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Section 1 - Executive Summary

Program/Discipline overview

Computer Information Systems (CIS) are a necessary and vital component of our modern life. The CIS program prepares students for careers in the field of Information Technology (IT) by providing education in the foundations of the discipline as well as training in the programming languages, tools and technologies used in today's IT industry. CIS classes are taken by students who are new to IT as well as by IT professionals who are interested in updating or expanding their skill set.

After completing a CIS degree, students are prepared for entry-level jobs such as computer support specialist, help desk representative, and assistant network administrator. While we are a career and technical education (CTE) program, we also support students interested in transferability with the Oregon Institute of Technology (OIT) as the main choice of transfer students. In addition, CIS courses support other programs at PCC including Computer Science, Computer Applications and Office Systems, and Business Administration. Three CIS courses (CIS 120, 121, and 122) continue to meet the general education requirement in the Math and Sciences area for the AAS, AS, and AGS degrees at PCC.

The CIS department of nine full-time faculty and 35 part-time faculty serves all four of PCC's campuses. We offer three degrees and 47 courses. Distance learning classes account for over 60% of CIS enrollment. Over the last seven years, CIS enrollments have increased from 1,100 in Winter 2008 to 1,600 in Fall 2013, peaking at 1,900 in Winter 2013.

In the face of the constantly changing field of IT, we emphasize the development of enduring skills and knowledge in the students, and an attitude of constant learning. To keep up with the fast-paced changes in IT, we have developed very close ties with industry, including an advisory board made up of representatives from industry and a full-time employment specialist. We have a co-op program that provides the students with valuable industry experience while pursuing their education. Our strong cohort of part-time faculty, most of whom are currently employed in the IT industry, help keep CIS courses relevant and fresh with the latest practices and technologies used in industry.

Educational objectives and national guidelines

The fundamental threefold goal of the CIS program is to enable students to develop 1) enduring foundational knowledge, 2) competency with present-day technologies, and 3) a facility for learning new skills as the IT field continually advances. To this end, CIS degrees and courses integrate the foundational knowledge of the field with languages and technologies currently in use.
This emphasis is in line with national guidelines. The Association for Computing Machinery (ACM), the world’s largest educational and scientific computing society, has produced curricular guidance for associate-degree IT programs\(^1\). The guidance consists of 48+ core learning outcomes in technical and soft skill domains, along with associated assessment rubrics. According to the ACM, these core IT learning outcomes are intended to be adaptable, not overly technology specific, and have reasonable staying power.

The table in Appendix section 1 maps CIS courses against the ACM recommended core IT outcomes. As the table shows, CIS courses cover nearly all the outcomes listed.

**Summary of changes since last review**

Since the last program review in 2009, the CIS program has undergone the following changes:

- Developed a Health Informatics degree as part of a statewide initiative
- *Added TCB 310 as a computer-equipped classroom
- Removed courses and added new courses in response to industry changes
- Reduced the number of electives in the CIS degree while keeping the total number of credits the same to help students choose the right path for them
- Four full-time faculty retired and four full-time faculty were hired, maintaining the full-time faculty cohort at nine
- Enrollment increased by 45%
- Completed learning and technical skills assessments for the CIS program
- *Formed a committee to improve marketing of CIS courses

*Starred items are changes made as a result of the last program review

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\(^1\) ACM CCECC, “ACM Associate-Degree Curricular Guidance for Information Technology,” Reviewer’s Draft, November 2013,

Section 2 - Outcomes and Assessment

Course level outcomes

- Content changes were made to the Java Programming II Design course CIS233J (which assesses Degree Outcome #6) because too many unacceptable and weak scores were reported in two of the topics.
- Additional material was added to the Testing and Documentation topics and the amount of class time spent on the topics was increased.
- The majority of courses in the AAS degree now have required rather than recommended prerequisites. This should allow students to be better prepared for the courses.
- The prerequisite course for the Software Design course CIS122 was examined and changes were made to the CCOG. This should better prepare students to succeed in the programming courses.

CIS course mapping to college outcomes and degree outcomes

<table>
<thead>
<tr>
<th>College Outcome</th>
<th>Degree outcome</th>
<th>Course Used in Assessment</th>
<th>Type of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>#1: Apply computer technology to address business information needs</td>
<td>CIS275 Database</td>
<td>Lab</td>
</tr>
<tr>
<td></td>
<td>#2: Develop and evaluate system requirements</td>
<td>CIS244 Systems Analysis</td>
<td>Paper</td>
</tr>
<tr>
<td></td>
<td>#3: Design, implement and deploy systems</td>
<td>CIS179</td>
<td>Lab</td>
</tr>
<tr>
<td></td>
<td>#4: Evaluate, test, debug and troubleshoot systems</td>
<td>CIS140M</td>
<td>Lab</td>
</tr>
<tr>
<td>Technology</td>
<td>#5: Create effective databases and user interfaces</td>
<td>CIS275</td>
<td>Lab</td>
</tr>
<tr>
<td></td>
<td>#6: Develop small programs</td>
<td>CIS233J</td>
<td>Programming assignment</td>
</tr>
<tr>
<td></td>
<td>#7: Use network concepts and terminology to communicate with vendors and users</td>
<td>CIS179</td>
<td>Lab</td>
</tr>
<tr>
<td></td>
<td>#8: Select appropriate technology tools by recognizing tool capabilities and</td>
<td>CIS244</td>
<td>Paper and report</td>
</tr>
<tr>
<td>limitations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Information Systems in Business</strong></td>
<td>#9: Apply operational business knowledge in addressing information systems needs</td>
<td>CIS244</td>
<td>Paper and report</td>
</tr>
<tr>
<td><strong>Personal and Interpersonal</strong></td>
<td>#10: Communicate effectively in both written and oral form</td>
<td>CIS244</td>
<td>Paper and report</td>
</tr>
<tr>
<td> </td>
<td>#11: Work effectively in teams</td>
<td>CIS244</td>
<td>Paper and report</td>
</tr>
<tr>
<td> </td>
<td>#12: Manage time tasks and projects</td>
<td>CIS244</td>
<td>Paper and report</td>
</tr>
</tbody>
</table>

**Assessment design and processes**

- All of the rubrics used in the previous assessment were modified. Every attempt was made to standardize them, which was recommended by the reviewers of the previous assessment.
- Each CIS class that was used for the assessment graded a student assignment or project against a rubric. Because the previous assessment found that the rubrics were not standardized across courses, the rubrics were modified so that they were consistent across the courses. Each rubric used the same four categories:
  - Strong
  - Acceptable
  - Unacceptable
  - Weak
- Each assignment was evaluated against the rubric and scored into one of the four categories. The percentage of assignments for each category was calculated and reported.
- The sample size for each assessment consisted of all the students in the class who had submitted the assignment, paper, or report. Assessment-driven changes to improve outcomes.
- A Capstone course is being developed for the AAS degree.
- The Visual Basic .NET programming course sequence is being replaced by a C# programming sequence.

### All Outcomes: All Results

![Graph of all outcomes](image)

- The course outcomes for the C# and Java programming sequences were aligned.
- The number of electives for the AAS degree was reduced to provide a clearer pathway towards completion of the degree.
- The majority of courses in the AAS degree now have required prerequisites.
Section 3 – Curricular Issues

The available data indicates that 62.5% of CIS classes are offered via the Distance Learning modality compared to 37.5% of classes offered on campus.

