STUDENT OUTCOMES COMMITTEE OF THE BOARD OF TRUSTEES

Thursday, September 22, 2022
2:00 p.m.
Hybrid

Zoom
&
The Klein Cube, P2 -3
Pavilion Building
1700 Spring Garden St.
Philadelphia, PA 19130

AGENDA

(1) Public Session

(a) Introductions (I)

(b) Approval of the Minutes of June 2, 2022 (A)

(c) Student Success Committee Overview/Scope (I)

(d) Computer Information Systems-Information Technology Academic Program Review (A)

- What changes in the Program have occurred as a result of assessment? Has continuous assessment taken place?
- What actions have been taken to address recommendations made in the last Program Review?
- To what extent does the Committee agree with the Program Review findings and recommendations?
- What is the Committee's action recommendation to the full Board?

Guests:

Arielle Norment, Interim Dean, Division of Business & Technology
Chuck Herbert, Department Head of Computer Technologies and Assistant Professor - Computer Science
Michael Hackett, Computer Science Program Coordinator and Assistant Professor - Computer Science
Barbara Hearn, Program Coordinator - Computer Information Systems – Information Technology, Course Lead - CIS 103 Applied Computer Technology, and Assistant Professor - Computer Information Systems - IT

(e) Computer Science Academic Program Review (A)

- What changes in the Program have occurred as a result of assessment? Has continuous assessment taken place?
- What actions have been taken to address recommendations made in the last Program Review?

- To what extent does the Committee agree with the Program Review findings and recommendations?
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(f) New Business

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 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

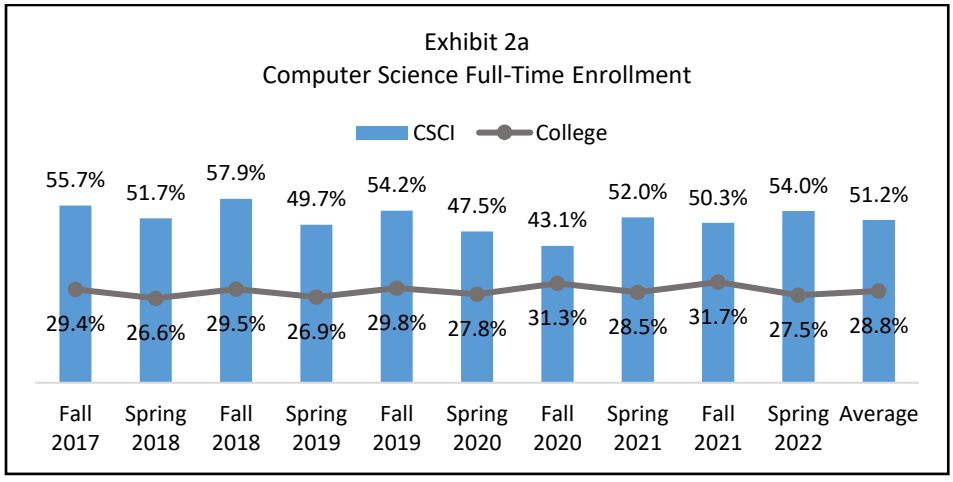
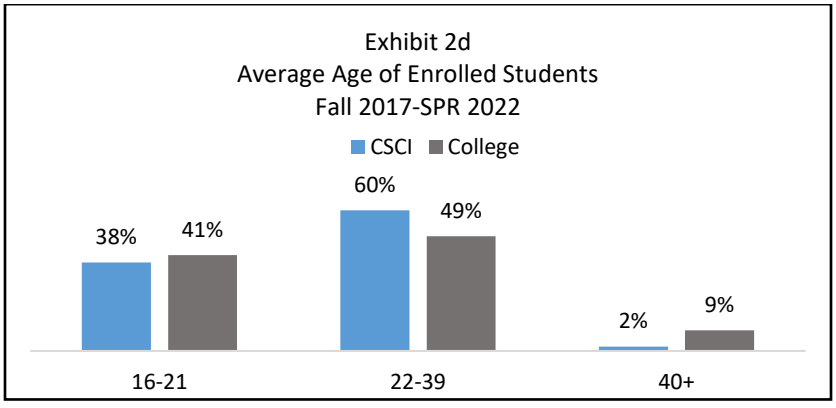


Exhibit 2b: Gender Within Ethnicity by Computer Science Program Majors												
		Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spr 2021	Fall 2021	CS Average	College Average
Asian	Female	6.1%	7.4%	7.9%	7.4%	6.3%	5.9%	7.4%	8.0%	5.7%	6.8%	5.6%
	Male	22.1%	24.2%	22.1%	22.7%	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%

