

## Career and Technical Education Program of Study Application 2018 Version (Full Application)

**Directions—please enter information into ALL the fields in this application.** If you have technical problems with this application, contact Ron Dodge [POS.Application@state.or.us](mailto:POS.Application@state.or.us).

(For detailed information on how to complete this application consult the [Guide to Using the Oregon CTE Program of Study Application 2018](#).) **DEADLINE for submission: June 29, 2018; (Early Bird: April 30, 2018)**

<b>CTE POS—Title:</b>	<b>Computer Programming and Software Development</b>
Career Area:	Arts, Information Communication--AIC
Cluster Area (& appropriate secondary CTE licensure):	AIC--Info Communication Tech (ICT)
Focus Area (if applicable):	
Secondary CIP Code: ( <a href="#">Link to CIP website</a> )	11.0201 (6 digit)
Community College CIP Code: ( <a href="#">Link to CIP website</a> )	52.1201 (6 digit)

Secondary School Name:		Health and Science High School
Secondary School District:		Beaverton School District
Secondary School ID Number: ( <a href="#">Link to ID lookup</a> )		4638
Secondary Teacher Name	Email	Current CTE License
Doug Willson (Lead Teacher)	doug_willson@beaverton.k12.or.us	IES--Transportation Technology

<b>Secondary Technical Skill Assessment (TSA):</b> Use the code from <a href="#">this table</a> for your selected TSA.	2AREG038
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<b>CC Technical Skill Assessment (TSA):</b> Use the code from <a href="#">this table</a> for your selected TSA.	2AREG054
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<b>Primary Oregon Community College Name:</b> (Contact <a href="mailto:POS.Application@state.or.us">POS.Application@state.or.us</a> to add multiple colleges)	Portland Community College
College Point of Contact:	PCC Sally Earll sally.earll@pcc.edu
Community College CTE Program Title(s):	Computer Information Systems
Community College Award:	Associate of Applied Science

<b>Visual/Roadmap:</b> (Insert link, or identify location where sample of visual can be found)	<a href="https://drive.google.com/file/d/13KpZeFJhQu6Xp_ANHKDhLRSKsXHX7-lq/view?usp=sharing">https://drive.google.com/file/d/13KpZeFJhQu6Xp_ANHKDhLRSKsXHX7-lq/view?usp=sharing</a>
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<b>Regional Coordinator/Contact:</b>	2A--Beth Molenkamp elizabeth.molenkamp@pcc.edu
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**CTE Teacher:** Submit complete electronic application materials to your CTE Regional Coordinator.

**Regional Coordinator:** Email application and addenda to this mailbox-- [POS.Application@state.or.us](mailto:POS.Application@state.or.us) , or follow an alternative process described in Step 8 of the **Submission Process** on the last page of this application.

**DEADLINE for submission: June 29, 2018**

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## CTE POS Course Lists—Secondary

**Directions:**

1) Please list below the CTE Program of Study Secondary Courses in which the instructor will:

- Teach with intent and purpose the CTE POS knowledge and skills identified in the CTE POS Skill Set, and
- Assess and record student achievement of those standards

2) Mark as “TSA” those courses that are necessary for students to take before they are required to take the Technical Skill Assessment for this POS.

*Note: Additional CTE courses may be listed (and supported with Perkins funds) if they support the identified skill set; but do not mark those as “TSA” Required*

Secondary Core CTE Courses **(Please be complete; this information will be entered into the CTE Program Update database and all fields are required)**

TSA* Required	School Course #	Secondary Course Name	# of Credits	5-digit NCES Code	Course Description (brief) (boxes below will expand)	Articulating College (if applicable)	College Course #	College Course Name
<input type="checkbox"/>	A4811	AP CS Principles	0.5	10019	Following the College Board’s suggested curriculum designed to parallel college-level computer science principles courses, AP Computer Science Principles courses introduce students to the fundamental ideas of computer science and how to apply computational thinking across multiple disciplines. These courses teach students to apply creative designs and innovative solutions when developing computational artifacts. These courses cover such topics as abstraction, communication of information using data, algorithms, programming, and the Internet.	Portland Community Co	CIS 122	Intro to Programming Logic
<input type="checkbox"/>	A4812	AP CS Principles	0.5	10019	(see above)	Portland Community Co	CIS 122	Intro to Programming Logic
<input type="checkbox"/>	A4901	Cybersecurity	0.5	10016	Following Project Lead the Way’s suggested curriculum, PLTW Cybersecurity courses introduce students to the tools and concepts of cybersecurity. In these courses, students are encouraged to understand vulnerabilities in computational resources and to create solutions that allow people to share computing	Portland Community Co	CIS 284C	Cybersecurity Concepts

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					resources while retaining privacy. These courses also introduce students to issues related to ethical computing behavior.			
<input type="checkbox"/>	A4902	Cybersecurity	0.5	10016	(see above)	Portland Community Co	CIS 284C	Cybersecurity Concepts
<input checked="" type="checkbox"/>	A4821	Ap CS A	0.5	10014	Following Project Lead the Way's suggested curriculum to prepare students for the College Board's Advanced Placement Computer Science A exam, PLTW Computer Science Applications courses focus on integrating technologies across multiple platforms and networks. In these courses, students collaborate to produce programs and analyze, adapt, and improve each other's programs using industry-standard programming and software tools.	Portland Community Co	CIS 133J	Java Programming I
<input checked="" type="checkbox"/>	A4822	Ap CS A	0.5	10014	(see above)	Portland Community Co	CIS 133J	Java Programming I
<input type="checkbox"/>						Select College		
<input type="checkbox"/>						Select College		
<input type="checkbox"/>						Select College		
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<input type="checkbox"/>						Select College		
<input type="checkbox"/>						Select College		

**\*TSA required—Technical Skill Assessment required course—required courses that, when completed, trigger TSA assessment eligibility for the student**

## CTE POS Course Lists—Post-Secondary

Post-secondary Core CTE Courses:

- Enter the name of the college program that is the postsecondary component of this POS
- Select the highest level of this component offered by the college
- List only the courses included in the Course/Skill Set crosswalk matrix