The following chart shows students’ success in both Distance Learning and campus classes. The data is available for a period of three terms (Fall 2012-Spring 2013) listing Sylvania CIS classes only. The success rate is measured by the number of students who have successfully passed CIS classes.

A closer look at selected areas provides different findings. The following chart shows that students do better in foundation classes taken in classroom setting rather than Distance Learning:

<table>
<thead>
<tr>
<th>Pass</th>
<th>Campus</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS120</td>
<td>71%</td>
<td>66%</td>
</tr>
<tr>
<td>CIS121</td>
<td>65%</td>
<td>52%</td>
</tr>
<tr>
<td>CIS122</td>
<td>76%</td>
<td>65%</td>
</tr>
</tbody>
</table>

In addition, in the following areas, students show better success taking classes on campus.
compared to Distance Learning classes:

<table>
<thead>
<tr>
<th>Course</th>
<th>Pass</th>
<th>Campus</th>
<th>Online</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS286</td>
<td>93%</td>
<td>72%</td>
<td></td>
<td>21%</td>
</tr>
<tr>
<td>CIS121</td>
<td>65%</td>
<td>52%</td>
<td></td>
<td>13%</td>
</tr>
<tr>
<td>CIS122</td>
<td>76%</td>
<td>65%</td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>CIS133J</td>
<td>82%</td>
<td>73%</td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>CIS276</td>
<td>81%</td>
<td>73%</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>CIS288M</td>
<td>94%</td>
<td>86%</td>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>CIS133W</td>
<td>80%</td>
<td>74%</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>CIS244</td>
<td>93%</td>
<td>88%</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>CIS120</td>
<td>71%</td>
<td>66%</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>CIS233J</td>
<td>89%</td>
<td>86%</td>
<td></td>
<td>3%</td>
</tr>
</tbody>
</table>

Contrary to the last two findings, the data indicates that Distance Learning students show higher success rate in the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Pass</th>
<th>Campus</th>
<th>Online</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS133B</td>
<td>59%</td>
<td>60%</td>
<td></td>
<td>-1%</td>
</tr>
<tr>
<td>CIS125D</td>
<td>64%</td>
<td>66%</td>
<td></td>
<td>-2%</td>
</tr>
<tr>
<td>CIS279L</td>
<td>77%</td>
<td>79%</td>
<td></td>
<td>-2%</td>
</tr>
<tr>
<td>CIS179</td>
<td>70%</td>
<td>74%</td>
<td></td>
<td>-4%</td>
</tr>
<tr>
<td>CIS240M</td>
<td>76%</td>
<td>84%</td>
<td></td>
<td>-8%</td>
</tr>
<tr>
<td>CIS275</td>
<td>70%</td>
<td>79%</td>
<td></td>
<td>-9%</td>
</tr>
<tr>
<td>CIS140M</td>
<td>52%</td>
<td>76%</td>
<td></td>
<td>-24%</td>
</tr>
</tbody>
</table>
Curricular changes as a result of exploring/adopting educational initiatives

The SAC constantly revises the curriculum as the result of industry, faculty, student, and advisory board input. In addition to Health Informatics program, the following courses have been added:

- 133C, 233C: C# Programming I and II
- 133W, 233W: JavaScript for Web Developers I and II
- 135A: Application Development with Agile/Scrum
- 135M: Mobile Application Programming
- 135T: XML and HL7
- 195P, 295P: PHP Web Development I and II
- 235R: Introduction to Ruby
- 235W: Introduction to Web Analytics
- 245: Project Management - Information Systems
- 287X: Microsoft Exchange Managed

Dual credit courses offered at area high schools

There are currently no CIS classes offered through Dual Credit. However, one high school CIS faculty member is approved and working on syllabi.

Barriers to developing further dual credit agreements

The CIS department is discussing ways to overcome this barrier.
Section 4 – Student / Community Needs

Student demographics

Gender

Female enrollment has declined from 38% in 2008 to 34% in 2013. The ratio is even more troubling when the computer concepts classes (CIS120, CIS121, CIS122) are excluded from the data. Since these classes can be taken by anyone in the college, excluding them from the data more accurately reflects students majoring in the CIS program.
Last year only one quarter of CIS students in non-Gen Ed classes were female. Compare this to the college-wide CTE gender distribution, where the female population slightly outnumbers the male population.

The CIS program enrollment mirrors the national trend of male dominance in “behind the scenes” computer fields such as Computer Information Systems and Computer Science. While Middle School and High School education undoubtedly play a large role in determining female interest in the CIS program, this does not absolve us of the responsibility to try to reverse that trend.

Harvey Mudd, a private liberal arts college in Claremont, CA, has instituted a program which increased female computer science majors from 10% to 40% in seven years. We will explore what they did and how we might implement some of their initiatives in Section 8 - Recommendations.
Race / Ethnicity distribution

Whether or not the Gen Ed concept classes are removed, most of the students in the CIS classes are white. However, unlike the gender distribution, this is only slightly higher than the CTE race distribution of about 72% white. In addition to increasing female participation, Harvey Mudd’s approach to computer classes also positively affected race / ethnicity distribution.
Once again, looking at non-concept classes, there is a difference of distribution. In particular, over 50% of CIS students are under age 30 when all classes are included. However, when the Gen Ed concept classes are excluded, over 50% of CIS students are over age 30.
Full / part-time distribution

The trend towards more full-time students, as reported in 2009, has continued. This mirrors the overall trend in CTE programs college-wide.

![CIS full-time vs part-time students](image)

Instruction changes as a result of demographic changes

The most significant change in the demographics of CIS students in the past five years is that DL students account for over 60% of CIS enrollment, up from 52% five years ago. More than any other demographic change, this has completely altered the way we teach.
We now require all new CIS instructors to enroll in Online Instructor Orientation the first term after they are hired. New faculty applicants must be willing to teach online. All CIS campus classes are required to have an online component (using the college’s Desire2Learn course management software).

**Projected demand and enrollment patterns**

Enrollment in CIS has always been cyclical. While CIS is still growing, the growth has flattened and we anticipate only a slight decrease in FTE in the current school year (Fall enrollment figures bear this out).

It is important to focus not just on current trends in technology, but on future trends as well. Even
as we focus on new areas of technology we need to bear in mind that new technology will continue to drive an increase in the need for CIS classes. Further, if our initiative to attract more females and minorities into the CIS program succeeds, FTE will see a major increase. In any case, long term industry projections suggest that industry needs will continue to drive increased enrollment.

**Strategies used to facilitate access and diversity**

The majority of students requesting accommodations in CIS courses request accommodations for learning disabilities. Because we require all CIS classes, distance or on-campus, to have a Desire2Learn shell, learning disabilities are easily accommodated. Testing time limits can be set for each individual student and testing online allows students to have a distraction free test environment.

New courses are designed to meet PCC’s accessibility criteria. We have also been reviewing existing courses and revising them to consider accessibility, as outlined in PCC’s Accessibility for Online Content

Diversity has already been discussed in the preceding Student Demographics section.

**Implementing approved academic accommodations**

The Distance Learning office reviews new courses and courses with a major revision. Accessibility is one of their major criteria for evaluating a course.

The college’s accessibility coordinator has attended several department meetings to keep faculty updated on accessibility issues and best practices.

We have developed a guide for adjunct faculty that describes various procedures and resources available including accessibility.

Students with concerns about accessibility can contact the CIS department co-chairs.

**Curriculum or instructional changes resulting from feedback (students, community groups, transfer institutions, business)**

Advisory Board (addressed in Section 7)

Student feedback has been adversely affected by the switch to CollegeNet. The amount of student feedback information that the faculty can access is severely reduced. Previously, almost all students responded to class surveys but now a 50% return is considered outstanding. This drastically reduces valuable student feedback.