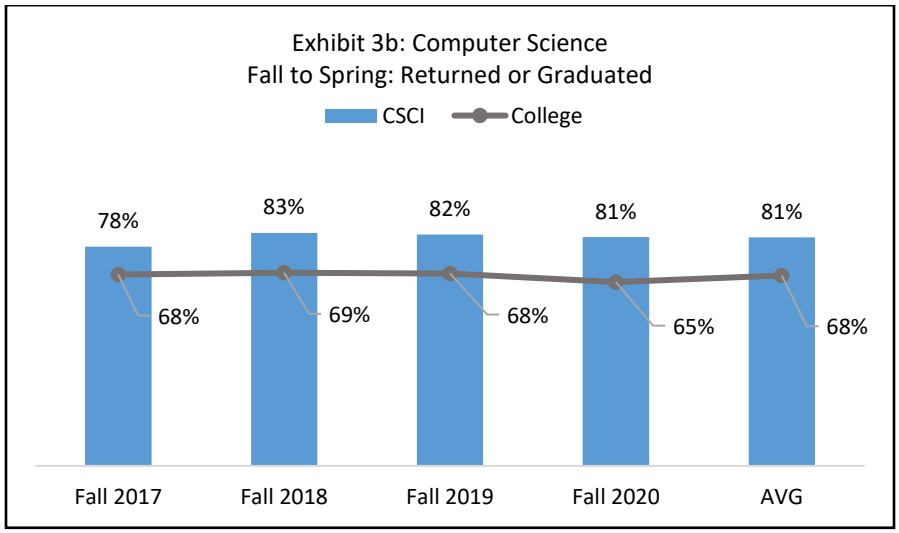


[1] ZIPPA The Career Expert

Retention – Returned or Graduated

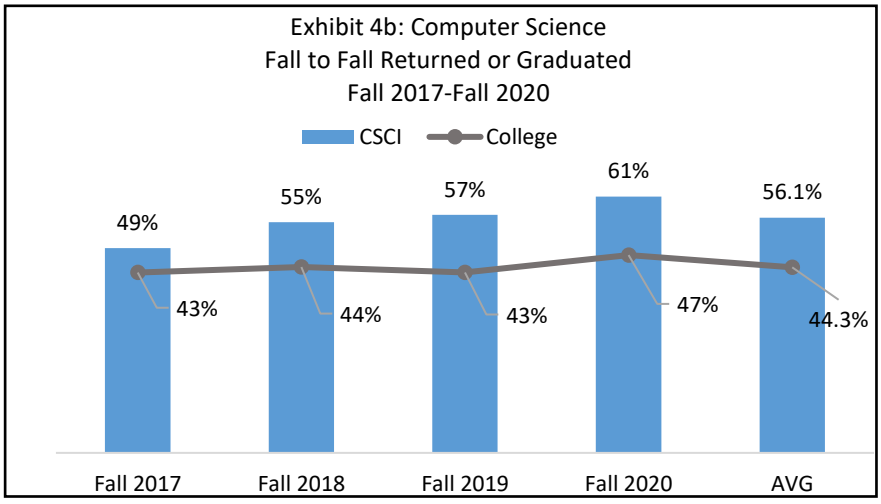
3. Fall to Spring Retention
   a. Fall to Spring Retention between fall 2017 and fall 2020: The Computer Science program's fall to spring retention, Returned to Same Program, averaged almost 9 points higher than the College average, see Exhibit 3a
   b. Fall to Spring Retention: On average, 81% of Computer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