<b>Name of Certificate or Degree Program</b>		Computer Information Systems	
<b>Highest award available in Program:</b>		AAS	
College Course #	Post-Secondary Course Name	Number of Credits	Accelerated College Credit/College Now?
CIS 120	Computer Concepts I	4	<input checked="" type="checkbox"/>
CIS 121	Computer Concepts II	4	<input checked="" type="checkbox"/>
CIS 122	Introduction to Programming Logic	4	<input checked="" type="checkbox"/>
CIS 140M	Operating Systems I: Microsoft	4	<input checked="" type="checkbox"/>
WR 121	English Composition	4	<input checked="" type="checkbox"/>
WR 122/WR 227	English Composition/Technical and Profession Writhing 1	4	<input checked="" type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

## Course-to-Skill Set Crosswalk/Matrix

Please use one of the Excel spreadsheets posted online at ([Skill Set Matrices Page](#)) (or use one you've created locally) to crosswalk the identified skill set to the listed secondary and post-secondary courses.

- You should use the same matrix for both secondary and post-secondary courses.
- It is only required to map courses to the standards (Knowledge and Skill Statements); it is not necessary to map the performance indicators, duties, or tasks.
- Be sure to identify the selected skill set in your matrix, the secondary and postsecondary components.
- If your selected skill set is not from the [Oregon Skill Sets](#) website, please identify its origin and how it was industry validated.

☒ Secondary: **(check this box to indicate secondary course-to-skills crosswalk is complete and attached)**

☒ Post-secondary: **(check this box to indicate post-secondary course-to-skills crosswalk is complete and attached)**

## CTE POS Design Elements

*There are five Elements necessary for a robust Career and Technical Education Program of Study—all are critical to being State approved in Oregon*

### GENERAL DIRECTIONS FOR COMPLETING THE ELEMENTS SECTIONS:

- In the first part of each Element section, click on each checkbox for criteria that applies to your Program of Study
- For those criteria that don't apply at this time, explain in the Comments box at the end of the section why those criteria are not met and how you will address them before the program is up for revision (POSs are usually approved for four years) Programs that do not meet all elements at the time of application may be temporarily approved as a "State Recognized Program" (SRP) until missing elements are completed; SRP's can convert to POS anytime and be immediately eligible for Perkins funds, per local grant administrator's budget.
- In the second part of each Element section, there is the expandable space provided for Comments, as mentioned above. Use this box to explain missing check marks in the criteria statements above, point out strengths of your program, or identify special circumstances you need to have considered during ODE review of this application
- If you already have documents or files that help demonstrate the strength or potential of each Element, simply attach those documents or files in the appropriate Addendum folder, or provide links to online documents, when submitting this application, rather than write lengthy responses in the Comment box. (Consult the [Guide to Using the Oregon CTE Program of Study Application 2018](#) for details about how to use Addenda if submitting supporting documents or files.)

## Element 1: Standards & Content

*Standards and Content are the foundational elements for designing and improving Perkins-eligible Programs of Study*

This POS design includes:

- ☒ A. Relevant, rigorous technical skill standards-based content, including or aligned with challenging academic standards
- ☒ B. Shared secondary and post-secondary technical content which incorporates the knowledge and skills identified in the Oregon Skill Sets or other industry-based standards, which are validated through national and state employer input
- ☒ C. Sufficient size, scope and sequence to include curriculum and instruction leading to student attainment of academic and technical knowledge and skills for high school graduation, college entry, and careers within high wage, high demand fields
- ☒ D. A systemic approach to instructional delivery of academic and technical knowledge and skills where student performance is demonstrated through valid and reliable technical skill assessments (TSA) aligned to industry standards
- ☒ E. A plan for continuous improvement of program design and instructional delivery that provides the opportunity for each CTE POS student to:
  - ☒ Meet diploma requirements, post-secondary entry requirements, and/or certificate/degree requirements
  - ☒ Demonstrate mastery of academic and technical content that is aligned with industry standards
  - ☒ Apply learning through authentic experiences
  - ☒ Develop skills and build confidence to compete in high wage, high skill, and/or high demand occupations.

- **Directions for using the Comment box**—Expandable space is provided for comments. This Box is intended for explanations for missing checks above, or notes regarding program strengths worth consideration during POS review. If you already have documents or files that do this more quickly, simply attach those documents or files (or links to them) to this application in an appropriate Addendum folder. (Consult the [Guide to Using the Oregon CTE Program of Study Application 2018](#), for more details.)

Please address these questions through your comments in **Element 1 Comment Box** below (or attach documentation in an appropriately identified file/folder):

- Address any unchecked box above
- Explain how this POS is aligned with challenging academic standards at the HS and CC levels
- Identify those who participated in the decision of which skill set to use for this POS
- Who participated in the crosswalk of the skill sets to HS and CC courses

### Element 1 Comment Box:

Supporting Documents:

[https://drive.google.com/drive/folders/1lwjt\\_VEufY8bxCpX1cPCQIS3qZVd\\_HSN?usp=sharing](https://drive.google.com/drive/folders/1lwjt_VEufY8bxCpX1cPCQIS3qZVd_HSN?usp=sharing)

A. No unchecked boxes

B. The courses of this POS are aligned with academic standards from the Beaverton School District, Portland Community College, the AP/College Board and Project Lead the Way. The curriculum for the three courses was designed by Project Lead the Way, a national leader in high school STEM curriculum (<https://www.pltw.org/experience-pltw>). This pathway will also be serving to fulfill Project Lead the Way's computer science pathway. The first and last courses of the pathway, AP CS Principles and AP CS A, additionally meet the academic standards set forth by the AP/College Board, which must annually approve the syllabi used for these courses.

C/D. The CTE regional coordinator and staff have helped to coordinate that academic standard at the high school and community college level are aligned.

The classes in the pathway provide age-appropriate challenges in learning how to program in a variety of languages and contexts (AP CS Principles), how to ensure maximize the safety and security of a software product (Cybersecurity), and how to develop and maintain a product to meet authentic client needs in the community (AP CS A).

