

2021-2022 Program Review



CAN Program Review (Instructional) - Computer Science (Fall 2021)

STEP 1: Program Review Narratives

2021-2022

Instructional Program Review (IPR)

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Program Context

1. Mission: *

The mission of the Computer Science Department is multifaceted and diverse.

The department offers an “Associate in Science Degree for Transfer (AS-T)”, which provides a pathway to the California State University (CSU). Students awarded an AS-T degree are guaranteed admission with Junior standing in the CSU system and given priority admission consideration to their local CSU campus or to a program that is deemed similar to their community college major.

Also, the mission of the Computer Science program is to provide up to date Computer Science classes that will “Lead to employment” after receiving an AS/T degree.

Also, it also provides classes in “Essential Computer Science knowledge”, for all majors studying at Canada College. In today’s modern world, nearly ALL majors need to understand computers. It is recommended that all student at Canada College take CIS 118 – Introduction to Computer Science, to help achieve this goal.

Next, it provides the ability to take individual classes to enable individuals to “Update their existing work skills”.

There is a Computer Science Degree and four certificates offered to achieve these goals.

- Computer Science AS/T
- Swift Programming certificate - For Apple computer
- C++ Programming certificate - For serious scientific computing
- Java Programming certificate - For Web base programming
- Oracle Cloud Computing certificate - For Cloud base computing.

Specifically, these mission goals are achieved by offering the following classes:

CIS 118 Introduction to Computer Science – Recommend course for ALL majors.
CIS 122 Introduction to Programming: Python
CIS 242 Computer Architecture and Assembly Language
CIS 250 Introduction to Object Oriented Programming: C++
CIS 252 Introduction to Data Structures - C++
CIS 262 Discrete Mathematics for Computer Science
CIS 284 Introduction to Object Oriented Programming- Java
CIS 286 Introduction to Data Structures - Java
CIS 294 Introduction to Object Oriented Programming: Swift
CIS 295 Amazon Web Services (AWS) and Introduction to Cloud Computing
CIS 296 Amazon Web Services (AWS) and Database Essentials in the Cloud

CIS 297 Amazon Web Services (AWS) and Cloud Compute Engines
CIS 298 Amazon Web Services (AWS) and Cloud Security
CIS 321 iPhone Programming: Swift
CIS 695 Independent Study

Over all, the computer science course offerings have been generally spread across different modalities: online, hybrid and on campus courses. Additionally, there have been daytime and evening classes on campus. The modalities and times address the need of the diverse workforce found in the Bay Area.

With the advent of the pandemic in the beginning of 2020, all Computer Science course offering have been successfully converted into online course. With the diminishing of the crisis, starting Spring 2022, the times and modalities will begin to return to normal.

The department strongly supports the Institutional Learning Objectives (ILO's). Critical Thinking, Creativity, Communications, Community and Quantitative Reasoning, by explicitly teaching how to create, validate and use ones Volitional Conceptual Facility. Only when an individual knows how to think, then they can be truly efficacious in their creativity, reasoning, communication and interaction with those in your community.

The Computer Science Department mission is to welcome and support all individuals, from all countries.

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2. Articulation: *

The Computer Science Department works closely with the Articulation Officer and Curriculum committee to maintain established articulation agreements and update courses when needed in order to address any articulation concerns that may arise. Moreover, regularly updated articulation agreements are imperative in order for students to successfully transfer to 4-year institutions once entering Cañada from high school or to enable a career or academic directional change. The core computer science courses are articulated with the CSU's and UC's. There are no articulation changes needed at this time for existing agreements.

The Canada College Computer Science Department has numerous articulation agreements.

An easy way to view the details of the articulation agreements is by viewing them on <https://www.assist.org/>.

Colleges and Universities with which the Canada College Computer Science Department has agreements are:

Cal Poly University, Pomona
Cal Poly University, San Luis Obispo
Cal State University, Bakersfield
Cal State University, Channel Islands
Cal State University, Chico
Cal State University, Dominguez Hills
Cal State University, East Bay (Hayward)
Cal State University, Fullerton
Cal State University, Long Beach
Cal State University, Los Angeles
Cal State University, Monterey Bay
Cal State University, Northridge
Cal State University, Sacramento
Cal State University, San Marcos
Cal State University, Stanislaus
Humboldt State University
San Diego State University
San Francisco State University
San Jose State University
Sonoma State University
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Los Angeles

University of California, Merced
University of California, Riverside
University of California, San Diego
University of California, Santa Barbara
University of California, Santa Cruz

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3. Community & Labor Needs: *

Analysis of Community labor needs and course offered.

* The program advisory committee meets as needed, and at least once annually in the Spring. It addresses the community and labor needs of the community in offering computer science courses. It will be attended by the following distinguished members:

Advisory Members

Ameer Thompson	Dean Science and Technology Canada College, Bio Science
Nadine Ferguson	Computer Science Professor San Jose State University and Canada College
Kirk Tramblee	Computer Science Professor Canada College, Engineering and Computer Science
William Schwarz	Computer Science Professor Canada College, Software Engineering, Security
James Hoffman	Computer Science Professor Canada College, Computer Scientist, Programmer

The core course topics for the Computer Science AS/T are recommended nationally by the Association for Computing Machine (ASM) and followed the Cal State Chancellor office. See Document folder: ACM Computer Curriculum 2020 Guidelines and ACM Computer Science 2013 Curriculum Guidelines. For an AS Computer Science Programming degree, the recommendation content and semester unit hours are:.

4 units - ACM 0 – Introduction to Computer Science
3 units - ACM 1 – Object oriented Programming
3 units - ACM 2 – Data Structures
3 units - ACM 3 – Computer Architecture
3 units – ACM 4 – Discrete Structure

Note: We can customize the ASM course recommendations to accommodate the labor needs for specific computer programming languages. The analysis of labor needs noted three is a strong demand for specific core computer programming languages. C++, Java and Swift. To accommodate the labor need, the Computer Science AS/T degree has three language tracts: C++, Java or Swift.

* Next, to accommodate those student only seeking a quick study, there are three certificate offered with just the core courses and the selection of a language tract: C++, Java and Swift.

* Also, in conjunction with the Canada College Marketing Department, there was noted a strong labor need for Amazon Web Services (AWS) and Cloud Computing Training. Professor Kirk Tramblee has developed a series of four courses for a Certificate in “Amazon Web Services and Cloud Computing”. It is now being taught at Canada College. The Amazon Web Services (AWS) coursed are being renamed to be consistent. The course titles now all contain: Amazon Web Services (AWS).