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

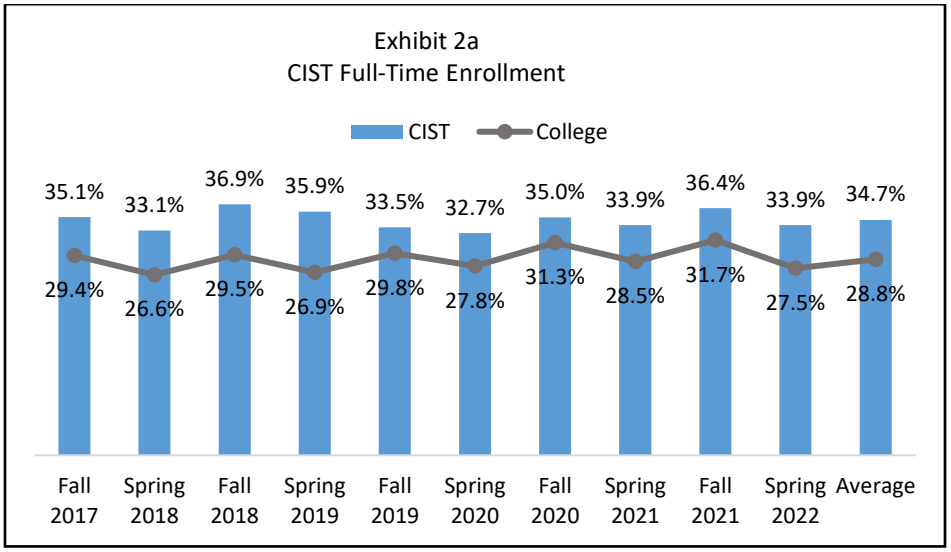
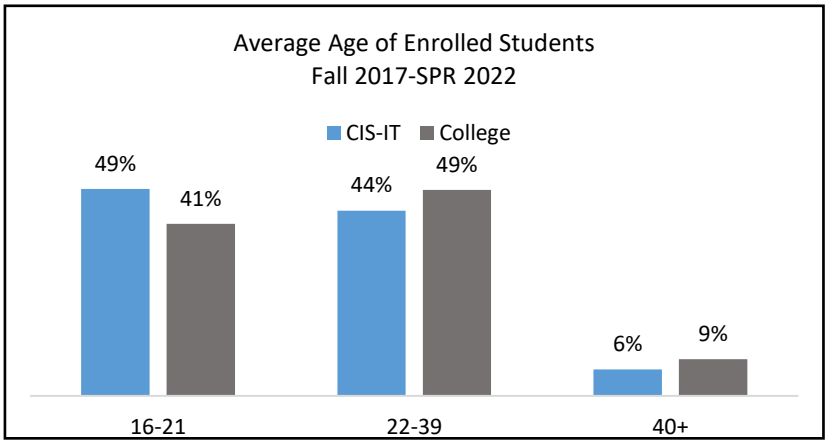


Exhibit 2b: Gender Within Ethnicity by CIS-IT Program Majors

		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



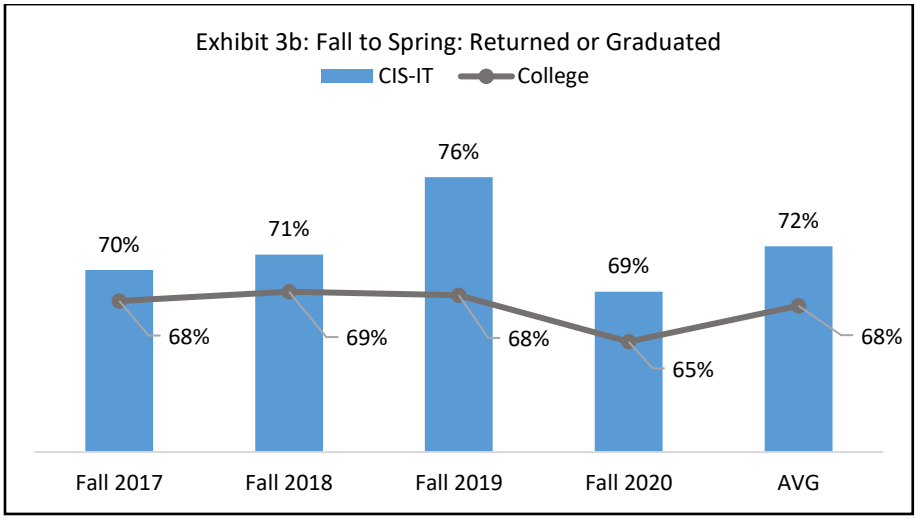
[1] US Labor Force Statistics from the Current Population Survey