The Computer Science department at Portland Community College, the Information Technology department of the Beaverton School District and members of the local office of Presidio, a company specializing in network security, are represented on the Pathway's advisory council. These three partners will provide regular consultation to ensure that the curriculum, projects and assessments for the courses in this pathway are relevant and adhere to the latest standards in the industry.

This pathway goes beyond teaching students how to write programs. One of the biggest areas of need in the country is to tighten our network security. This includes not only network solutions, but also security considerations in both the design and use of software. Because security is often overlooked at the high school level, we have sought a specialist in network security as a partner and advisor. We also have a unique advantage of having our school in the same building as our district servers; our district has one of the largest district networks in the region. Staff from the district have expressed an interest in helping our students learn about network security in a way that is safe and collaborative. Finally, the curriculum for all three courses in the pathway has been created and vetted by Project Lead the Way, one of the nation's leading providers of high school curriculum in the areas of biomedical sciences, engineering and computer science.

Using curriculum designed by Project Lead the Way (PLTW) the two programming courses in the pathway are designed for students to succeed on the PLTW's end-course-assessment, as well as the AP exam. Roughly 80% of our students in these two courses take the AP CS Principles and AP CS A exams. This ensures that our students work is up to national standards in programming. Our advisory team will help to ensure that the academic and technical knowledge and skills in the area of network security and cyberhygiene meet contemporary standards of excellence. Finally, the TSA used to complete the pathway requires students to meet the requirements laid out in a rubric used across several high schools in the district for making a software product to meet the needs of an authentic client.

All three courses in the pathway meet year-long course requirements toward graduation. The two AP courses additionally provide CTE POS students the opportunity to earn college credit and/or advanced placement through their performance on the AP exams. The Software Engineering Design Technical Skill Assessment developed locally in region 2A corresponds very closely with a very successful client-based software development project our students carried out last year. This will help to establish this as a capstone project for the pathway. It will require CTE POS students to develop, test, and document a software product, while adhering to security standards developed by our advisory team. We have had students develop software products that clients sought to continue using after our students completed their computer science coursework. This provides CTE POS students with having to face authentic challenges, such as issues about securing personal information, as well as maintaining and improving software of the course of its life. At SST we view knowledge of

## **CTE Program Of Study .... 2018 Application** (continued)

programming not as an end in itself, but as a tool that has power when coupled with a knowledge in other content areas. Thus we encourage students to attain a solid foundation in statistical analysis and core knowledge in an area in which they are passionate. We are preparing them for work and study in a wide variety of fields, from research in science, medicine and mathematics to engineering to web and network applications. A solid foundation in cybersecurity will only enhance their position and their skillset ((<https://www.beaverton.k12.or.us/schools/health-and-science/academics/Pages/High-School-Course-Sequence.aspx>.)



## Element 2: Alignment and Articulation

*Alignment and Articulation are key to getting Program of Study partners working together to build career pathways for CTE students*

The alignment of this POS includes:

- ☒ A. A unified, cohesive sequence of content among secondary and post-secondary partners contained in a non-duplicative sequence of courses or learning experiences.
- ☒ B. Alignment of content between secondary and post-secondary education partners may include course articulation or other ways to acquire post-secondary education credits (e.g. Oregon's Credit for Proficiency, Dual Credit, Oregon Transfer credit, etc.).
- ☒ C. Articulation agreements are developed, implemented and supported at the institutional level to ensure long-term sustainability and cross-sector cooperation.
- ☒ D. Based on the program design and instructional plan, each student will:
  - ☒ Continually progress in knowledge and skills when ready;
  - ☒ Earn high school or college credit based on performance; and
  - ☒ Make the connection between educational preparation and entry into a career.

- **Directions for using the Comment box**—Expandable space is provided for comments. This Box is intended for explanations for missing checks above, or notes regarding program strengths worth consideration during POS review. If you already have documents or files that do this more quickly, simply attach those documents or files (or links to them) to this application in an appropriate Addendum folder. (Consult the [Guide to Using the Oregon CTE Program of Study Application 2018](#), for more details.)

Please address these questions through your comments in **Element 2 Comment Box** below (or attach documentation in an appropriately identified file/folder):

- Address any unchecked box above
- Briefly describe the level of alignment and/or articulation that exists for this POS (you may also identify non-Perkins eligible alignments that exist with private schools, universities, etc.)
- Briefly describe the alignment and/or articulation activities that have occurred, and who participated from HS and CC levels

### Element 2 Comment Box:

Supporting Documents:

[https://drive.google.com/drive/folders/1lwjt\\_VEufY8bxCPx1cPCQIS3qZVd\\_HSN?usp=sharing](https://drive.google.com/drive/folders/1lwjt_VEufY8bxCPx1cPCQIS3qZVd_HSN?usp=sharing)

A. There are no unchecked boxes

B. As described in greater detail in the comments below, this pathway follows an articulated path for students from no programming background up through software developer. All of the courses in this Program of Study are articulated with PCC CIS courses. Along the way students are eligible to earn college credit through their performance on AP exams in CS Principles and CS.

C. Doug Willson, the SST teacher for this CTE pathway, has established contact with the chair of Portland Community College's chair of the Department of Computer Information Systems, Cara Tang. Contact between Mr. Willson and the teachers of Introduction to Programming Logic, Cybersecurity Concepts and Java Programming I will ensure that the pathway meets the standards of the CIS program at PCC. Mr. Willson has also worked with Dual Credit contacts at all levels to articulate this Program of Study.

This logical progression from programming survey to cybersecurity awareness to software developer was designed by the Computer Science department at the School of Science and Technology in consultation with SST's site administrator, principal and the Beaverton School Districts chief information officer.

The courses in the Computer Programming and Software Development pathway provide three distinct sequential steps from freshmen interested in learning how to program to graduates who have experience in designing a software application that fulfills an authentic need in the community and adheres to the latest standards in security. Each of these steps is unique: step one is wide exposure



## **CTE Program Of Study .... 2018 Application** (continued)

to what programming is and how to do it, the second step is to acquire skills and knowledge around cybersecurity, and the final step is to learn a less-abstracted language in-depth and to apply the skills and knowledge from these three steps into a real-world product.

