baccalaureate-level rigor. Most of the six program outcomes will be addressed in each of the construction management courses.

The program learning outcomes for the proposed Bachelor of Applied Science in Construction Management degree align with Pierce College' broader mission which is to "Create quality educational opportunities for a diverse community of learners to thrive in an evolving world", as well as Pierce College's Core Themes and Objectives. These include: 1) Access; 2) Excellence; 3) Contribution to Community; 4) Equity, Diversity and Inclusion; and 5) Student Learning and Success. These are assessed at the program and institutional level. Working with members of under-represented communities is a special emphasis for each of the construction management courses.

Table 3: Program Learning Outcomes for the proposed Bachelor of Applied Science in Construction Management

Category	Graduates will:
Professionalism	Model professionalism in the construction industry through ethics and advocacy; team building; leadership; mentorship especially around supporting historically marginalized employees in the industry.
Safety and Accident Prevention	Evaluate the importance of jobsite safety and research strategies that can be used to build a culture of safety.
Communication	Compose, implement, and assess the efficacy of communications tools used in the construction industry to disseminate technical and professional business information to diverse stakeholders.
Analysis and Problem Solving	Analyze projects through the application of mathematics, logic, and technology to solve problems in construction documents; materials and methods; estimating; budgets; and scheduling.
Planning and Organization	Research, implement, and evaluate construction processes using project planning methods and tools.

Sustainability	Assess concepts related to running sustainable projects in order to build sustainable business processes.

Standard 2: Program Evaluation Criteria and Process

Pierce College is dedicated to a continuous improvement process to ensure program relevance and student success. A comprehensive approach to the evaluation process will include well-established procedures as well as new processes.

- Pierce College has implemented a Career Pathways model to assist students in achieving success. The model is based on four principles: 1) Clarify the Path, 2) Help Students Get on a Path, 3) Help Students Stay on Their Path, and 4) Ensure Students are Learning. Career Pathways at Pierce College focus on six overall career "paths," narrowing to more specific areas particular to student interests. Career Pathways is embedded into the proposed Bachelor of Applied Science in Construction Management degree program design. The career map will be carefully designed by the Pierce College program developers in collaboration with construction management industry professionals.

- The Construction Management Advisory Committee is convened twice a year to review Construction Management Program goals and assess program outcomes. The advisory committee is composed of professionals in the field who volunteer their time and expertise to ensure that the program outcomes are relevant to work of construction managers. Appendix A lists the members of the Pierce College Construction Management Advisory Committee. Construction management courses have been approved by the advisory committee and analyzed by construction management professionals to ensure rigor and industry relevance.

- To assure that the needs of the industry are translated successfully to the student as learning objectives, the proposed Bachelor of Applied Science in Construction Management courses will be evaluated based upon the Washington Course Design Checklist. The Washington Course Design Checklist was developed by eLearning professionals from community and technical colleges across the state with the goal of defining the essential indicators of a well-designed online/hybrid course.

- Disciplines and programs are responsible for the collection, assessment, and evaluation processes for student attainment of degree outcomes at the course level. The degree outcome data collection, assessment and evaluation are described in the construction management assessment plan. Faculty members within the construction management program are responsible for documenting degree outcome assessments, evaluations, and continuous improvement efforts in the Program/Discipline Annual Review. Pierce College supports educational effectiveness through a district-wide assessment process that provides the faculty time and space to engage in this work. During the academic year, the construction management faculty will identify needs for any changes to instructional materials, courses, or program outcomes, and develop a plan of action in collaboration with the program advisory committee.

- As outlined in the 2015-2022 Institutional Assessment Plan, each program and discipline

complete a self-study that is a compilation of a program's or discipline's assessment plan and three annual reviews within on assessment cycle. For each annual review the construction management program identifies courses, assignments and assessment tools to evaluate the indicated degree outcomes listed in the construction management's assessment plan; measure student performance on indicated degree outcomes; collect and evaluate student performance metrics; set goals and report on progress of existing goals. The self-study serves to identify program needs and updates from data gathered through the program mapping process, advisory board input, industry engagement, and faculty input. The self-study ensures ongoing alignment with industry standards and current practices. The process for program self-study evaluates data including, but not limited to, completions, part time/full time enrollment, working students, and first-generation students. This open-ended process ensures the proposed Bachelor of Applied Science in Construction Management degree will maintain the highest level of industry relevant education in an academically prepared construction management workforce. The program and discipline self-studies are compiled and analyzed by the Outcomes Team to identify institutional opportunities for improvement.

- Pierce College will work with the Center of Excellence for Construction, hosted by Renton Technical College, to obtain additional industry feedback beyond the advisory committee. This ongoing connection with the Center of Excellence will supplement available labor market data and provide a real-time approach to program quality management, data gathering, and current job information.

- Quarterly student evaluation provides feedback on course content, delivery quality, and faculty effectiveness.

- An assessment reflection on program efficacy is done by program faculty annually as part of the institutional assessment processes. This work is supported by the Assessment Office, the Outcomes Team, and the Office of Institutional Research.

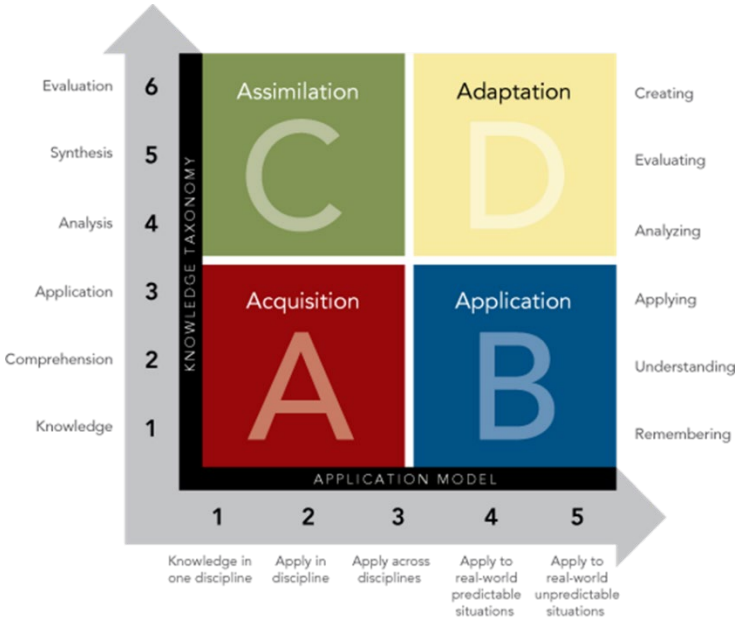
- All courses, certificates, degrees, and maps are reviewed on a 6-year cycle through the curriculum review process, which includes review by the Pierce College Learning Council.

- Data gathered from program advisory committee members, employer interviews and surveys, student course evaluations, post-graduation surveys, institutional program statistics, and cost analysis will be regularly collected to inform the Pierce College Construction Management Program administrative staff and the advisory committee of the viability of the Bachelor of Applied Science in Construction Management degree program. This process will serve as a basis for collaborative discussion between construction industry professionals, educators, and the proposed Bachelor of Applied Science in Construction Management program administrators, with the goal of validating the ongoing relevance of the proposed degree program to employers, hiring managers, and students.

As a basis for establishing and demonstrating baccalaureate level rigor, the proposed Bachelor of Applied Science in Construction Management degree will apply the Rigor/Relevance Framework

model developed by the International Center for Leadership in Education (ICLE). 1 Figure 2 below illustrates the relationship between complexity of thinking and flexibility of application.2 Bloom's Taxonomy provides a level of versatility in program design and will be used as an additional evaluation tool to gauge the level of rigor embedded in program and student outcomes, instructional materials, lessons, and assessments for existing curriculum. The taxonomy will also be applied to courses being developed for the bachelor of applied science degree to ensure the appropriate level of rigor is designed into proposed Bachelor of Applied Science in Construction Management course materials.

Figure 2: Rigor/Relevance Framework



Framework Quadrants Defined

A - Acquisition	Students gather and store bits of knowledge and information. Students are primarily expected to remember or understand this knowledge.
B - Application	Students use acquired knowledge to solve problems, design solutions, and complete work. The highest level of application is to apply knowledge to new and unpredictable situations.
C - Assimilation	Students extend and refine their acquired knowledge to be able to use that knowledge automatically and routinely to analyze and solve problems and create solutions.
D - Adaptation	Students have the competence to think in complex ways.

[1] International Center for Leadership in Education (2014)
[2] Daggett, B., If Not Common Core, Then What?: Rigor and Relevance: The Foundation of Effective Instruction. International Center for Leadership in Education. (2014).

Standard 3: Course Preparation Needed by Students Transferring with Technical Associate Degree

As an open-door institution, Pierce College seeks to provide access to as many students as possible. The goal of the Bachelor of Applied Science in Construction Management degree program is to ensure transfer students and new program applicants are given the opportunity to access the Construction Management Program pathway leading to the proposed Bachelor of Applied Science in Construction Management degree. With the proposed Bachelor of Applied Science in Construction Management degree pathway, the students will have access to the many professional careers available in construction and be able to pursue promotions in the field.

The proposed Bachelor of Applied Science in Construction Management admission requirements will provide the opportunity for students to accelerate their education through transfer credits, academic credit for prior learning, and work experience evaluation. In many cases course substitution would be done if students have taken other courses within the same general education distribution area in their associate degree. Because of the specialized nature of the proposed, students transferring in must have foundational, construction industry knowledge and skills that are contained within construction associate of applied science degrees. Construction management related technical associate degree programs offered at Pierce College and other community or technical colleges will be evaluated to ensure articulation of the respective professional technical associate degree toward the proposed Bachelor of Applied Science in Construction Management degree. Students transferring from a technical or community college without articulation agreements will be evaluated from transcripts and given the maximum number of credits toward the Bachelor of Applied Science in Construction Management degree program. Generally, transfer students would have 90 credits of their construction-related, associate degree applied toward the 180-credit required for the Bachelor of Applied Science in Construction Management degree. However, if a transfer student is deficient in some of the general education credits, they would need to take those prior to or during the proposed Bachelor of Applied Science in Construction Management program. Through dialogue with the advisors for the proposed degree, an individualized education plan would be created for the student to ensure no course gaps exist.

