STUDENT OUTCOMES COMMITTEE OF THE BOARD OF TRUSTEES

MEETING MINUTES

Thursday, September 22, 2022
2:00 p.m.
Pavilion Klein Cube, P2-3 and via Zoom

Presiding: Ms. Chekemma Fulmore-Townsend

Committee Members: Ms. Rosalyn McPherson, Ms. Mindy Posoff, Representative Morgan Cephas

Board Participants: Chairman Harold Epps

College/Cabinet Members: Ms. Carol de Fries, Dr. Guy Generals, Dr. Alycia Marshall, Ms. Danielle Liautaud-Watkins, Ms. Victoria Zellers

Guests: Interim Dean Arielle Norment, Chuck Herbert, Michael Hackett, Barbara Hearn, Elizabeth Gordon

(1) Executive Session

There were no agenda items for the Executive Session.

(2) Public Session

(a) Approval of the Minutes of June 2, 2022

The minutes were approved unanimously.

(b) Academic Program Review

Interim Dean Arielle Norment – Oversees the computer technologies programs, Chuck Herbert, Michael Hackett, Barbara Hearn, – Computer Info Systems AAS Degree.

Computer Information Systems (AAS Degree)

Chuck Herbert, Dept. Head, provided highlights from the oldest Computing degree program at the College. Mr. Herbert noted that the Computer Information Systems program started back in 1964, and faculty from Penn and Drexel assisted with starting the program. Mr. Herbert, shared that in 1966/67, CCP was the first in the country to start an AAS degree in Computing. The first dean of science who was from Penn, recruited then-recent Penn graduates to start the program. Mr. Herbert noted that the program name has changed but it is the same program. Mr. Herbert shared that the Department decided on a model that led to specific degrees in certain hot topics:

- Cybersecurity
- Networking

- Web and App Development

The CIS IT degree is broken up into 3 parts:

- General education core
- Required Computing courses
- Elective Computing Courses (3rd part is flexible)
    - Mr. Herbert noted that the 3rd part of this program structure provides the students with flexibility to determine what they want to focus on and still finish their degree to avoid getting stuck in the mix of innovative changes in the program. There is a core number of classes that every CIS IT AAS degree must take and many of the course offerings are focused in specific professional certifications.

Mr. Herbert shared that while enrollment has been down at the College, enrollment in the CIS IT program has held up and hasn't had as much attrition. Mr. Herbert mentioned that they want to look at 5% growth in the future for the CIS IT program.

Challenges/Opportunity –
Mr. Herbert noted that the Department wants to increase the number of female students who enroll in the program. The percentage of students that are female are below the female average at the College and the national average, and the department would like to pay closer attention to this problem.

Mr. Herbert cited a couple of statistics about women of a certain age making career decisions differently than men do. They have different reasons for choosing their professions. Due to the Department's goal of increasing the number of female students that enroll in the CIS-IT AAS degree, the Department plans to investigate women in technology grants from NSF to get assistance with recruiting women. The problem of not having or attracting enough women into the information technology field exists across the country and reflects less than 25% of those who work in the field are women.

Mr. Herbert is also suggesting a curriculum revision for *CIS 270- Systems Analysis and Design* and *CIS 271- IT Project Management*. The two courses are similar. Systems Analysis is no longer taught at the Associate level most places, and is no longer needed if we teach Project Management. Mr. Herbert said the Department believes the Business Leadership, Fashion, & Hospitality Department is better suited to teach Project Management than the Computer Technologies Department and that the program review suggests replacing CIS 271 with *PJMT 110 - Foundations of Project Management.*

Mr. Herbert stated that they worked very hard to diversify the faculty in the Computer Technologies Department and he is very proud of it. He stated that the CIS IT Department had 17 faculty members (16 white males 1 African American) when he started at the College in the 1980's. Today, the Department is among the most diverse in the College, especially the part-time faculty, the majority of whom are now female and a majority are African American. Mr. Herbert noted that the Department will continue to focus on diversifying the faculty.

Ms. Hearn stated the CIS103 course is the largest course in the Department and every student pursuing an associate degree at the College must take it or a similar course to satisfy the

College's Technological Competency requirement. Ms. Hearn stated that she is always updating the course to meet the innovative demands of the industry. Ms. Hearn expressed wanting to collaborate with other departments and programs for CIS 103 and is leaning towards starting with Automotive Technology for the different programs who must take the course. Ms. Hearn is a graduate of the college and takes pride in the program's growth and where it is going.

Ms. Hearn also stated that she still works with the Tech Girls program and she is looking to start the program back up. The program was paused due to the pandemic. The program is designed to work with middle school girls to teach them how to code and create applications. The CIS IT degree is a general degree and serves several purposes.

Ms. Gordon from Institutional Effectiveness reinforced what Mr. Herbert shared regarding the CIS IT program enrollment and stated that the enrollment was resilient before and during the pandemic and has had consistent enrollment growth even when the College's overall enrollment dipped.

Ms. Gordon also shared that the program's efficiency ratio was strong and tended to fill up. Retention and completion in the CIS IT program are a little bit stronger than the College's average. They are looking to develop surveys and engage students who appear to be transferring out of the program after they complete 12 credits to understand why they are transferring out of the program.

Ms. Gordon also stated that the drop-ins and drop-outs are skewing the numbers a bit.

Ms. Fulmore-Townsend inquired about CIS IT student level outcomes and expressed concerns around struggling through assessment which was previously identified in the previous APR.

Mr. Herbert shared that the CIS program faculty utilized the assessment recommendations from the previous audit to make the current changes and ensured that the recommendations were implemented.

Mr. Herbert shared that the department has since responded to this need by using AEFIS (an assessment software program), the assessment data is complete, and they have closed the loop. They need to go over the assessment data for every course every semester to determine what intentional actions need to be taken from the data.

Mr. Herbert referenced the information that was being discussed and noted that the items were located on the top of page 11 on the Student Outcomes meeting materials.

Mr. Herbert noted that the AEFIS program has not been working properly. The department's assessment data is being gathered for the entire year which includes; fall, spring, summer 1 and 2, and winter semesters.

Mr. Epps expressed concern regarding a process issue referencing the assessment gap.

Mr. Herbert stated that the CIS department has all the assessment data and reports from the coordinators that show the progress that the department made. The prior audit pointed it out

as a weakness, and they have the information readily available to provide to middle states, so this has been addressed.

Ms. McPherson – Posted two comments in the chat before she left the meeting – What steps has the department taken to address the differences between recruiting before and after in the age of covid?

Mr. Herbert shared that the Department got away from recruiting at the high schools due to the pandemic. The department wants to take a more sophisticated approach to find out what will help them attract more women (possibly through an NSF grant) and they have been paying attention to other things and got away from the decline in women who enrolled. The National Center for Women in Technology is one of the areas they would like to strategically target. They want to work with them to get more information to see if funding is available to help them with this recruitment initiative.

Mr. Herbert shared currently no women teach Computer Science at the College. They would like to target identifying women to teach Computer Science. Mr. Herbert shared that he knows someone who recently retired that may be interested. They recently lost a couple of female faculty members who moved on to teach other subjects and shared that they have a lot more flexibility with PT positions.

Representative Cephas stressed that there should be an emphasis placed on identifying women of color (Latina and African American women) and shared that if it is not measured it is not managed.

Representative Cephas also asked Mr. Herbert and the faculty how they are going to measure the data and shared that the Department will have to look at the data to determine the impact they believe that hiring qualified women will have on the department. The department believes that this will make it easier to attract other female faculty members and ultimately female students.

Mr. Herbert also shared that CIS IT is a bigger program so it is easier to recruit more diverse faculty, whereas computer science is a little harder to recruit for and they must be conscious of this challenge. They plan to talk to experts and request advice from those who have had a proven track record in recruiting minorities and women.

Representative Cephas asked Mr. Herbert if there is any thought of looking at the CTE pipeline with the School District and suggested that neighborhood schools should be considered not just magnet schools and Girls High.

Mr. Herbert said the department works with the School District's CTE programs, and has visited high school CTE classes in the past and they would like to get back to doing so post-COVID.

Mr. Herbert shared that students who take networking in high school and take the NOCTI (statewide exams that replace professional exams for A+ and Network+ certification for students enrolled at CTE HS programs) exams can get AP credit if they pass to transfer into CCP.

Ms. Posoff wanted to know the impact of increasing enrollment and the connection to marketing and wanted to know what targeted marketing opportunities could be implemented to support the recruitment effort?

Ms. Posoff also shared that the collaboration of curriculum is an exciting idea and is curious to know how this came about.

Mr. Herbert shared that the Department tries not to do things that other people are better at. He referenced the example about project management and systems analysis. They tend to work together with colleagues who have additional expertise in these areas collaboratively to create curriculum.

Mr. Herbert shared that the CIS IT connection to marketing is the program coordinator and they also worked with John Neugubeuer and he partnered with faculty to visit the high schools but now that he has moved on to a new position, there is a bit of a void in this space.

Mr. Herbert shared that the faculty worked to hold an open house in August, and that Admissions thinks we picked up 12 FTEs as a result of this event.

Chairman Epps asked how wide is our definition of information science and do we offer artificial intelligence, drones, e-sports, robotics, etc. and what is our use of these words in our curriculum? In addition, how do they fit into our present or future programs – Mr. Epps further expressed that the cutting edge of this industry is machine learning and data science.

Mr. Herbert shared that the cutting edge of AI is machine learning and that the program does have a machine learning course. He said in associate's program we must build a foundation first to help prepare students for a 4-year program which goes more deeply into AI.

Mr. Epps shared that if we don't say the words like artificial intelligence, e-sports and robotics, it will prevent us from connecting with 17- 25 yr. olds. Maybe creating certificates in robotics combined with engineering and computer science could serve as a foundational course. You can start to think about the related career fields and part-time work opportunities.

Mr. Epps shared that we should work to connect with Comcast to offer scholarships, and the students that apply should get to visit NBC and Comcast even if they don't get the scholarship. This gives them an opportunity to show the connection to the programs that we offer. We need to reach as deep into the next generation as possible, - do we have structured planned programs for pipelines of partnerships starting at elementary school?

Ms. Hearns shared that we had our students become tutors at the elementary school – Working with young girls in elementary school like our Jr. Stem Academy. She shared that women tend to make decisions about their careers earlier. The tech girls organization allowed them to target middle school girls to teach them game development, and provide things like workshops in a box at no charge to the students.