The three courses of the pathway match courses offered in Portland Community College's Department of Computer Information Systems as shown in the Course Lists section. In two of the courses in the pathway, students are eligible to earn college credits and placement consideration based on their performance on the College Board's AP examinations.

Doug Willson, the SST teacher for this CTE pathway, has established contact with the chair of Portland Community College's chair of the Department of Computer Information Systems, Cara Tang. Contact between Mr. Willson and the teachers of Introduction to Programming Logic, Cybersecurity Concepts and Java Programming I will ensure that the pathway meets the standards of the CIS program at PCC.

## Element 3: Accountability & Evaluation

*Accountability and Evaluation are core elements for Perkins eligibility—they provide data illustrating the value of CTE to students' future plans*

In this POS design:

- ☒ A. Performance will be measured against the Perkins-required performance measures as described in Perkins IV Measurement Definitions identified in Oregon's State Plan (re: Data Collection)
- ☒ B. Business, community and education partners (specifically, an Advisory Committee) participate in CTE Program of Study design and development, including:
  - ☒ Assistance in evaluating program vision, goals and priorities
  - ☒ Validation of industry skill standards for curriculum content and technical skill assessment, where appropriate
  - ☒ Participation in the CTE teacher recruitment, instructor appraisal process, and ongoing faculty professional development
- ☒ C. Perkins performance data is used for data-driven, CTE program of study design and improvement decisions
- ☒ D. Students have the opportunity to learn in a contextual career related environment that allows them to:
  - ☒ Monitor their own progress through their demonstration of attaining technical and academic skill standards
  - ☒ Demonstrate their technical and academic proficiency in meaningful ways, e.g., Technical Skill Assessment, etc.
  - ☒ Adapt their program to meet personal goals based on industry requirements and performance outcomes

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Please address these questions through your comments in **Element 3 Comment Box** below (or attach documentation in an appropriately identified file/folder):

- Address any unchecked box above
- Identify the data used in designing this POS, and the effect that the data had on the design
- Identify the members of the Business Advisory Committee
- How will the POS be evaluated, and by whom?
- How will you know if the POS is successful?
- What process will you use to decide any changes that need to occur because of the POS evaluation?
- **Required:** List the TSA(s) code used for this POS on Page 1 ([ODE approved list](#))

### Element 3 Comment Box:

A. There are no unchecked boxes.

B. SST administration and CTE pathway teachers will use the ODE Skill Sets and the skills listed on the Occupation Profiles from the State of Oregon Employment Department in order to evaluate performance of teaching and learning in the pathway

([https://drive.google.com/file/d/1cXYRNMxTq40m\\_AcIC2ZaXzls8bJXjluf/view?usp=sharing](https://drive.google.com/file/d/1cXYRNMxTq40m_AcIC2ZaXzls8bJXjluf/view?usp=sharing)).

Data will be collected each year across the eleven performance indicators of the Oregon Secondary CTE Performance Measurement rubric. This data will be used for improvement and any possible re-design of the pathway.

C. Advisory Board members include the cybersersecurity specialist at the Beaverton School District and employee(s) of Presidio (a national company with a location in the Portland metro area).

D. Ultimately, the POS will be evaluated by the SST principal, site administrator and SST faculty, along with the members of the Advisory Committee. We have a small faculty of 8 teachers, a site administrator and school counselor which meets on a weekly basis. All activities of the school should serve to carry out the living mission statement of the school: SST's mission is to challenge and support students to be independent learners, researchers, and leaders in STEM fields and beyond. The faculty and administration will ensure that the POS is aligned with this mission. Advisory

## **CTE Program Of Study .... 2018 Application** (continued)

committee members will also play an integral role in evaluating the performance of the pathway. Not only will they help us with the planning and vision for the overall pathway, they will also provide recommendations for assessment and curriculum modifications necessary to meet industry standards. Our industry partner will be key in facilitating ongoing professional development of our pathway teachers. Our advisory team will also help us identify criteria for and sources of additional CTE teachers for expanding the scope of the pathway and for maintaining the pathway as pathway teachers leave the field.

### **E. Benchmarks for success of the POS:**

- All sophomores take CS Principles
- 90% of students who take CS Principles score 3, 4 or 5 on the AP exam
- 50% of students score 4 or 5 on the CS Principles AP exam
- 75% of students of juniors take Cybersecurity
- All students pass the PLTW Cybersecurity End of Course exam
- 50% of seniors take AP CS A
- 90% of students who take CS A score 3, 4 or 5 on the AP exam
- 50% of students who take CS A score 4 or 5 on the AP exam
- All students who take all three POS courses will successfully compete their TSA.
- There is no significant difference of participation in any of the POS courses according to gender or minority status. The class demographics should match the demographics of the school population.
- There is no significant difference of performance in any of the POS courses according to gender or minority status.
- As part of an overall school goal for success, this pathway will facilitate all students in their fulfilling of an internship or senior capstone project before graduating from SST. The community application project of the final POS course can serve as a capstone-level project. We hope we will find community business partners that can facilitate student internships.

F. Changes to the POS will be decided by the SST staff and administration as well as the CS department in consultation with the POS advisory committee.

### **G. Information on the TSA:**

Assessment: Software Engineering Design

Level: Secondary

CIP Code: 15.12

ID Code:2AREG038

Proficiency Level: Proficient in all 5 dimensions

Description: This software engineering design performance assessment was developed for use in the computer science and information technology programs at Century, Southridge, and Sunset High School. Students develop, test, and document a software product.

Industry input is at the heart of the curricular development of the three classes in this pathway. All three courses use curriculum developed by Project Lead the Way, a national leader in development of STEM curriculum. We will be launching a pilot version of PLTW's cybersecurity course in 2018-19. This course has been developed over the course of several years with input from industry experts as well as the National Security Agency. Consequently, the activities of these classes give students authentic experiences in programming and software development. In the first course, which opens the door for all students regardless of their coding background, students are introduced to and practice the iterative Agile Design framework for creating a programming product. By senior year, students in the pathway carry out this process with greater autonomy, authenticity and responsibility. Our industry partners, including the IT department of our school district, help to guide students toward meeting the

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highest industry standards for their product. The TSA, developed and used by a variety of similar CTE pathways in the region, is organized a comprehensive and clearly-defined rubric in order for students to self-assess the progress of their projects and learning. As mentioned previously, students seek clients in the community for whom they can provide an application to meet an identified need.