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

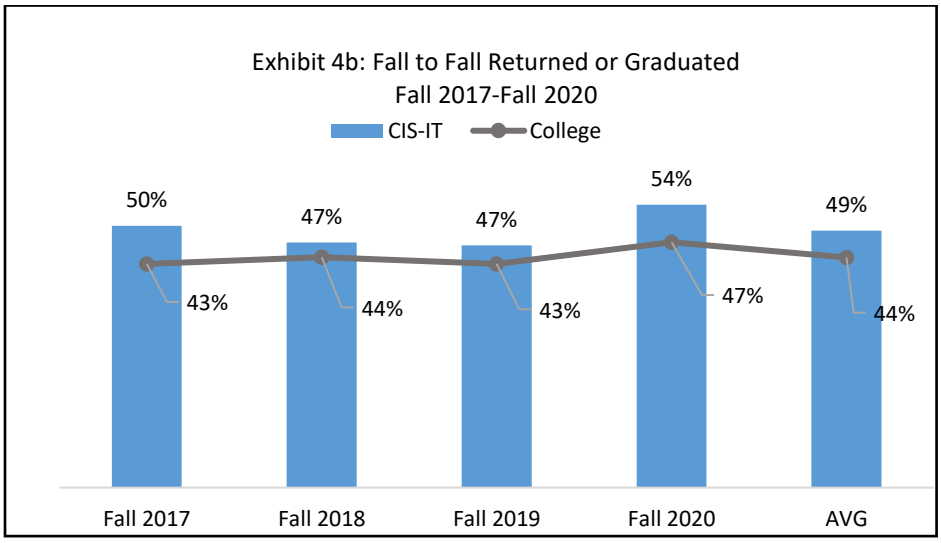
Exhibit 3a: Fall to Spring Retention

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

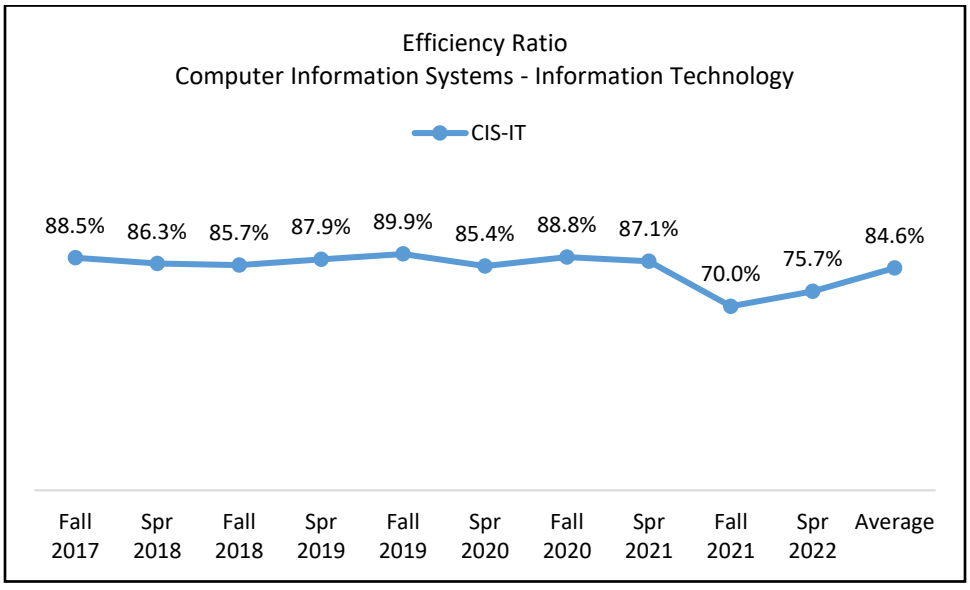
Degrees Awarded						
	2017	2018	2019	2020	2021	Total
Computer Information Systems/Information Tech	75	62	59	80	45	321
A.A.S.	587	530	558	482	241	2398

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.

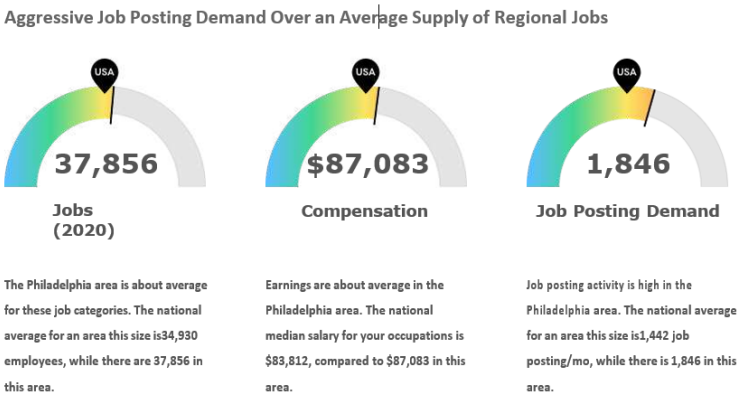


7. Transfer
    - Although CIS-IT is a workforce program, more than one-third of the program graduates transferred to continue their education
    - 43% of the departing students earned 12 or more credits but did not graduate (Total Count of Departing Students, Did Not Graduate, Earned > 12 Credits → (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