Ms. Norment shared that the program offers foundational courses such as intro to gaming simulation and introduces gaming at the entry level. Offering summer camp to middle schools is also another opportunity. We also offer a Robotics course co-taught by Computer Tech and

Engineering faculty and offer scholarships through NBC Universal/Comcast to Computer Tech students. We may need to determine where it will be housed. We can set up a lab for current students and open it up to the general public to spark an interest in the CIS field overall – so they can create a hands-on program lab.

Action: The Student Outcomes Committee unanimously recommended that the Board of Trustees accept the program review updates for Computer Information Systems – Information Technology with 5% growth over five years with the goal of reviewing the potential for growth up to 8%.

Computer Science – Mr. Hackett was hired as the program coordinator to start and oversee the computer science program –

Mr. Herbert shared that everything is kept current for the program and enrollment has been growing since 2017 until now even though the college's enrollment was slowing down and Mr. Herbert shared that this semester, every section of CIS 111 was filled.

Mr. Herbert believes that this program works better in person although they were able to grow by offering the program online. He provided two examples; the students can find teachers when they are on campus to work through questions about their assignments. Faculty can follow up with written responses through Canvas and can respond to the students in real time. What else can we do to be proactive and intentional?

Mr. Herbert shared that computer science is one of the fastest growing programs at the College. We don't want to compromise the quality of the program, steady growth with intentional outreach to women and people of color. Faculty are willing to do whatever it takes to help the program grow which was noted as a strength of the computer science program. It is structured as an honors program for computing.

On the other end of the spectrum, the department is trying to find ways to further engage students who have developmental course needs by exposing them to computer lessons while they are taking developmental courses.

Ms. Gordon shared that the program accreditation board for engineering standards – makes the graduates in high demand when they earn credentials and graduate. She cited notable recent transfers of students that can be found in the handouts for the SOC meeting. Enrollment was stable during the pandemic and most students in the program are full time. There are strong pathways to careers and on average, the program retains 50% of its students year-to-year. Over the past 5 years, 41% of the AS degrees offered at the college are computer science degrees.

Dr. Marshall added that there are only 5 associate degrees of science at the institution and is impressed with the steady enrollment outcomes. Faculty are continuously engaged in the program which has helped the consistency of enrollment.

Mr. Herbert acknowledged that there is a growing need for female students in the program and acknowledges that there is a need for female instructors in the program as well. The division is experiencing this in multiple disciplines and they are focused on access and equity to participate in the program.

The alignment with the accrediting model has helped to strengthen the school to career pipeline. The department's focus is to identify female faculty and students strengthening pipeline with K – 12 developing specific metrics and putting them in place to structure the metrics with outcomes for the recruitment arm of the program.

Mr. Herbert is retiring at the end of the year and Dr. Marshall expressed some concerns around finding his replacement and a chair considering the challenges with recruiting highly qualified faculty in this high demand field.

Dr. Generals asked if we know the degree to which he is retiring and asked if we have the leadership in place to build upon in Chuck's absence. Dr. Marshall shared that she is confident in the team that Ms. Norment has with Ms. Hearns and Mr. Hackett and other faculty. The department is currently searching for a new Computer Science faculty member to replace Professor Herbert.

Representative Cephas asked if we can get targeted enrollment information of where the programs are heading and the activities that are taking place to get them to the numbers that they are proposing to grow enrollment. The overarching goal was to identify how they are coming up with their goals for growth.

There was interest from the Board members to see metrics regarding the outcomes related to the discussed strategies to recruit female students and women as faculty members and what pipelines they will tap into. It was shared collectively that these would be great metrics to see.

Mr. Epps wanted to revisit the process question – adding the cross-college partnership/collaboration for the SOC meetings to ensure that we are efficiently utilizing our resources.

Ms. Townsend asked for a motion to approve computer information systems technology program AS degree – and Mr. Epps asked to approve the motion with a target for growth of 5% total enrollment growth for the institution and felt that this is a more conservative approach given the fact that this program is one of the top 5 programs for growth at the institution. It was shared that since this is the first program that the Board is approving this year, the recommendations should be thoughtful as they want to ensure that they are consistent in their diligence to approve programs and reasonable projected growth.

Action: The Committee unanimously approved the Computer Science program for 5 years and would like to review the enrollment growth and strategies over the next year to determine if the goal of 5% enrollment growth should be increased to 8%.

Rep Cephas asked how the growth rate is determined for this program – is it based on industry growth? or the College's goal over the next 5 years. The committee discussed institutional enrollment growth which hasn't been at 8% so why this amount for the program? We need to talk about how we are making these projections. It should be informed by institutional trends, department and community trends.

The committee then discussed in more detail the process of setting growth targets for

programs as well as the relationship between the program enrollment goals and the College's overall growth target.

Dr. Marshall shared that the Computer Information System and Computer Science departments are among the top 5 programs for enrollment in the Business & Technology Division. We need better information to balance our actions with our intention – better information about what's possible – talk about the full picture of program growth – to focus solely on one area without focusing on how these programs are integrated into the other areas in the College should play a role in this process. In addition, consideration should be given to the availability of college resources needed to intentionally grow programs such as marketing and facilities as well as the availability of qualified faculty in hard to hire disciplines.

Ms. Posoff shared that if we understood marketing's priorities, we could have a better understanding of the process to market our programs.

Mr. Epps shared that we should be doubling down on resources to satisfy the demand of employers.

Ms. Townsend shared that our Marketing Department promotes to bring people to the institution, not to specific programs – and Mr. Epps shared that we should be doubling down on marketing our top 5 programs.

Ms. Townsend said that the data will determine reality – affirmative or negative – we have a department that is struggling to find faculty – what does it take to make it grow?

Dr. Marshall shared that it will take a while to make this happen so we can see what is possible in terms of gathering the appropriate projection data.

Ms. Townsend shared that she is comfortable with the 8% growth because it is over 5 years and in addition, shared that the Committee should look at the nursing recommendations from last year as the best way to formulate the approach.

Mr. Epps shared that we lose company partnerships when we can't build capacity to support their company growth.

Ms. Townsend asked if there was any hesitancy in approving this program for the next 5 years at 5%.

Mr. Epps shared that given what was discussed about how programs are determining their enrollment growth targets, the Committee agreed to approve the computer science program at 5% over 5 years for now with the option to review and increase enrollment projections to 8% after consulting with institutional effectiveness and the marketing department to review the college-wide enrollment trends.

Ms. Townsend concluded that the Committee needs to acknowledge the gaps in their learning and understanding of these processes at the College and Mr. Epps acknowledged that we want to determine how efficient we are at enrollment growth against our peers.

Ms. Townsend asked for a motion to adjourn the meeting. It was stated that the Committee

needed to find a new regular time to meet. Ms. Townsend acknowledged that the Committee has historically met on the same day of the board meeting and a doodle poll would be forthcoming to determine when the SOC meetings will take place this year once Ms. Townsend and Dr. Marshall meet to discuss the meeting options**.**

Attachments:
Minutes of June 2, 2022
Computer Information Systems-Information Technology Academic Program Review
Computer Science Academic Program Review

STUDENT OUTCOMES COMMITTEE OF THE BOARD OF TRUSTEES

MINUTES

Thursday, June 2, 2022
1:00 p.m.
Zoom/Hybrid

Presiding: Ms. Fulmore-Townsend

Committee Members: Ms. McPherson, Ms. Posoff

College Members: Dr. Adanu, Ms. de Fries, Dr. Generals, Dr. Hirsch, Ms. Liautaud-Watkins, Dr. Rooney, Dr. Thomas

Guests: Ms. Barbano-Maxwell, Dr. DiRosa, Ms. Gordon, Dr. Saia, Dr. Sweet

(1) Public Session

(a) Approval of the Minutes of May 5, 2022

The minutes were approved unanimously.

(b) Early Childhood Education (AA Degree) Program Review

Dr. Chae Sweet, Dean of Liberal Studies, began by noting that this program review is a little different from other program reviews in that it is primarily based on the accreditation review in March 2021. This accreditation is very important and its success marks the program as a premier program in Philadelphia. Dr. Sweet noted that this is a strong program and one of the largest in Liberal Studies.

Dr. Amy Saia, Coordinator of the Education: Early Childhood (Birth to 4th Grade) Program, noted that an annual review was conducted five years ago and the results indicated that vital changes were needed. Student outcomes were shifted to reach the long-term goal of national accreditation by NAEYC, the largest professional accreditation program in North America. Dr. Saia was proud to note that the program is now nationally accredited. Once the report was received in May 2021, it was noted that there were some conditions that can be reviewed by referencing the report that was provided to the Committee. The program was the first ever to be reviewed by NAEYC online.

Program staff worked with Ms. Gordon and Institutional Research to address the conditions and align student outcomes to meet these conditions. This started in

October 2021, and the conditional review was completed, as well as the annual report on March 31, 2022. The program is awaiting the findings, and hoping for a response before the end of June.

Dr. Saia noted that the program is in the process of making other changes as well, with strong partnerships with institutions such as Arcadia and Holy Family and a program-to-program transfer agreement with Drexel University. New partnerships are also being developed with Parkway West for a CTE program, and the program is about to launch a new partnership with City Years Scholars over the summer. An apprenticeship program was created in 2017, and the program is working with the Workforce and Economic Innovation as well.

Ms. Gordon noted that she worked closely with the program on responses to the conditions and commended the program for the detailed work and dedication to improving assessment practices. Program staff are very open to feedback.

A question was raised regarding whether accreditation helps our students receive higher pay when they graduate. Dr. Saia noted that accreditation is highly prestigious but does not make a difference in pay. It does make a difference, however, with agreements and articulations that are in place. Accreditation is advantageous in terms of the program's profile with partners and programs. Dr. DiRosa added that accreditation adds validity to the program itself so even if students are not compensated in terms of higher pay, the program is viewed as stellar. It does help students in terms of graduating from a nationally accredited program.

It was noted that fall-to-fall retention is six points higher than the overall College average. An FYE course was offered as part of the program providing information on what it takes to be a successful college student, and the course is taught by Education faculty. Students can learn what it takes to become an early childhood educator, gain experience and learn how to become engaged directly from Education faculty.

Appreciation was expressed regarding the enormous amount of work it took to obtain the accreditation and ensuring that the conditions were addressed.

Action: The Student Outcomes Committee unanimously recommends that the Board of Trustees accept the program review of the Early Childhood Education program for five years.