Students also choose the team they will work on for this TSA project based on their own interest.

Post Secondary TSA: 2AREG054

## Element 4: Student Support Services

*Student Support Services include the ways that all students are made aware of the career and education opportunities available in the CTE career Pathway that is the focus of this POS.*

In this POS design:

- ☒ A. All CTE students will have informational guidance support and advising to assist them in progressing through a CTE program of study in an efficient and seamless manner (e.g. Career Pathway Templates, Education Plan and Profile, POS visual guides, Career Information System, etc.).
- ☒ B. Each student will be able to:
  - ☒ Identify the career path options he/she can follow to a chosen career;
  - ☒ Receive consistent and informed messages about career and possible financial options for post-secondary education;
  - ☒ Take ownership of their education through maintaining a current education plan;
- ☒ C. Compliance is evident with Federal regulations, including Title VI- Civil Rights Act of 1964; Title IX – Education Amendments of 1972; Section 504 of the Rehabilitation Act of 1973; Vocational Education Programs Guidelines for Eliminating Discrimination and Denial of Services on the Basis of Race, Color, Sex, Religion, National Origin, Age or Disability; Title II of the Americans with Disabilities Acts of 1990; therefore, this POS provides:
  - ☒ Appropriate access for all students, including non-traditional and special populations.
  - ☒ A non-biased and non-discriminating learning environment (with respect to race, color, national origin, gender and disability status).
  - ☒ Program facilities with physical access and instruction that accommodates students with disabilities, including various learning styles (e.g. the use of visual, auditory, tactile, and kinesthetic teaching methods, and other appropriate forms of instruction).
  - ☒ Responsiveness to the needs of students for whom English is a second language.
- ☒ D. Opportunities for structured student leadership are a program component and integrated into CTE POS instruction. This POS integrates either:
  - ☐ 1) One of the [state chartered CTSO's](#): ☐ DECA, ☐ FBLA, ☐ FCCLA, ☐ FFA, ☐ FNRL, ☐ HOSA, or ☐ SkillsUSA **or**
  - ☒ 2) Another local or national organization that meets the criteria listed in the ODE [Student Leadership criteria](#) document.
    - The locally developed student organization or experience provides leadership development opportunities that meet the following expectations (see details in linked document above):
      - ☒ Context related instruction, career development , and practical assessment
      - ☒ Community-based learning experiences
      - ☒ Organizational management and administrative experiences

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Please address these questions through your comments in **Element 4 Comment Box** below (or attach documentation in an appropriately identified file/folder):

- Address any unchecked box above
- Briefly describe the POS-specific student support services that HS and CC students will receive in this POS that will support their success in the courses
- How will those student support services help inform and prepare HS and CC students for their next educational and career steps?
- Briefly describe the specific efforts that will be made to recruit all types of students into this POS (both HS and CC levels)
- Briefly describe any student leadership opportunities that will be available for both HS and CC

### Element 4 Comment Box:

A. There are no unchecked boxes.

B. All first year students at SST are expected to take Computer Literacy, a course which familiarizes students with a computer's hardware and how to utilize applications that will help them to succeed in school. In this course, as well as in new student orientation and open house events, students and families will be made aware of this pathway. See attached file Computer Programming and Software Development Pathway Template for a visual aid that the school will use to make students aware of the

## **CTE Program Of Study .... 2018 Application** (continued)

pathway sequence which begins their sophomore year. Students receive information, guidance and counseling about this program during schedule forecasting with their teachers and school counselor.

C. SST's mission is to challenge and support students to be independent learners, researchers, and leaders in STEM fields and beyond. Our small size goes a long way toward helping us meet this mission by fostering strong collegial relationships among and between students and teachers. We also have a full-time counselor, and AVID program and support services for students who are eligible.

In AP Computer Science Principles there is an activity for students to find out the latest income levels and typical educational requirements associated with various computer-related careers. Students are also exposed to career options in the computer literacy course. We emphasize that learning how to program and understanding cybersecurity issues are not ends in themselves, but are at least useful and often vital in order to succeed in a wide variety of careers today. Students maintain an education plan through their counselor and seminar advisory. Students at SST are required to complete the Career Informations System curriculum through their seminar groups. Students are also counseled on the advantages of taking an AP exam for college credit and as a way to improve their college readiness. SST consistently has one of the highest rates of AP test participation of high schools in the state.

D. SST seeks ways to encourage women and underrepresented groups to enroll and succeed in courses in information technology. We expect all freshmen to take our Computer Literacy course and all sophomores to take AP Computer Science Principles. At that point students can choose to continue their way through the pathway, or to enroll in other departmental electives such as web design or game design. In the 2017-18 school year an SST junior became our first regional Aspirations award winner from the National Center for Women and Information Technology. Our students are our best ambassadors for spreading the word and encouraging new students to enter the pathway. One expectation of NCWIT award winners is that they will develop ways to encourage women to learn computer programming and consider coursework in information technologies. Every year, SST encourages a group of students to participate in Portland State University's summer computer camp. Two of our eight teachers act as counselors for our ninth-graders during the camp. This year we will be having a team of freshmen girls attend the camp designed to encourage them to learn more about programming.

All laws are followed to ensure access of opportunity and materials to all students. Appropriate modifications are made for students on a modified diplomas, IEP's are followed, the classes are all differentiated according to student IEPs, 504s and individual needs.

Students with special needs as well as English Language Learners (ELL) will be given equal opportunities to succeed in this class. Adaptations will vary lesson to lesson due to content and students' individual needs, interests and abilities.

Regular and authentic assessments provide a meaningful measure of the level of learning and growth of each student. The assessments in CS Principles are based mostly on evidence that students are able to show understanding of key concepts in computing and demonstrate skill in producing a product meeting pre-defined specifications. These demonstrations are more often than not carried out in collaborative activities consisting of two-student partnerships. Students are put through a random rotation throughout the year so that they end up partnering with nearly every other student in the class one or two times. This mimics the collaborative process that is prevalent in the industry.



