COMPREHENSIVE PROGRAM REVIEW REPORT

Photonics & Laser Technology

Program Context

1. Mission

Share how your program contributes to the college, fits into the college's mission, vision, and values, and contributes to the college's Education Master Plan. If your program has a mission statement, you may include it here.

What other academic programs and student/academic services does your program engage with? Examples of student/academic services include the Learning Center, Library, STEM Center, SparkPoint, Dream Center, etc. Another example, how does your program fit into any of the College's plans (such as Student Equity and Achievement Program, Technology, Strategic Enrollment, etc.)?

The mission of the Cañada College Photonics and Laser Technology program is to prepare students to work in a variety of sectors, from telecommunications to health care to aerospace, that apply light and lasers in different forms through two certificates. **The stackable certificates were designed for high-school graduates that allows students with minimal math and science background to be able to succeed by** providing all the foundational knowledge and hands-on skills in optics and lasers that are needed for entry level, career track jobs in this high growth sector.

2. Articulation

Are there changes in curriculum or degree requirements at high schools or 4-year institutions that may impact your program? If so, describe the changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes."

no known changes

3. Community & Labor Needs

Are there changes in community needs, employment needs, technology, licensing, or accreditation that may affect your program? If so, describe these changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes." CTE programs: identify the dates of your most recent advisory group meeting, its membership, and describe your advisory group's recommendations for your program.

The PALT certification program was created in response to Bay Area Photonics Industry leaders reaching out to the instructor (Dr. Ramki Kalyanaraman) to create a training program that could help fill technician positions in the workforce. Research and analysis into the Labor Market Information was provided by the SF Bay Center of Excellence for Labor Market Research in February of 2021 based on which the college approved creation of the certificate programs working closely with Workforce Development.
The expectation was that the program would attract between 10-20 students on an annual basis but this has not been borne out. The program's advisory board was created from Bay area industry and national lab agencies. All members were actively working in the photonics area, including in leadership positions such as Vice President at Coherent Inc., the worlds largest laser manufacturer. Despite this strong support and guidance, along with a few targeted but scattered marketing strategies, students were not attracted into the program.

LMI data provided by LIghtcast for Q3 of 2025 and available through the PRIE data dashboard collects together information on engineering technician related opportunities. While the data provided shows healthy demand for engineering technicians (>3641 unique job postings) across several industry sectors (884 competing employers), the PALT program is more focused on technician jobs in areas of optics, lasers and pohotonics.

Silicon Photonics and AI-driven optical technologies, including optical computing are expanding photonics related infrastructure which are expected to create indirect need for technicians.

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A search for technician related jobs using job sites like indeed and linkedin continues to show a healthy need for technicians in the laser, optics and/or photonics industry in the bay area. For example, as of Mid October, 2025, below is a snapshot of the market as found using web searches.

Key Job Opportunities:

Photonics Technician Roles: Over **100+ photonics-related jobs** are listed in the Bay Area on Indeed, including roles such as *Photonics Test Engineer* and *Photonic Engineer*, particularly in cities like Fremont, Emeryville, and San Francisco. However, “engineer” jobs required either an Associates or higher degree.
Laser and Optics Technician Roles: There are **15+ laser technician jobs** and numerous optics-focused roles, including *Optical Test Technician*, *Acoustic Optical Test Technician*, and *Optical Scientist Intern*, with companies like G&H Photonics, Coherent Corp., and Lumentum hiring in Fremont and San Jose.
Fiber Laser Jobs: LinkedIn shows **65 fiber laser jobs** in the region, with opportunities in testing, packaging, and R&D.

Key employers include:
Ayar Labs (Emeryville) – silicon photonics and testing
Aeva (Mountain View) – photonics for LiDAR
SLAC National Accelerator Laboratory (Menlo Park) – research and x-ray optics
Meta (Menlo Park, Sunnyvale) – optical systems for AR/VR
Lumentum and **Coherent Corp.** (Fremont) – optical components and fiber lasers

Qualifications and Pay

Education: Associate degrees or technical certifications in photonics, optics, electronics, or related fields are typically required.
Experience: 1–3 years in testing or manufacturing environments is common for mid-level roles.
Salaries: Range from **$75,000 to $105,000+** annually for technician and entry-level engineering roles, with higher pay for specialized or senior positions.

While this information is a snapshot, the underlying message is that there is a need for technicians in the laser, optics and photonics area. This is also constantly iterated by the several board members during our annual meetings – their own companies are looking for folks!