Our involvement in the statewide organization Oregon Council of College Chairs (OCCC) keeps us in touch with educational trends that are occurring throughout the state.
Articulation discussions with OIT help our students transfer to a four year school.

CIS instructors supervise co-op internships and at the end of the term, they visit the site of the interns’ employment.

The CIS Employment Specialist keeps us in touch with nationwide, statewide, and local employment trends in the high tech industry.
Banner and Institutional Effectiveness data shows that CIS Winter 2014 enrollment is 60% higher than Winter 2008, and 7% lower than the peak in Winter 2013. As previously noted, CIS enrollment tends to be cyclical—when the economy declines, enrollments rise and when the economy rises, enrollments decline. Since the last program review, enrollments have risen steadily through Fall term of 2011, at which time they started leveling to about 1,800 a term. The good news is that enrollments have not tanked as they did from 2001 to 2004. The better news is that the leveling-off period has now been in effect for two years, which could be indicative of a “normal” level during economy growth.

This is an interesting time for CIS. If this enrollment trend continues through 2014, PCC should consider adding an additional full-time CIS instructor to meet the current and future demand for technology classes and programs.
CIS enrollments are approaching a level equivalent to that seen in 2003, yet the number of full-time faculty is less than 69% of that in 2003 (In 2003, CIS had 13 instructors teaching CIS classes full-time, as well as 6 full-time instructors from CS, BA and CAS teaching CIS classes). To make up the difference, the number of sections taught by part-time faculty has increased.

Since 2008, the percentage of part-time faculty teaching CIS classes has steadily increased from 55% in 2008 to 66% in 2014. For the two academic years from 2011 to 2013, part-time instructors taught 70% of all CIS sections. This high percentage is considered an anomaly as one full-time instructor was on medical leave and another on sabbatical leave.
District-wide, the current ratio for sections taught in all departments is 34% full-time to 66% part-time. The proper ratio of FT to PT instructors has been argued for years with no standards established by any accreditation agency, yet there is an acknowledgement that a larger number of full-time faculty members typically results in higher quality learning. In 2011, OEDb ranked schools by their ratio of FT faculty to PT faculty. PCC is not on the list; however, based on the current ratio, PCC would rank in the 500-600 range.

CIS struggles to obtain part-time faculty that meets the instructor qualifications due to the demand for IT professionals and private industry being able to offer more attractive employment packages.

According to PCC Faculty Federation President Frank Goulard, the district-wide goal is 65% full-time and 35% part-time, along with an acknowledgement that CTE programs need a higher ratio due to the part-time faculty recruitment issues.

For CIS to maintain and grow a high-level program, the school should consider the addition of another full-time CIS faculty instructor.

**Anticipated faculty turnover and changes in the next five years**

Since the last program review, four full-time CIS faculty have retired. It is reasonable to think that over the next five years, CIS could see the retirement of an additional four full-time faculty members.

**Faculty diversity and cultural composition**

CIS Faculty Composition by Sections Taught:

Winter term, 2014

PCC seeks to have female and minority representation among faculty that reflects that of the student population and industry. According to the CIS Employment Specialist, nationally, women hold 57% of all professional positions but only 25% of technology and computing jobs. Currently,
females account for a little over 50% of the CTE enrollment.

Open Education Database (OEDb), 2011, http://oedb.org/rankings/student-faculty-ratio/

As shown by the composition charts above, CIS faculty representation falls short of PCC’s goals. We are cognizant of this fact and strive to hire minorities and women who meet the education and experience requirements.

Changes made to instructor qualifications since the last review

CIS SAC recommended the following instructor qualification changes which are being reviewed by the Industry Board:

CIS Instructor

● Education:
  o Bachelor’s degree in science, technical, engineering, math (STEM) or STEM-related Bachelor’s degrees.
● Experience:
  o 4 years non-teaching industry experience in the subject area.
● Related Instruction:
  o Instructors who meet the above requirements are qualified to deliver all of the related instruction in this subject area.

Professional development activities of the faculty

Below is a sampling of activities and conferences that CIS instructors participated in during 2013. All CIS instructors also supplement their technical expertise via technology publications, both in-print and online.

Professional

● Two CIS Instructors are working on Ph.D. degrees
● Two faculty members had sabbaticals

Conferences/Committees Attended

● SIGCSE 2013
● CCSC NW2013
● AACC Annual Convention
● ACM CCECC
● Pacific Northwest Great Teachers Seminar
● Open Source Convention (OSCON Exhibitor and Attendee)
● STEMtech 2013

Webinars

● Accessible Documents Training
● Video Captioning Training
● Practical Presence: Giving Interactive, Formative Feedback in Online Learning
● Organic Feedback: Growing through Consistent Adjustments
● Aligned Assessments: Effective Formative Assessments to Meet Common Core Standards
● Data-Driven Decisions: Using Rubrics for Programmatic Assessments
● Teaching Originality, Creativity and Thinking
● Finding the Needle in the Haystack: Informational Fluency and Digital Literacies
● Plagiarism Spectrum Drill Down
● Responding to Plagiarism Lesson Plans and Strategies
● Developing Effective Academic Integrity Policies

Other

● Quality Matters (QM) faculty centered voluntary peer review process
● Cara Tang has implemented secure computing and code control in her classes, and has offered ways for other faculty to incorporate such methodologies in other CIS courses. She has also become a member of the ACM CCECC (Committee for Computing Education in Community Colleges), which is crafting international curriculum guidelines for two year IT programs. PCC has been a leader in IT since its inception, and Cara Tang’s participation in such guidelines will allow PCC to maintain and expand IT leadership and curriculum in the CIS program.
Section 6 - Facilities and Support

Impact of classroom / lab space and technology on student success

Value of Computers in the Classroom

CIS instruction focuses on programming, database development, web development, networking, and data communications. Readily available computers allow students to apply what they read and hear about in class. Increasing computing hardware classroom access has enhanced our ability to support our students.

Classrooms

Most CIS courses require classrooms equipped with computers for student use. The limited number of these rooms results in sections being scheduled in regular classrooms or at times that are difficult for CIS students to attend. In response to students’ concern about CIS sections that do not have the proper facilities, we have expanded the number of computerized classrooms and scheduled more creatively so that as many sections as possible are scheduled in a computerized classroom. This included converting TCB 310 into a computerized classroom and expanding the functionality of TCB 307 to better support networking courses by adding access to the department server room via a second, isolated network. When bond-related activities forced us to move our computer lab in the SS building, we took the opportunity to increase the number of stations from 24 to 28 to serve more students. Even so, with the growth of the CIS program, adequate access to computerized classrooms has been challenging.

All CIS classrooms now have electronic podiums with monitors, computers, and overhead projectors. These podiums include the ability to plug in a laptop computer in order to provide highly customized content. The improved technology has helped provide consistent quality instruction.

Each classroom has at least some, and often an abundance of whiteboard space. Being able to spontaneously illustrate a concept is critical to classroom instruction.