In addition to these activities that require students to write programs that meet pre-defined specifications of performance, students in AP CS A are assessed regularly on their ability to answer questions similar to those that they will encounter on the College Board AP CS A exam. The course places an emphasis on preparing them for success on the exam. Additionally, the course requires students to find authentic clients in the community who would benefit from a computer application, develop a team of up to four students, and develop the application to meet the specifications of the client through an iterative design process.

Our industry partners will work with us to develop the most appropriate forms of assessment to prepare students for work or further study in the field of network security.

E. One SST's strengths is its program of student-run, teacher-sponsored clubs. Students initiate, organize, promote and maintain clubs in their areas of interest. Two clubs that have been very successful are related to this component of providing students opportunities for leadership: Robotics and CTF, a nationwide cybersecurity challenge. A robotics club has been available to SST students for many years. Students work throughout the fall and winter to prepare their robot for local, regional and national competitions. Students act as officers within the club, typically coordinating the efforts of a couple dozen students.

Four students decided to enter a CTF cybersecurity competition during the 2016-17 school year. They have regularly entered tournaments ever since, competing against other high school and college teams; they have consistently ranked as one of the top tiers of teams. This year, four of these competitors ran an after-school computer club twice a week to pass their knowledge and enthusiasm on to a new generation of students. This club can continue to grow and refine itself with additional input from our partner from the network security industry.

The National Center for Women and Information Technology and the Saturday Academy are two more organizations that provide support, networking and internship opportunities for students.

1. Relevant Links:

PCC WEBSITES OF PROGRAMS <http://www.pcc.edu/programs/>

COMPUTER INFORMATION SYSTEMS WEBSITE <http://www.pcc.edu/programs/computer-info/>

COMPUTER INFORMATION SYSTEMS CATALOG

<http://catalog.pcc.edu/programsanddisciplines/computerinformationsystems/>

PROGRAM SPECIALIST WEBSITE <http://www.pcc.edu/staff/index.cfm/984,html>

COOPERATIVE EDUCATION COURSE <http://spot.pcc.edu/competch/>

GRAD PLAN <http://www.pcc.edu/resources/advising/grad-plan/>

ADVISING SERVICES <http://www.pcc.edu/resources/advising/>

COUNSELING SERVICES <http://www.pcc.edu/resources/counseling/>

CAREER COUNSELING <http://www.pcc.edu/resources/careers/resource-centers/career-exploration.html>

CAREER CENTER <http://www.pcc.edu/resources/careers/resource-centers/>

START LAB <https://www.pcc.edu/resources/orientation/documents/orientation-schedule.pdf>

ESOL PROGRAM ADVISORS <http://www.pcc.edu/prepare/esol/sylvania/>

ESOL PROGRAM <http://www.pcc.edu/prepare/esol/>

INTERNATIONAL ADVISORS <http://www.pcc.edu/about/international/>

DISABILITY SERVICES <http://www.pcc.edu/resources/disability/>

OFFICE OF AFFIRMATIVE ACTION AND EQUITY <http://www.pcc.edu/about/equity-inclusion/>

DIVERSITY TRAINING <http://www.pcc.edu/about/equity-inclusion/training.html>

TRANSFER INFORMATION <http://www.pcc.edu/programs/university-transfer/>

SOU BAS BUSINESS MANAGEMENT TRANSFER INFORMATION

<http://www.sou.edu/assets/admissions/docs/articulation/BAS-AAS-PCC%202010.pdf>

OIT BAS TECHNOLOGY AND MANAGMENT TRANSFER INFORMATION

<http://www.oit.edu/distance-education/programs/technology-management>

OREGON TRANSFER GUIDES <http://www.pcc.edu/programs/university-transfer/transfer-guides/>

OUT OF STATE TRANSFER GUIDES <http://www.pcc.edu/programs/university-transfer/transfer-guides/out-of-state.html>

2. Technical Skill Assessment: <http://www.ode.state.or.us/search/page/?id=3230>

3. All expectations have been met. The following information provides supporting evidence for the Expectations: Student Support Services per each original statement.

A. Students receive information, guidance, and/or counseling specific to this CTE Program of Study, including career and job market information, and college program information. Evidence: Students in the Computer Information Systems program at PCC have a specialized advisor who is knowledgeable about PCC systems as well the nuances of the field and the program. In addition PCC offers services on how to get started, a career center, advising and career counseling. The Computer Information Systems program has their own website, which details how students can get started and get support. The CIS Perkins Advisors offer a variety of advising methods to reach both prospective and current student including: traditional advising appointments, on-line information sessions for new or prospective CIS students via Blackboard Collaborate, on-campus information sessions for new or prospective CIS students; advising appointments by Skype; an active and up-to-date advising website ([spot.pcc.edu/computers](http://spot.pcc.edu/computers)); drop-in advising times; in class presentations to CIS courses, and a Quarterly ezine to all registered CAS and CIS students.

B. Students participate in CTE POS specific career related learning experiences or related work experience. Evidence: Students must complete the required 4 credits of CIS 280D Coop: Application Development and/or OS 280F for the AAS degree CIS. There is an employment specialist who works with students to help find placement and earn college credit for them.

C. Students' education planning is developed around information specific to this CTE Program of Study. Evidence: Students and advisors work with the GRAD PLAN program to create a personalized degree plan based on the students' level of entry at PCC and the program requirements. In addition, the catalog of programs and degrees offers guidance on educational planning.

D. Extended application projects or capstone experiences are developed within the context of this CTE Program of Study. Evidence: Many of the advanced courses that are required to complete for the AAS CIS degree require students to complete extensive projects within the programming language or in a focused area of study.

E. Written information is provided to all students in this CTE Program of Study informing them of available articulated college (or university) credits, dual credit, expanded options, scholarships, and other postsecondary opportunities. Evidence: The advising specialist who works with these students organizes and announces group meetings, one-on-one advising, job postings and announcements, foundation scholarships, requirements for the co-op and employer visits. PCC has extensive and detailed information available on the transfer website and in the transfer guides that are available showing the paths of articulation from PCC CTE programs to university programs. Currently there is a

## **CTE Program Of Study .... 2018 Application** (continued)

direct transfer program with Southern Oregon University for a BAS Business Management and Oregon Institute of Technology, BAS Technology and Management that AAS students can transfer directly into.