(c) Dual Enrollment Presentation

Ms. Megan Barbano-Maxwell, Director of K-16 Partnerships, began the Dual Enrollment presentation by describing the differences between dual enrollment and dual credit. She noted that the majority of the students in the College's Dual Enrollment program are seeking dual credit – both high school and college credit. The School District of Philadelphia is their largest partnership. She reviewed the Dual Enrollment model: Advance at College and ACE Summer program. Advance at

College is the traditional dual enrollment program, generally for high school juniors and seniors, and the ACE summer program is for high school students in grades 9 through 12. She briefly touched on the other programs in the model: 100 Steps, Parkway Center City Middle College, Gateway to College, MC2, Advance Senior Year, Mastery Senior Year and Early Scholars.

Advance at College: This program provides eligible Philadelphia 11th and 12th grade students and students actively pursuing a high school equivalency the opportunity to enroll in college-level and developmental course. Commonly taken courses include English, math, history and gen ed courses which are high school requirements. The majority of students take classes during the day, in person, between 8 a.m. and 3 p.m.

Advanced College Experience (ACE): This program provides college exposure to motivated, rising 9th through 12th grade students and students under the age of 21. The classes start out as non-credit; however, if the students earn a C or higher, they gain college credit. In July 2022, 21 courses will be offered. Sample course offerings include Introduction to Law, Introduction to the Music Business, Music Technology, Introduction to Healthcare Professions, and Creative Writing. They are beginning to align ACE courses as a pipeline and move toward STEM and career-focused courses.

Dual Enrollment students are eligible to take advantage of services offered at the College such as tutoring, computer labs, Counseling, and Advising. Individuals in the Division of Access and Community Engagement (DACE) are available to provide students with guidance on course selection, as well as providing an orientation regarding what it means to go to college. Financial support is provided in terms of reduced tuition and one free official hard copy transcript at the end of each enrolled term. Funding can be used for developmental courses as well.

Data surrounding the program were reviewed. For 2021-2022, there were 1,290 students for all Dual Enrollment Programs. For 2021-2022, course enrollment is down 13% compared to the previous year. Reasons for this include students taking fewer online courses. Program staff are advising students to take one online course instead of two. The School District of Philadelphia who funds a considerable portion of this was not allowing funding for asynchronous courses. The pass rate is 86% for 2021-2022, compared with 89% in 2020-2021.

Data provided by Institutional Research (IR) tracks fairly consistently and is probably representative of the City. The number of black students enrolled in the Dual Enrollment Program are slightly higher than traditional students, and white students enrolled in the Dual Enrollment Program are lower than traditional students. Traditional and Dual Enrollment gender breakouts are exactly the same; however, it was noted that the Program needs to enroll more male students.

Dual Enrollment students tend to be more successful when compared to the traditional students. Reasons include Dual Enrollment students are more highly motivated to do well and prove themselves. They are also concurrently enrolled in high school, so they have the entire support system in the high schools as well.

Students are also closer to the material and have no gaps between high school graduation and starting college. They are fully immersed in learning the subject areas.

In 2022, 133 Dual Enrollment students graduated from the College which is 7% of total graduates. The majority of graduates were from Parkway Center City Middle College.

Ms. Barbano-Maxwell noted that they are in the process of building a Dual Enrollment dashboard in Tableau. Sample reports were provided. It was noted that there will be a public side to this dashboard where individuals will be able to see data such as unduplicated enrollment head counts in each of their programs. It is planned that reports will be available by specific school to see how well students are doing, final grades, etc. This data will be valuable when discussing the programs.

Future plans include using current and securing new funding to expand existing programs and create new programs to broaden their portfolio; establishing hubs at the Regional Centers; expanding professional development sessions for faculty on pedagogy and research-based instructional strategies; and creating career pipeline partnerships.

Lessons learned: Dual Enrollment students benefit from additional support to prepare for college courses. Pass rates are consistently in the 83-89% range, but they have learned that the more support they can provide for their students, the better. High school and dual enrollment students prefer in-person courses and structured pathways. Better understanding of dual enrollment by the partners equates to better performance of dual enrollment students. Dual enrollment students are most successful in courses when faculty are organized, communicate clearly, maintain high expectations and treat all students fairly.

A question was raised about growing the program beyond the current 1,400 students who are participating and what are some obstacles. It was noted that funding is definitely one. The timeframe that the majority of high school students are available is 3 to 6 p.m., and they would like to see more classes offered during these hours. In the fall, they are moving to block scheduling, and this may work better for their students. High school students can perform at a college level and can meet expectations; however, support within the College is helpful. There are no courses with just high school students, and there is no state requirement for others to accept dual enrollment credits. Dr. Thomas noted that they are trying to get everyone across the institution to understand that the Dual Enrollment students are not just their students, they are the College's students. Resources will need to be expanded to meet student needs as the program grows.

Another question was asked about how much we can expand this program. It was noted that they have operated on trying to increase by 10% each year, and they are able to that with very little marketing. Dual Enrollment is very popular at the moment, and many schools come to us. In terms of a final number, there is no answer

at the moment. They would like to expand to the Regional Centers and are looking to partner with high schools in those areas. It was noted that a lot of this is driven by the State. Funding for dual enrollment was removed at some point, and we have asked for restoration each year for many years, but that has not happened yet. This is something that will continue to be pursued with the Commonwealth.

A question was also raised as to whether there is any sort of cohort with traditional and high school students for mentoring purposes. It was noted that with some programs, this automatically happens but not with others where students are taking one or two classes. One of the thoughts was a dual enrollment club that would allow students to connect with others. However, dual enrollment students do not want to be identified as dual enrollment students. A balance needs to be met regarding the fact that they are high school students but do not want to be treated differently. Academic mentors have been created to serve as mentors to their students to provide guidance, support and modeling for academic success.

(d) Year in Review

The year-in-review document that was provided allows planning for next year so the Committee can target their focus moving forward.

This was Dr. Hirsch's final meeting before he retires. Ms. Fulmore-Townsend expressed appreciation to him for being a stellar partner with executing the work of the Committee, and he was publicly acknowledged for his leadership. Committee members come on board with different levels of understanding and interest, and he has managed this well and navigated through so all have a strong understanding. The Committee has grown and adjusted over time, and Dr. Hirsch has been the "captain of the ship." The Committee will ensure that the reflection of Dr. Hirsch's legacy continues with this great work.

(e) New Business

There was no new business.

Next Meeting

The next meeting of the Student Outcomes Committee of the Board is scheduled for September 1, 2022.

Attachments:

Minutes of May 5, 2022
Academic Program Review: Early Childhood Education (AA Degree)
Dual Enrollment PowerPoint Presentation
SOC Year in Review
2022 SOC Agenda Calendar – Monthly Topics
Academic Pathways 2021-2022

Community College of Philadelphia

Academic Program Review:
Computer Information Systems – Information Technology, A.A.S.

Authors: Barbara Hearn, Charles Herbert, Dr. Dawn Sinnott
Fall 2022

Executive Summary

A. Key Findings

Enrollment

1. Average enrollment in the CIS-IT program between fall 2017 and spring 2022 was 564 students per semester, see Exhibit 1

Exhibit 1: College and Program Enrollment

	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022	Average
College-Wide	17,296	16,503	16,671	15,544	15,996	14,789	13,673	12,195	11,647	10,431	14,474
CIS-IT	582	541	658	602	653	630	568	496	492	416	564

2. Enrollment and Demographics
   a. CIS-IT average full-time enrollment (34.8%) is 17% higher than the college average (28.8%); see Exhibit 2a
   b. Enrollment by Gender within Race, see Exhibit 2b
      - On average, the CIS-IT program's distribution of gender and ethnicity indicates a higher percentage of Asian males (16.3%) than the College (4.6%)
      - On average, the CIS-IT program's distribution of gender and ethnicity indicates a higher percentage of Black males (27.4%) than the College (13.5%)
      - On average, the CIS-IT program's distribution of gender and ethnicity indicates a higher percentage of Hispanic males (13.1%) than the College (4.9%)
      - On average, the CIS-IT program's distribution of gender and ethnicity indicates a higher percentage of White males (17.3%) than the College (8.6%)
   c. The CIS-IT program is providing minority students long-term professional career prospects and economic security at a higher rate than the national average, as observed in the US Labor Force Population Survey, see Exhibit 2c
   d. The CIS-IT program's female enrollment is generally lower than the national average of females employed in computer-related occupations, see Exhibit 2c
   e. On Average, CIS-IT students were more likely to be between 16 to 21 years of age than the college-wide average; CIS-IT 49% and College 41%, see Exhibit 2e

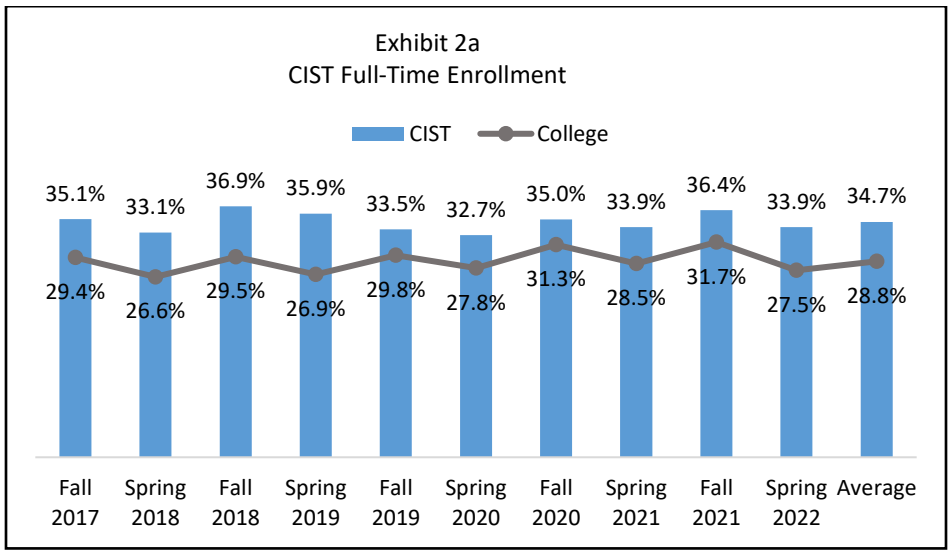
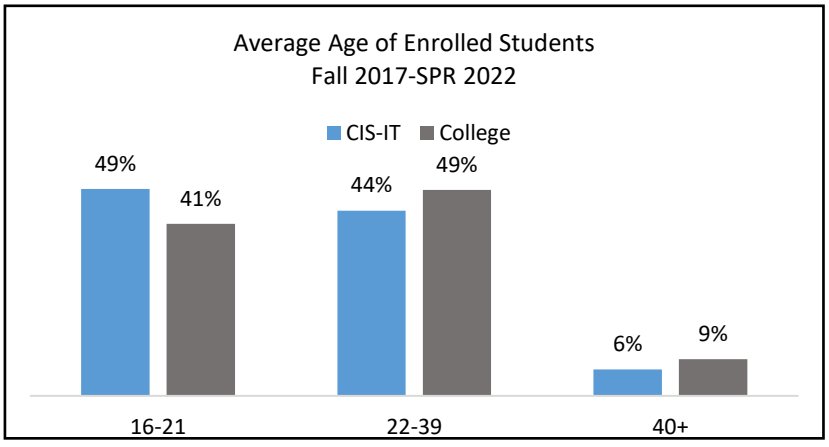