Pierce College is currently implementing an online tool to aid students, faculty, and advisors to evaluate academic credit for prior learning. This online tool will bring uniformity, structure, and consistency for evaluation of each student's prior experience. The short personal statement of interest required during the application process would allow the program faculty to identify potential courses that the student could receive academic credit for prior learning based upon their work experience. Following submission of the application materials, if the work experience appears appropriate for academic credit for prior learning, the student would be directed to the online tool and assisted as needed by the program support staff and faculty in the use of that tool.

Standard 4. General Education Component

Pierce College provides a broad educational foundation for students and offers an array of general education courses in communication, quantitative symbolic reasoning, humanities, social science, and natural science that fulfill the fundamental areas of knowledge expected of a baccalaureate level student. Table 4 lists the general education courses that would be taken by students in their associate of applied science degree and those that would be taken with the proposed Bachelor of Applied Science in Construction Management.

Table 4: General Education Courses that would be applied to the Bachelor of Applied Science in Construction Management degree

GER Distribution Area	Credits	AAS Courses	BAS CM Courses
Communications	10	ENGL& 101 English Composition (5) ENGL& 235 Technical Writing (5)	
Natural Science All listed courses fulfill the Lab requirement	10	Select one courses from the below list: GEOL& 101 Intro. to Physical Geology (5) GEOL& 110 Environmental Geology (5) PHYS& 110 Physics for Non-Science Majors (5)	Select one courses from the below list: GEOL& 101 Intro. to Physical Geology (5) GEOL& 110 Environmental Geology (5) PHYS& 110 Physics for Non-Science Majors (5)
Social Science	10	Select one courses from the below list: ECON 110 Survey of Economics (5) BUS& 101 Introduction to Business (5) ECON& 201 Microeconomics (5) ECON& 202 Macroeconomics (5)	Select one courses from the below list: ECON 110 Survey of Economics (5) BUS& 101 Introduction to Business (5) ECON& 201 Microeconomics (5) ECON& 202 Macroeconomics (5)
Humanities #1	5	CMST& 101 Intro. to Communications (5) OR CMST 105 Intercultural Communications	
Humanities #2	5		Select one course from the below list: PHIL& 150 Philosophy – Intro to Ethics (5) CMST& 220 Public Speaking

GER Distribution Area	Credits	AAS Courses	BAS CM Courses
			(5) CMST& 230 Small Group Communication (5) CMST& 330 Professional & Organizational Communication (5)
Quantitative	5	Math& 141 Precalculus (5) OR Math& 147 Business Precalculus (5)	
Additional General Education	15		Select three additional courses from the above Natural Science, Social Science, or Humanities course lists
Total General Education Credits	60		

Standard 5: BAS Courses at the Junior and Senior Level

Students will complete 60 credits of upper-division core requirements for the Bachelor of Applied Science in Construction Management degree, as shown in Table 5. Appendix B provides an example of a four-year schedule for a student completing the Associate of Applied Science in Construction Management degree and then transitioning to the Bachelor of Applied Science in Construction Management Program.

Table 5: Junior and Senior Core (CONST) Coursework for Bachelor of Applied Science in Construction Management degree

Course #	Core Requirements (60 credits)	Credits
CONST 300	Surveying, Earthwork, and Infrastructure	5
CONST 310	Building Relationships	5
CONST 320	Concrete and Foundation	5
CONST 330	Communications and Conflict Resolution	5
CONST 340	Mechanical, Electrical, and Plumbing (MEP)	5
CONST 350	Budgeting and Accounting for CM Projects	5
CONST 400	Virtual Construction Modeling	5
CONST 410	Means and Methods II	5
CONST 420	Estimating II	5
CONST 430	Planning and Scheduling II	5
CONST 440	Virtual Construction Integration with Estimating and Scheduling	5
CONST 460	Construction Management Capstone (5)	

Course #	Core Requirements (60 credits)	Credits
	OR	5
CONST 470	Construction Management Work-based Learning (5)	
	Total Core Credits	**60**

Criteria 2

Qualified faculty.

All faculty and administrators in the proposed Bachelor of Applied Science in Construction Management program will meet certification requirements for professional and technical administrators and instructors as required by the Washington Administrative Code. Faculty teaching in the proposed Bachelor of Applied Science in Construction Management program will typically be required to hold as a minimum a master's degree; exceptions may be made for highly specialized courses such as construction-specific core courses required for this degree. In these instances, a combination of bachelor degree level credentials, industry experience, and industry certifications may be considered adequate. Prior to her hire, our full-time faculty member in the program had over 30 years of industry experience with a well-known, high-volume, local construction company. Her experience working in the male-dominated, construction industry has translated into Pierce College often having construction management classes that are composed of 50 percent women and persons of color. Her instruction overtly addresses the inequities seen in the industry and she challenges her students to create inclusive environments in the construction workplace. Graduate schools with construction management programs are not readily available and construction management professionals who do pursue a graduate degree usually seek out a Master of Business Administration. Adjunct faculty will typically be construction management professionals who are working in the field, and adjunct faculty with industry experience will be hired in specific technical areas. Faculty teaching general education courses within the bachelor of applied science program will do so as part of regular faculty load. For 300- and 400 level general education courses Ph.D. faculty in the specific discipline will develop course content.

The college plans to hire one full-time director/faculty position whose time and salary will be prorated at 2/3 faculty and 1/3 administration. This is in addition to the existing tenured faculty position. One staff position will be hired that will be shared with another bachelor of applied science program. Administrative responsibilities will be evaluated as the program grows to ensure appropriate staffing levels are in place for faculty and program administration. While 50 percent of our current faculty are women, we do not have any persons of color teaching in the program. This is reflective of the white-dominated construction industry but is not in alignment with Pierce College anti-racism goals nor reflective of Pierce College student demographics or the makeup of the surrounding community. Targeted position advertising, reduction of barriers to the hiring process, and training of screening committee members about bias are some of the strategies Pierce College is using to increase diversity in the faculty.

Table 6: Faculty Credentials

Faculty Name	Credentials	Status	Areas of Expertise
Dolores Kelley	Bachelor of Arts in Business Administration, Pacific Lutheran University; Certificate in Project Management, University of Washington; Certificate in Construction Management, University of Washington	Full-time	Business Management and Construction Management
Larry Price	Master of Education in Adult and Higher Education, Western Washington University; Master of Business Administration, Columbia College; Bachelor of Science in Forest Resource Management, West Virginia University	Adjunct	Safety
Sherry Eshenbaugh	Master of Construction Engineering Management, Montana State University; Master of Architecture, Montana State University; Bachelor of Environmental Design, Montana State University	Adjunct	Architecture, Construction Management and Building Information Modeling
Chad Worth	Master of Business Administration Emphasis Project Management, City College; Bachelor of Science in Business Law Studies, City College	Adjunct	Business Management and Construction Management

Table 7: General Course Prerequisite Faculty Credentials: Pierce College

COMMUNICATION: ENGL& 101, ENGL& 102, ENGL& 235			
Tenured/Tenure Track Faculty, Full-time	14	12, MA/MFA/MS	2, Ph.D./Ed.D.
All Adjunct Faculty	Master's Degree in discipline, or master's degree in a related field, or master's degree with 15 graduate semester credits in English		
SOCIAL SCIENCES: PSYC& 100, SOC& 101, BUS& 201, ANTH& 106, POLS& 202, ECON& 201, ECON& 202			
Tenured/Tenure Track Faculty, Full-time	5	2, SW/MA/MS	3, Ph.D./Ed.D.
All Adjunct Faculty	Master's degree in discipline, or master's degree in a related field		
HUMANITIES: PHIL& 150, CMST& 220, CMST& 230, CMST& 330			
Tenured/Tenure Track Faculty, Full Time	3	3, MLA/MA	2, Ph.D./Ed.D.

All Adjunct Faculty	Master's Degree in discipline, or master's Degree in a related field		
QUANTITATIVE/SYMBOLIC REASONING: MATH& 107, MATH& 146			
Tenured/Tenure Track Faculty, Full-time	8	8, MLA/MA	0, Ph.D./Ed.D.
All Adjunct Faculty	Master's degree in discipline, or master's degree in a related field		
NATURAL SCIENCES: ATMOS 101, BIOL& 100, CHEM& 110, PHYS& 110			
Tenured/Tenure Track Faculty, Fulltime	17	13, MA/MS	4, Ph.D.
All Adjunct Faculty	Master's degree in Discipline, or master's degree in a related field, or Master's degree with 15 graduate semester credits in Earth Sciences or related discipline		

Criteria 3

Selective admissions process, if used for the program, consistent with an open-door institution.

The institutional mission of Pierce College is to create quality educational opportunities for a diverse community of learners to thrive in an evolving world. Five core themes forming the key tenets of the college's mission include:

- Access to comprehensive and affordable educational offerings and services.
- Student learning and success where students will experience quality, relevant learning that increases their knowledge, skills, and abilities to maximize the potential for individual success.
- Excellence in the quality, sustainability, and continuous improvement in all of its departments and programs to ensure graduates will be prepared and competitive in the job market.
- Positive and diverse college environment where quality teaching and learning are fostered, decision-making is collaborative, and students and employees feel valued and respected; and
- Contribution to the community as a recognized leader, building and maintaining academic, industry, and broad-based community partnerships to advance local educational opportunities and economic development.

The proposed Bachelor of Applied Science in Construction Management degree program will continue to develop and expand established focus areas for student selections with our community and industry engagement and with advising connections. Pierce College will expand current marketing strategies in-house and externally, and will continue to work with community and technical institutions to improve and develop Associate of Applied Science (AAS) transfers and articulations.

Program faculty will work with the Construction Center of Excellence to make connections with other colleges locally and statewide to ensure that those institutions and the students they serve are aware of the proposed Bachelor of Applied Science in Construction Management and how students can transition into the program. Communication will continue with construction firms locally and statewide to share with them how the associate degree and proposed Bachelor of Applied Science in Construction Management program can support the professional development of their employees. Pierce College students who are in other pathways will also be made aware of the Construction Management Program in case they are exploring other career options.