In cooperation with the CAS department, the division has converted TCB 309 into a dual PC/Apple computerized classroom. There have been a variety of technical and scheduling challenges which have made this new classroom challenging to use. When the technical challenges are overcome, we expect to be able to make better use of these new computers.
Computer equipped classroom hardware

Most of the CIS computer equipped classrooms use Dell Optiplex 580 computers with an AMD Athlon II X2B22 processor, 4 GB RAM, and 2 USB 2.0 ports on the CPU chassis plus one on the monitor. All have a 232 GB hard drive, a DVD drive, gigabit Ethernet plus headphone and microphone ports. They also have 17” flat screen monitors built in 2004 (now 10 years old). These computers are fairly low-end full size desktop models. To save money, during the last round of computer replacement, the monitors were not replaced (hence the 2004 vintage monitors).

We push the capabilities of the hardware pretty hard. The amount of software we have on every computer is much greater than on a typical home computer, as we need a broad range of software to support a variety of classes. We use virtualization, especially in the Operating Systems classes, which is challenging with the limited RAM. Altogether, that puts a considerable strain on the processing power of these small machines.

The monitor screen size and resolution limits what we can do, especially in the area of web development. The monitor stands are typically adjusted by every student in every class. Since they were not designed to be adjusted that often, they quickly wear out. This situation has improved since the last CIS program review when the majority of monitor stands were broken at any point in time.

IT support continues to be a challenge. Although the goal of IT is to have all PCs repaired within 24 hours, this goal has seldom been reached. Communication between IT and the large number of faculty who use the labs can be problematic, especially since the labs are used by faculty from several different departments. We have tried several methods of standardizing and centralizing the reporting and follow-up of computer repair, but there is still room for improvement.

Servers

We have a small server room located adjacent to TCB 311 to support the Operating Systems classes. Faculty members provide all support for these servers and network hardware including all software installations, backups, and repairs. This is also where we will be installing the new Computer Club server.

Having a separate server room has significantly improved the flexibility and functionality of how we can deliver quality instruction, especially with regard to operating systems classes.

We also have two virtual database servers supported by a combination of PCC’s IT department and faculty. This shared support model has been challenging as it’s not always clear who is responsible to fix a problem. Often it requires coordination between CIS support people, outside contractors, and PCC’s IT department. This process has been improving over the last couple of years.
Scheduling challenges

One challenge is that we seem to have a high percentage of students who work during the day and who can only take classes in the evening. The result is that we typically fill every available evening class time slot, including Friday evenings, with sections spilling into Saturday mornings. All of the division’s Business Administration (BA) computer based courses have been moved into division computer labs in order to maximize the use of this resource.

Campus specific scheduling challenges

CIS is a school-wide program, so we deliver classes at Sylvania, Rock Creek, Cascade, and Southeast Center. Typically, the larger enrollment entry level classes are taught at all campuses, while the more limited enrollment higher level classes are taught only at Sylvania. This allows us to have a greater fill rate in each classroom. At Sylvania we have several classrooms for which we control or share the control of scheduling, including TCB 307, 309, 310, 311 and SS 110. We do not have similar dedicated facilities at the other campuses. Outside of Sylvania we have to submit a request for access to classrooms and are routinely blocked from the evening time slots when CIS students are most likely to be available. This prevents us from being able to provide a consistent presence on these campuses, which makes it more difficult to support those student populations.

Distance Learning online support

The Student and Faculty Helpdesks provided by Distance Learning has been a bright spot in the support of CIS students and faculty. Resource people are available, knowledgeable, and helpful. Support for DL students is especially valuable because they can’t as easily get help directly from faculty, tutors, or administration. When others are unavailable, the DL support staff are ready to help. They provide a crucial support role for the department. We value their contribution and hope that they will continue providing support at the current levels.

Student use of library or other outside information resources

Overall use of library resources has changed in the last five years. On-campus library resources are of less value because a smaller percentage of CIS students are on-campus. Due to more online delivery of content, online publications are being used more. In particular, the EBSCOHOST online collection of periodicals sees a greater usage than most other collections as it focuses on more relevant technical content. The library has been willing to hold and check out reserved copies of CIS textbooks which has been of tremendous value for CIS students, especially those who have limited resources. Unfortunately,
the library is unwilling or unable to buy the textbooks, so we have to use department funds, for which we are not budgeted. That means we don’t consistently have textbooks available in the library.

Administration of how textbooks are kept on reserve has also been a challenge. Library policies are often disconnected from how textbook access is needed, so books will move from reserved to general checkout without clear communication with the department, which means the textbooks can become completely unavailable except to a single student. Better communication between the library and the department is needed.

We have experimented with online delivery of textbooks with limited success. Our first foray was through the library, which has a limit on the number of simultaneous readers (usually four). Unfortunately, students seem to want access all at the same time (near due dates or exam times). The low number of simultaneous readers means that students are blocked from reading when they need it most. Furthermore, delivery was inconsistent, often slow, and prone to freezing. Our experiment using the library for online textbook delivery proved unsatisfactory for CIS students.

We also experimented with digital delivery of textbooks by going directly to an online service provider (Safari). That also ended up being unsatisfactory to CIS students due to a perceived lack of value, plus the challenge of having all books only available online.

Clerical, technical, administrative and/or tutoring support

Administrative Support

The division provides a presence to greet students or faculty Monday thru Thursday, 8 AM to 6 PM, and Friday, 8 AM to 4:30 PM. A rotating team of three people ensures that someone is always available to respond to student and faculty needs. The coverage and quality of support has continued to improve since the last CIS program review. For financial reasons, there continues to be no support beyond 6 PM. With the number of classes we offer in the evening, this will continue to need monitoring to see if extending support later into the evening is warranted.

Office supplies, including whiteboard supplies, continue to be well-supported.

Support for printing in both classrooms and in the cubicle areas has also continued to be strong.

Tutoring

The CIS department, along with the CS department, provides a dedicated tutoring lab for CIS students on the Sylvania Campus in TCB 308. Approximately 70% of all CIS students take advantage of this service at least once during the time they are completing a CIS Certificate or Degree. The Student Resource Specialist hires, trains, and manages six to eight student tutors to provide approximately 52 hours of tutoring per week to CIS and CS students every term.
Computer Resource Center (CRC)

While some CIS students are able to use the CRC for generic class assignments that involve writing or research, many CIS on-campus sections have requirements that the CRC cannot meet. TCB 308 provides specialized software for programming, database, and web development. It is also configured with removable hard disk drives to support Network Administration courses that require special network access and operating systems installations. Tutors with training to support CIS-specific classes make this environment especially valuable to CIS students.

Unfortunately, other campuses in the district do not have similar resources. This restricts the ability of the CIS department to extend many of these classes throughout the district. Providing an enhanced computer lab similar to TCB 308 with tutoring and specialized resources at other campuses should be considered as we further expand onto other campuses.

Other tutoring

As with students from other programs at the college, CIS students share a need for Math and Writing help, and they utilize the Math/Writing tutoring centers on every campus. Distance Learning provides online tutoring, but it is limited to application support so it is not a replacement for the TCB 308 tutoring center.

Advising, counseling, disability services impact on students

Computer Information Systems academic advising

All of the CIS certificates and degrees are open-entry programs except for the AAS degree in Health Informatics, which became a limited-entry program starting Fall 2013. Students can start their CIS program in any given term and complete their coursework as a part-time or full-time student. For this reason, academic advising is crucial to ensure each student has an academic plan that will progress them towards completion.

CIS is a somewhat complex program, so general advisers are not always equipped to provide the best support for CIS students. Because of this, the CIS department has an embedded Student Resource Specialist, who provides academic advising to all CIS students on the Sylvania Campus. There is also a Learning Skills Specialist at the Rock Creek Campus, who advises Rock Creek students in the CIS program. These two advisors work with approximately 400 CIS students each term. They answer all email, phone calls, and drop-in requests for information from prospective CIS students, vocational counselors, and PCC partners, such as high schools. In addition, the Sylvania Resource Specialist represents the department at the annual High School Preview Day as well as at other events, where she presents the various certificates and degrees offered through the department.