CIS 295 Amazon Web Services (AWS) and Introduction to Cloud Computing
CIS 296 Amazon Web Services (AWS) and Database Essentials in the Cloud
CIS 297 Amazon Web Services (AWS) and Cloud Computer Engines
CIS 298 Amazon Web Services (AWS) and Cloud Security

* Also, there was noted a strong labor demand for the programming Language of Python. Python is a major Object Oriented language used in the Development in Machine Learning and Artificial Intelligence (AI). The course CIS 122: Introduction to programming: Python, was developed and is now taught at Canada College.

The labor market data, as applicable to computer science.

* According to US Bureau of Labor Statistics (<https://www.bls.gov>). As of May, 2020, California and specifically the Bay Area is the highest employer of technical computer users in the USA. There are over 450,000+ employed in California alone. (https://www.bls.gov/oes/current/oes_ca.htm)

The US Bureau of Labor notes strong labor market demand for CS majors. The strong labor demand supports the likelihood that the courses for the AS degree and the CS certificates will have growing and sufficient enrollment.

Representative Sample of labor for 'common' computer science fields" in California, May 2020, US Bureau of Labor:

			Count	Growth
Computer and Information Research Scientists	7,170	10.1%		
Computer Network Support Specialists	15,390		5.1%	
Computer User Support Specialists		75,950	2.6%	
Computer Network Architects			19,650	6.3%
Network and Computer Systems Administrators	31,430	3.0%		
Database Administrators and Architects		15,600	4.5%	
Computer Programmers			21,800	7.3%
Software Developers and Software ...				
... Quality Assurance Analysts and Testers		249,700	3.5%	
Web Developers and Digital Interface Designers	22,020	4.6%		
Computer Occupations, All Other			83,170	2.8%

It should be noted that Computer Science majors commonly have DUAL majors. Employers look for and prefer labor who have a Subject Matter Expertise (SME) and knowledge of Computer Science, so they can 'process' the subject Matter Data. The statistics given by the US Bureau of Labor Statistics' data does not reflect this reality. Thus the actual Labor count listed above are undercounted and the true demand for computer science labor is under represented.

It should be recommend too many majors at Canada College that employer's prefer graduates with a knowledge of Computer Science. Other majors should be encouraged to have a dual major in Computer Science or at the very least a minor in Computer Science. There is a strong labor demand for graduates to have a knowledge of Computer Science.

Looking Back

4. Curricular Changes: *

The Computer Science Department works closely with the Articulation Officer and Curriculum committee to maintain/update published and established course curriculum when needed.

** Degree/Certificate Updates **

Degree: AS/T Computer Science
 Faculty Contact: William Schwarz
 Action: No Update Needed

Certificate: Computer Science: C++
 Faculty Contact: William Schwarz
 Action: No Update Needed

Certificate: Computer Science: Java
 Faculty Contact: William Schwarz
 Action: No Update Needed

Certificate: Computer Science: Swift
 Faculty Contact: William Schwarz
 Action: No Update Needed

Certificate: Computer Science: Cloud Computing
 Faculty Contact: Krik Tramblee
 Action: No Update Needed

** Course Updates **

Course: CIS 118 - Introduction to Computer Science: C++

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 122 - Introduction to Programming: Python

Faculty Contact: Nadine Ferguson

Action: No update needed

Course: CIS 242 - Computer Architecture and Assembly Language

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 250 Introduction to Object Oriented Programming: C++

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 252 Introduction to Data Structures - C++

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 262 Discrete Mathematics for Computer Science

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 284 Introduction to Object Oriented Programming- Java

Faculty Contact: James Hoffman

Action: No update needed

Course: CIS 286 Introduction to Data Structures - Java

Faculty Contact: James Hoffman

Action: No update needed

Course: CIS 294 Introduction to Object Oriented Programming: Swift

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 295 Amazon Web Services (AWS) and Introduction to Cloud Computing

Faculty Contact: Kirk Tramblee

Action: No update needed

Course: CIS 296 Amazon Web Services (AWS) and Database Essentials in the Cloud

Faculty Contact: Kirk Tramblee

Action: No update needed

Course: CIS 297 Amazon Web Services (AWS) and Cloud Compute Engines

Faculty Contact: Kirk Tramblee

Action: No update needed

Course: CIS 298 Amazon Web Services (AWS) and Cloud Security

Faculty Contact: Kirk Tramblee

Action: No update needed

Course: CIS 321 iPhone Programming: Swift

Faculty Contact: William Schwarz

Action: No update needed

Course: CIS 695 Independent Study

Faculty Contact: William Schwarz

Action: No update needed

**** Website Review ****

The Computer Science Website at <https://canadacollege.edu/computerscience/degree.php>

Faculty Contact: William Schwarz

Action: No update needed - Fully updated with all degree, certificates, and courses. Fall 2020

**** SLO and PLO's update Contacts ****

Faculty Contacts: William Schwarz, Krik Tramblee, Nadine Ferguson, James Hoffman

Admin Contact: Jose Perez Curriculum

Department Contact: Dean Science and Technology Ameer Thompson

The SLO's are all updated for all classes, except CIS 284 SLO 3.. Its Update is in progress. Oct 2021.

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5A. Progress Report - IPC Feedback: *

This 2020-2021 Program Review addresses any Prior Feedback by offering more details and analysis in each of the review sections.

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5B. Progress Report - Prior Program Goals: *

A prior goal was the creation of a stream-lined SLO's assessment Guide to help Adjunct faculty update SLO's Assessments using the Improve (TracDat) online Assessment system.

The Issue: Difficult to get SLO's assessments from Adjunct Faculty for the classes they teach. It is very difficult to get working professional adjuncts to do the SLO's. Thus our listing is incomplete.

Proposed Solutions: Action Required - Create a Guide and Train Adjuncts

The Goal is being carried forward and directed to the following Individuals:

* Dean Ameer Thompson - Assign time for creation of guide and training..

* Canada College Technical Training Officer for faculty

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6A. Impact of Resource Applications: *

The completion of Building 23 with it two dedicate Computer Science 'Smart' classrooms, and 20+ computers in each room has filled a major Resource need for the Computer Science Department. It has made a significant impact. Students can either bring their own PC to class, or utilize the class room PCs.

* Recurring Software resources updates:

Mainly there is the need to periodically update the following software on all the computers in the two computer department class rooms: 23-140 and 23-141.

* BlueJ - Java IDE

* Microsoft Visual Studios - IDE for C, C++, Java, Python

* Microsoft Office - Full Edition

* Eclipse - Java IDE

* Maria Simulator - For Assembly Programming

* ASM - For Assembly Programming

* - For Python Programming

* CPU-Z for hardware inquiry

* Web Browsers: Firefox, Brave, TOR

Working closely with Canada College's Information Technology Services department, the Software updates are make as needed.