In keeping with its mission, values, and core themes, Pierce College maintains an open-door admissions policy that ensures equal opportunity and does not discriminate in its educational programs. No one is denied admission to the college because of race, color, national origin, sex, sexual orientation, disability, or age. Admission criteria to the proposed degree program will be consistent with these institutional principles. Diversity and inclusion metrics are in place as part of the Achieving the Dream work at Pierce College. Theses metrics include enrollment and completion data that is disaggregated by ethnicity, race, age, gender, etc. This data is used to inform the proposed Bachelor of Applied Science in Construction Management marketing and outreach efforts. Pierce College has a strong commitment to becoming an anti-racist institution and has established an EDI office and related programs to not only provide outreach to under-represented communities, but to provide support for students while they are in the program. The proposed Bachelor of Applied Science in Construction Management will provide additional opportunities for place bound, under-represented populations to access and complete coursework that lead to a degree in a supported environment.

Proposed Admissions Process

Consistent with an open-door institution, every application that meets the college's criteria for admission will be considered for the proposed Bachelor of Applied Science in Construction Management degree program. A college level cumulative 2.5 grade point average is the minimum requirement for admission to the Bachelor of Applied Science in Construction Management program. Admission into the Pierce College's proposed Bachelor of Applied Science in Construction Management program will be consistent with other public baccalaureate institutions. Admissions requirements are established to ensure students:

- Are academically prepared for the rigor of baccalaureate level work, and
- Have a thorough understanding of the level of personal and professional responsibility necessary to advance and succeed in the construction management profession.

To support workers in the construction field who often must work long days and have limited time to complete the application process, the program on-boarding will be designed to reduce barriers and will be available online.

Candidates considered for admission to the proposed Bachelor of Applied Science in Construction Management program will submit:

- A completed Pierce College application.
- Unofficial transcripts. Upon acceptance into the program students will need to submit official transcripts to the Evaluations Office of the college.
- A personal introduction statement (250-500 words) that addresses why they are seeking to enroll in the program. This would include a statement outlining work experience in the industry, military service, or volunteer experience. The personal introduction statement is to inform the selection committee of the student's experience and knowledge of the construction field to assess that student's readiness to be a part of the program. It also alerts program faculty of the potential for academic credit for prior learning. The student will be contacted and a follow-up conversation with program staff will occur so that the student can more fully elaborate on their personal statement and they can receive additional information about the program.

While any student who has earned, an associate degree would be able to apply to the proposed Bachelor of Applied Science in Construction Management program, the degree was created to build upon the foundation laid down by the associate of applied science degree in construction management. If a student doesn't have an associate degree that is construction-based, it may be necessary for program staff to design an individualized education plan that includes some 100 and 200 level construction management courses to ensure an appropriate on-ramp into the proposed Bachelor of Applied Science in Construction Management. While all students who complete the application will be considered for the program, if there are more students applying than there are seats in the program, students who have completed an associate degree in construction management or a construction-related associate degree will be given preference. In order to increase the diversity within the program, outreach will occur to other community and technical colleges seeking students from their programs. Since student diversity is greater in programs for construction trades, Pierce College will make a concerted effort to recruit from those programs. In addition, the college will reach out to construction firms and professional organizations to encourage them to seek out their employees for professional development through our program.

Pierce College also targets under-represented groups through marketing and outreach to diverse audiences by ethnicity whenever possible. Database lists are used to examine what languages may be spoken in the home, or the ethnicity of household members, so campaigns can be tailored to specific households. Pierce College also use geofencing to reach ethnically diverse communities and can also target businesses that cater to ethnic groups. College marketing can also be translated into languages such as Korean, Vietnamese, Russian, Spanish and Chinese. The college regularly advertises on local Spanish radio and always includes information about workforce programs and certificates. A marketing campaign for the proposed Bachelor of Applied Science in Construction Management launch has been included in the budget for future implementation.

Criteria 4

Appropriate student services plan.

Student support services are accessed through the easily navigable MyPierce account. To serve working students and those in online programs such as that proposed for the proposed Bachelor of Applied Science in Construction Management, most Pierce College support services are available online in addition to typical Monday through Friday business hours.

Financial Aid

Pierce College received approval from the Northwest Commission on Colleges and Universities to confer baccalaureate degrees. This designation allows the Financial Aid office to notify the U.S. Department of Education of the College's new additional bachelor of applied science degree offerings.

Students eligible for the proposed Bachelor of Applied Science in Construction Management degree program may be awarded State Need Grant funds based on established sector amounts as determined by the Washington Student Achievement Council. Federal student loans will be certified based on the student's year in school. Subsidized loan limits will be extended (to 6 years) and reported to the Department of Education as required. Maximum time to degree completion as defined by the Pierce College Satisfactory Academic Progress Policy will be adjusted to reflect the program length. Financial aid consumer information will be updated, and staff will research and post any scholarship opportunities that pertain to those enrolled in the Pierce College's proposed Bachelor of Applied Science in Construction Management degree program.

Following acceptance into the proposed degree program, students will be directed to the Pierce College websites to obtain financial aid information, FAFSA completion deadlines and application forms. The Financial Aid Office prepares and disburses federal, state, and institutional aid for all Pierce College students. Students can monitor the financial aid application progress online. In order to make the financial aid process as transparent and understandable as possible, students with questions about their financial aid will be assisted by the Pierce College financial aid team.

Advising Services

The college fosters student autonomy by encouraging students to build professional and academic relationships with their advisors. To accomplish this, students will attend a bachelor of applied science program orientation to learn about the program and be assigned a faculty mentor. The expectation is that they meet with their faculty mentors quarterly via phone, online, face-to-face, or using conferencing software such as Zoom. While an initial education plan will be created for each future Bachelor of Applied Science in Construction Management student, there are opportunities for that education plan to be adjusted based upon changing student circumstances.

Academic Credit for Prior Learning

The proposed Bachelor of Applied Science in Construction Management degree is focused on incumbent workers and will integrate Academic Credit for Prior Learning (ACPL) as an opportunity for incoming students. Academic Credit for Prior Learning was one of the areas expressed in comments

by students as important to their decision on enrolling in a Bachelor of Applied Science in Construction Management program. The Pierce College Guided Pathways model creates a framework for students to seek credit for what they already know and can do related to course outcomes and skills practiced through "in-station" training. To help optimize its Academic Credit for Prior Learning offerings, Pierce College is implementing the PLA Accelerator, an online tool that guides students through the process of documenting their work and learning experiences. The PLA Accelerator not only helps identify specific areas of knowledge and expertise, it can also enable students to self-assess their skills against the college's professional technical program's specific learning outcomes. In this way, the PLA Accelerator adds structure and consistency to the Academic Credit for Prior Learning process and creates efficiencies in the advising function by automating the PLA intake process and providing a framework for tracking data on student engagement with Academic Credit for Prior Learning.

Admissions staff or student success coaches review the outcomes of the PLA Accelerator (online academic credit for prior learning tool) and use the results to guide an initial discussion with the student around educational goals, prior learning options, and the construction management career pathway. Students will be directed through the online registration process. Next steps include meeting with a construction management faculty mentor/advisor to review the results from the PLA Accelerator and to further discuss academic credit for prior learning options. The faculty role is central to evaluation of a student's credentials and faculty advisors are responsible for final recommendations for prior learning credit. Academic Credit for Prior Learning options include:

- Testing through College Level Exam Program (CLEP), Dantes Subject Standardized Test (DSST), or a Local Competency Exam.
- Non-traditional training matched to an established Crosswalk. This information is captured in the PLA Accelerator. Pierce College construction management courses will be cross walked to common experiences within the construction sector.
- Demonstration of experience through writing a Portfolio that aligns college-level learning with outcomes of a specific course.

Career Services

Faculty advisors provide career services, resources, and strategies for making positive career choices. This includes choosing a college major and developing career plans, creating job search materials, finding internships and full-time jobs, and making successful career transitions. Resources include a computer lab, an extensive library of books, videos, and one-on-one appointments with career and employment specialists. Services are free and open to students, former students, and the general public. The Job and Career Connections Department is available during normal working hours and upon request they will extend hours of service to meet the program's needs.

Achieving the Dream and Starfish Student Support and Retention Tool

Pierce College is committed to student academic success and early alert systems have been documented to increase student success and retention. One of the best practices for student retention efforts is informing students early if they are exhibiting behaviors that put their academic performance at risk. Pierce College has recently implemented the Starfish Student Support and

Retention tool that assists faculty in helping students reach their educational goals, helps foster individual student connections with faculty, and encourages students to take early advantage of campus resources.

Pierce College's commitment to assisting all students to achieve their educational goals resulted in joining the Achieving the Dream (ATD) National Reform Network which focuses on putting systems in place that support community college student success. Achieving the Dream priority groups are in place at Pierce College that targets clearly defined skills, increased connections to employability, and contributions to economic growth for communities and our nation as a whole. In 2014, Pierce College was named an Achieving the Dream Leader College in recognition of retention gains and work to close achievement gaps for underrepresented populations. Examples of ongoing Achieving the Dream work include: College 110, an introductory course required for all students with no prior college experience; improvements in onboarding that connect students with their pathway very early in the process; the incorporation of a student success team that stays in place for the student's entire journey at the college; and work with faculty to develop and implement inclusion. A recognized challenge will be to increase the diversity of faculty teaching in the Construction Management Program so that students will be able to see themselves as being successful professionals in the field. The program faculty will reach out to members of the construction community to bring in guest speakers that represent the diversity within the field. In addition, graduates of the program will be asked to speak to new students to share with them what their work looks like on a daily basis and what things they wish they had known when they were new students.

Counseling and Academic Support

The support services at Pierce College are extensive. All Pierce College students may access these services and construction management faculty and staff work closely with the various departments to assist students in their academic success.[3] Although Pierce College does not staff a mental health center, the college does employ three licensed counselors who can provide intervention and referrals as necessary. The college also offers several resources for tutoring which are free to all students. These include traditional on-site tutoring options, as well as online e-Tutoring.[4]

Library Services

Systems are in place through Pierce College libraries to provide resources that support the educational mission of the college. The Bachelor of Applied Science in Construction Management program chair met with the Dean of Library and Learning Resources and the Systems and Instruction librarian responsible for collections development. Library and program staff reviewed existing online database collections and the individual courses outlined in the proposed bachelor of applied science curriculum framework (Table 8).