The two CIS Advisors utilize a variety of advising methods to reach their students:
● Traditional advising appointments made in advance
● Online 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)
● Drop-in advising times
● In-class presentations to CIS courses
● Quarterly e-zine to all registered CIS students

The non-traditional methods, such as advising through Blackboard Collaborate and Skype, have allowed them to provide advising to students who cannot easily come to campus, such as students with disabilities, full-time working students, and students with young children.

While it is difficult to quantify how advising has helped CIS students, students who do not take advantage of the help often have trouble negotiating the degrees and certificates we offer in an effective manner. We believe retention of students on academic probation is improved by the current advising system.

**Job and cooperative education advising**

The CIS Employment Specialist advises students about career and cooperative education opportunities. He manages a database of about 2,000 employers that he is in contact with at least once a term, up from 1,000 during the last CIS program review. Because he has such strong business contacts, it was natural that the employment specialist coordinate the CIS Advisory Board, making it one of the strongest and most effective for any department at PCC. See the Appendix Section 7 for advisory board membership information.

The employment specialist posts at least 500 opportunities each month and provides in-person advising sessions with students to help them prepare for interviews. He provides information on how to use social media, the current state of resumes, labor market trends, and branding support. See the Appendix Section 6 for a summary of co-ops and student labor market success since the last program review. Also in the Appendix is a sample of the New Labor Market presentation, a letter of support from the Business Education Compact, and labor market trends for computer technologies.

**Counseling, Financial aid, Multicultural center, Office for students with disabilities, ROOTS, and Women’s resource center**

Anecdotal evidence shows that CIS students make use of the Office for Students with Disabilities (OSD), the Women's Resource Center, and the Multicultural Center. Because the information is either confidential, inconsistently tracked, or untracked, we do not have any hard data on how many CIS students use these services.

However, we have met individually with each of the aforementioned groups and invited
representatives from the OSD, Financial Aid, and Multicultural center to attend our SAC or Department meetings to better educate the faculty on the services they provide. We also include information provided by these groups in our classes.

Distance Learning students seem to be less connected to most student services than on-campus students, especially the Multicultural Center and Women’s Resource Center. More work needs to be done to find ways to provide better Student Services support for DL students.

**Current patterns of scheduling and pedagogy of the program**

As mentioned above, the greatest demand for CIS classes is in the evening.

Currently, we schedule around 60% of CIS sections as wholly DL. Because of classroom availability limitations, student scheduling challenges, and other factors, the percentage of DL sections continues to grow.

Most classroom sections are scheduled for three hours once a week if delivered in the evening, and two hours twice a week if scheduled during the day. Each class also includes a Distance Learning component through Desire2Learn that typically includes online assignments, quizzes, and additional learning material. Classroom time is focused on those concepts that can best benefit from direct student-to-faculty interaction.

Those classes that have a greater hands-on component that can’t be delivered via software on D2L meet twice a week for three hours each. Examples are CIS 145, a class that involves troubleshooting computing hardware; and CIS 278, a class that involves construction and configuration of hardware components such as cables, switches and routers.
Section 7 - CTE Programs

Impact of the Advisory Board

The CIS Advisory Board has provided the CIS program with feedback and insight on several key initiatives:

- Instructor qualifications - the Advisory Board made recommendations for instructor qualifications based on industry trends and what the CIS program will need to teach students in order to be competitive in the Portland metropolitan marketplace.
- Adjustments to the course make-up for CIS AAS degree - the Advisory Board made recommendations on how students might use degree electives to build a strong educational foundation in order to be competitive in the Portland metropolitan marketplace.
- Implementation of the Technical Skills Assessment (TSA) - As part of the Perkins funding of CTE Programs at PCC, a TSA must be performed. The TSA must have the support of the Advisory Board for the program. The CIS Advisory Board reviewed and validated the faculty-developed skills assessment against the degree outcomes before giving its approval.
- Working to improve student soft skills - the Advisory Board expressed the importance of students possessing soft skills, such as written and verbal communication, critical thinking skills, etc.

Program students

All of the CIS certificates and degrees are open-entry programs except for the AAS degree in Health Informatics, which became a limited-entry program starting Fall 2013.

Students can start their CIS program in any given term and complete their coursework as a part-time or full-time student. For this reason, academic advising is crucial to ensure each student has an academic plan that will progress them towards completion. The CIS department has an embedded Student Resource Specialist who provides academic advising to all CIS students on the Sylvania Campus and a Learning Skills Specialist at the Rock Creek Campus who advises Rock Creek students in the CIS program. These two advisors work with approximately 400 CIS students each term.

The AAS degree in Health Informatics program accepts 15 students every fall. Students are required to attend an online orientation session as well as complete prerequisite courses to be considered for admission into the program.
Prerequisite requirements for AAS degree in Health Informatics

- By the end of the spring term in the year they wish to start the AAS degree in Health Informatics
  - Complete WR 121, CIS 120, CIS 121, and MP 111 with grades of C or better
  - Meet the MTH 65 competency by either completing MTH 65 or higher with a grade of C or better, or by passing the MTH 65 competency exam
- Students must have a cumulative GPA of 2.5 or higher at the time they apply for the program.
- Students are informed of the requirement to have criminal background checks and drug tests to be employed in health care industry jobs.

Job placement

The CIS Employment Specialist advises students about career and cooperative education opportunities. The specialist manages a database of about 2,000 employers that he is in contact with at least once a term, up from 1,000 during the last CIS program review. Since he has such strong business contacts, it was natural that the specialist coordinate the CIS Advisory Board, making it one of the strongest and most effective of any department at PCC. See the Appendix Section 6 for advisory board membership information.

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See the Appendix Section 6 for a summary of co-ops and student labor market success since the last program review. Also in the Appendix is a sample of the New Labor Market presentation, a letter of support from the Business Education Compact, and labor market trends for computer technologies.

While PCC does not provide or track job placements, CIS students and alumni often let us know about their post-college successes.

Several CIS students have had 12 to 18-month paid internships at Intel (through our partner, Business Education Compact), with many being hired full-time after the internship.

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Coop placements</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>17 co-ops, 59 credits, 6 unpaid, 11 paid @ $19.85 average</td>
</tr>
</tbody>
</table>
One student came back to thank us and shared he has been working at Intel for about two years. Intel has decided to pay him to get his Bachelor’s degree in Computer Science, which he will start here at PCC and then complete at PSU.

A graduate of Health Informatics was hired by Providence. She is a single mother in her mid-50’s who had been out of work for 2+ years after being laid off from a 20 year career in the Telecom industry. She completed the AAS in Health Informatics with no previous experience in health care. A model student with an A average, she was hired as a tutor in the CIS Computer Lab, and was also a recipient of a PCC Foundation Scholarship. She did two unpaid internships and was hired on at Providence to assist them in converting to a new Electronic Health Records system. The student now has a job with benefits and is able to provide for her teenage daughter and her two older children who are in college.

All of these alumni successes and many more are directly attributed to the quality CIS education that they received at PCC.

**Barriers faced by students**

**Financial**

Most CIS students take advantage of the Financial Aid services. In addition, the PCC Foundation offers four scholarships for CIS majors (details in Appendix, Section 6).