Additionally, Technology Services updates software in the STEM center and Library computers so they can be used by Computer Science Students.

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6B. Impact of Staffing Changes: *

** Staff changes **

There has been a steady level of staffing for the Computer Science program for the last 4+ years

Staff Name: Nadine Ferguson

Faculty: Adjunct

Staff Name: Kirk Tramblee

Faculty: Adjunct

Staff Name: James Hoffman

Faculty: Adjunct

Staff Name: William Schwarz

Faculty: Full Time Tenured

There may be a need to hire a new adjunct faculty. There are is a possible need to offer CIS 242 and CIS 262 twice a year instead of once a year. There is also the possible need to offer CIS 294 and CIS 321 Swift programming courses, so students can complete the SWIFT - Apple programming language tract.

There is a definite need for the dean to review how to deal with the above mentioned issues.

There may be a simple resolution: Ask existing Adjuncts to teach the newly offered sections for those classes.

The existing faculty have demonstrated the flexibility to staff additional classes in the past.

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Current State of the Program

7A. Enrollment Trends: *

The enrollment trends for Canada College on a whole are flat or decreasing.

The enrollment trend for the Computer Science Department is increasing.

The Program Review Data Packet, for Computer Information Systems, the Computer Science Department, shows that the number are mostly increasing for the last three years for 3 measurable outcomes: Course Enrollments, FTEF, Section Count. The load dipped but is back up in 2020-2021.

Year	Course Enrollments:
2018-2019	549
2019-2020	565
2020-2021	661

Year	FTEF
2018-2019	5
2019-2020	6
2020-2021	7

Year	Section Counts
2018-2019	22
2019-2020	25
2020-2021	27

Year	Load
2018-2019	391
2019-2020	338
2020-2021	382

The analysis it that the demand for labor "with knowledge of computer science" is increasing and that the population is aware

of this, and are signing up for classes.

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7B. Significant Changes in Your Program: *

There are three significant changes to the program.

* First, a significant change to the program is the addition of the Amazon Web Services (AWS) and Cloud Computing Certificate. Professor Kirk Tramblee has developed a series of four courses for a Certificate in "Amazon Web Services and Cloud Computing". It is now being taught at Canada College.

- CIS 295 Introduction to Cloud Computing
- CIS 296 Database Essentials in the Cloud
- CIS 297 Amazon Web Services (AWS) and Cloud Compute Engines
- CIS 298 Amazon Web Services (AWS) and Cloud Security

* Second, there was noted a strong labor demand for the programming Language of Python. Python is a major Object Oriented language used in the Development in Machine Learning and Artificial Intelligence (AI). The course CIS 122: Introduction to programming: Python, was developed by Nadine Ferguson and is now taught at Canada College.

* Third, all courses are now Distance Education compliant in Curricunet, and can be/are taught fully online. This change was largely driven by the all classes going online as necessitated by the pandemic.

* There are no other significant program changes.

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7C. Planning for Your Program: *

** Future Plans

1. Develop curriculum for Your Personal Computer and Electronic Security.

DESCRIPTION

Develop a one unit course to train community members and organizers in general how to increase Computers Security and Electronic Security. Covers: Internet Secure Browsers like TOR and Brave, Cookies types, Cross site tracking, Browser fingerprinting, ISP logging, VPNs End point problem, Proxies, IP addresses, VOIP, Operation Systems, Anti Virus software, Biometrics like Voice or Image Recognition systems, Mesh networks and Internet of things (IOT), cell phone security, types of different Blue tooth signals, Wi-Fi vers Cable, Near Field Communications, Vehicle system monitoring like OnStar and others, Smart phone app security, AI systems like Amazon Alexa, Microsoft Cortana, and Apple Seri , the Cloud, email monitoring and privacy, PC and smart phone application monitoring, store monitoring, search engine logging, Smart TV's, road system monitoring, 'The right to be forgotten", and more.

CIS: Your Personal Computer and Electronic Security

Measurable outcomes:

A new course submitted in time for the 2022/2023 catalog. Class to start in late 2022.

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8A. Access & Completion: *

Is it possible for a student to complete the AS/T Computer Science degree, and all the four certificates at Canada College while taking/accessing only classes at Canada College ?

These are all the course offered at Canada College used for the AS/T Computer Science degree:

- CIS 118 Introduction to Computer Science – Recommend course for ALL majors.
- CIS 122 Introduction to Programming: Python
- CIS 242 Computer Architecture and Assembly Language
- CIS 250 Introduction to Object Oriented Programming: C++
- CIS 252 Introduction to Data Structures - C++
- CIS 262 Discrete Mathematics for Computer Science
- CIS 284 Introduction to Object Oriented Programming- Java
- CIS 286 Introduction to Data Structures - Java

CIS 294 Introduction to Object Oriented Programming: Swift
CIS 321 iPhone Programming: Swift

The Frequency of the AS/T degree courses:

Analysis:

- 1) The Degree is possible to complete at Canada, since all course are frequently offered/accessible at Canada.
- 2) The AS/T has three language tracks: C++, Java and Swift.

Currently the C++ and Java course language tract has faculty to teach the courses.

There is a need to hire an adjunct the CIS 294 and CIS 321 Swift language specific course.

- 3) There is a need to offer CIS 242 and CIS 262 in both the Spring and Fall, to increase the speed in which a student can graduate.

Outcomes: There is a need for the Dean to looking at the viability of hiring Adjuncts to teach the two courses for frequently.

Course	Fall	Spring	Summer
CIS 118	Yes	Yes	Yes
CIS 250	Yes	Yes	Yes
CIS 252	Yes	Yes	No
CIS 284	Yes	Yes	No
CIS 286	Yes	Yes	Yes
CIS 242	Yes	No	No
CIS 262	No	Yes	No

The Frequency of the Programming: C++ Certificate

Analysis: The Certificate is possible to complete at Canada, since all course are frequently offered/accessible at Canada.

Course	Fall	Spring	Summer
CIS 118	Yes	Yes	Yes
CIS 250	Yes	Yes	Yes
CIS 252	Yes	Yes	No
CIS 242	Yes	No	No
CIS 262	No	Yes	No

The Frequency of the Programming: Java Certificate

Analysis: The Certificate is possible to complete at Canada, since all course are frequently offered/accessible at Canada.