Pierce College library services has developed extensive online resources consisting of subject specific databases and class resource guides. The primary research source for the proposed Bachelor of Applied Science in Construction Management will be the PM World Library for Students[5].

[3] Pierce College Support Services. Web: http://www.pierce.ctc.edu/dist/supportservices/. Sept 2015.
[4] Pierce College Tutoring. Web: http://www.pierce.ctc.edu/dist/tutoring/. Sept. 2015.
[5] PM World Library for Students: https://pmworldlibrary.net

The PM World Library assists students with research for their studies and provides educational articles and papers related to project and program management. Students will gain knowledge of how projects are created, planned, financed, and managed and will have access to information on construction management practices from around the world.

A list of library materials aligned with course topics is being compiled from industry and academic practitioners to ensure industry specific peer reviewed journals, articles, and research databases are made available to support student research at the baccalaureate level. The Pierce College database collections and online resources provide 24/7 access for Bachelor of Applied Science in Construction Management students to study at their convenience. Examples of the extensive library research and course resources available to students can be found in Table 8 and at http://libguides.pierce.ctc.edu/researchguides.

Table 8: Sample of Online-Accessible Library Resources

Key Databases
ProQuest Research Library or Academic Search Complete for newspaper, magazine and scholarly journal articles. CQ Researcher or Gale Opposing Viewpoints in Context for controversial issues or current events. Gale Virtual Reference Library for encyclopedia entries. WOIS (Washington Occupational Information Service) for career research and planning. Films on Demand for educational videos Ebook Central or EBSCO eBook for eBooks you can read on your computer or mobile device.
Research and Help Guides
Library research guides by subject, class, or area of research need Alphabetical list of more than 80 databases on a variety of subjects. Find a specific article, journal, or magazine Cite sources in MLA or APA Finding and evaluating scholarly journals Help connecting to library databases.

All Pierce College librarians are faculty. Librarians are available to assist program staff and faculty to ensure information literacy, a college core ability, is embedded in associate and bachelor of applied science program materials. The integration of literacy components is customized for each course and aligned with course outcomes. Each instructional division has a dedicated librarian to support reading and research assignments included in the programs within the division. The division librarian will work with the Bachelor of Applied Science in Construction Management faculty and students to ensure library materials are available to meet the academic rigor required for a baccalaureate degree, particularly in research methodologies with online access to resources, and increased support for research and upper division writing skills.

Computer Services

All Pierce College students have access to several open computer labs in addition to the library as well as Wi-Fi access throughout most of the campus. Computer labs have extended hours. Following the online model that is used for the associate of applied science degree in Construction Management, the core course for the proposed Bachelor of Applied Science in Construction Management degree will be offered through CANVAS, the college system's learning management system. The online model for the proposed Bachelor of Applied Science in Construction Management program opens access to courses at a time and place of convenience to the students in order to accommodate the inconsistent schedules of construction industry professionals.

Access and Disability Services

Pierce College's Access and Disability Services (ADS) staff assist those with disabilities in pursuing their educational goals. Access and Disability Services staff members are committed to ensuring that Pierce College, its services, programs, and activities are accessible to individuals with disabilities. Pierce College and the Construction Management Program faculty and staff recognize that traditional methods, programs, and services may need to be altered to assure full accessibility to qualified persons with disabilities who meet the minimum criteria for engaging in the construction management course of study.

Access and Disability Services is the primary focus of efforts by Pierce College to assure nondiscrimination on the basis of disability. Through the Access and Disability Services Office, qualified persons with disabilities can address their concerns regarding attitudinal or procedural barriers encountered, as well as any need for academic adjustments and/or auxiliary aids to ensure equal access. Access and Disability Services also serve as a resource to the campus community in striving to make Pierce College both an accessible and hospitable place for persons with disabilities to enjoy full and equal participation. The Construction Management Program faculty and staff consult with Access and Disability Services staff or refer students to Access and Disability Services staff whenever additional support is needed.[6]

Admissions, Registration and Records

The Registration and Records Offices offer online and in-person registration services. Additionally, staff members assist new college students with enrollment verification and official transcript requests. Both new and transfer students meet with advisors who help students register for classes after completing an application for admission and submitting the application to the Admissions Office.

Equity, Diversity, and Inclusion (EDI)

Pierce College continues its work with the ATD network and is strongly focused on becoming an anti-racist institution. The college has created the EDI CARES (College Access, Retention, and Engagement Services) Office which is focused on empowering students to achieve their academic, professional, and life goals. EDI CARES play a critical role in fulfilling the college's most important mission to create quality educational opportunities for a diverse community of learners to thrive in an evolving world. They are charged with achieving this mission for students who have faced various

[6] Pierce College Access & Disability Services. Web: http://www.pierce.ctc.edu/dist/supportservices/ads/. Sept. 2015.

forms of marginalization, equity and economic barriers, and educational barriers. To truly be anti-racist we must work deliberately to eliminate barriers that have prevented the most promising and capable students from entering and thriving in college.

Staff work to facilitate and implement success strategies for students of color to include promoting access and student success; providing academic advising, educational planning, career exploration, and student programs that support students of color; assisting with financial aid and scholarships; sponsoring leadership development activities; and the annual Students of Color Conference. In addition, all faculty and staff undergo ethics and diversity training annually. In 2021-22, Pierce College is also part of the Race and Equity Leadership Academy (RELA), which works to examine structures and policies that serve as barriers for racially minoritized students. These efforts will also help Pierce College work with employment sectors that have goals to diversify their workforces.

Veterans' Services

Pierce College Fort Steilacoom has a Center of Excellence for Veteran Student Success. The College's aim is to increase veteran student enrollment and completion rates by:

- Providing a single point of contact to coordinate Veteran student support services.
- Increasing awareness of support services.
- Reinforcing the existing support system and advocating for Veteran students.
- Expanding needed services.

Students who have served in the military are invited to visit the Veterans Resource Center at the Fort Steilacoom campus. The Center offers the following services and amenities:

- A textbook lending library.
- Computers for student use.
- Study areas.
- Opportunities to meet other Veterans and connect with both on- and off-campus services and resources.
- Access to community service providers to assist Veterans with transition to civilian life.
- Peer support.

Safety

The mission of the Campus Safety Department is to provide for the safety and security of the Pierce College District, while maintaining a positive and diverse environment that promotes excellence, accountability, and respect. While every member of the college community shares responsibility for campus safety and security, the Campus Safety Department takes the lead in this area.

Administrative responsibility lies with the Vice President of Administrative Services and the District Director of Safety and Security.[7]

Criteria 5

Commitment to build and sustain a high-quality program.

Pierce College is committed to developing and sustaining the proposed Bachelor of Applied Science in Construction Management. The college's commitment to growing the construction management pathway and meeting employer demand for a skilled workforce will be expanded from the Construction Management AAS/Certificate level to a Bachelor of Applied Science in Construction Management degree to meet industry demand for construction management professionals with integrated leadership and management knowledge, skills, and competencies to practice in an evolving and dynamic profession.

Foundation of a High Quality and Sustainable Program

Pierce College has taken a sector strategy/career pathways approach to the creation of a high quality, sustainable program by leveraging the mapping of feeder program pathways and identification of related career fields. Among the feeder pathways into the proposed Bachelor of Applied Science in Construction Management program that have been identified are the Construction Management Associate Degree program at Pierce College and the Renton Technical Construction Management program. There are also pathways into the construction sector through project management, construction trades programs, and applied business degrees and certificates.

A process of continuous engagement with partners on the Construction Management Advisory Committee has led to the development of the bachelor of applied science pathway based on industry changes, which continue to drive the need for educational pathways to the proposed Bachelor of Applied Science in Construction Management degree. The Advisory Committee championed the program from the beginning, dating back to development of the associate of applied science degree in 2005-2006. Their willingness to invest their time and professional expertise in the Construction Management program framed the direction and continues to provide invaluable support. The advisory committee members also provide internship sites, support their incumbent workers to access education, host capstone activities, provide input on additional certificates (BIM), provide job shadowing and guest speaking experiences, present to the Board of Trustees, work with the foundation, etc. The advisory committee is committed to continued involvement with both the associate of applied science and the bachelor of applied science. The list of current advisory committee members is located in Appendix A.

Tuition, Revenue and Local Funds

Pierce College functions with an open and transparent budget that takes place each spring. The process is based on an annual budget projection based on overall allocation, tuition revenue, contracted revenue, etc. The bachelor of applied science programs goes through the budget process to request support for development and implementation. The bachelor of applied science program

[7] Pierce College Campus Safety. Web: http://www.pierce.ctc.edu/studentlife/safety/. Sept. 2015.

development is also approved through the Executive Team prior to moving forward with feasibility studies, statements of need, and proposals. The Deans and Vice Presidents of Instruction also meet to prioritize budget requests prior to presenting to the larger budget committee. Instructional funds support faculty and staff salaries, instructional materials, professional development, purchase and repair of equipment, travel, etc. The proposed Bachelor of Applied Science in Construction Management program will be supported as a state Full Time Equivalent (FTE) program with all tuition revenue going into the tuition account. Additional tuition revenue that results from the upper division tuition rate will be utilized to cover the additional expenditures that result from proposed curriculum changes. Start-up costs will be covered by the district budget and general workforce program development funds.

The overall bachelor of applied science program budget was developed using the same budget model as in previous degrees. The enrollment projections are based on what is known about course taking behavior with the Associate of Applied Science in Construction Management students, other bachelor of applied science program students, as well as industry employment demand data. There are several factors that led the proposed Bachelor of Applied Science in Construction Management degree development team to feel confident with higher level enrollment projections, primarily due industry input, data, and modality (the proposed Bachelor of Applied Science in Construction Management will be the only online accessible degree of its type in Washington State). The decision to move the program online was done to address the need for increased flexibility and for improved access. The projections are conservative in terms of retention as often students continue working while they pursue their education.