Exhibit 2b: Gender Within Ethnicity by CIS-IT Program Majors

		Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	CIS-IT Average	College Average
Asian	Female	5.5%	3.9%	3.8%	3.6%	3.8%	3.5%	3.5%	4.2%	2.8%	3.9%	5.6%
	Male	14.4%	14.6%	16.1%	15.6%	15.8%	17.0%	17.6%	16.7%	19.9%	16.3%	4.6%
Black	Female	8.2%	8.3%	7.0%	8.4%	7.8%	7.6%	7.9%	7.1%	8.1%	7.8%	30.4%
	Male	28.2%	28.2%	27.8%	28.5%	26.8%	29.0%	25.4%	25.6%	26.6%	27.4%	13.5%
Hispanic	Female	2.7%	3.3%	2.9%	3.1%	2.8%	2.9%	3.0%	3.6%	2.6%	3.0%	10.4%
	Male	13.1%	12.9%	14.9%	14.9%	14.7%	13.6%	11.1%	8.9%	12.8%	13.1%	4.9%
White	Female	2.9%	2.8%	1.7%	2.0%	3.2%	3.6%	4.2%	5.6%	5.7%	3.4%	14.4%
	Male	18.0%	17.9%	17.2%	16.1%	17.5%	16.0%	18.3%	20.2%	15.0%	17.3%	8.6%
										Female	18.1%	60.8%
										Male	74.2%	31.6%
										Other/ Unk	7.7%	7.6%

Exhibit 2c: US Labor Force Statistics from the Current Population Survey [1] {Numbers in thousands]						
		Percent of Total Employed				
	Total Employed	Women	Asian	Black or African American	Hispanic or Latino	White
Computer systems analysts	464	37.5	16.0	11.3	11.0	70.0
Information security analysts	152	18.2	9.0	11.8	7.4	76.7
Computer programmers	444	19.5	22.0	6.0	6.4	68.4
Software developers	1,932	19.7	37.1	5.4	5.8	54.7
Software quality assurance analysts and testers	74	46.5	27.6	14.1	5.7	55.9
Web developers	81	38.7	7.5	4.6	8.6	84.7
Web and digital interface designers	64	51.1	6.6	5.0	9.6	87.4
Computer support specialists	660	23.8	14.5	10.5	11.7	72.1
Database administrators and architects	111	35.0	20.0	5.1	6.3	73.1
Network and computer systems administrators	212	17.2	12.9	10.4	8.1	72.6
Computer network architects	102	11.8	18.3	6.5	9.1	72.0
Computer occupations, all other	889	27.2	15.0	11.9	11.5	70.4



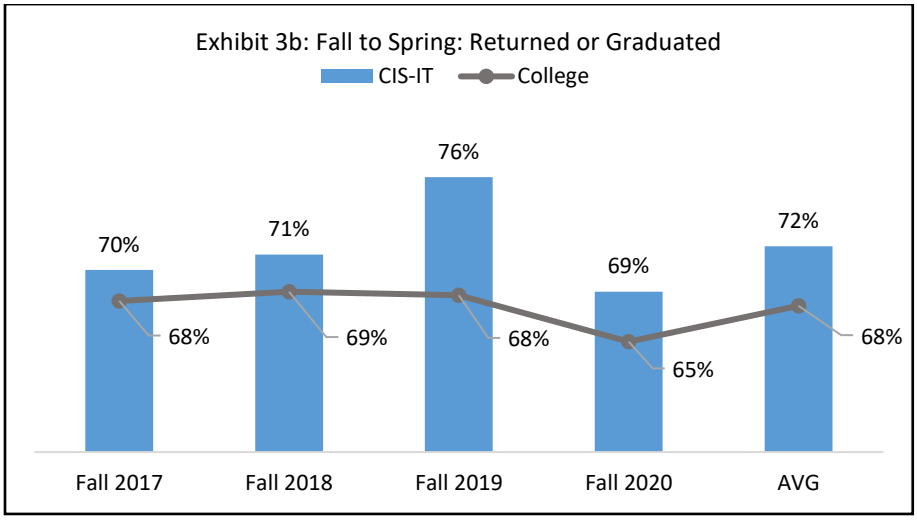
[1] US Labor Force Statistics from the Current Population Survey

Retention – Returned or Graduated

3. Fall to Spring Retention
   a. Fall to Spring Retention between fall 2017 and fall 2020: The CIS-IT program's fall to spring retention, Returned to Same Program, averaged almost 3 points higher than the College average, see Exhibit 3a
   b. Fall to Spring Retention/Graduation: On average, 72% of CIS-IT students returned to the same program or graduated, while 68% of students College-wide returned to the same program or graduated, see Exhibit 3b

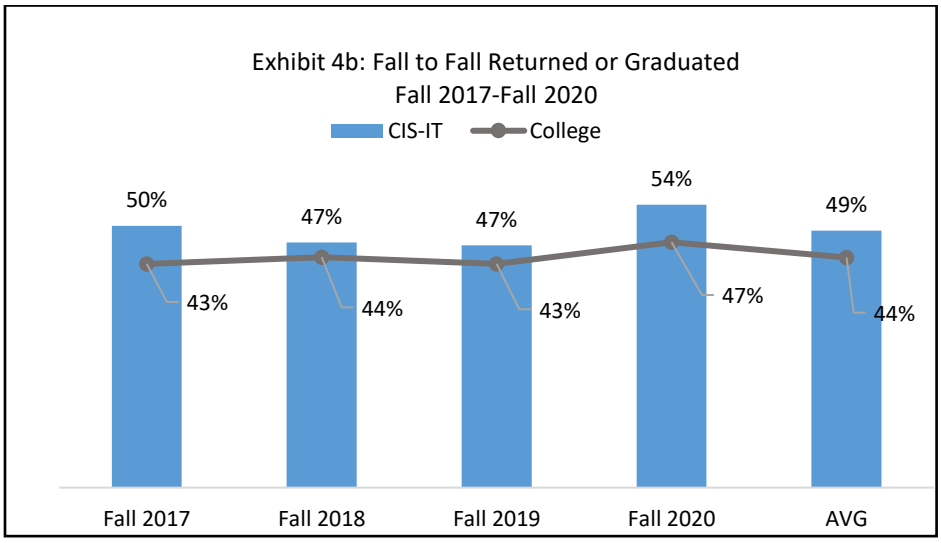
Exhibit 3a: Fall to Spring Retention

CIS-IT	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Program Average	College Average
Headcount	582	658	653	568	615	15,909
Returned to Same Program	66.2%	67.8%	71.5%	63.4%	67.4%	64.8%
Returned to Different Program	5.3%	4.9%	4.3%	5.1%	4.9%	4.4%
Graduated	4.0%	3.3%	4.7%	5.3%	4.3%	2.9%
Did Not Persist	24.6%	24.0%	19.4%	26.2%	23.4%	27.9%



4. Fall to Fall Retention between fall 2017 and fall 2020
   a. Fall to Fall Retention between fall 2017 and fall 2020: The CIS-IT program's fall to fall retention, Returned to the Same Program (38.0%) averaged almost 4% high than the College average (34.2%), see Exhibit 4a
   b. Fall to Fall Retention/Graduation: On average, 49% of CIS-IT students returned to the same program or graduated, see Exhibit 4b

Exhibit 4a: Fall to Fall Retention						
CIS-IT	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Program Average	College Average
Headcount	582	658	653	568	615	15909
Returned to Same Program	39.0%	38.4%	35.1%	40.0%	38.0%	34.2%
Returned to Different Program	7.7%	8.7%	7.4%	9.7%	8.3%	7.2%
Graduated	11.3%	8.7%	11.5%	14.4%	11.4%	10.1%
Did Not Persist	41.9%	44.2%	46.1%	35.9%	42.3%	48.5%



Academic Success and Graduation

5. Degrees Awarded

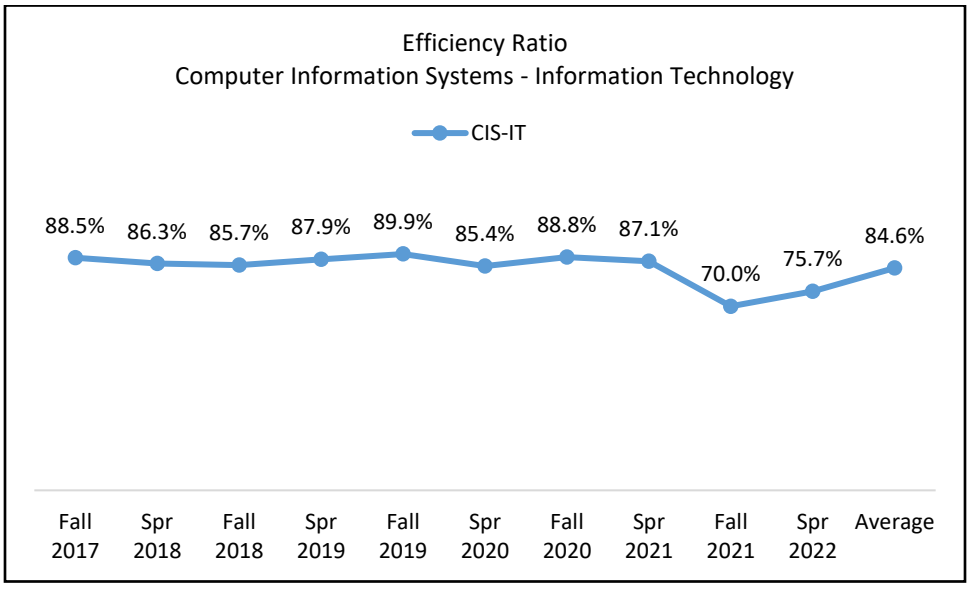
Degrees Awarded						
	2017	2018	2019	2020	2021	Total
Computer Information Systems/Information Tech	75	62	59	80	45	321
A.A.S.	587	530	558	482	241	2398

6. Section Operating Efficiency

Includes core courses: CIS 103, CIS 105, CIS 106, CIS 150, CIS 205, CIS 270

Efficiency Ratio

- The efficiency is a ratio that compares effective capacity, seats available per semester, with actual capacity, seats occupied.
- The following exhibit shows stability in effective capacity versus actual capacity between fall 2017 and spring 2021.