Course	Fall	Spring	Summer
CIS 118	Yes	Yes	Yes
CIS 284	Yes	Yes	Yes
CIS 286	Yes	Yes	No
CIS 242	Yes	No	No
CIS 262	No	Yes	No

The Frequency of the Programming: Swift Certificate

Analysis: Two courses, CIS 321 and CIS 294 needs to be offered so a student can complete this certificate

These two classes have not been offered in the last two years.

// Needed Outcome - Strongly recommend to the Dean, the need to hire an adjunct to teach CIS 321and CIS 294

Course	Fall	Spring	Summer
CIS 118	Yes	Yes	Yes
CIS 294	No	No	No
CIS 321	No	No	No
CIS 242	Yes	No	No
CIS 262	No	Yes	No

The Frequency of the Programming: Amazon Cloud Computing Certificate

Analysis: Depending on the demand for each class, certification completion may not occur.

Recommend Outcome: The Dean and the the professor teaching these classes need to discuss the issue and resolve it.

- CIS 295 Amazon Web Services (AWS) and Introduction to Cloud Computing
- CIS 296 Amazon Web Services (AWS) and Database Essentials in the Cloud
- CIS 297 Amazon Web Services (AWS) and Cloud Compute Engines
- CIS 298 Amazon Web Services (AWS) and Cloud Security

In summary, there is an need to look into offering CIS 321, CIS 294, CIS 242 and CIS 262 more frequently, so the student can

graduate faster or complete the SWIFT language tract.

* Changes that can be made:

There may be a need to hire a new adjunct faculty member. There is a definite need for the Department Dean to review how to deal with the above mentioned issues. There may be a simple resolution: Ask existing Adjuncts to teach the newly offered sections for those classes. The existing faculty have demonstrated the flexibility to staff additional classes in the past.

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8B. Student Equity: *

Overview:

Note the gaps in the PRIE statistics on Access and Performance and more, based on Racial/Ethnic/Gender/First Generation characteristics.

Upon carefully studying the PRIE statistics and their values, the PRIE statistics show that largest inequity gaps are with Black and Latinx, along with inequity gaps between male and female students for the computer science department and Canada College. Here, there are serious questions asked, and serious up-to-date and modern Answers/Solutions are offered and implemented to reduce the gaps! These solutions are based on serious feedback from "Staff", "Faculty", "Students" and "Experts in Modern pedagogical teaching methods".

Please do not ignore student's self-reported reasons for the gap issues! The answers to reduce the PRIE statistical equity gaps are not 'simple'. They involve MANY elements! The following discussion involves many elements to address the gaps issue. IT DOES NOT ADDRESS THEM ALL. Also note that the focus is on what can be done for those PRIE identified groups and the statistical gaps !

Main Section:

This analysis and solutions needed, or currently implemented, are divided in to the following sections:

Part 1 - Access Issues

Part 2 - Student self-Analysis of the Reasons for Performance and Retention gaps

Part 3 - New MODERN teaching Pedagogical methods and reducing PERFORMANCE gaps.

Part 4 - Student Preparation for the class.

Part 5 - Conclusions

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PART 1 - Access Issues

The question - Is there any systemic issue with Canada College with the admission processes for the admission of male versus female, or Hispanic and Black students, possible first generation college students and other groups to Canada College and the computer science courses ?

A) Analysis - Upon discussion with other professors, counselors and diverse students the following is found:

POSITIVES:

- * There are no systemic/Registrations impediments to access/register at Canada College
- * There are no systemic/Course enrollment impediments to take COMPUTER SCIENCE courses, with the exceptions of:
 - Money paid for class
 - Existing course prerequisite
- * There is virtually complete and open access for any diversity gap individuals like latinx students to register and enroll in classes at Canada College. The California constitution forbids it. This is evident with a 42% latinx population. You will find there are no restrictions on gender, ethnicity (like latinx), religion, sexual orientation, immigrations status (Dreamers) and other characteristics. The only other restrictions are for High School students, or International Students.

B) Solutions:

IMPROVEMENTS NEEDED:

- * Increased encouragement/assistance from our Academic Counseling Department for female, Hispanic and black students,

and first generation college students to enroll in Computer Science classes.

- Note: For diversity gap Latinx students, and others, to be more successful in college and in the workplace, the Counseling department should seriously encourage enrollment in CIS 118 - Introduction to Computer Science. Computer are used in virtually all professions today.

* Staff and Faculty need to Engage with the PUENTE and UMOJA programs to try to increase enrollment, of latinx and black male and female gap students, in computer science courses, to reduce the gaps.

* Increased financial aid/scholarships to allow diverse gap student in college and study computer science

* Increased outreach to diverse high schools to encourage enrollment in Computer Science classes

* To increase the zero cost/online books used for the computer science courses for gap students

* Enrollment Imbalance found with women. The counseling department need to increasingly encourage more females to study Computer Science. Fortunately, the gender gap has been steadily reduced.

AWARENESS of Canada College and the Computer Science Department:

* One reason for the gender gap and other ethnic gaps is lack of awareness that Canada Colleges Exists, and what Canada College and the Computer Science department can offer to diverse gap students. So, there needs to be more advertising of Canada College and the computer science department to diverse students.

COMPETITION for other colleges:

* Competition - Many of the diverse gap students choose to attend college of San Mateo, or other Community colleges, or universities where there are more majors and computer sciences classes. Is this case, it is a case of "more access" to greater resources elsewhere. This competition skews the equity gaps statistics.

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PART 2 - Gap classified Student Analysis of the Reasons for their Performance and Retention

A) Analysis - The retention and performance: Ethic Hispanic, Black, Pacific Islander, male and female students report the reasons that effect their performance and retention in the computer science classes. To those diverse students, these are SERIOUS issues that cause the inequity performance gaps, which are personal to them. Do not ignore them. The 8 top reasons that interfere with their success/performance, that the gap students explicitly and repeatedly reported, to the departments' professors:

A) Analysis - What are the ISSUES:

1* Work requirements

Percentage of Canada College Students surveyed May 2021 reported:

24% work > 20 hours per week

11% work >11-30 hours per week

16% work 11-20 hours per week

11% work 6-10 hours per week

25% work 0 hours per week - None

The fact that student work so hard show their STRENGTH in solving many of their problems !

2* Family life and support issues - these are disproportionally reported by female students.

3* Lack of timely Tutoring Support Issues outside of the class room

4* Personal Health Issues / and the 'Pandemic' of 2020 and 2021

5* Monies issues

6* Transportation issues

7* Study habits/Logical Thinking

8* Mental Health Issues

B) Analysis and SOLUTIONS:

There are current solutions that help diverse gap discussed in the PRIE gap students. Canada college addresses/has solutions for many of the STUDENT identified and Canada College Identified, reasons for the above PRIE GAP issues. There are many serious programs, and money and effort expended to close/reduce the gaps issues. These students are STRONG and they can be part of the solution.