In addition to Construction Management AAS graduates, target populations include students from associate degree pathway construction industry programs with outreach to other community colleges, construction trade program completers, and current construction professionals. Career professionals and transitioning military who have previous education or work experience can receive credit toward their studies through prior learning assessment and transcript evaluation. Transfer students will also receive a full evaluation of transcripts to maximize the number of credits transferred into the proposed Bachelor of Applied Science in Construction Management degree program. The online delivery of the program enables incumbent workers with inconsistent schedules or who are mobile in their current careers access to the proposed Bachelor of Applied Science in Construction Management degree.

Following is a transparent breakdown of the projected expenditures for the proposed Bachelor of Applied Science in Construction Management with additional notes following Table 9:

Table 9: Projected Bachelor of Applied Science in Construction Management Revenues & Expenditures

Pierce College BAS in Construction Management Projected Revenues and Expenditures						
		Year 1	Year 2	Year 3	Year 4	Year 5
		2021-22	2022-23	2023-24	2024-25	2025-26
	Number of Year 3 Students	20	25	30	30	30
	Number of Year 4 Students		17	22	27	27

Revenue					
Tuition					
Tuition Year 3 Students	$118,026	$147,533	$177,039	$177,039	$177,039
Tuition Year 4 Students	$0	$100,322	$129,829	$159,335	$159,335
Total Tuition	$118,026	$247,855	$306,868	$336,374	$336,374
Minus 3% ctcLink assessment	$114,485	$240,419	$297,662	$326,283	$326,283
Minus 3.5% for local financial aid	$110,354	$231,744	$286,921	$314,510	$314,510
Other Revenue					
Consumables Fee	$0	$0	$0	$0	$0
Workforce Funding--Base Allocation	$10,000	$10,000	$10,000	$10,000	$10,000
High Demand Compensation Funding	$24,000	$24,000	$24,000	$24,000	$24,000
Total Other Revenue	$34,000	$34,000	$34,000	$34,000	$34,000
Total Revenue	$144,354	$265,744	$320,921	$348,510	$348,510
Expenditures					
Operating Costs					
Instruction (adjunct faculty costs)	$4,440	$31,701	$32,335	$32,982	$33,641
Support Staff (.5 FTE)	$41,170	$41,993	$42,833	$43,690	$44,564
Program Director/Faculty	$62,094	$63,336	$64,603	$65,895	$67,213
High Demand Stipends	$24,000	$24,000	$24,000	$24,000	$24,000
Advising and Admittance Support (.5)	$20,500	$20,500	$20,500	$20,500	$20,500
Curriculum Development	$10,000	$10,000			
Library Support (.25)	$12,500	$12,750	$13,005	$13,265	$13,530
Benefits	$60,347	$67,108	$65,781	$68,108	$70,522
Goods and Services--Marketing	$5,000	$5,000	$1,000	$1,000	$1,000
Goods and Services - Non-Lab	$0	$0	$0	$0	$0
Student Consumable Expenses	$0	$0	$0	$0	$0
Equipment purchases and replacements	$0	$0	$0	$0	$0
Accreditation*	$5,500				
Professional Development/Conferences	$1,000	$1,000	$1,000	$1,000	$1,000
Travel	$2,000	$2,000	$2,000	$2,000	$2,000
Library Material/data bases	$5,500	$5,500	$5,500	$5,500	$5,500
Total Operating Costs	$254,051	$284,888	$272,556	$277,939	$283,470
Non-Operating Costs					
Indirect Costs (10%)	$25,405	$28,489	$27,256	$27,794	$28,347
Total Non-Operating Costs	$25,405	$28,489	$27,256	$27,794	$28,347
Total Expenditures	$279,456	$313,377	$299,812	$305,733	$311,817

Net Income (Loss)	($135,102)	($47,633)	$21,109	$42,777	$36,693
Salary and Benefit Projections assume 2% annual inflation					
*Northwest Commission on Colleges and Universities, American Council for Construction Education					

Budget Notes: High Demand salary funding is legislated and could be temporary but is included in the proposal as it illustrates the need to provide compensation high enough to attract faculty from industry. The salary amount included is the faculty contracted level four on the current placement schedule. Longer term plan would be to have an Associate Dean or Director in an administrative exempt position with responsibility for the business-related Career Pathways (Applied Business, Accounting, and Construction Management). A Bachelor of Applied Science in Accounting is in feasibility stage as is the organizational structure.

Moving the program online is the reason for no direct facilities costs or equipment. Facilities costs and equipment costs are supported through indirect. There is a 3-D printer associated with the Virtual Design and Construction courses as well as software costs which are supported through IT and the instructional equipment process. The 3-D printer usage will be considered as hybrid labs if needed.

Marketing is coordinated through Pierce College's Marketing and Communications Department (MARCOM). They receive annual funding for general program marketing, guided pathways specific marketing, outreach campaigns and materials, website work, etc. Workforce budgets (Perkins, WRT, Base Allocation, and bachelor of applied science) also work with MARCOM for funding for specific programs, including the bachelor of applied science program launch. Relationship building with employers, and word-of-mouth with program completers will complement the advertising. Plans are to utilize testimonials of employers, alumni, and current students in marketing campaigns.

Criteria 6

Program specific accreditation.

Construction management program faculty from three universities (University of Washington, Central Washington University, and Washington State University) as well as multiple, current working professionals in the industry have recommended that Pierce College seek accreditation through the American Council for Construction Education (ACCE). Pierce College has met with the American Council for Construction Education Board members to discuss the process of accreditation for the proposed Bachelor of Applied Science in Construction Management. Pierce College's proposed Bachelor of Applied Science in Construction Management program would be eligible for accreditation based upon the standards of the American Council for Construction Education. A comparison of the courses required for the American Council for Construction Education accreditation and those that would be offered in the proposed Bachelor of Applied Science in Construction Management program can be found in Appendix D. The proposed curriculum in the Bachelor of Applied Science in Construction Management is in alignment with American Council for Construction Education standards.

By working with the American Council for Construction Education, Pierce College will have the opportunity to work with industry, other higher educational institutions, and the public at large to maintain standards and criteria for accreditation, and to participate and provide guidance for the process.

Criteria 7

Pathway options beyond baccalaureate degree.

Central Washington University offers a Master of Science degree in Engineering Technology and Management (MS-ETM) with a specialization in Construction Management. Warren Plugge, Director and Professor at Central Washington University stated that a few key challenges for Pierce College's future Bachelor of Applied Science in Construction Management students would be the math and engineering requirements required for the program. To address this potential issues, Pierce College can take steps to identify In some cases additional or supplemental coursework for students to take prior to full admission in to the proposed Bachelor of Applied Science in Construction Management degree program .

The University of Washington—Seattle offers a Master of Science Degree in Construction Management. John Schaufelberger, Professor of Construction Management at the University of Washington stated that graduates of Pierce College's Bachelor of Applied Science in Construction Management program would be eligible for admission into the university's master of science degree program.

Washington State University does not have a master's degree program in construction management. Jason Peschel, Associate Professor, and head of Washington State University's Bachelor in Construction Management program stated that most students do not pursue a master's degree in construction management because it is not needed in the profession. Most companies value experience as much or more than pursuing a master's degree in construction management. Students who move to executive positions often pursue a Master of Business Administration.

Criteria 8

External expert evaluation of program.

Three external experts identified to evaluate this Bachelor of Applied Science in Construction Management proposal were: Jason Peschel, Associate Professor and program head of the Washington State University Construction Management Program; 2) Warren Plugge, Director and Professor of the Central Washington University Construction Management Program; and 3) John Schaufelberger, Professor in the University of Washington Construction Management Program, former Chair of American Council for Construction Education (ACCE). Summaries of their reviews are below. The full evaluation documents along with their biographical information can be found in Appendix F.

Washington State University (WSU) Jason Peschel Associate Professor & Program Head, stated that "the proposed Bachelor of Applied Science Construction Management program will provide a crucial

resource for students in the Pierce County area/region. The expansion of the degree offering will enable a great growth opportunity that they may not have otherwise been able to pursue. Pierce College's proposed Bachelor of Applied Science will provide opportunities for graduates of the program to meet the demand and growth of the construction industry, and graduates will have great opportunities to advance in construction management careers of choice. The proposed Bachelor of Applied Science in Construction Management's curriculum as developed will offer the students at Pierce [College] the specific skills needed to succeed in the field of construction management." Professor Peschel states: "the continued use of adjuncts (especially industry professionals as noted) to deliver core curriculum can be challenging. The challenges mainly arise due to the demanding nature of employment in the construction industry...these industry professionals will be working 40-60 hours per week in addition to any teaching responsibilities for the program. It can also lead to a lack of consistency within the course curriculum if a long-term commitment/contract cannot be established with an adjunct faculty member." The Pierce College associate degree program staff have not found an issue with having adjuncts teach many of our courses. It allows current professionals in the field to bring their expertise to the students. The adjunct faculty have been very consistent over the past seven or eight years. They seek to give back to the next generation. The online modality of the construction management courses allows for flexibility of instruction in response to changes in work schedules.

Central Washington University (CWU) Warren Plugge PhD, noted in his review that “overall the program and learning outcomes are well laid out and will provide students the opportunity to seek construction management positions with many different types of construction organizations with a bachelor of applied science degree. The Bachelor of Applied Science in Construction Management degree will provide Pierce College students a path to construction management careers as well as specialized career opportunities in the field." Dr. Plugge made two suggestions for enhancement of the program. The first was: "The learning outcomes do not address the specific engineering concepts commonly found at other bachelor of science (BS) degree programs within other universities but have a level of rigor appropriate for a Bachelor of Applied Science level degree in Construction Management". Later in his review he states: "While there is very little engineering focus within the program, a suggestion might be to incorporate or show evidence students are receiving some information within the curriculum associated with basic engineering principles such as statics and strength of materials used within the construction industry." While it is appropriate for students to have a basic understanding of materials and their strengths, the Pierce College bachelor of applied science degree is one which focuses upon graduates to be able to step into construction management roles. When the advisory committee which is made up of active construction managers was asked about what courses from their educational background was least beneficial to them the engineering and calculus courses came to the top of the list. While those engineering concepts are important for the engineering team working on construction projects, those skills would not be used by members of the construction team.