F. Efforts are made to provide information to students who are considered non-traditional by gender to the occupations resulting from this CTE Program of Study. Evidence: PCC is committed to reaching out to all students regardless of their gender. The CTE program advisors are empowered to reach out to high school students through high school visits, annual student preview day, and career fairs. The program advising specialist does presentations that include information on the computer information system degree to different high school groups throughout the year.

G. Access and recruitment to courses in this CTE POS are provided for all students including, but not limited to all Oregon and federal protected classes. Evidence: PCC is firmly committed to creating a diverse student body through continued and regular education of staff and faculty as well as by offered ongoing support to students and staff through the Office of Affirmative Action and Equity. The CIS student advising specialists provide outreach to high school and underserved populations through participation in PCC Preview days, Portland Youth Builders' classes, and high school visits to Rosemary Anders Highschool.

H. Accommodations are made to assure students with special needs can participate in this CTE POS. Evidence: The Disability Services office at PCC is able to help accommodate students with documented disabilities receive services they may qualify for.

I. Assistance is provided for students wishing to participate in this CTE POS for whom English is not their native language. Evidence: Most CTE programs require an English and Reading level minimum placement of WR 115 and/or RD 115. PCC offers ESOL courses for students who wish to improve their English language proficiency prior to entering into their CTE program of choice. For students who are studying on an international visa, international advisors that specialize in helping non-native speakers enter into the ESOL program are available.

Postsecondary TSA: 2AREG054 or 2AREG041

## Element 5: Professional Development

*Professional Development for POS teachers should be designed on the needs identified by data, and should focus on continuous improvement of student opportunities within this POS.*

The planned professional development for this POS will:

- ☒ A. Connect to teacher effectiveness evaluations.
- ☒ B. Help teachers and administrators develop and improve standards-based curriculum and learning experiences that promote the integration of coherent and challenging academic content and industry-based technical standards, including opportunities for the appropriate academic and CTE instructors to jointly develop and implement classroom-based curriculum and instructional strategies.
- ☒ C. Include professional development that is high quality, sustained, intensive, and focused on instruction designed to increase the academic knowledge and understanding of industry standards
- ☒ D. Encourage applied learning methodology that contributes to the academic and CTE knowledge of the student
- ☒ E. Provide research and training opportunities that help teachers develop appropriate and useful assessment tools and strategies.
- ☒ F. Provide training and guidance geared to help improve instructional delivery methodology that helps improve student performance and skill acquisition, particularly skills needed to work with and improve instruction for special populations.
- ☒ G. Assist teachers in accessing and utilizing CTE accountability data, student achievement data, and data from assessments

➤ **Directions for using the Comment box**—Expandable space is provided for comments. This Box is intended for explanations for missing checks above, or notes regarding program strengths worth consideration during POS review. If you already have documents or files that do this more quickly, simply attach those documents or files (or links to them) to this application in an appropriate Addendum folder. (Consult the [Guide to Using the Oregon CTE Program of Study Application 2018](#), for more details.)

Please address these questions through your comments in **Element 5 Comment Box** below (or attach documentation in an appropriately identified file/folder):

- Address any unchecked box above
- Briefly describe how PD will be planned and implemented, based on the needs of the POS
- Briefly describe any planned joint PD ventures for HS and CC teachers, as well as regional trainings

### Element 5 Comment Box:

A. There are no unchecked boxes.

B. Annual Student Learning and Growth Goals are set as part of the performance review process between CTE pathway teachers and our site administrator. Growth goals are measured with pre and post assessments addressing student performance in identified learning targets in the pathway. Results are broken down by different demographics, including under represented minorities, EL students, students on IEPs, and other measurements. As part of this process, resources are identified to help teacher growth in order to continually strengthen teacher affectiveness in these areas resulting in higher student performance. This goes hand-in-hand with the evaluation process of the pathway (see Element 3), as more general indicators of pathway success are reflected through that set of data.

Academic and CTE teachers work within their Professional Learning Teams and the curricular TOSAs in the district to continually develop and improve learning targets. Industry partners advise the teachers and district specialists in outlining the skills and knowledge standards within the field.

CTE pathway teachers will receive ongoing training and advice through Project Lead the Way's core and continual training programs, AP workshops, shadowing or interning with industry partners, district-wide Professional Learning Teams and Oregon Computer Science Teachers Association Professional Learning Communities and workshops.

While there are authentic learning activities even in the first two courses of the pathway, these two courses also provide more scaffolding from the teacher. Approaching a new language or piece of software, or approaching a brand new type of problem, can be very daunting and intimidating for those

## CTE Program Of Study .... 2018 Application (continued)

with little programming experience. There is an approach that can be taught and practiced. Learning how to find information needed to solve a problem; developing an attitude and mindframe of how to work toward a solution to something that initially seems foreign and new: these are important skills not only for programming but for success in highly technical fields in general. Working collaboratively is also something that may be new for students. This is taught from the first day of the pathway: an ethos of collaboration is established and students are given expectations for how to work effectively with someone they've never met before. In the first two years, teachers do much more in providing students with problems and contexts, setting up collaborative partnerships and providing starter code to help students build up their skill sets. By the third course of the pathway, much of the scaffolding is taken away. Students have much greater independence in setting up their partnerships to fit a given situation. They are more frequently required to start code from scratch. They have more responsibility in independently insuring that they are meeting predefined standards. By the end of the pathway, many students will have created a product that is meeting a need in the real world. All students should have a clear idea of what areas of study they could pursue to further their skills in their area of interest.

Part A described how the performance of pathway teachers is evaluated. The site administrator consults with each pathway teacher throughout the year to provide guidance and suggest training classes or workshops that may benefit the teacher's ability to maximize the effectiveness of the program. The Beaverton School District provides many professional development offerings to improve instructional delivery methodology that helps improve student performance and skill acquisition, particularly skills needed to work with and improve instruction for special populations.