1) Many of the issues might be mitigated to different degrees by a gap student contacting a Canada College Counselor:

Academic or personal. Professors need to point students to resources at Canada that might help. To help in this, Faculty and Staff need to inform gap students to go speak with a counselor and tell them their issues so they can get the help they may need.

2) The STEM center, the Canvas System WEB tutor link, and other Tutoring centers at Canada College, should be give more resources and advertising to let the gap student know they are there to help with their class success and performance. The Computer Science department professors do tell the gap students that these types of tutoring are available. When student engage with tutors they become STRONGER.

3) Monies issues may be addressed by the Career Center and the Job fairs it holds. Today there is a shortage of workers... There are job posting everywhere. This should be a non-issue at this time. Need a Job? Go to T-Mobile, they have a signing bonus of \$2,000. Also, they should direct students to apply for scholarships. The NSF scholarships are a great source of scholarship for STEM computer science. Additionally, gap students should be informed of internships available. Currently Computer Science professors put links and information on their Canvas web site inform gap diverse students of these opportunities. The STEM center actually holds sessions that walk them through many of these financial opportunities.

4) Health issues should directed to the Student Health center. When healthy and stronger, they can perform better.

5) Transportation issues... monies for free bus transportation or carpools with other students.

6) Study Habits and methodologies. Many gap students are first generation college students, and have a need to learn an effective study method.

a) There are courses at Canada College that help, contact the library.

b) Part of the course content for many computer science classes is for students to learn a clear cut study method based on Modern Cognitive Psychology and its teaching pedagogy.

* Learning to create, evaluate, identify valid and invalid concepts, and use concept.

* Learn to write a summary of key concepts.

* Learn to integrate key concepts to a conceptual hierarchy/knowledge tree, to promote:

Validation, long term retention, and use.

7) Mental Health Issues, direct a student to the Personal Counseling Center.

8) No lack of computing resources or computers to be used by gap Students of the computer science dept.

a) The library loans out computers.

b) Some programs give out free computers...that the student can keep !

c) The computer Science Department has two dedicated class rooms to teach computer classes.

In each of the two room are 20+ computers available for the student to use.

d) The Tech Support installs computer science need software on available computers in the STEM Center and Library, and learning centers.

9) Support of family members, especially children can be helped by a Day Care Center at Canada College. Stress issues may be helped by a mental health center at Canada College.

Other support issues for ailing family member, are not addressed.

10) There are so many programs and resources at Canada College that help diverse gap students... the list is LONG. The fact that many PRIE gap students participate in the programs shows their STRENGTH and effort they exert to succeed.

The diverse equity gap latinx students, and other gap students, need to be more informed of all the resources available at Canada College, to further reduce the PRIE statistical gaps.

PART 3 - New MODERN teaching Pedagogical methods and reducing the Performance/Retention gaps for the diverse Latinx and other gap students mentioned the PRIE statistics.

Note: The new pedagogy discussed here is a MODERN serious demonstratively effective solution to reducing Performance/Retention GAPS by the PRIE identified Groups. It is based on the new discipline, the science of: Cognitive Psychology/Cognitive Science.

A MODERN SOLUTION:

The New MODERN Pedagogical teaching methods and how they can successfully address the reduction in Performance/Retention gaps for Male vers Female, Ethic Hispanic , Pacific Islander, Black, first generation college student, gender identification and more, are discussed here. Learn and use the key tool to success. Success breeds happiness !

Sections:

*** 1) Origins

- Multidisciplinary

*** 2) Key Issues

- Hardware and Software

- Conceptual Facility - Key to performance and success for diverse gap identified students

*** 3) Application of MODERN teaching Pedagogy the Class room

- Class room environment

- Written Lectures

- Spoken Lectures

- Lab time

*** 4) Application by the PRIE gap students

- Comprehension

- Retention

*** 1) ORIGINS:

Note: The department here, in analysis, is the COMPUTER SCIENCE department and programs efforts to close the PRIE gaps.

It is interesting to note that with the advent of computers and computer programming, there was the creation and growth of a branch of psychology called COGNITIVE PSYCHOLOGY/Cognitive Science. Today, computer science concerns itself with all branches of knowledge, and cognitive psychology/science is at its CORE.

Computer science is truly interdisciplinary. The branches of Philosophy: Metaphysics, Epistemology and Ethics, Digital circuit Engineering, Object Oriented programming, Boolean and Symbolic logic, Artificial Intelligence and Machine Learning: Voice, speech and Image recognition, Physiology (Inputs- 5 senses, Process-Cognitive Facility, Store-Memory and output(vocal, written, physical), Cognitive PSYCHOLOGY, and more have engaged many of the brightest minds. Do you talk to or use the Artificial Intelligences (AI's): Amazon ALEXA, Microsoft Cortana, Apple Siri, or Google Assistant? They involve all the above disciplines and more. Computer Science is truly interdisciplinary and amazing. Computers and AI's makes life happier.

"Hay Alexa, play my favorite song"

*** 2) KEY ISSUE:

The modern principals of cognitive psychology/science can seriously help any gap diverse student increase their performance. Specifically, computer science concerns itself with how a human mind 'actually' functions, and all the factors involved. Cognitive Psychology/Science and Computer Science run in parallel today! Do you still love your smart phone and its AI ?

Computer Science and Cognitive Psychology have identified the key characteristic of an individual human being: Their 'Cognitive Facility'. In the MODERN world of computer science today, is all about mimicking how the mind actually works, both in hardware and software (Body and soul).

The major cause for Performance/Retention issues has been identified clearly with the Development of Cognitive Psychology/Science. An effective teaching pedagogy centers on the correct identification of the characteristics of the human Cognitive Facility. Cognitive Psychology/Science studies the unique method for a human, (Male or Female, Hispanic, Pacific Islander, Asian, black and all other individuals PRIE identified groups), needs to 'live' in his world: It is to develop their Cognitive Facility.

*** 3) APPLICATION of the MODERN 'COGNITIVE PSYCHOLOGY/SCIENCE' TEACHING PEDAGOGY IN THE CLASS ROOM:

--- Class room Cognitive Psychology/Science induced "positive" class climate and Environment.

* A Healthy room/learning environment induced by focusing on their Cognitive Facility, not on non-subject tertiary characteristics.

* Knowing that the world is Knowable/Understandable yields a positive attitude.

* How so ? Thought learning how to correctly create, use, validate and integrate their ideas/concepts into a non-contradictory whole.