The second suggestion came from this comment: "Although some students may be placement bound coming into the program with some construction experience, those who are new to the industry may require some type of internship to expose them to what the industry has to offer." The Pierce College team felt this was an appropriate enhancement for the program. The curriculum will be modified so that at the end of the proposed Bachelor of Applied Science in Construction Management program a student can take either the capstone course or an internship based upon that student's needs. For

the student that is already employed by a construction company and earning the proposed Bachelor of Applied Science in Construction Management degree for career advancement within the company, they would be advised to take the capstone course. For the student who is not currently employed in the construction field, they would be advised to take the internship course in order to obtain job experience in the industry. It is generally easy for a student in the construction management field to obtain an internship. Often members of the advisory committee (Appendix A) will offer internship to Pierce College students.

University of Washington (UW) John Schaufelberger Professor and Former Chair of the American Council for Construction (ACCE), summarizes the overall program: "The proposed Bachelor of Applied Science in Construction Management program is well-structured to serve the needs of students and the construction industry not only in Pierce County, but throughout the State. Many potential students may not be able to attend one of the construction management baccalaureate programs offered at Washington universities. By offering an online alternative, Pierce College is proposing to increase the pool for construction management graduates in the State to better meet the ever-increasing industry demand for new talent. The program is well-conceived and will provide the needed educational foundation for success in the industry. The college will need to widely advertise the program throughout the State so that enrolled students can obtain summer internships to complement their formal schooling during the academic year."

Conclusion

Construction Management is a fairly new, but rapidly growing, career specialty within the construction industry. Historically, it was the estimators or operation managers who ran all the construction projects and made the decisions. As construction projects became larger and more complicated, they required more attention than could be provided by an estimator with several projects and an operation manager running all the projects for the company. Pierce College faculty and industry representatives collaborated on the creation of the foundations (curriculum) of skills needed to educate students for this career pathway. In 2005-2006, Pierce College designed a two-year, associate degree program in construction management. That program was built that was designed to provide construction management training for working adults and place-bound adults, and students unable to attend traditional universities. Since 2006, the associate degree program in construction management has been successful with launching graduates into construction management careers.

Technology has transformed the construction industry. Drones are routinely used for surveying the terrain, documenting project progress, and to access tight areas of the construction site. Computer-aided design (CAD) software brings a project to life. Building Information Modeling (BIM) is the application of software that allows all construction project team members to access the model of the project in order to identify and prevent building design clashes. Changes can be immediately disseminated to all team members using the software. Building Information Modeling can be used for planning, scheduling, billing, and identifying project risk. With phones and tablets, construction project team members have the capability of discussion specific areas of concern and have the ability to improve materials and methods implementation while walking the site or from the office. The construction industry is changing rapidly due to the greater demands expected of our construction projects and the technology that is needed to implement those projects. The proposed Bachelor of Applied Science in Construction Management will address rapid changes and greater demands. Students who enroll in the proposed degree pathway will graduate with the credentials, knowledge and management skills for careers in the 21st Century construction management industry. The nearest 4-year degree in construction management is the University of Washington-Seattle. The proposed Bachelor of Applied Science in Construction Management at Pierce College will be designed in by program faculty in collaboration with industry construction managers. The proposed Bachelor of Applied Science in Construction Management will be affordable, accessible, supportive and flexible. Graduates of the program will have optimal career opportunities in the construction management industry.

Pierce College's proposed Bachelor of Applied Science in Construction Management faculty will collaborate with employers and the industry sector. Faculty will attend, and occasionally guest speak, at construction industry associations such as the Associated General Contractors of America (AGC), National Associates of Women in Construction (NAWIC), and Construction Specification Institute (CSI). Participation in these organizations will help to promote Pierce College's associate's degree in construction management and proposed Bachelor of Applied Science in Construction Management degree pathways. The proposed Bachelor of Applied Science in Construction Management degree program will be an outstanding training opportunity for future students, one that will provide

students with the skills and credentials to become managers in a continually advancing industry. Pierce College is excited to bring the proposed Bachelor of Applied Science in Construction Management program to full implementation.

Appendix A:

Pierce College Construction Management Advisory Committee Member List

Kurt Balmer	Estimator	Absher Construction Company
Josh Beloit	Project Engineer	Johansen Construction Company
Anders Bjorn	Owner	Colvos Construction Company
Steve Crandall, Sr.	Project Engineer	Johansen Construction Company
Roy Cutler	Owner—Pierce College Adjunct	Cutler Management Company
Sherry Eshenbaugh	Project Manager/BIM Manager	The Rush Company
Raygan Kettman	Project Engineer	Absher Construction Company
Jill McNally	Project Engineer	Absher Construction Company
Devin Page	Owner	Colvos Construction Company
Colbey Strange	Project Engineer	Alutiiq Construction Division
Marc Streleski	Sr. Project Manager	Walsh Construction Company
Jeff Tiegs	Owner	Lincoln Construction Company
Chad Wirth	Senior Project Manager/Pierce College Adjunct	Abbott Construction Company
Blaine Wolfe	Project Executive	Absher Construction Company

Appendix B:

Bachelor of Applied Science in Construction Management Program 4-year Student Sample Schedule

	Fall Quarter 1		Winter Quarter 2		Spring Quarter 3		Credentials Earned
	Course	Credits	Course	Credits	Course	Credits	
Year 1	*COLLEG 110 College Success *May be waived for students with prior college experience.	3	Math& 141 Precalculus OR Math& 147 Business Precalculus	5	ENGL& 101 English Composition	5	
	CONST 101 Intro. to Construction Management	5	CONST 150 Construction Documents	5	CONST 200 Estimating	5	
	CONST 140 Construction Drawings: Printreading	5	CONST 160 Materials and Methods	5	CONST 230 Scheduling and Planning	5	
	BTECA 110 Microsoft Word: Prepare and Edit Documents	1	BTECA 121 Microsoft Excel: Prepare Basic Worksheets	1			
			BTECA 122 Microsoft Excel: Manage Workbooks	1	CONST 180 Building Codes	3	
	BTECA 111 Microsoft Word: Format Pages and Objects	1	BTECA 123 Microsoft Excel: Financial Formulas and Charts	1			
	Total Credits	15	Total Credits	18	Total Credits	20	Total Year 1 Credits: 53

	Fall Quarter 1		Winter Quarter 2		Spring Quarter 3		Credentials Earned
	Course	Credits	Course	Credits	Course	Credits	
Year 2	CMST& 101 Intro. to Communications OR CMST 105 Intercultural Communication	5	CONST 250 Construction Safety and Accident Prevention	3	CONST 260 Construction Project Management	5	Award AAS Construction Management degree (104 credits)
	ACCT 101 Survey of Accounting OR ACCT& 201 Principles of Accounting	5	BUS& 201 Business Law ENGL& 235 Technical Writing	5 5	CONST 198 Work Based Learning	3	
	BUS 260 Project Management I OR MGNT 130 Customer Relationship Management OR MNGT 182 Creative Sales and Customer Relationship Management OR MNGT 283 Principles of Management OR MNGT 284 Small Business Planning	5	BUS 261 Project Management II OR MGNT 130 Customer Relationship Management OR MNGT 182 Creative Sales and Customer Relationship Management OR MNGT 283 Principles of Management OR MNGT 284 Small Business Planning	5	ECON 110 Survey of Economics OR ECON& 201 Microeconomics OR BUS& 101 Intro. to Business OR Econ& 202 Macroeconomics GEOL& 110 Environmental Geology OR GEOL& 101 Intro. to Physical Geology OR PHYS& 110 Physics for Non-Science Majors	5 5	
	Total Credits	15	Total Credits	18	Total Credits	18	Total Year 2 Credits: 51
Year 3	CONST 300 Surveying, Earthwork, and Infrastructure	5	CONST 320 Concrete and Foundation	5	CONST 340 Mechanical, Electrical and Plumbing (MEP)	5	

	Fall Quarter 1		Winter Quarter 2		Spring Quarter 3		Credentials Earned
	Course	Credits	Course	Credits	Course	Credits	
	CONST 310 Building Relationships	5	CONST 330 Communications and Conflict Resolution	5	CONST 350 Budgeting and Accounting for CM Projects	5	
	BUS& 101 Introduction to Business OR ECON 110 Survey of Economics OR ECON& 201 Microeconomics OR ECON& 202 Macroeconomics	5	Phil 150 Introduction to Ethics	5	CMST 330 Organizational Communication	5	
	Total Credits	15	Total Credits	15	Total Credits	15	Total Year 3 Credits: 45
Year 4	CONST 400 Virtual Construction Modeling	5	CONST 420 Estimating II	5	CONST 440 Virtual Construction Integration with Estimating and Scheduling	5	
	CONST 410 Means and Methods II	5	CONST 430 Scheduling II	5	CONST 460 Construction Management Capstone	5	
	PHIL 115 Critical Thinking	5	HUM 106 Ethnic Though and Culture	5	GEOL& 101 Intro. to Physical Geology OR GEOL& 110 Environmental Geology OR PHYS& 110 Physics for Non-Science Majors	5	Award BAS CM degree (180 credits)
	Total Credits	15	Total Credits	15	Total Credits	15	Total Year 4 Credits: 45

Fall Quarter 1		Winter Quarter 2		Spring Quarter 3		Credentials Earned
Course	Credits	Course	Credits	Course	Credits	
				Total Year 3-4 Credits	90	
				Total Credits Associate degree (90 credits brought forward) plus Years 3 & 4 to earn BAS CM degree	180	

Appendix C:

Bachelor of Applied Science in Construction Management Course Descriptions

CONST 300 Surveying, Earthwork, and Infrastructure (5 credits)

Introduction to construction surveying including layout of construction features, distance, and elevation measurement, and use and care of surveying equipment. Studies the materials, methods, and techniques used in site work, highway, utility, and other heavy construction projects. Addresses concrete as a construction material, foundations, rigid and flexible pavements, bridges, dams, and tunnels.

CONST 310 Building Relationships (5 credits)

Introduction to challenges of managing a construction organization. Focuses on ethical behavior, organizational behavior, human resources management, marketing, financial management, and risk management.