- Gordon T. Adkins - One award of $800
- Computer Information Systems - Two awards of $1,500 each
- Providence Health and Services - One award of $700
- Jim and Bette Straight - $1,000 award(s) (number of awards not specified)

While these do not meet the financial needs of every student, they do help make a CIS certificate or degree possible for some students.

**Juggling work and family obligations with school**

Most of the CIS students are non-traditional students. Many work part-time or full-time jobs while
completing their CIS program. A number of them are parents as well. These non-school obligations make it challenging for many of CIS students to attend daytime classes or to take advantage of many school resources.

As a result, the CIS department offers classes in the evenings, occasionally on Saturday mornings, and through Distance Learning. In fact, the AAS degree in CIS, the AAS degree in Health Informatics, and the one-year Certificate in CIS can all be completed entirely online.

As noted earlier, the two Academic Advisors for the CIS program provide academic advising through a number of methods, including online orientations via Collaborate, Skype, email, and phone advising appointments. This has allowed them to provide advising to students who cannot come to campus during regular working hours.

**Access to computers and software**

Students who do not have access to a PC and current software are at a significant disadvantage when completing a CIS certificate or degree. To meet this challenge, the CIS department maintains a Tutoring Computer Lab that provides CIS students with the necessary tools to complete their class assignments. The lab is on the Sylvania Campus, TCB 308. Every term it is open 10 AM to 8 PM (Mon-Thu) and 10 AM to 4 PM (Fri-Sat).

Student tutors are available for assistance and act as lab monitors. Many CIS instructors offer scheduled times in this lab for their students. While most CIS students have computers at home, there have been a few CIS students who have completed their entire program by accessing the resources in this lab.

**Opportunities for continued education**

Computer Information Systems, or IT, is considered a vocational or technical major and is therefore not a traditional transfer major. However, two Oregon universities have created transfer options for any student who has earned an Associate of Applied Science Degree:

- Southern Oregon University (SOU) has created a Bachelor of Applied Science degree in Management which can be completed entirely online
- Oregon Technology (OIT) has created a Bachelor of Applied Science degree in Technology and Management which can be completed partly online and at their Wilsonville campus

**Changes to program since last program review**

- Implementation of the Health Informatics degree
- Updated programming course offerings to reflect industry changes
- Implemented the Perkins Technical Skills Assessment
- Reduced number of electives for the CIS degree while maintaining same number of credits
Section 8 – Recommendations

General

● Increase ethnic diversity and percentage of women in student population.
● Continue redesign of CIS degree as needed.
● Increase development of CIS Web program.
● Improve Distance Learning's Online Instructor Orientation training to produce better quality online instructors.
● Because Distance Learning accounts for so much of our department’s enrollments, it is imperative that CIS is consulted before significant DL rule changes are made, and that these changes be made with sufficient lead time to allow faculty to adequately plan the schedule.
● Restore Teacher Assistant funding to previous level of 50 hours per faculty member per term.
● Improve survey response rate (severely reduced since adopting CollegeNet).

Faculty Recommendations

● Continue pursuing employment of a diverse faculty, with emphasis on women and ethnicity.
● For CIS to continue being a leader in IT courses and programs, the addition of an additional full-time faculty member should be investigated.

Facilities Recommendations

● Provide dedicated time slots in computerized classrooms for CIS on the Cascade, Rock Creek, and SE campuses.
● Shorten the replacement cycle of lab computers from four to two years. Update classroom monitors on a four year cycle.
● Improve the quality of computers in the labs.
● Library should acquire a single copy of each textbook to keep available for short term checkout.
## Section 9 – Appendices

### Section 1 - Executive Summary

Evaluation of CIS courses against the ACM’s recommended core learning outcomes for associate-degree IT programs.

<table>
<thead>
<tr>
<th>ACM Learning Outcome</th>
<th>CIS Course(s) Addressing Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply communication, negotiation, and group decision-making abilities in team collaboration.</td>
<td>122, 244</td>
</tr>
<tr>
<td>Carry out basic network troubleshooting techniques.</td>
<td>240L, 279L, 240M, 288M, 289M</td>
</tr>
<tr>
<td>Carry out troubleshooting strategies for resolving an identified end-user IT problem.</td>
<td>120, 225, 244, 240L, 279L, 240M, 288M, 289M</td>
</tr>
<tr>
<td>Demonstrate best practices for designing end-user interfaces.</td>
<td>122, 133B, 133W, 195P, 233B, 233J, 233W</td>
</tr>
<tr>
<td>Demonstrate professional behavior in response to an ethically-challenging scenario in computing.</td>
<td>120, 121, 243</td>
</tr>
<tr>
<td>Demonstrate the techniques of defensive programming and secure coding.</td>
<td>133W, 195P, 233B, 233J, 233W</td>
</tr>
<tr>
<td>Describe the attitudes, knowledge and abilities associated with quality customer service.</td>
<td>225, 243</td>
</tr>
<tr>
<td>Describe the data management activities associated with the data lifecycle.</td>
<td>125D, 275</td>
</tr>
<tr>
<td>Describe the layers, protocols and components of the OSI model.</td>
<td>279L</td>
</tr>
<tr>
<td>Diagram a database design based on an identified scenario.</td>
<td>121, 275</td>
</tr>
<tr>
<td>Diagram the components of an integrated system.</td>
<td>279L</td>
</tr>
<tr>
<td>Diagram the phases of the Secure Software Development Lifecycle.</td>
<td>120, 122, 244</td>
</tr>
<tr>
<td>Diagram the stages of the Technological Design Process.</td>
<td></td>
</tr>
<tr>
<td>Differentiate among a variety of technology-based sensory interactions.</td>
<td>120, 121, 243</td>
</tr>
<tr>
<td>Activity</td>
<td>References</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Differentiate among data types, data transfer protocols and file characteristics specific to targeted use.</td>
<td>120, 121, 133B, 133W, 195P, 233B, 233W, 243, 279L,</td>
</tr>
<tr>
<td>Differentiate among strategies for business continuity provisioning at the enterprise level.</td>
<td>243</td>
</tr>
<tr>
<td>Differentiate among various networking models.</td>
<td>121, 179, 188, 189, 243, 278</td>
</tr>
<tr>
<td>Differentiate among various operating systems.</td>
<td>120, 121, 140D</td>
</tr>
<tr>
<td>Differentiate among various techniques for securing a network.</td>
<td>284</td>
</tr>
<tr>
<td>Differentiate between public and private data.</td>
<td>133B, 133J, 133W, 233B, 233W, 243</td>
</tr>
<tr>
<td>Discuss applications of data analytics.</td>
<td>243, 277T</td>
</tr>
<tr>
<td>Discuss data governance and its implications for users as well as IT professionals.</td>
<td>243</td>
</tr>
<tr>
<td>Discuss issues relevant to dealing with very large data sets, both structured and unstructured.</td>
<td>121, 195P, 243</td>
</tr>
<tr>
<td>Discuss significant trends and emerging technologies and their impact on society.</td>
<td>120, 243</td>
</tr>
<tr>
<td>Discuss software development methodologies.</td>
<td>122, 133B, 133J, 133W, 233W</td>
</tr>
<tr>
<td>Explain the process of authentication and authorization between end-user devices and network resources.</td>
<td>243</td>
</tr>
<tr>
<td>Identify a variety of assistive technologies and universal design considerations.</td>
<td>120, 133W</td>
</tr>
<tr>
<td>Identify a variety of enterprise-level storage technologies.</td>
<td>120, 240L</td>
</tr>
<tr>
<td>Identify basic components of an end-user IT system.</td>
<td>120, 121, 225, 279L</td>
</tr>
<tr>
<td>Identify database administration tasks.</td>
<td>121, 195P, 275, 276</td>
</tr>
<tr>
<td>Implement a hardware and software configuration responsive to an identified scenario.</td>
<td>279L, 288M</td>
</tr>
<tr>
<td>Implement a variety of practices for securing end-user systems.</td>
<td>279L</td>
</tr>
<tr>
<td>Implement an application of virtualization.</td>
<td>120, 121</td>
</tr>
<tr>
<td>Implement communication principles into digital media design.</td>
<td>243</td>
</tr>
<tr>
<td>Modify a non-compliant system to ensure data</td>
<td>189, 284, 287M</td>
</tr>
<tr>
<td>Task</td>
<td>Code References</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
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<tr>
<td>Produce documentation appropriate to an Information Technology task that conforms to the requisite format and syntax.</td>
<td>133B, 133J, 133W, 195P, 233B, 233J, 233W, 234B, 234J, 234N, 295P</td>
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<tr>
<td>Produce simple database queries.</td>
<td>121, 125D, 195P, 233B, 275, 276</td>
</tr>
<tr>
<td>Summarize life-cycle strategies for replacement, reuse, recycling IT technology and resources.</td>
<td>120</td>
</tr>
<tr>
<td>Summarize strategies to assist users with their IT resources.</td>
<td>225</td>
</tr>
<tr>
<td>Summarize the flow of data through a network scenario.</td>
<td>243, 279L</td>
</tr>
<tr>
<td>Summarize the implications of various cloud computing models.</td>
<td>287L</td>
</tr>
<tr>
<td>Summarize the security implications and risks for distributed IT systems.</td>
<td>243, 284, 285, 287M</td>
</tr>
<tr>
<td>Summarize the tenets of ethics and professional behavior promoted by international computing societies, such as ACM and AITP.</td>
<td>121</td>
</tr>
<tr>
<td>Use a programming or a scripting language to share data across an integrated IT system.</td>
<td>233B, 233J, 233W, 234B, 234J, 234N, 295P</td>
</tr>
<tr>
<td>Use data analytics to support decision making for a given scenario.</td>
<td>277T</td>
</tr>
</tbody>
</table>
### Section 3 – Curricular Issues