Note: when ideas are 'contradictory' students are not 'happy' and have 'reduced performance'.

When Ideas, thought and actions are integrated, the term used is "Integrity".

We are striving for successful, high performing and happy PRIE identified diverse students with "Integrity".

--- Written Lectures - induced faster learning

* Written word and diagram learning modality

* Define correctly terms: Differentia (Definition) and Genus (Integration)

* Diagram Integration of terms from top-level general concepts down the hierarchy of concepts

to more and more-specific concepts in a conceptual hierarchy. Special note: Integration is association, and association is the best method to remember/retain long term the material of the class, so they can use it in later classes and in the work force. This yields a happy and efficacious PRIE identified gap student, and reduces performance gaps !

* Learning logical fallacies of ideas with no connections to physical reality, which are all too common today is stressed. Identifying how to avoid, invalid concepts and the miss use of concepts, increase PERFORMANCE and reduces PRIE Gaps !

--Spoken Lectures - Integrated knowledge induces more engagement

* As the Cognitive Psychology/Science pedagogy teaches, a professor, to have the best positive environment for students, they must understand the physical foundation of the ideas/concepts presented in the class, and be able to walk up and down the "conceptual hierarchy", showing how the parts fit together. Why? All things are composed of parts and those parts are required to be assembled correctly to work. A positive learning environment is an efficacious teacher who can demonstrate how to correctly create, use, validate and integrate the concepts into a FUNCTIONING whole. Consider it like the puzzle of knowledge, the more pieces you know, then the more of the puzzle you can put together, and you get a bigger picture, and performance is significantly improved. Note: A working smart phone is more useful than a 'bricked' smart phone. Which one makes you happy?

--- Lab time/Assignment - Personal Experience solidifies learning.

* Learning by doing - personally identifying the pieces and fitting them together, verifies the truth of the concept and how it is integrated with the whole of knowledge. What does a tree of knowledge look like ? A living tree of knowledge is better than a bunch of dead branches depressingly disconnected from the earth, molding randomly on the ground. Personally integrate/validate concepts !

*** 4) Application by the PRIE gap students of the Learning methods of Cognitive Psychology/Science

Every class needs to incorporate/weave-in and teach the effective learning methods, to increase PERFORMANCE for the PRIE Identified gap students.

-- Initial lessons of Cognitive Psychology learning

* STRENGTHS gap Students possess are that once introduced to the methods, they readily see its effectiveness and apply to other classes!

* Lesson Illuminating a human minds key structures, its conceptual nature.

What is STEM - the philosophy of science and the nature of existence.

Things have an identity and gap students have the STRENGTH to know how the world works.

Limited short term memory span - which necessitates the need to create and use concepts.

What are concepts: the reduction of many entities into one concept, by noting that they all share the same defining/essential characteristics.

The non-contradictory integration of new ideas into a Tree/Hierarchy of Knowledge

Identification and avoidance of invalid concepts and integrations.

How to be creative and create new integrations

- Benefits to PRIE gap identified students

Significantly improved performance

Emotions have a cause: increase performance cause efficacious and happier gap student

Causes student interactions to be more thoughtful and friendly, by focusing on their Cognitive Facility, not on non-subject tertiary characteristics.

Increased creativity - Note this an Institutional Learning Objective !

Part 4 - Student preparation for the class.

Issue: Latinx Student and other gap students, self-report that most have never taken a class in concept creation, use, validation and integration, or Logic or Clear thinking.

Solutions: The computer science department full time professor is continuing to incorporate and weave the in an understanding of concepts and logic in all the core computer science program classes. Other computer science faculty, and Administration need to learn and incorporate the Cognitive Psychology Teaching Pedagogy.

Gap Student Response to the Cognitive Psychology/Science based Teaching pedagogy:

- * Students express a STRONG appreciation for learning the logical thought processes need to SUCCEED in STEM and life.
- * Students express a STRONG appreciation for a Healthy room/learning environment induced by focusing on their Cognitive Facility, not on non-subject tertiary characteristics.
- * Students express a STRONG appreciation for learning, and a recognition of that they are capable of understanding and applying their new found understanding of themselves, and the correct use of their cognitive functions.

**

Part 5 - CONCLUSION:

While this analysis does not cover the infinite possibilities for the 'causes' of and the solutions to ACCESS, PERFORMANCE and RETENTION of all the PRIE identified classes of students, it definitely address the several key issues and offers effective solutions.

Over all Canada College has tremendous resources available that increase equity and performance, which are openly accessible to diverse student Identified in the PRIE Statistics. Canada college PRIE statistical student show their STRENGTH by solving many of their issues. Solution: There should be a required orientation for students informing them of the wonderful and numerous helpful resources available at Canada College. These resources can set the foundation for greater student success/performance for a diverse student. There needs to be a written 'Quick Guide' for the resource emailed/sent at the beginning of each semester, and available online.

What the Computer Science Department: Staff and Faculty can do.

The Faculty and Staff of the Computer Science Department can embrace a STEM modern scientific Cognitive Psychology/Science Based Teaching Pedagogy. This truly effective solution that can help close the performance/retention gaps for latinx students. It will work also for the gender gap, the ethnic gap and all others.

The application of the MODERN science of "Cognitive Psychology/Science", is beginning to be applied to the teaching of Computer Science department classes. Cognitive Psychology parallels Computer science classes and is all about the creation, validations and use of concepts/classes and the integration of concepts/classes. It is about positive outcome by embracing the Pedagogy. It is about being in accord with how thing actually are, and efficacious and happy gap diverse students. It is about reducing the performance/retention GAPS found in the PRIE statistics. It is about a Healthy room/learning environment/classroom induced by focusing on their Cognitive Facility, not on non-subject tertiary characteristics.

The creation of the written and spoken lessons based on MODERN, validated and effective teaching methods, based on "Cognitive Phycology/Science" is needed. They can significantly help close the retention and performance gaps mentioned in the PRIE statistics. It is about making/creating an exceptional classroom experience by highlighting the use a student intellectual strengths.

<https://canadacollege.edu/assessmentsloplo/ilos.php>

Remember: Remember the #1 Institutional; Learning Outcome (ILO) at Canada College is to teach:

* Critical Thinking!

The Cognitive Psychology/Science Teaching Pedagogy does exactly that. Its good use promotes safe classrooms, students intellectual STRENGTHS and performance, for underperforming Latinx students and more.