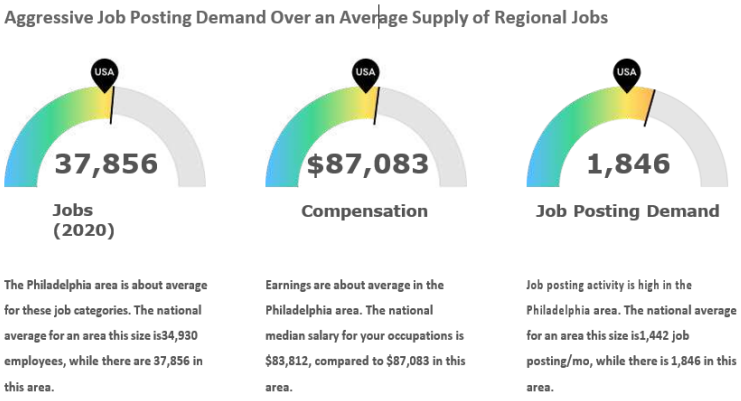


7. Transfer
    - Although CIS-IT is a workforce program, more than one-third of the program graduates transferred to continue their education
    - 43% of the departing students earned 12 or more credits but did not graduate (Total Count of Departing Students, Did Not Graduate, Earned > 12 Credits → (66+172+180)/972))
    - 48% of the departing students left before earning 12 credits graduate (Total Count of Departing Students, Did Not Graduate, Earned < 12 Credits → (469/972))

Transfer					
Departing Students who entered the College between 2017 and 2020					
Exit Status	Transfer		Did Not Transfer		Total Count of Departing Students
	Count	Percent	Count	Percent	
Graduate	28	33%	57	67%	85
Earned 45 or more credits	4	6%	62	94%	66
Earned 23 to 44 credits	27	16%	145	84%	172
Earned 12 to 22 credits	25	14%	155	86%	180
Earned less than 12 credits	50	11%	419	89%	469 *
Grand Total	134	14%	838	86%	972
* A significant number of students, some already with degrees, come to CCP to earn one or more professional certifications related to specific courses, or to learn about specific technologies. These students often register as CIS-IT students, and their presence affects persistence numbers. For additional details, see Page 15, Action Step 3					

8. Employment/Workforce

The following data is sourced from EMSI to better understand the local economy, industries, demographics, employers, and in-demand skills. This insight is useful to confirm or adjust the alignment of programs with labor market opportunities and to support students' abilities to thrive in a competitive job market.



Most Jobs are Found in the Computer Systems Design and Related Services Industry Sector	
Computer Systems Design and Related Services	17.5%
Management of Companies and Enterprises	8.6%
Insurance Carriers	5.1%
Colleges, Universities, and Professional Schools	4.6%
Wired and Wireless Telecommunications Carriers	4.5%
Management, Scientific, and Technical Consulting Services	4.3%
Other	55.3%

Top Companies
Robert Half
The Judge Group
Motion Recruitment
Deloitte
Randstad
Accenture
Comcast
IBM
University of Pennsylvania
Kforce

9. Assessment

The Computer Information Systems-Information Technology Program's assessment is robust and up-to-date. Direct assessment measures are used and include scores from class projects, class discussions, group activities, embedded exam questions, case study assignments, and grades on lab reports. The competency benchmarks are currently set at 75%.

Assessment data for all Course Learning Outcomes is collected each semester. The Program Coordinator creates a program assessment report for each semester, using the Course Level assessment data to assess the Program Level Outcomes. The consistency and quality of CLO/PLO assessments for Computer Information System courses meet all requirements. The benchmarks are currently set at 75%.

B. Prior Audit Action Items

1. Program SLOs must be completed:
    a. Although progress has been made, program level student learning outcomes remain to be assessed.

Department Response

Assessment data for all Course Learning Outcomes for the CIS-IT Program is collected each semester. The Program Coordinator creates a program assessment report for each semester, using the Course Level assessment data to assess the Program Level Outcomes.

2. Cultivate K-12 Pipelines
    a. Students in certain Philadelphia School District programs could earn up to 11 credits at CCP while still enrolled in high school. Creating bridges to these students to cultivate their enrollment here is an important contribution to the Program, the School District and the City's mission for increased educational attainment.

Department Response

The Department has worked with the School District of Philadelphia and other high schools to develop PLA (Prior Learning Assessment) equivalencies between our courses and CTE (Career and Technical Education) programs in the School District of Philadelphia. The Department also worked with the PA Department of Higher Education to develop equivalencies between our programs and Pennsylvania State SOAR (Students Occupationally and Academically Ready) high school programs of study based on corresponding CIP codes. See the Computer Technologies PLA document on Page 23 of this document.

In order to receive college credit, high school students must have passed either the related professional certification exam, such as CompTIA's *Network+* exam, or the NOCTI (National Occupational Competency Testing Institute) *exams* for the related subject. PA House Bill 202 in 2017 authorized the use of NOCTI exams to provide transferable industry credentials for secondary students in SOAR (Students Occupationally and Academically Ready) programs in Pennsylvania high schools. NOCTI develops state-specific exams to provide credentialling for students in vocational programs.
See: https://www.nocti.org/credentials/state-programs/pennsylvania

The Current Computer Technologies Department Chair, Chuck Herbert, served on the Pennsylvania Department of Education's committees to draft the NOCTI exams for *Computer Systems Networking, Computer Technology/Computer Systems,* and *Management Information Systems,* and worked with the School District and the appropriate personnel at the College to ensure smooth transition between their CTE programs and our courses.

A team of faculty members from the Computer Technologies Department has also made themselves available for visits to high schools with people from our admissions office. During the 2020-2021 and 2021-22 Academic years, they participated in virtual meetings via Zoom with School District of Philadelphia guidance counselors, CTE faculty, interested students, and interested parents. In previous years, we visited different high schools with admissions personnel. We also participated in new student open houses at the College and hosted visits by CTE classes from different high schools. Our primary contact for this was John Neugebauer, the College's Career-Technical Education Student Outreach Specialist.

Two recent events are examples of these ongoing efforts:

- On Friday, May 7th, Sonny Chang, Berna Dike-Anyiam, Michael Hackett, and Chuck Herbert participated in a CCP CTE Career Day set up by John Neugebauer. In addition to information sessions hosted by the admissions office, we held breakout sessions for students interested in networking, software development, and cybersecurity.
- On Thursday, August 11th, 2022, Sonny Chang, Michael Hackett, and Laurence Liss held an open house in our computer labs for high school students interested in programs and courses in the Computer Technologies Department. There were two sessions – one in the afternoon and one in the evening. The open house was planned by Chuck Herbert and Laurence Liss, with the admissions office sending out invitations to interested potential students. So far, it looks like the open house resulted in 5 new students registering full-time and 12 new students registering part-time.

3. Evaluation of student self-reports
    a. Students have indicated they may not be gaining the people and lifetime learning skills that they need to be successful over the long term in their field. The program should investigate this further and explore opportunities to bolster these skills in their students. This has the potential to require alterations to the program SLOs. Additionally, there are some faculty concerns that lab limitations may mean that students are not able to practice (and therefore fully develop) certain important technical skills.

       Utilizing the Advisory Committee and student and alumni input, the Program should develop a list of skills needed to be a successful profession in the field, focusing on both the technical and interpersonal areas. Once completed, this list should be compared to offerings in the program to identify shortcomings and areas where these can be shored up.

Department Response

All of our computer courses are offered in hands-on computer labs for the duration of the time they meet.

In conjunction with Information Technology Services, the Department has made student loaner laptops available to students during the semester. We recently ordered 24

additional Perkins-funded Mac laptops to make those available for students to borrow throughout the semester.

Students also have access to available computers on campus through LabStats software. LabStats is cloud-based computer lab monitoring and networking software that allows students to log into an open computer in our computer labs or classrooms and use that computer to complete their assignments or to practice working with the systems.

We have also scheduled open lab sessions for our networking courses to allow students to come in and practice their skills with an instructor present to help. For example, in the Summer of 2022, Sonny Chang staffed several open lab sections for networking students in room C3-08, our networking lab. Students in *CIS 252 - Managing Network Servers* could practice setting up and configuring servers during these sessions.

All students in our majors have access to Azure Dev Tools for Teaching, which provides professional developer tools, software, and services from Microsoft. Students receive developer tools at no cost to install onto their personal computers for non-commercial use. The College subscription is paid for through Perkins Funding.

Students also have access to Microsoft Office which they can install on their personal computers at no cost. All software available are full working versions that do not expire.

4. Evaluation of Student Success
    a. The CIS program has both a strong graduation rate and a large number of students who depart unsuccessfully. Both of these phenomena need to be better understood so that more students in the latter category can be converted to the former. The program, working with Assessment and Institutional Research should examine course taking patterns of their students (Perkins data may be particularly helpful in this regard) to better understand indicators that lead students to better successes or struggles.

Department Response

The faculty were surprised by this recommendation and did look into it. The program had and continues to have a high student success rate and transfer rate for an A.A.S. program. Quoting from the audit's presentation of data regarding students' success."

> "*Students in CIS-IT are performing academically, like many other students in the College, with one important exception – students are more likely to depart as a graduate (41%) than students in the Division (13%) or the College (10%). They are also more likely to depart unsuccessfully (41% vs. 36%).*"

41% percent of the students in the program as of the last audit were finishing their degrees compared to 10% College-wide and 13% in the Division. The faculty believe that many of the 36% leaving unsuccessfully include students who found employment, primarily as computer support service technicians based on CompTIA A+ and Network+ certifications students who were only taking a few courses with us to improve their professional skills.

5. Discontinued Options
    a. There are still students enrolled in older, discontinued CIS options. These students should be contacted and transferred to the CIS-IT program.

Department Response

This has been fully addressed. According to Institutional Research, there are currently no active student whose major is listed as one of the deprecated programs. Occasionally someone who was a student in one of those programs returns to the College and is placed in a current program.