CONST 320 Concrete and Foundation (5 credits)

Introduction to the properties and behavior of concrete. Focuses on uses of concrete as a building material and new techniques for concrete construction.

CONST 330 Communications and Conflict Resolution (5 credits)

Study and development of skills needed to develop and deliver professional construction management presentations. Includes a series of workshops and practical exercises in construction presentation skills, teamwork, and leadership.

CONST 340 Mechanical, Electrical, and Plumbing (MEP) (5 credits)

Examines and explores the building heating, cooling, plumbing, fire protection, and electrical systems, including aspects of design, construction, estimating, terminology, construction documents, theory, practice, and problem solving.

CONST 350 Budgeting and Accounting for CM Projects (5 credits)

Introduction to accounting for the contractor, placing emphasis on the analysis and use of financial statements and a job cost accounting system.

CONST 400 Virtual Construction Modeling (5 credits)

Introduction to Virtual Design and Construction (VDC) and Building Information Modeling (BIM). Students will gain an understanding of how these construction management processes improve the coordination and control of a construction project.

CONST 410 Means and Methods II (5 credits)

Analysis of building methods for structural, non-structural, and design components, and use of temporary structures, including method selection, sequencing, and coordination of specialty trades in commercial and industrial construction.

CONST 420 Estimating II (5 credits)

Principles and techniques for estimating commercial construction projects including a mock bid day exercise on a commercial construction project.

CONST 430 Planning and Scheduling II (5 credits)

Introduction to the use of automated programs for planning, scheduling, and controlling construction projects. Focuses on the use of Planner software.

CONST 440 Virtual Construction Integration with Estimating and Scheduling (5 credits)

Students will generate cost-loaded schedules, and how to combine traditional project schedules with 3D, 4D and 5D Building Information Modeling (BIM), to quickly and accurately capture real-time progress and the value of work-in-place.

CONST 460 Construction Management Capstone (5 credits)

Capstone project using case studies to apply skills, knowledge, techniques, and concepts developed in prior courses. Emphasis on the concept of integrated project management, including cost estimating and bidding, scheduling, cost control, safety, project organization, and documentation.

CONST 470 Construction Management Work Based Learning

Students will obtain on the job experience in construction management in order to apply construction management theories into practice.

Appendix D:

Internet Resources for the Bachelor of Applied Science in Construction Management Degree Program

http://aec-business.com/ AEC Business
http://www.builderonline.com/ Builder
https://www.building.co.uk/ Building
http://www.bdcnetwork.com/ BIM Engineers
http://www.constructconnect.com/blog/ Construct Connect
https://www.constructiondive.com/ Construction Dive
http://www.constructionexec.com/ Construction Executive
http://www.construction-today.com/ Construction Today
http://www.equipmentworld.com/ Equipment
https://www.softwareadvice.com/resources/construction-news/ Software Advice Construction News
PM World Library | A Global Resource for Continuous Learning in PPM
Students | PMWorld Library
Home | Construction Management Association of America (cmaanet.org)
Home – DBIA Design Build Institute
AIA Contract Documents (aiacontracts.org) American Institute of Architects
Project Management Institute | PMI Project Management Institute
Home - Construction Specifications Institute (csiresources.org) Construction Specifications Institute
Associated General Contractors of America (agc.org) Associated Contractors of America
American Arbitration Association | ADR.org
Associated Builders and Contractors - National Office > ABC
Home | Occupational Safety and Health Administration (osha.gov)
Home - American Subcontractors Association - National (ASA) (asaonline.com)
USGBC homepage | U.S. Green Building Council
Green Building |US EPA
CFMA - Construction Financial Management Association

Appendix E:

Comparison of American Council for Construction Education (ACCE) Category Quarter Credit Requirements with the Bachelor of Applied Science in Construction Management Curriculum

ACCE Curriculum Categories	ACCE Required number of quarter credits	Pierce College BAS CM courses that would fulfill ACCE requirement	BAS CM quarter credits
Communication	9	ENGL& 101 English Composition AND ENGL& 235 Technical Writing	10
Mathematics	4	MATH& 141 Precalculus OR MATH& 147 Business Precalculus	5
Physical or Environmental Science	9	Select two of the following: GEOL& 110 Environmental Geology GEOL& 101 Intro. to Physical Geology ENVS& 100 Survey of Environmental Science PHYS& 110 Physics for Non-Science Majors	10
Business and Management	18	BUS& 101 Intro. To Business BUS& 201 Business Law BOTH BUS 260 Project Management I: Planning AND BUS 261 Project Management II: Managing	20

		OR Two of the following: MNGT 130 Customer Relationship Management MNGT 182 Creative Sales and Customer Relationship Management MNGT 283 Principles of Management MNGT 284 Small Business Planning MNGT 295 Human Resource Management	
Additional credits from the above categories	8		
Construction	75	CONST 101 Intro to Construction Management CONST 140 Construction Drawings: Printreading CONST 150 Construction Documents CONST 160 Materials and Methods	
Other Credits (to meet learning outcomes)	57	Select two courses from the below list: ECON 110 Survey of Economics (5) BUS& 101 Introduction to Business (5) ECON& 201 Microeconomics (5) ECON& 202 Macroeconomics (5)	
Total ACCE Accreditation Requirements	180		

	American Council for Construction Education(Accreditation Requirements						
Curriculum Categories							
	Required Credits		***Pierce College Class***			***Quarter Credits***	
Communication	***9***						
			ENGL& 101 English Composition			5	
			ENGL& 235 Professional and Technical Writing			5	***10***
Mathematics	***4***		Math&141 Precalculus (5) **or**			5	***5***
			Math&147 Business Precalculus (5)				
Physical or Environmental Science	***9***		GEOL& 100 Environmental Geology (5) **or**			10	***10***
			GEOL& 101 Intro to Physical Geology (5) **or**				
			ENVS& 100 Survey of Environmental Science (5) **or**				
			PHYS& 110 Physics for Non-science Majors (5)				
Business and Management	***18***		ACCT 101 Survey of Accounting (5) or			5	***20***
			ACCT& 201 Principles of Accounting				
			BUS& 201 Business Law			5	
			ECON 110 Survey of Economics (5) or			5	
			ECON& 201 Microeconomics				
			MGNT 283 Principles of Management (5)				
			MGNT 284 Small Business Planning (5)				
			MGNT 130 Customer Relationships (5)				
			MGNT 182 Creative Sales and Customer Relationships				
			BUS 260 Project Management I (5)				
			BUS 261 Project Management II (5)				
Construction	***75***		CONST 101	Intro. to Construction Management (5)			***106***
			CONST 140	Construction Drawings: Printreading (5)			
			CONST 150	Construction Documents (5)			
			CONST 160	Materials and Methods I (5)			
			CONST 180	Building Codes (5)			
			CONST 198	Work-Based Learning (3)			
			CONST 200	Estimating I (5)			
			CONST 230	Planning and Scheduling I (5)			
			CONST 250	Construction Safety and Accident Prevention (3)			
			CONST 260	Construction Project Management(5)			
			CONST 300	Surveying, Earthwork, and Infrastructure (5)			
			CONST 310	Building Relationships (5)			
			CONST 320	Concrete and Foundation (5)			
			CONST 330	Communications and Conflict Resolution (5)			
			CONST 340	Mechanical, Electrical, and Plumbing (MEP) (5)			
			CONST 350	Budgeting and Accounting for CM Projects (5)			
			CONST 400	Virtual Construction Modeling (5)			
			CONST 410	Means and Methods II (5)			
			CONST 420	Estimating II (5)			
			CONST 430	Planning and Scheduling II (5)			
			CONST 440	Virtual Const. Integration with Estimating and Scheduling (5)			
			CONST 460	Construction Management Capstone (5)			
Other Credits-varies			Available classes				29
			College 110	College Success (3)			
			BTECA 110	Microsoft Word Prepare and Edit Documents (1)			
			BTECA111	Microsoft Word Format Pages and Objects (1)			
			BTECA 121	Microsoft Excel Prepare Basic Excel Worksheets (1)			
			BTECA 122	Microsoft Excel Manage Workbooks (1)			
			BTECA 123	Microsoft Excel Financial Formulas and Charts (1)			
			BUS& 101	Introduction to Business (5)			
			CMST 330	Organizational Communications (5)			
			CMST& 101	Introduction to Communications (5) or			
			CMST 105	Intercultural Communications (5)			
			PHIL 115	Critical Thinking (5)			
			HUM 106 Ethnic Thought and Culture (5)				
					Total		***180***

Appendix F:

External Review of the Bachelor of Applied Science in Construction Management Program

Applied Baccalaureate External Review Rubric

College Name:	Pierce College	**BAS Degree Title:**	BAS Construction Management
Reviewer Name/ Team Name:	Warren Plugge, PhD	**Institutional or Professional Affiliation:**	Central Washington University
Professional License or Qualification, if any:	PhD in Education and Civil Construction Engineering and Management	**Relationship to Program, if any:**	Program Reviewer
Please evaluate the following Specific Elements			
a) 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 program is relevant and appropriate to the employer demands and needs of educated construction professionals to manage the basic functions of a construction operation. The program will lead to job placement for students who complete the BAS degree.***		
b) Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?		
	Comment ***The degree program learning outcomes do show the appropriate degree rigor for the type of institution offering the BAS degree. The learning outcomes do not address the specific engineering concepts commonly found at other Bachelor of Science (BS) degree programs within other Universities but have a level of rigor appropriate for a BAS level degree in Construction Management.***		
c) Curriculum Alignment	Does the curriculum align with the program's Statement of Needs Document?		
	Comment ***Yes, the curriculum design does align with the statement of need to provide qualified BAS applicants to fill positions within a construction organization.***		
d) 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 ***Since the employer needs and demands are to fill construction positions with BAS applicants within a construction management organization with specific needs in construction management and cost estimating, there is evidence to show the core and elective courses align with the employer needs and demands. The upper-***		

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	level courses are relevant to the industry and seem to demonstrate the academic rigor appropriate for a BAS degree. However, a suggestion would be to show how the BAS upper division courses would further advance the learning outcomes from lower division courses within the curriculum.
e) 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 general education courses seem to be appropriate and suitable for a BAS level program and meet the basic breadth and depth requirements.***
f) Preparation for Graduate Program Acceptance	Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs?
	Comment ***Depending on the graduate degree requirements students who complete the BAS may be required to seek higher level course work to meet the basic level coursework for the graduate degree. For example, most engineering based graduate degree programs may require Calculus I and/or Calculus II or evidence of higher level math to be admitted into their professional programs.***
g) Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?
	Comment ***The program faculty qualifications appear to be adequate to teach and continuously improve the program. Of the four faculty listed, three of them have Masters degrees that are relevant to the subject areas they are teaching. All faculty members have evidence of a Baccalaureate degree, industry experience, and industry certifications to teach the curriculum.***
h) 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 college does demonstrate they have adequate resources to sustain and advance the program with the appropriate student and library services, as well as facilities.***
i) 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 ***Through the surveys conducted by the program to the Advisory Committee, it seems the program has responded appropriately to the Advisory Committees recommendations for the development of the BAS program.***
	Please summarize your overall assessment of the program.