Note: It is good to discuss a proven and effective MODERN teaching Pedagogy based on Cognitive Science, a pedagogy based on numerous scientific disciplines , and its application in numerous reality based STEM based Computer Science courses. Student's performance becomes STRONGER with its application in the classroom **

Note: Many solutions also not just applicable to PRIE groupings, but to other many other students and the personal issues that affect their access, retention and performance. It is impossible to separate them.

* * *

8C. Completion - Success Online: Student Success

* With the transition to all online class for the computer science department, along with the increased demand for computer science graduates, the computer science department has seen an increase in enrollment in the last three years.

** Success and Withdraw Rate

	Success Rate	Withdraw Rate
2016-2017	67%	22%
2017-2018	68%	20%
2018-2019	65%	18%
2019-2020	66%	17%
2020-2021	58%	26%

Success Rate Modality

Success and Withdraw Rate

	Success Rate	Withdraw Rate
2016-2017	67%	22%
2017-2018	68%	20%
2018-2019	65%	18%
2019-2020	66%	17%
2020-2021	58%	26%

Analysis: Contributing factors for the 4 year decrease of the withdraw rates and last year's increase:

Pandemic Issues:

Before the pandemic, 2017 to 2020, the withdrawal rate, went down from 22% to 17%. This decrease was because of efforts of staff and faculty. However, during the last 18 months of the pandemic, students and their families have been negatively impacted in many ways. The withdrawal rate increase for the 2020-2021 clearly reflect the serious issues brought upon by the pandemic !

Additional factor affecting the Withdrawal rate for all groups:

- 1) Many student inform the professors the reason that they are not participating, or for the need to withdraw is because they are enrolled in too many courses, and that they only can devote little time to each course. The academic counselors department should strongly monitor students' academic loads with their success rates.
- 2) Many students state that they work part time or full time, and need to take care of family. They inform the professors of that as a reason for their lack of full participation, or need to withdrawal.
- 3) Many students inform the professors that the reason they enrolled in the course is primarily because of the recommendations from the Academic counseling department. The academic counselors have constantly recommended students take an intermediate or advanced computer science course they are not prepared for academically. This causes students be 'administratively' withdrawn by the professor for non-participation, and also causes the student to withdraw themselves.

To address this issue, student are informed at the beginning of every class, via emails, and message board online in Canvas, what suggested prerequisites are required for a class. However, student generally ignore the issue and stick it out for several weeks and then truly discover they are unprepared. They then start thinking about withdrawal. The computer science department faculty has attended the counseling department meetings many times, to keep reminding the counselor of the issue ... of them recommending students take the incorrect level of CIS class.

4) Lastly, some students sign up for the class, with the intent of not seriously participating. They clearly inform the professors of this and that regardless of their success, they need to stay in the class to collect their student monies, and they strongly request not to be dropped.

The above combination of issues accounts for the success rate and withdrawal rate, and their fluxations.

** Success Rate Modality

* Face to Face

	Success Rate
2016-2017	69%
2017-2018	70%
2018-2019	64%
2019-2020	72%
2020-2021	63%

* Online

	Success Rate
2016-2017	60%
2017-2018	63%
2018-2019	67%
2019-2020	62%
2020-2021	57%

* Analysis:

Many students state a preference for face to face class rooms, because they find it increases their success rates.

The above statistics show that is indeed the case! The statistics show a 4-10% increase in the in success when a student take a face to face class. This is historical and has always been the case. There are different modalities of learning and face to face is highly preferred by students.

With the advent of the pandemic, and all computer science classes were converted to online class for the duration. Since all CIS classes are now online, student have been forced to take online classes. Many student who would other wise learn better in face to face classes, now must take online classes. The increase of an additional 5% in the withdrawl rate can be attributed to the pandemic, specfically:

- * A switch to a 100% online modality
- * The increase family and health issues
- * The increase in work/money/economic issues

* Further efforts to keep the rate increase low:

To reduce the withdrawl rate, online classes in Canvas classes have been structured to minimize the impact of students converting to online. Each online class should consists of a well structured layout. They are organized in a clear weekly format.

* Week 0 - Explanation of all the class elements

* Each subsequent week:

- * Objectives
- * Pretest
- * Written Lectures, Recorded Video Lectures and Zoom meeting lectures
- * Online Discussions
- * Assignments
- * Quiz or Exam: Midterm and Final

The professor logon daily to quickly address any student issues and questions.

Over all, the Computer Sciece Department is working hard to minimize the huge impact of the pandemic.

**

9A. SLO Assessment - Compliance: *

Results for the SLO's Assessed for Compliance and Relevance to the Course

CIS 118 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Eighty percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 2 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Eighty Eight percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 3 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Eighty Eight percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 4 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Eighty Eight percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

CIS 242 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Ninety percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 2 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Ninety percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 3 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES
Results Eighty Seven percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
Action No Action is required

SLO 4 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Eighty Four percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 5 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Eighty Four percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

CIS 250 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Eighty Nine percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 2 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Ninety six percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 3 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Ninety six percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 4 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Ninety six percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

CIS 252 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Eighty two percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 2 Relevant SLO YES
Benchmark 75% of the students will earn a score of 75-100%
Criterion Met YES

Results Eighty nine percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 3 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Ninety percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 4 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results One Hundred percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

CIS 262 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Ninety two percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 2 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Ninety eight percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 3 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Eighty four percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 4 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Ninety two percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

CIS 284 Individual SLO's Results and Assessments

SLO 01 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Seventy five percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 2 Relevant SLO YES

Benchmark 75% of the students will earn a score of 75-100%

Criterion Met YES

Results Seventy five percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.

Action No Action is required

SLO 3 Relevant SLO NO
 Benchmark 75% of the students will earn a score of 75-100%
 Criterion Met NA
 Results NA - percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
 Action Action is required - SLO to be update

SLO 4 Relevant SLO YES
 Benchmark 75% of the students will earn a score of 75-100%
 Criterion Met YES
 Results Seventy five percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
 Action No Action is required

SLO 5 Relevant SLO YES
 Benchmark 75% of the students will earn a score of 75-100%
 Criterion Met YES
 Results Seventy five percent of the students achieved 75% or better. Those who did not reach the target score turned in an incomplete assignment or did not turn in the assignment.
 Action No Action is required

ADDITIONAL ASSESSMENT

Issue Difficult to get SLO's from Adjunct Faculty
Proposed Solutions If it is very difficult to get working professional adjuncts to do the SLO's. Thus our listing is incomplete.
Action Required Yes - Create a Guide and Train Adjuncts

Issue Delayed Funding for Texts for Vets and Financial aid students
Proposed Solutions Perhaps the college can offer these students a small loan, payable directly to the bookstore.
Action Required Yes - Have Dean Bring up issue to ADMIN

Issue Life-long learners don't typically regard the grade as important
Proposed Solutions The Stats for the CTE class are often skewed because of the enrollment of life long learners. Nothing to do for this.
Action Required None

**
9B. SLO Assessment - Impact: *

Summarize the dialogue that has resulted from these course SLO assessments. What specific strategies have you implemented, or plan to implement, based upon the results of your SLO assessment?