6. Student Lab Experiences
    a. There were some concerns among program faculty that student experiences in labs may not be limited by software and hardware issues. The program needs to develop a Technology Plan to assess their needs and course and program assessment materials to identify current shortcomings. Once completed, weaknesses may be addressed through the use of Perkins funds.

Department Response

This is no longer an issue that has not been for the past three years. Currently, there are no shortcomings in the hardware and software available for our courses in our Department. The Department has a faculty committee to deal with lab hardware and software. It now works closely with Information Technology Services to ensure that all labs in which CIS courses are taught have the required hardware and software for our courses and that the labs are well-maintained.

For the 2021-22 AY and the 2022-23 Academic year, the Committee consists of Sonny Chang, Networking Program Coordinator; Michael Hackett, Computer Science Program Coordinator, and Laurence Liss, Web and App Development Program Coordinator. All three have the hardware and software skills necessary to set up and manage model systems for the classrooms. Typically, they work with IT to create a classroom master -- called an “image” by IT professionals -- for each room we use, then the approved image is replicated in the corresponding classroom.

7. Network and System Administration Proficiency Certificate
    a. The Network and System Administration Proficiency Certificate is relatively small, and the program should consider its continued viability. It should be closed if there is no energy around attempting to grow the program.

Department Response

The existing *Networking Technology and Management* A.A.S. degree was discontinued, and a new *Network Administration* A.A.S. degree was put in place for the 2021-2022 AY.

Networking courses and the associated proficiency certificate were revised as part of this process.

This is addressed in detail in the Academic Program Review of that program conducted last semester.

8. Transfer

    a. Given the changes in the CIS field, almost 40% of students who graduate transfer (despite the fact that the program is an AAS). The program needs to develop articulation agreements with local Bachelors programs to ensure students' long-term success. There are 17 colleges within 20 miles of the CCP that have corresponding programs and could serve as potential transfer institutions for interested students. Students interested in transfer need to be advised by program faculty to take electives that will maximize transfer credits (particularly for institutions without program to program agreements).

Department Response

According to our transfer office, There are currently articulation agreements in place with Bloomsburg University, Chestnut Hill College, Jefferson University, Lincoln University, Cheyney University, Peirce College, Rutgers University – Camden, and Wilmington University. Discussions are ongoing with several other schools, including Harrisburg University and Holy Family University.

Transfer agreements for our CIS-IT degree with Drexel University became null and void when Drexel discontinued its IT programs in the Goodwin College of Professional Studies.

Temple University has no transfer agreement for our CIS-IT degree because Temple requires Calculus and other higher-level Math courses in all of their IT-related degrees, such as Temple's Computer Science and Computer Information Systems degrees. These courses are not included in our A.A.S. degree program. Temple offers a BBA (Bachelors in Business Administration) degree with a concentration in Management Information Systems, which has most of its computing courses in the third and fourth years and a series of economics, accounting, and management courses in its first two years. Students interested in this program are better served by earning Community College of Philadelphia's A.A. in Business – General degree, which transfers to Temple's BBA program.

The model for academic advising has changed since the last audit. Students now work almost exclusively with professionals and dedicated academic advisors. Faculty in the Department now work closely with academic advisors to ensure that all students are informed about transfer opportunities and select the correct major and elective courses to meet their educational goals.

C. Action Items

Enrollment and Demographics

1. Increase Enrollment as follows:

	Average (Bench-mark)	Fall 2021	Fall 2023 Increase in Headcount		Fall 2025 Increase in Headcount		Fall 2027 Increase in Headcount	
Headcount *	564	492	507	3%	527	4%	553	5%
Returned to Same Program	38%	40%	42.0%	5%	44.1%	5%	46.3%	5%
Graduated	11.4%	14.4%	14.8%	3%	15.3%	3%	15.7%	3%

* A graduated increase in enrollment is related to institutional enrollment patterns and subject to available marketing, outreach, and recruitment resources.

2. Program Growth

The percentage of female students in CIS-IT (18%) is significantly below the College average. It is also below the national average for women in the IT workforce, which, according to data from *The National Center for Women & Information Technology (NCWIT),* is 25%. (https://ncwit.org)

Faculty and selected offices within the College should develop and implement a plan to attract more female students to the discipline.

A growing body of research shows that girls and women generally make career decisions differently than boys and men. The Department (and the College) should try to better understand this phenomenon, develop better plans to serve female students' needs, and reach out to girls and women about IT-related careers and education.

Many agencies provide funding for projects related to outreach to females in IT-related disciplines (Such as the National Science Foundation). The Department should work with Institutional Advancement and others within the College to secure grant funding for projects designed to help us understand, attract, and retain female students in IT-related disciplines.

Person responsible: Department Head
Timeline: Fall 2022 through Fall 2027

3. First-year attrition

Many students, some already with degrees, come to CCP to earn one or more professional certifications related to specific courses or learn about specific technologies. These students often register as CIS-IT students, and their presence affects persistence numbers.
The courses they take and certifications they pursue include:

CIS 105 – *Computer Systems Maintenance* ..... CompTIA *A+* certification
CIS 150 – *Network Technology* ..... CompTIA *Network+* certification

CIS 204 – *Fundamentals of Linux and Unix*..... CompTIA *Linux+* certification
CIS 252 – *Managing Network Servers* ..... CompTIA *Server+* certification
CIS 256 – *Network Routing and Switching* ..... Cisco *CCNA* certification
CIS 259 – *Computing and Network Security* ..... CompTIA* *Security+* certification
CIS 261 – *Cyber Investigation* ..... EC Council** *Certified Hacking Forensic Investigator*
CIS 271 – *IT Project Management* ..... Project Management Institute's *Certified Associate Project Manager*
CIS 274 - *Ethical Hacking & Penetration Testing* ..... EC Council *Certified Ethical Hacker*
* CompTIA - *Computing Technology Industry Association* (www.comptia.org)
** EC Council - *International Council of Electronic Commerce Consultants (www.eccouncil.org*)

Other courses attract similar drop-in students who wish to learn just specific technologies, such as:

CIS 200 & 201 – *Apple App Development I and II*
CIS 201 & 211 – *Android App Development I and II*
CIS 205 – *Database Management Systems*

Some regular students leave to take a job after securing specific course-related certifications, and many students return to finish a degree in the future.

Finally, some students depart to enter baccalaureate degree completion programs, especially those with heavy advertising and strong outreach.

These enrollment gaps create a discontinuity in tracking student outcomes.

1. The Department should work with Admissions, Registration, and Institutional Research to better identify students with short-term educational goals at CCP, such as those seeking specific professional certifications.
2. The Department should work with Institutional Research to identify students leaving early for baccalaureate degree completion programs. Encourage these students to transfer back several courses from their baccalaureate programs at little or no charge to complete their A.A.S. degrees (or certificates) at CCP.

Person responsible: Department Head
Timeline: Fall 2022 through Fall 2027

4. Curriculum Revisions related to Systems Analysis and Project Management

Currently, the CIS-IT program requires two courses related to planning and implementing IT solutions in the workplace *CIS 270 - Systems Analysis and Design* and *CIS 271 – IT Project Management.*

CIS 270 - Systems Analysis and Design is an old-fashioned course in determining computer systems requirements and designing a solution to provide for the IT needs of a particular workplace. It dates to the earliest days of the College when the course was *Data Processing 270 –Systems Analysis and Design*

Modern systems analysis is significantly different than it was in earlier times and much more complex. Many schools granting Baccalaureate degrees have moved the modern course to their degree programs' third or fourth year. For example, at Peirce College, to which many of our students transfer, the course is now *BIS 402 –Systems Analysis and Design*, taught in the fourth year.

In many places, it has been replaced by a project management course. Here at CCP, we added a project management course but retained a Systems Analysis course.

CIS 270 no longer fits within an A.A.S. degree and should be dropped from the curriculum. As part of this change, the Department should determine how best to replace the credits that will be removed from the program.

The Department of Business Administration has several very successful courses in project management, including *PJMT 110 - Foundations of Project Management,* which leads to the Project Management Institute's entry-level *Certified Associate in Project Management (CAPM)* certification. In short, they are better suited and better qualified to teach the course than the Computer Technologies Department. Most of what is covered in CIS 271 is not specific to IT, and a significant portion of modern project management in any discipline involves Information technology, including in PJMT 110.

CIS 271 – IT Project Management should be replaced in the curriculum by *PJMT 110 - Foundations of Project Management* to better serve our students' needs and better prepare them for the modern workforce.

Person responsible: Department Head
Timeline: Fall 2022 through Fall 2025

4. Assessment

Continue rigorous assessment schedule, share, discuss outcomes and document changes within the department.
Monitor the effects of program and course revisions on PLO proficiency assessments to ensure continuous improvement.

Person responsible: Department Head
Timeline: Fall 2022 through Fall 2027

D. Narrative

Although similar, computer information systems and computer science are distinct fields; computer science tends to be more theoretical, while computer information systems focus is on more workforce applications. Employment in computer and information technology occupations is projected to grow 13 percent from 2020 to 2030, faster than the average for all occupations. [2]

The CIS-IT program has a rich history at the College. The program's development is historically significant as the first associate degree in computing offered by a community college in the United States. This resulted from an early association with the University of Pennsylvania, where modern digital electronic computing first appeared during World War II. The original name for the degree was Data Processing.

The study of Microcomputers, including the Apple computer and the IBM PC, was added to the curriculum in 1979. In the 1980s, the A.S. transfer degree in Computer Science was added to expand the theoretical foundation and prepare students to continue their education. In 1995 Mardi Holliday and Chuck Herbert conducted a research study on the types and availability of computing degree programs at community colleges in the United States to determine the best direction for the Community College of Philadelphia. After presenting and meeting with colleagues nationally, the Team recommended that the Community College of Philadelphia adopt the model in place today, a separate A.S. degree in Computer Science and a single A.A.S Degree in Computer Information Systems. The curriculum has been revised throughout the years to meet the demands of new technologies in the workplace. Most recently, an A.A.S. in Web and Applications Development was created and will be offered for the first time in the 2022-2023 AY. The demand for the CIS degree, now *Computer Information Systems – Information Technology*, remains strong. The CIS-IT program provides students with the common core of fundamental IT skills needed by every computer professional while allowing them to develop expertise in a particular area of information technology.