**Fall 2012 - Spring 2013**  
All Credit  
DL and classroom  
CIS courses

<table>
<thead>
<tr>
<th>Campus</th>
<th>Subject</th>
<th>Course</th>
<th>Subject Course</th>
<th>Enrollments</th>
<th>Pass%</th>
<th>Enrollments</th>
<th>Pass %</th>
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<tbody>
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<td>SY</td>
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<td>CIS 120</td>
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<td>563</td>
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<tr>
<td>SY</td>
<td>CIS 121</td>
<td>CIS 121</td>
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<td>65%</td>
<td>304</td>
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<td></td>
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<tr>
<td>SY</td>
<td>CIS 122</td>
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<td>393</td>
<td>65%</td>
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<tr>
<td>SY</td>
<td>CIS 178</td>
<td>CIS 178</td>
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<td></td>
<td>107</td>
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<tr>
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<td>CIS 179</td>
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<td>207</td>
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<td>SY</td>
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<td>CIS 225</td>
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<tr>
<td>SY</td>
<td>CIS 243</td>
<td>CIS 243</td>
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<td></td>
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<td>76%</td>
<td></td>
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<tr>
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<td>93%</td>
<td>72</td>
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<td>SY</td>
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<td>CIS 245</td>
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<td></td>
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<tr>
<td>SY</td>
<td>CIS 275</td>
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<td>70%</td>
<td>140</td>
<td>79%</td>
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<tr>
<td>SY</td>
<td>CIS 276</td>
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<td>71</td>
<td>73%</td>
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</tr>
<tr>
<td>SY</td>
<td>CIS 284</td>
<td>CIS 284</td>
<td>NA</td>
<td></td>
<td>128</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>SY</td>
<td>CIS 286</td>
<td>CIS 286</td>
<td>15</td>
<td>93%</td>
<td>25</td>
<td>72%</td>
<td></td>
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<tr>
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<tr>
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<td>61%</td>
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<tr>
<td>SY</td>
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<td>CIS 289M</td>
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<td>55%</td>
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</tr>
</tbody>
</table>
Section 4 – Student / Community Needs

Data obtained

http://www.pcc.edu/ir/program_profiles/201213/Production%20tables/CIS.pdf

Harvey Mudd article / video

Section 5 - Faculty

Enrollment Data obtained from:

- Banner:  https://my.pcc.edu

Historical Unemployment Data for Oregon:

- Oregon.gov (https://data.oregon.gov/dataset/Historical-Unemployment-Rate-Chart-seasonally-adjusted/db5t-4zd9)

Open Education Database Ranking of Schools by FT to PT Faculty Ratio

- http://oedb.org/rankings/student-faculty-ratio/
November 14, 2013

Dear PCC College Administration,

It is with great pleasure that I write to you about the Business Education Compact’s (BEC) successful partnership with PCC’s Computer Information Systems department. The BEC is a nonprofit organization focused on student achievement. Our intern program illustrates that focus by providing high school and undergraduate students an opportunity to bring what they are learning in the classroom and in their degree programs to the professional workplace.

Our biggest partner in our intern program is a large, local technology innovator. For the past five years the CIS department has been a great resource for us to recruit student candidates. Your students account for 20% of our placements this year.

As the field supervisor of BEC interns I appreciate the individual attention that each of our interns that are students at PCC report receiving from your staff. They are encouraged to apply for credit for their internships which helps streamline the goals and focus of their Internship. It also provides an opportunity for PCC and the BEC to work with the site organization, often increasing the investment the site supervisor makes—all playing a role in the success of the student. Additionally the caliber of student that we encounter is exceptional.

We look forward to continued partnership and for further opportunities to collaboratively meet the needs of students.

Please feel free to contact me with further questions or comments.

Best,

Elaine Charpentier Phili
Intern Relationship Manager
BEC STEM Connect™ Committee Chair
Scholarships

Most CIS students take advantage of the Financial Aid services. In addition, the PCC Foundation offers four scholarships for CIS majors with the restrictions shown below:

**Gordon T. Adkins - One award of $800**
- 3.5 GPA
- Completed at least 18 credits in the Computer Information Systems program by the end of Winter term

**Computer Information Systems - Two awards of $1,500 each**
- 3.0 GPA
- Full-time student (12 credits or more per term)
- Majoring in Computer Information Systems

**Providence Health and Services - One award of $700**
- Majoring in Computer Information Systems Health Informatics
- Preference given to applicants of minority heritage

**Jim and Bette Straight - $1,000 award(s) (number of awards not specified)**
- 3.0 GPA
- Majoring in Computer Information Systems
- Full-time student (12 credits or more per term)

CIS Program Review

Alumni Success & Testimonials

Compiled 11/5/13 by Gary Coleman

As the Embedded Employment Specialist for the CIS Program, I currently offer the following services to 2500+ students & 300+ alumni:

- Cooperative Education Assistance
- Job & Career Coaching
- Computer Technology Google Group (send out 500+ opportunities/month)
- Marketing Tools Review (cover letters, resume, references, portfolios, etc.)
- Labor Market Information
- Social Media Adviser & Linkedin Profile Review
- Networking, Sales, Marketing, Branding Support
- Employer Database: 2000+
- Web Link Resources: 900+ (spot.pcc.edu/comptech)

Even though PCC does not offer job placement services, many of our students & alumni let us know about their post college successes.