Summarize Strategies:

The SLOs purpose it to insure that a student is able to utilize the critical key ideas taught in a class.

The specific strategies implemented in computer science classes to support the class topics and SLO's are:

1) The use of Online Learning System like CANVAS has helped student tremendously. They are available 24 by 7.

- * Syllabus and a Section clearly stating how every element works
- * Objectives clearly stated
- * Pretest so a student can judge their level of knowledge
- * Written lectures, diagrams and fully functional programming examples
- * Recorded Video Lectures
- * Live Zoom Meeting for lectures, and Questions and Answers
- * Live Chat online in Canvas
- * Online Discussions - A learning environment where a student can clarify there understanding
- * Email to the professor
- * Text book online

- * Exams and Quizzes online
- * Expectations help for Final projects

2) A student is also pointed to the tremendous resources available on the Internet, which are also available 24 by 7.

- * Google it - How to use Google properly
- * Watch videos that explain anything at www.youtube.com
- * and more

3) Face to Face class instruction - When Canada College begins to return to a more diverse set of class delivery, then students can select which method best match their learning styles/modalities.

There is no longer a lack of resource, there is in fact an overwhelming number of Internet resources, and in the CANVAS Courses, and in person. There are also numerous resources available at Canada College that also support a student 'life issues.

The SLO's topics are linked to the Canvas resources and the Internet resources. They clarify to a student ,in many ways, what is being taught.

**

10. PLO Assessment: *

Describe your program's Program Learning Outcomes assessment plan using your Program/Department's Three Year Assessment Plan (<https://www.canadacollege.edu/assessmentsloplo/assessmentplans.php>). Summarize the major findings of your PLO assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

Description of the 3-Year Assessment Plan for Computer Science (CIS)

The plan consists of evaluating the following course during following years and Semesters

	2020-2021	2021-2022	2022-2023
Fall Semester	CIS 250 - SLO 1	CIS 242 - SLO 5 CIS 252 - SLO 1	CIS 286 - SLO 3 CIS 321 - SLO 1
Spring Semester	CIS 118 - SLO 2 CIS 262 - SLO 4	CIS 284 - SLO 4	CIS 294 CIS 122 CIS 680 CF
PLO's accessed	PLO #1	PLO #5	PLO #4
ILO's Accessed	Critical Thinking Community Communication Quantitative Reasoning	Critical Thinking Communication Quantitative Reasoning	Critical Thinking Communications Quantitative Reasoning

Assessment of the 3 year plan: It can be improved by specifying which SLO to evaluate for CIS 294 and CIS 122.

According to the plan, there is one class that needed to review: CIS 250.

Assessment: CIS 250 Assessment Results: The CIS 250 assessment was completed and for CIS 250: Curricunet is up to date, the Course Catalog is up to date, the SLO's are up to date in Improve (TracDat), the Computer Science Website is up to date. There no changes needed.

Assessment: The mapping between SLO's - PLO's and ILO's is complete in Improve (TracDat) and is correct. There are no changes needed.

The only issue is getting Adjunct faculty to conduct the required SLO assessment for the classes they teach. This is being addressed in section the SLO' assessments - Compliance

**

Program Review Narrative Status: Complete

Goal Description: Programming and Goals 2021 Assessment Cycle

Create guide and train Adjunct Faculty to Conduct SLO assessments for their classes

Goal Status: 1 - New (PR)

Relevant Program Review Cycle: 2021-2022

Estimated Start Date: 11/15/2021

Estimated Completion Date: 11/30/2021

Who's Responsible for this Goal?: Canada College Training Coordinator and Dean Ameer Thompson

Please select the college goals with which your program goal aligns.: Organizational Development - Focus institutional resources on the structures, processes, and practices that invest in a diverse student population and prioritize and promote equitable, inclusive, and transformative learning.

Please select the college strategic initiatives with which your program goal aligns.: Institutionalize Effective Structures to Reduce Obligation Gaps

Goal Description: Access offering CIS 321 and CIS 294 Swift classes

Need to offer classes in the Swift language tract for the AS/T degree and the Programming: Swift Certificate.

Have the Dean evaluate the feasibility.

Goal Status: 1 - New (PR)

Relevant Program Review Cycle: 2021-2022

Estimated Start Date: 10/25/2021

Estimated Completion Date: 11/30/2021

Who's Responsible for this Goal?: Dean Ameer Thompson and faculty

Please select the college goals with which your program goal aligns.: Student Completion/Success - Provide educational and student services programs that highlight inclusivity, diversity, and equity in their mission to help students meet their unique educational goals and minimize logistical and financial barriers to success.

Please select the college strategic initiatives with which your program goal aligns.: Improve Student Completion

Goal Description: Create class on Computer and Electronic Security

Create a class covering Computer and Electronic Security for students and community organizers.

Goal Status: 1 - New (PR)

Relevant Program Review Cycle: 2021-2022

Estimated Start Date: 10/25/2021

Estimated Completion Date: 11/30/2021

Who's Responsible for this Goal?: Professor William Schwarz

Please select the college goals with which your program goal aligns.: Community Connections - Build and strengthen collaborative relationships and partnerships that support the needs of, reflect, and enrich our diverse and vibrant local community.

Please select the college strategic initiatives with which your program goal aligns.: Enhance Marketing

Goal Description: Implement Cognitive Psychology Teaching Pedagogy

Teach computer science professors, Full time and adjunct, the modern effective Cognitive Psychology/Science Teaching Pedagogy Utilize and teach STUDENTS the Cognitive Psychology/Science learning pedagogy use of their conceptual facility

Goal Status: 1 - New (PR)

Relevant Program Review Cycle: 2022-2023

Estimated Start Date: 01/17/2022

Estimated Completion Date: 12/12/2022

Who's Responsible for this Goal?: Dept Dean and a lead professor

Please select the college goals with which your program goal aligns.: Student Completion/Success - Provide educational and student services programs that highlight inclusivity, diversity, and equity in their mission to help students meet their unique

CAN Program Review (Instructional) - Computer Science (Fall 2021)

educational goals and minimize logistical and financial barriers to success.

Please select the college strategic initiatives with which your program goal aligns.: Improve Student Completion