The curriculum is designed to provide students with a core understanding of things that never change while enabling them to meet the challenge of things that often change, such as computer operating systems, programming languages, and user interfaces. The three-tiered curriculum provides:

1. **General Education courses**, including English 101 and 102, Intermediate Algebra, Public Speaking, Sociology, Physics, and Computer Applications
2. **A core of courses providing a common foundation in IT skills**, including courses in Computer Math and Logic, Computer Systems Maintenance, Computer Programming, Network Technology, Database Management, and Systems Analysis
3. **A minimum of 15 credits in elective courses in Computer Technology,** chosen to develop a specialization in a selected area of computing or to obtain a broader understanding of computer technologies and how they fit together.

Student success is of preeminent importance. To this end, the department has created a mini lab for students within the perimeter of department offices, where students are encouraged to drop in and meet with faculty to get help on assignments and projects. This environment promotes student success and creates synergistic relationships that can explore transfer and career options.

[2] U.S. Bureau of Labor Statistics

Community College of Philadelphia

Academic Program Review:
Computer Science (CSCI), A.S.

Authors: Charles Herbert, Michael Hackett, Dr. Dawn Sinnott
Fall 2022

Executive Summary

A. Key Findings

1. Average enrollment in the Computer Science program between fall 2017 and spring 2022 was 170 students per semester, see Exhibit 1

Exhibit 1: College and Program Enrollment

	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spr 2022	Average
College-Wide	17,296	16,503	16,671	15,544	15,996	14,789	13,673	12,195	11,647	10,431	14,474
Computer Science	131	149	140	163	192	204	188	173	193	163	170

2. Enrollment and Demographics
   a. Computer Science average full-time enrollment (51.2%) is 44% higher than the college average (28.8%); see Exhibit 2a
   b. Enrollment by Gender within Race, see Exhibit 2b
      - On average, the CSCI program's distribution of gender and ethnicity indicates a higher percentage of Asian males (23.4%) than the College (4.6%)
      - On average, the CSCI program's distribution of gender and ethnicity indicates a higher percentage of Black males (21.2%) than the College (13.5%)
      - On average, the CSCI program's distribution of gender and ethnicity indicates a higher percentage of White males (22.9%) than the College (8.6%)
   c. The CSCI program provides Black students long-term professional career prospects and economic security at a higher rate than the national average. See Exhibit 2c
   d. On Average, Computer Science students were more likely to be career age, between 22 to 39 years of age, than the college-wide average; CSCI 60% and College 49%, see Exhibit 2d

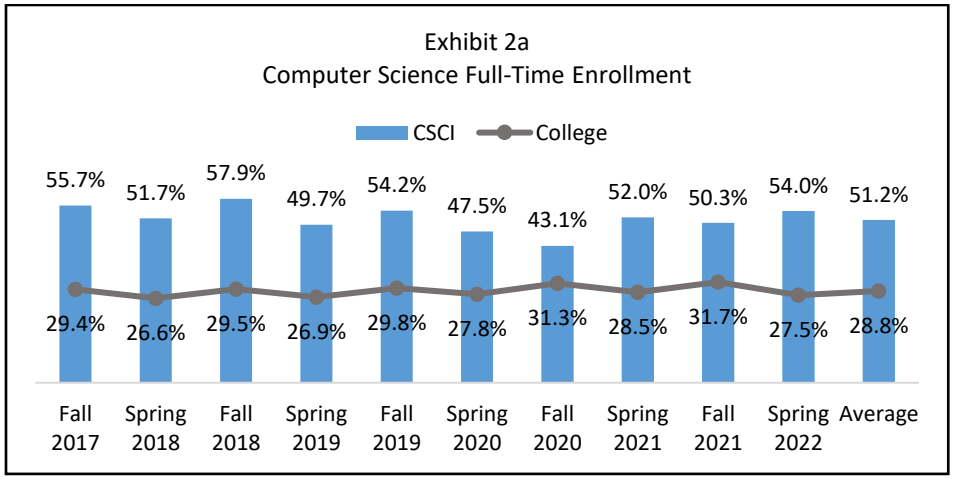
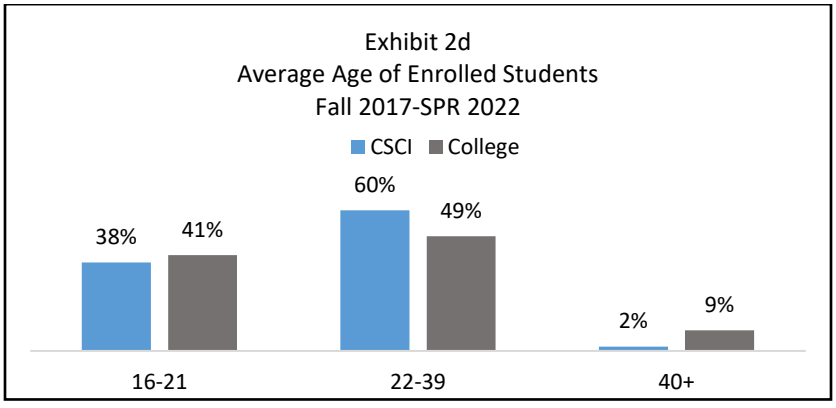


Exhibit 2b: Gender Within Ethnicity by Computer Science Program Majors

		Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spr 2021	Fall 2021	CS Average	College Average
Asian	Female	6.1%	7.4%	7.9%	7.4%	6.3%	5.9%	7.4%	8.0%	5.7%	6.8%	5.6%
	Male	22.1%	24.2%	22.1%	22.7%	26.0%	23.5%	21.3%	25.9%	22.2%	23.4%	4.6%
Black	Female	3.1%	3.4%	5.0%	4.9%	4.2%	4.4%	2.7%	4.6%	4.1%	4.0%	30.4%
	Male	29.8%	26.8%	21.4%	22.1%	20.3%	20.1%	20.7%	15.5%	17.5%	21.2%	13.5%
Hispanic	Female	0.8%	0.7%	1.4%	1.2%	2.1%	2.0%	1.1%	0.6%	2.6%	1.4%	10.4%
	Male	10.7%	10.1%	10.7%	8.0%	5.7%	7.8%	9.6%	9.2%	9.8%	8.9%	4.9%
White	Female	2.3%	2.0%	3.6%	3.7%	5.2%	3.4%	4.8%	5.7%	5.2%	4.1%	14.4%
	Male	22.9%	22.8%	24.3%	25.2%	22.9%	26.5%	21.8%	19.5%	20.1%	22.9%	8.6%
										Female	16.4%	60.8%
										Male	76.4%	31.6%
										Other/ Unk	7.2%	7.6%
											100.0%	100.0%

Exhibit 2c: Computer Science Field by Race [1]

	CCP	National
Asian	30.2%	25.0%
Black or African American	25.2%	1.0%
Hispanic or Latino	10.4%	5.2%
White	27.0%	66.1%

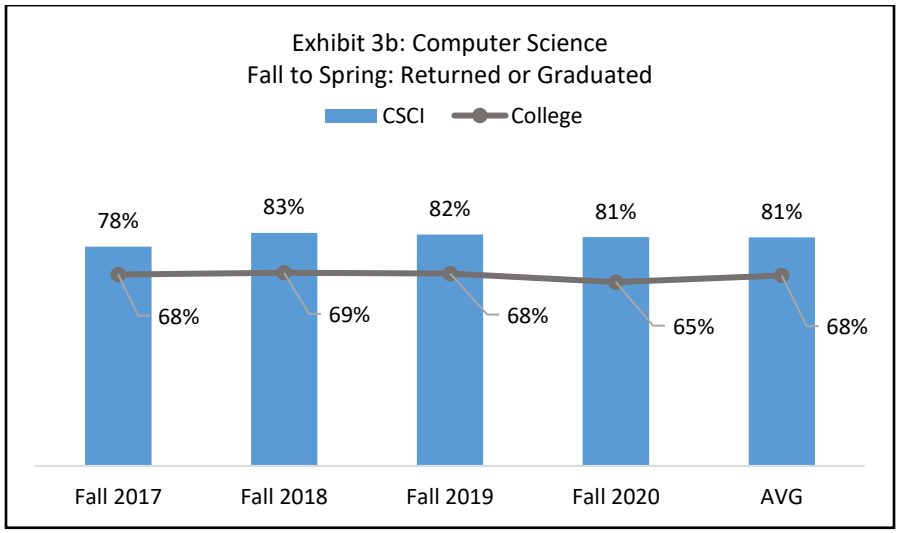


[1] ZIPPA The Career Expert

Retention – Returned or Graduated

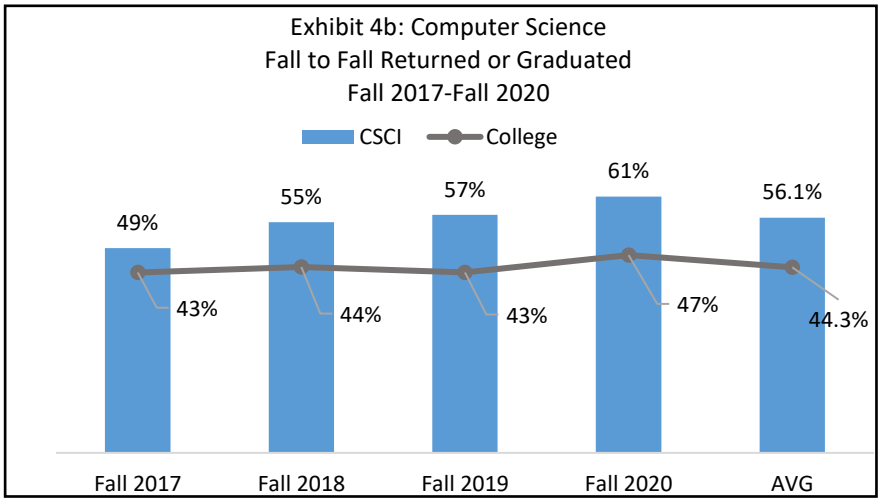
3. Fall to Spring Retention
   a. Fall to Spring Retention between fall 2017 and fall 2020: The Computer Science program's fall to spring retention, Returned to Same Program, averaged almost 9 points higher than the College average, see Exhibit 3a
   b. Fall to Spring Retention: On average, 81% of Computer Science students returned to the same program or graduated, while 68% of students College-wide returned to the same program or graduated, see Exhibit 3b

Exhibit 3a: Fall to Spring Retention						
Computer Science	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Program Average	College Average
Headcount	131	140	192	188	163	15,909
Returned to Same Program	74.0%	77.1%	75.0%	69.1%	73.6%	64.8%
Returned to Different Program	4.6%	2.1%	3.1%	1.1%	2.6%	4.4%
Graduated	3.8%	5.7%	7.3%	12.2%	7.7%	2.9%
Did Not Persist	17.6%	15.0%	14.6%	17.6%	16.1%	27.9%