Pathway teachers will work with the site administrator at SST to assess and utilize CTE accountability data, student achievement data and data from assessments.

C. Secondary and Post Secondary instructors will meet at least once a year to ensure that there is alignment in the courses and continue other professional growth together. There will also be a community college instructor visiting the high school courses to provide feedback in regard to community college articulation alignment.

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CTE Teacher: Submit complete electronic application materials to your CTE Regional Coordinator.

Regional Coordinator: Email application and addenda to this mailbox-- [POS.Application@state.or.us](mailto:POS.Application@state.or.us), or follow an alternative process described in Step 8 of the **Submission Process** on the last page of this application. **DEADLINE for submission: June 29, 2018**



## Certification of Assurance

Directions: **After filling in all the appropriate fields in this form**, print out a copy of this Certification of Assurance page and acquire all the appropriate signatures. **All signatures must be on one form.** Email completed COA with ALL signatures to [POS.Application@ode.state.or.us](mailto:POS.Application@ode.state.or.us).

<b>Name of CTE POS</b>	Computer Programming and Software Development
<b>Name of Secondary School</b>	School of Science and Technology
<b>Name of Community College</b>	Portland Community College

<b>SECONDARY LOCAL SUPPORT and CERTIFICATE OF ASSURANCE</b>	I have reviewed this program application document for clarity, completeness and adherence to program quality standards, and support its approval. I agree that the CTE program area requirements for secondary CTE programs, including appropriate CTE certification for teachers, the rules and regulations for Public Law 109-270, and the requirements contained in the Oregon State Plan for Career and Technical Education will be complied with in the operation of the CTE programs and services offered by the district or through contract between the district and other agencies, institutions, or individuals. I agree to furnish CTE program data as requested by the Oregon Department of Education.	
<b>Secondary School District Administrator Signature</b>		<b>Date:</b>
<b>Administrator's Name</b>	Jonathon Sanchez	

<b>LOCAL SUPPORT and CERTIFICATE OF ASSURANCE</b>	The program advisory committee has been involved in the design and development of this program.	
<b>Advisory Committee Signature</b>		<b>Date:</b>
<b>Advisory Committee Member's name</b>	Nathan McNulty	

<b>POST-SECONDARY LOCAL SUPPORT AND CERTIFICATE OF ASSURANCE</b>	This community college has been involved in the design and development of this CTE program of study and agrees to continue collaboration meeting all 5 Core Elements, especially alignment and articulation and reliable and valid technical skills assessment.	
<b>Community College Administrator's Signature</b>		<b>Date:</b>
<b>CC Administrator's Name</b>	Enter CC Administrator's Name	

<b>For Regional Coordinator Use Only</b>	
<b>Recommended Status:</b> <input type="checkbox"/> <b>RECOMMENDED FOR STATE APPROVAL (Perkins Eligible)</b> <input type="checkbox"/> <b>DISAPPROVED (and returned for revision)</b>	
<b>Regional Coordinator Signature</b> 2A--Beth Molenkamp elizabeth.molenkamp@pcc.edu	<b>Date:</b> _____

<b>For ODE Use Only</b>	
<b>Approval Status:</b> <input type="checkbox"/> <b>FINAL STATE APPROVAL (Perkins Eligible)</b>	
<b>Education Specialist Signature</b> Tom Thompson	<b>Expiration Date:</b> _____ <b>Date:</b> _____

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## Submission Process

### Instructions

Submit complete electronic copies of the application materials by following this procedure:

1. **Do not send PDF applications.** Please send in original Word format.
2. Be sure you are using the correct year's application from [ODE's website](#).
3. Create a file (main folder) for storing all documents to be submitted
4. Title the folder using the name of the secondary school, the name of the Program of Study, and the year of submission, e.g., "OregonTownHSAccounting2018."
5. Create subfolders clearly named for each Element's Addendum that you are including with the application, e.g., "OregonTownHSAccounting2018Addendum1," "OregonTownHSAccounting2018Element1," or "OregonTownHSAccounting2018StandardsContent."
6. If submitting unique documents for individual schools in a Regional Application, create subfolders for each school within the appropriate Element's Addendum folder, e.g., "OregonTownHSAAddendum1."
7. Place the completed POS Application and a scanned copy of the completed Assurance document in the main folder; put any other documents included with the application in their appropriate subfolders. ([Please name documents and folders so that they are clearly identified.](#))
8. Each application needs to include a completed Assurance page with all signatures included on one page—please, no duplicate Assurance pages with partial signatures.  
(For Regional Programs of Study, however, each secondary institution will need to have its own Assurance page; for those Regional applications, please secure Community College signatures first, then photocopy for each secondary partner and acquire secondary signatures; then scan and place all originals in the main POS folder with the application.)
9. Please be sure all required documents, links, and examples are in their appropriate folders before performing Step 8.
10. Prepare files for submission:
  - a. Submit each POS application main folder with its subfolders one POS at a time.
  - b. Use the electronic download process using ODE's FTP portal. Go to the ODE Secure File Transfer site ([ODE FTP Site](#)) and follow the online directions for sending your POS folder to [POS.Application@state.or.us](mailto:POS.Application@state.or.us). For technical help with this procedure, call Kenzie Mozejko—503-947-5636.
  - c. Alternatively, you may save folders on a Jump Drive or CD-ROM and send to ODE, in care of: Kenzie Mozejko, Oregon Department of Education, PSB 2<sup>nd</sup> Floor, 255 Capitol St. NE, Salem, OR 97310.

CTE Teacher: Submit complete electronic application materials to your CTE Regional Coordinator.

Regional Coordinator: Submit application and addenda using the FTP process described in 10 above, to this mailbox:

[POS.Application@state.or.us](mailto:POS.Application@state.or.us) ). (Alternatively, using Step 10(c) above, a jump drive or CD ROM can be used to send files to ODE.)

**DEADLINE for submission: June 29, 2018**

**Early Bird deadline (assures feedback before teachers leave for summer): April 30, 2018**

**(You may delete this page before submitting this application.)**