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Applied Baccalaureate External Review Rubric

j) Overall assessment and recommendations	**Comment** ***Overall, the program and learning outcomes are well laid out and will provide students the opportunity to seek construction management positions with many different types of construction organizations with a BAS degree. It is important to show how the learning outcomes for construction prerequisite classes will be advanced within the higher-level construction coursework.*** ***Within the admissions criteria it may help to show a point breakdown or rubric on how the students will be assessed to be accepted into the program based on the stated criteria. This information would be best shown in some type of student handbook explaining the BAS in Construction Management that could be found on the program website.*** ***Although some students may be placement bound coming into the program with some construction experience, those who are new to the industry may require some type of internship to expose them to what the industry has to offer. This also helps with retention of those students with a successful internship that might help pay for the future education of the intern while completing the degree. The program should encourage this where they can or require as part of admissions.*** ***While there is very little engineering focus within the program, a suggestion might be to incorporate or show evidence students are receiving some information within the curriculum associated with basic engineering principles such as statics and strength of materials as used within the construction industry. Maybe not specific courses, but from a layman's perspective show how these concepts are being addressed within the curriculum so students are prepared to understand these concepts as they move into the field working along side engineers, architects, and other specialty design professionals. There should also be some transparency provided to the students as to the comparison of the BAS degree to that of a student with a BS degree in Construction Management from the other Universities within the state. This information should also be shared with the employers so they understand level of construction education their future employees are acquiring. This is also important in case students want to pursue higher level degrees at other major Universities, student may need to take additional coursework to compete with others within their cohort.***
Reviewer Bio or Resume Evaluator, please insert a short bio here: Dr. Warren Plugge has over thirty (30) years of industry and education experience in the area of Construction Management and Construction Education. His PhD, Masters, and BS degrees were completed at Colorado State University in Fort Collins, Colorado and are all related to Construction Management, Engineering, and Higher Education. His industry experience spans across the United States on commercial, high-technology, and heavy civil construction projects working for contractors, owners, and subcontractors holding several positions in project	

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Applied Baccalaureate External Review Rubric

engineering, project management, quality inspection, and production and project controls. He currently is the Construction Management Program Director at Central Washington University (CWU) and has been with CWU for fifteen (15) years.

Applied Baccalaureate External Review Rubric

College Name:	Pierce College	**BAS Degree Title:**	BAS Construction Management
Reviewer Name/ Team Name:	Jason Peschel	**Institutional or Professional Affiliation:**	Washington State University
Professional License or Qualification, if any:	Associate Professor & Program Head - Construction Management	**Relationship to Program, if any:**	none
Please evaluate the following Specific Elements			
a) 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, the concept is relevant and appropriate to current employer demands…though, it is worth noting that hiring numbers have decreased for interns and slowed for entry level graduates due to the impacts of COVID-19. Considering that the anticipated student is "local", as long as the construction economy remains strong, job placement should not be a problem. It appears that the learning outcomes will lead to a strong program which should ensure continued success relative to job placement. Further these learning outcomes are appropriate to current employer demands.		
b) Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?		
	Comment: Yes, they do though a better use of Bloom's Taxonomy terminology (evaluate, apply, create, etc.) might prove beneficial and provide some continuity to "Standard 2". Further, the higher level terms such as create lead to and/or infer greater rigor. The use of create would be applicable to estimating, budgets, and scheduling. (What Is Bloom's Taxonomy? A Definition For Teachers | (teachthought.com) Should the program pursue accreditation via ACCE (American Council for Construction Education) as indicated in this document, the use of Bloom's Taxonomy will be important and a key part of the Student Learning Outcomes (SLO's) established and/or required by this accrediting body.		
c) Curriculum Alignment	Does the curriculum align with the program's Statement of Needs Document?		
	Comment: Yes, the curriculum does appear to line with the "Statement of Needs Document" and is very technical and construction focused.		

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d) 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: Yes, the core and elective courses align with employer needs & demands…especially the business/management related electives. Upper level courses are relevant to industry…they appear to be similar to what one would find at other 4-year degree granting institutions. It is difficult to evaluate academic rigor based solely on course titles and descriptions (sans syllabi) though it appears that the courses should have the needed academic rigor.
e) 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 general education requirements are suitable and meet the breadth & depth expected for a baccalaureate level program. It is worth noting that these requirements vary from institution to institution though the GER's proposed here do seem adequate.
f) 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 would appear that graduates would be prepared to enter and undertake suitable graduate degree programs. NOTE: This is an interesting question (and clearly an academic one) considering the reality that a graduate degree is not incredibly valuable to the construction industry. In the construction industry things like experience, work ethic, character, and dedication to the direct project objectives (time, money, & performance/quality) often hold more value than an advanced degree.
g) Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?
	Comment: Yes, no concerns with faculty qualifications. The proposed use of adjuncts for specialized and/or technical course via industry professionals is a great idea. That being said, the continued use of adjuncts (especially industry professionals as noted) to deliver core curriculum can be challenging. The challenges mainly arise due to the demanding nature of employment in the construction industry…these industry professionals will be working 40-60 hours per week in addition to any teaching responsibilities for the program. It can also lead to a lack of consistency within the course curriculum if a long term commitment/contract cannot be established with an adjunct faculty member.

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Applied Baccalaureate External Review Rubric

h) 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: Yes, it appears that Pierce College has a strong system for student support at the institution…ranging from career services to counseling. Especially in the current environment, all of these resources will be necessary to sustain and advance the program. It's interesting that library services are still considered to be so critical to student success though I assume that "library" is intended as a physical AND virtual space. It's clear that the program is working to confer with industry & academic practitioners do develop a collection of construction related resources. Assuming that this is funded, there should not be any concerns. It is this reviewer's opinion, however, that the number of full-time faculty in the construction program should be increased. This decreases the need to continually hire adjunct faculty who are typically industry professionals who already have a full-time career working 40-60 hours per week. Adjuncts can bring great things to a program but they are often not a sustainable source of construction education.
i) 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 cannot adequately address this question. However, it is critically important that a construction management program have an Advisory Board/Committee AND have their support when pursuing such an undertaking. The implementation of this baccalaureate program (in addition to the existing associates degree offering) will not be an easy process or transition for the program and external support (financial or otherwise) will be important.
j) Overall assessment and recommendations	Please summarize your overall assessment of the program.
	Comment: It is my opinion that the proposed BAS Construction Management program will provide a crucial resource for students in the Pierce County area/region. The expansion of the degree offering will enable a great growth opportunity that they may not have otherwise been able to pursue. The PNW has, and continues to have, been fortunate to experience a phenomenal construction industry over the last decade. Though the COVID-19 pandemic has had a somewhat negative impact on certain sectors of the industry, the industry as a whole continues to be strong. Thus, the demand for students with this type of education will continue to be in high demand. The curriculum is well thought out and conceived as one that is applied, technical, and appropriate for those who want to be successful in the construction industry. This program as a BAS, rather than a BS, needs to be marketed and explained as such. The two offerings are different (no value assessment inferred) and it's important that current/potential students are aware of the similarities and/or differences considering that there are three (3) other BS Construction Management programs in the state.

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Applied Baccalaureate External Review Rubric

Reviewer Bio or Resume
Evaluator, please insert a short bio here

Jason B. Peschel is the Richard L. Silliman Distinguished Professor of Estimating and a Scholarly Associate Professor in the School of Design and Construction at Washington State University, with over 10 years of teaching experience in construction estimating, scheduling, materials, construction graphics, management, and residential green building for Construction Management majors. In addition to teaching several courses per semester, Peschel also serves as the Program Head for Construction Management. This administrative role encompasses numerous tasks pertinent to the day-to-day operations and the long-term endeavors of the students and faculty within the program. Professor Peschel brings more than 15 years of construction experience to the classroom. That experience includes almost 10 years of extensive experience as estimator and chief estimator. In addition to estimating experience, he has construction project management experience in the areas of cost control, scheduling and contract administration. Peschel also has five years of field experience in the construction industry working as a carpenter, concrete laborer/finisher, as well as a general laborer in residential, commercial and utility construction. To stay current with the industry and provide real world context/information in the classroom, Professor Peschel performs construction related consulting for owners and architects. His main area of focus is preconstruction services; conceptual cost estimating, value engineering, constructability review and bid solicitation. A recent project with the Nez Perce Tribe in Lapwai, Idaho consisted of a feasibility study that included a business plan, site analysis, spatial and programmatic analysis, value engineering, sustainability review and conceptual estimating services.
In April 2017, Peschel was named the recipient of the Reid Miller Excellence in Teaching Award at the Voiland College of Engineering and Architecture convocation. The Reid Miller award is designed to honor Reid Miller for his long and distinguished career in the college as both a faculty member and as its dean. The award recognizes Dr. Miller's strong commitment to the quality of teaching in the college. Peschel was nominated along with four other non-tenured track faculty, one from each of the schools/departments within the Voiland College of Engineering and Architecture.
EDUCATION
Master of Business Administration, Wayne State College.
Bachelor of Science in Construction Management, University of Nebraska-Lincoln.

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