4. Fall to Fall Retention between fall 2017 and fall 2020
   a. Fall to Fall Retention between fall 2017 and fall 2020: The Computer Science program's fall to fall retention, Returned to the Same Program (35.2%) was slightly higher than the College average (34.2%), see Exhibit 4a
   b. Fall to Fall Retention: On average, 56.1% of Computer Science students returned to the same program or graduated, see Exhibit 4b

Exhibit 4a: Fall to Fall Retention						
Computer Science	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Program Average	College Average
Headcount	131	140	192	188	163	15,909
Returned to Same Program	36.6%	34.3%	37.5%	32.4%	35.2%	34.2%
Returned to Different Program	6.9%	3.6%	2.6%	2.7%	3.7%	7.2%
Graduated	12.2%	20.7%	19.3%	28.7%	20.9%	10.1%
Did Not Persist	44.3%	41.4%	40.6%	36.2%	40.2%	48.5%



Academic Success and Graduation

5. Degrees Awarded

The College offers the following A.S. degree programs:

- Biology
- Chemistry
- Computer Science
- Engineering Science
- Mathematics

On average, 41% (162/390) of the A.S. degrees awarded between 2017-2022 were in Computer Science

Degrees Awarded						
	2017	2018	2019	2020	2021	Total
Computer Science	33	24	34	41	30	162
A.S.	92	64	82	90	62	390

6. Transfer

- Looking at the students who entered the Program between fall 2016 and fall 2020, approximately 28% (95/342) of Computer Science students who departed have transferred, see Exhibit 6a
- Nearly 60% of the program graduates transferred to continue their education, see Exhibit 6b
- 68% (234/342) of the departing students earned 12 or more credits but did not graduate, and almost 17% (40/234) of these students transferred, see Exhibit 6a
- 5% (18/342) of the departing students left before earning 12 credits, see Exhibit 6a
- Top Transfer Institutions included Temple, Drexel, and Western Governors University, see Exhibit 6b

Exhibit 6a: Departing Students who entered the College between 2016 and 2020					
Exit Status	Transfer		Did Not Transfer		Total Count of Departing Students
	Count	Percent	Count	Percent	
Graduate	52	58%	38	42%	90
Earned 45 or more credits	20	21%	77	79%	97
Earned 23 to 44 credits	17	18%	78	82%	95
Earned 12 to 22 credits	3	7%	39	93%	42
Earned less than 12 credits	3	17%	15	83%	18
Grand Total	95	28%	247	72%	342

Exhibit 6b: Transfer Institutions
Temple University
Drexel University
Western Governors University
La Salle University
Rutgers
Camden County College
West Chester University
University of Pennsylvania

7. Assessment

At the end of each term, faculty collect course assessment data for each course and review the data each semester in a teaching circle. Course assessment reports document CLO success rates and instructor comments suggesting changes or improvements in course instruction and delivery. Faculty may also meet to perform this qualitative assessment while reviewing the quantitative assessment data in teaching circles.

A program assessment report is prepared annually by the Computer Science program coordinator. This report aggregates the course-level assessment data from courses that align with program learning outcomes. The scope of this report is the prior academic year (i.e., the last Fall and Spring semesters). Completed program assessment reports are kept in a departmental repository of assessment data and reports.

B. Prior Audit

Action Items From Prior Audit: Computer Science
The Office of Assessment and Evaluation makes the following recommendations for the Computer Science Program:

1. Document Program Improvements:
    a. The Department has developed an effective strategy for retention. The Program should ensure they have documented their improvement strategy and find opportunities to share its relevant practices with other programs.

Program Response

Program coordinators regularly, but informally, collaborate on strategies to increase retention. This includes discussions with other faculty members in the department, students, and advisory board meetings. Specific improvements have been documented in program and course revisions and in assessment documentation.

2. Increase Recruitment and Retention of Female Students:
    a. Due to the gender imbalance in the Computer Science Program, the Program should evaluate the need for a recruitment and retention plan for female students.
    b. The Program should work with the Student Success Committee to develop a recruitment and retention plan to utilize offices at the College to improve female recruitment and retention.

Program Response

Female recruitment in the computing field remains a nationwide challenge. Over the last five years, there has been a steady number of female computer science students at CCP.

3. Request data from the Mathematics Department for Assessment of PLO #4:
    a. The Program should request relevant CLO assessment data from the Mathematics Department.
    b. The Program should analyze the assessment data received from Mathematics in the same way it analyzes the assessment data it collects.
    c. Results of the analysis should be applied to improve student learning experiences.

Program Response

The Mathematics department has shared relevant assessment data. When the Computer Science program was revised, math courses remained on the curriculum map but were removed as points of assessment for the program. Computer Science no longer relies on assessment data from the Mathematics department for the purposes of its assessment.

4. Assessment Documentation:
    a. The Program should share its most recent assessment data.

Program Response

Program assessment data is available and hosted in a departmental repository in Canvas.

C. Action Items

The OAE makes recommendations based on the key findings

Enrollment and Demographics

1. Increase Enrollment as follows: Recommended projected growth, to be discussed with department

	Average (Bench-mark)	Fall 2021	Fall 2023 Increase in Headcount		Fall 2025 Increase in Headcount		Fall 2027 Increase in Headcount	
Headcount*	170	193	199	3%	207	4%	217	5%
Returned to Same Program	32%	35%	37.0%	5%	38.8%	5%	40.7%	5%
Graduated	28.7%	20.9%	21.7%	4%	22.6%	4%	23.5%	4%

* A graduated increase in enrollment is related to institutional enrollment patterns and subject to available marketing, outreach, and recruitment resources.

2. Program Growth

The percentage of female students in Computer Science (16%) is significantly below the College average. It is also below the national average for women in the IT workforce, which, according to data from *The National Center for Women & Information Technology (NCWIT)* is 25%. (https://ncwit.org)

Faculty and selected offices within the College should develop and implement a plan to attract more female students to the discipline.

A growing body of research shows that girls and women generally make career decisions differently than boys and men. The Department (and the College) should try to better understand this phenomenon, develop better plans to serve female students' needs, and reach out to girls and women about IT-related careers and education.

Many agencies provide funding for projects related to outreach to females in IT-related disciplines (Such as the National Science Foundation). The Department should work with Institutional Advancement and others within the College to secure grant funding for projects designed to help us understand, attract, and retain female students in IT-related disciplines.

Person responsible: Department Head
Timeline: Fall 2022 through Fall 2027

3. Recruit Qualified Female Faculty
   Currently, no women are teaching Computer Science courses at the College. The presence of a female instructor in Computer Science would most likely motivate more female students to consider the discipline.

   The Department has a full-time opening in Computer Science for the 2022-2023 Academic Year and is developing a pool of adjunct faculty for Computer Science. The Department should quickly develop and implement a plan for recruiting qualified female applicants. They should consider seeking the assistance of *The National Center for Women & Information Technology (NCWIT)*. (https://ncwit.org) and similar groups, especially at the local level.

   Person responsible: Department Head
   Timeline: Fall 2022 through Fall 2024

4. Assessment
   Continue rigorous assessment schedule, share, discuss outcomes and document changes within the department.
   Monitor the effects of program and course revisions on PLO proficiency assessments to ensure continuous improvement.

   Person responsible: Department Head
   Timeline: Fall 2022 through Fall 2027

D. Narrative

According to the Bureau of Labor Statistics (BLS), skilled computer science professionals are in high demand in almost every job market. Entry-level opportunities in these fields pay well; median hourly earnings range from $27.00 to $69.00 per hour. The A.S. in Computer Science at Community College of Philadelphia (CCP) provides a rigorous curriculum in theoretical concepts and practical computing skills through lectures and laboratory projects from highly qualified instructors and is designed to transfer to baccalaureate programs in computer science.

The A.S. in Computer Science provides students with a foundation in computational thinking. Its rigorous curriculum prepares students to transfer to many baccalaureate programs in computer science. It is a pathway to rewarding computing, software development, and computer engineering careers. Fundamentally, the program teaches students what is computable and how to solve problems algorithmically. Students learn both theoretical concepts and practical skills in computing through lectures and laboratory projects from highly qualified instructors.

Following ABET (Accreditation Board for Engineering and Technology) standards for Computer Science programs, CCP graduates are in high demand as transfer students. Student success highlights from the last two years include:

- Graduates Danielle Duncan, Andy Gallagher, Mark Lacanilao, and Ruhan Li (who all hold bachelor's degrees in different areas) were accepted to Georgia Tech's highly selective computer science master's degree program.
- Graduate Jaffar Alzeidi transferred to Temple University and is currently an Amazon software development engineer intern.
- Graduate Nhat Doan transferred to Temple University and is currently a software engineer intern at SAP.
- Graduate Keon Hayes transferred to Penn State and is currently an IT security analyst at W.L. Gore and Associates.
- Graduate Danielle Whitmarsh transferred to Rowan University and is currently a cloud operations intern at Metidata Solutions.
- Current student Michael Geraghty secured an internship at UPenn's Singh Center for Nanotechnology.
- Current student Peter Quinn secured an engineering aide position with Lockheed Martin's space division.
- Current student Patrick Ulad-Lieu secured an internship (which became a full-time position) with the City of Philadelphia's Office of Technology

To foster student success, the department has created a mini lab for students within the perimeter of department offices. Students are encouraged to drop in and meet with faculty to get help on assignments and projects there. This environment promotes student success and creates synergistic relationships that can explore transfer and career options.

To optimize opportunity, almost all sections of all Computer Science courses use texts and teaching materials free of charge to students. Charles Herbert and Michael Hackett have each authored teaching materials that are provided free of charge to students. In several cases, faculty have made special arrangements with publishers to use the PDF files of copyrighted material from their own published works free of charge at CCP. In other cases, material for use at CCP was developed as a prototype for published works. Faculty also use open-source material and freely available web resources for our Computer Science courses.

The software used in all Computer Science courses is also freely available to students and is the same software used professionally by software developers.

Assessment is well documented, rigorous, and current. Following the Assessment Plan has been a department and faculty priority over the past five years. Course assessment data is collected in AEFIS each semester and reviewed by faculty in teaching circles. According to the curriculum map alignment, annual semester course outcomes are aggregated up to the program level. The Computer Science program coordinator prepares a program assessment report which is reviewed in department teaching circles and kept in the department repository of assessment data and reports.