- Many of our students have had paid 12-18 month internships at Intel (through our partner, Business Education Compact) with many of them being hired on including Erik, Andy, Neil & many more. One student came back to thank us & shared he has been working at Intel about 2 years & they are now going to pay for him to get his Bachelor’s degree in Computer Science, which he will start here at PCC & complete at PSU.

A few of our other CIS graduate successes include:

- Robert got a job as a Software Engineer at Wacom Technologies due in major part to PCC’s quality CIS education.
- Steve got an IT Specialist job at Solutions.com.
- Gil got his first IT job at Oregon Health Division and is now working for Microsoft in Redmond, Washington.
- Ivy got a job at DEQ as an Informational Support Specialist 3
- David landed a Programmer/Analyst position at Joes Sporting Goods
- Bryce got his ideal job in Health Informatics at Kaiser Permanente
- 4 of our Health Informatics students have been hired on at Providence including Cheryl.

  ○ Cheryl is a single mother in her mid-50’s who had been out of work for 2+ years after being laid off from a 20 year career in the telecom industry. She completed the AAS in Health Informatics with no previous experience in health care. She was a model student with almost a straight A average. She was hired as a CIS tutor in our Computer Lab. Shw was also a recipient of a PCC Foundation Scholarship due to grades & need. She did 2 unpaid internships and did such a fine job that she was hired on at Providence to assist them in converting to a new Electronic Health Records system. She now has a job with benefits & able to provide for her teenage daughter & her 2 older children who are in college.

All of these alumni successes & many more are directly attributed to the quality CIS education that they received at PCC.
## Labor Market Trends

### Projected National Growth by 2020

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Growth Percentage</th>
<th>Median Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Software Developers/Systems Software</td>
<td>32%</td>
<td>$94,180</td>
</tr>
<tr>
<td>- Database Administrators</td>
<td>31%</td>
<td>$73,490</td>
</tr>
<tr>
<td>- Network &amp; Computer System Administrators</td>
<td>28%</td>
<td>$69,160</td>
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<tr>
<td>- Software Developers/Applications</td>
<td>28%</td>
<td>$87,790</td>
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<tr>
<td>- Computer System Analyst</td>
<td>22%</td>
<td>$77,740</td>
</tr>
<tr>
<td>- Information Security Analysts/Web Developers/Architects</td>
<td>22%</td>
<td>$75,660</td>
</tr>
<tr>
<td>- Computer &amp; Information Systems Managers</td>
<td>18%</td>
<td>$115,780</td>
</tr>
<tr>
<td>- Computer Support Specialists</td>
<td>18%</td>
<td>$46,260</td>
</tr>
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</table>

*(Computer World)*

### Projected Oregon Growth by 2020

- Software Publishers                              48%
- Computer Programmer                               24.9%
- Computer Systems Design                           23%
- Computer Science                                  22.7%
- Computer Specialist                               21%
- Computer Information System Manager               20.8%
- Database Administrators                           19.8%
- Computer Support/Other                            18.2%

*(OLMIS)*

**Flat & Dropping Wages (real wages hovering around 1990 levels)**

- Applications Software Developers                 drop 2.7%
- Computer Programmers                              drop 2.4%
- Systems Software Developers  
drop 1.4%  
(Bureau of Labor Statistics)

**Educational Make-up of Current Computer Tech Labor Force**

- Has Non-Tech-Related College Degree 33%
- Has no College Degree 36%
- Has BA+ Tech-Related College Degree 24%
- New tech jobs requiring BA Degree 50%
- STEM graduates get jobs in STEM area 50%

(Bureau of Labor Statistics)

**Skills/Qualities Employers Want (in descending priority)**

- Ability to work in a team structure
- Ability to make decisions & solve problems
- Ability to plan, organize, and prioritize work
- Ability to verbally communicate with persons inside & outside organization
- Ability to obtain & process information
- Ability to analyze quantitative data
- Technical knowledge related to job
- Proficiency with computer software programs
- Ability to create &/or edit written reports
- Ability to sell or influence others

**Office of Institutional Effectiveness latest data for PCC CIS graduates in marketplace:**

- Employed 2011 - Median Wage: $24.64 / Full-time: $25.75/Part-time: $20.54
CIS Program Review

5-Year Cooperative Education Report

Compiled 10/29/13 by Gary Coleman

2009              8       4-paid ($18.25/hour average)       4-non paid
Companies: Intel, ODS, Horizon Christian Schools, PCC, World Flag, Bridge City Legal

2010              21      9-paid ($16.20/hour average)       12-non paid
Companies: Intel, Sponsored Link Management, Wright Imaging, PCC, Portland Clinic, Eureka Ridge, Centennial Schools, Practice Wise, Okura, Circle Into Square, Providence, MetaFilter, US Geological Survey

2011              22      15-paid ($14.31/hour average)       7-non paid

2012              18      8-paid ($16.56/hour average)       10-non paid
Companies: Google, OLCC, Intel, PCC, MESD, Bosco-Milligan, Vestas Americas, Kaiser, VA Hospital, Bulkley Associates, SIP, Free Geek, Chrome Systems, Providence

2013              16      9-paid ($19.12/hour average)       7-non paid
Companies: Intel, Scribes Stat, All-Tech, Precision Castparts, Cross Current, Kaiser, Department of Veteran Affairs, Flower Pot Media, Oregon Army, Free Geek

5-Years          85      45-paid ($16.89/hour average)       40-non paid
Section 7 – CTE Programs

CIS Advisory Board

CIS Advisory Board Guidelines Brochure

CIS Advisory Board Members

Compiled by Advisory Board Facilitator, Gary Coleman

Rick Slavin – Advisory Board Chair

Director of Information Services – CorVel

Cathi Row – Advisory Board Vice Chair

Talent Development Program Manager – Cambia Health

Chris Falbusch – Technical Staff – Galois, Inc.

Cormac Burke – Director of SAP & Corporate Applications – PacifiCorp

Dave Johnson – President/CEO – Netropole (PCC Alumni)

Doug Mathias – IT Recruiter – Private Consultant

George Belloff – Group Development Manager – US Bank

Georges Rahbani – Systems Architect – ADP

Greg Jackson – Director of Technology Operations – WebMD (Adjunct Faculty)

James Lee – Data Architect – NIKE

Jeff Grossman – Security Architect – Pac Star (Adjunct Faculty)

Lance Kidd – VP Network Engineering & Security – Umpqua Bank

Michael Stevens – Field Computer Application Engineer – Arrow Electronics
PCC employees attend meetings as a resource to the Advisory Committee. They provide knowledgeable information about the program. They are not voting members.

**Advisory Committee Meetings**

Effective meetings are critical to the success of the Advisory Committee. It is at meetings where discussion and deliberation of important matters are translated into decisions and recommendations. Meetings should be conducted in a businesslike manner to facilitate the effectiveness of meetings.

- Meetings (approximately 2 hours) are held quarterly with special meetings to be called as timely agenda items may require

- The agenda is prepared by the Chair with input from the Program Facilitator

- Meetings are conducted according to current practices as outlined in the Roberts Rules of Parliamentary procedure. Committee recommendations are stated in the form of motions, which are discussed, voted upon and recorded in minutes

- Minutes are to be recorded of each meeting and provided to Advisory Committee members, the Program Facilitator, program faculty, and others, as needed

- Program faculty may participate in discussions and offer suggestions, but should NOT attempt to take over the meetings