To summarize then, one could argue that since the program was first created in Fall 2021, the technician needs in the area of the certifications, at the very least, continues to exist

Looking Back

4. Curricular changes
4A. Progress Report - IPC Feedback
Provide your responses to all recommendations received in your last program review cycle.

This is the first Program review for PALT so no prior recommendations are available.

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4B. Progress Report - Prior Program Goals

Provide a summary of the progress you have made on the program goals identified in your last program review. Include any challenges that have prevented or limited your pursuit of the program goals.

This is the first Program review for PALT so no prior comments to program goals are available to respond to.

Current State of the Program

As stated in the 2022-2027 EMP: "Can~ada College continuously assesses processes and removes barriers to student access, success, and completion." The program review is an essential part of that process.

5A. Program Changes

List any significant changes that have occurred over the prior years in your program's curricular offerings, scheduling, or mode of delivery. Please describe if any changes impacted specific programs of study within your discipline. For decisions made by your department, explain the rationale for these changes. If applicable, how have state policy changes affected your program offerings?

The major change has been the inability to offer the classes within the PALT certifications on a regular basis due to a lack of enrollment. A handful of PALT classes (401, 402, 403, 404, 405, and 406) were offered in AY 22-23 and Fall of AY 23-24.

However, since Spring 2024, no classes or the certificates have been offered.

5B. Program of Study Completability

Look at your course offerings, in the last program review cycle: was it possible for a student to complete your certificate(s) or degree(s) while only completing courses at Cañada College? If not, was your certificate(s) or degree(s) completable within the District?

Yes, it is possible to complete certificates while only completing courses at Cañada College

5C. Program of Study Maps

Review your discipline's currently listed program(s) of study maps. Are any updates needed? If so, please list the needed changes. (These changes will be forwarded to the PRIE office after the Program Review process is completed, or you may submit changes using the PRIE Data request form.)

no updates needed

6: Enrollment Trends and Changes

Use the data provided by PRIE to examine your enrollments by discipline and courses. Analyze each of the following: •Trends, significant changes, and any disproportionate enrollment impacts in course offerings, •Any disproportionate enrollments of student subpopulations indicated in PRIE data, •Trends in headcount, FTES, and load.

Based on your analysis of the data, discuss what you believe is noteworthy. If applicable, describe any other enrollment data that is relevant to your program, such as courses that are part of learning communities. You are welcome to include additional graphs or charts if they help your analysis. For example, has there been a significant increase or drop in FTES or Load? If applicable, consider trends in class cancellation rates and how it might have affected your course offerings. If needed, consider how the pattern of course offerings (times/days/duration/delivery mode/number of sections) affected your enrollment. Please note: If additional sources of data are used, please upload these documents or provide links.de links.

The program has NOT managed to attract students on a consistent basis. Over the three semesters of offering Fall 22, Spring 23 and Fall 23, a total of 7 different students registered across the 6 different PALT classes offered. Of these, there was not a single high school student and in fact, all the enrollees were Adult learners, either interested in a career change or already working in Industry and looking for a specific skill upgrade (like the ZEMAX software learning class PALT 403).

Therefore, there is not enough data to provide enrollment trends and other attributes other that to state that since Spring of 2024, we have not offered the program.

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7: Retention and Success

• Please Note: Retention rate counts enrollments who have earned a passing grade, a failing grade, or an incomplete grade. • Please Note: Success rate counts enrollments who have earned a passing grade.

7A. Current Retention and Success Data

Describe the retention and student success rates in your courses and any disproportionate enrollment impacts using the data provided by PRIE.

Insufficient data

7B. Online Success

The college has a goal of improving success in online courses. Using the data provided by PRIE, what significant gaps do you see in success between different course modalities: asynchronous, synchronous, hybrid, and face-to-face courses? Analyze any disproportionate online course retention and success rates by modality. If your program does not offer online courses, please write "not applicable."

Insufficient data

8: Resource Changes

8A. Impact of Prior Resource Applications

Describe the impact to date of previously requested new resources (assignment, equipment, facilities, research, funding) including both approved and non-approved resource request. What impact have these resources or lack of resources had on your program and measures of student success? Do you notice any disproportionate impact on any student populations? What have you been unable to accomplish due to resource requests that were not approved? ?

Sufficient laboratory and classroom resources were available to offer the various classes. All the laboratory classes are well furnished with equipment purchased through funds provided by the Workforce Development Office.

8B. Impact of Staffing Changes

Describe the impact on your program of any changes within the last program review cycle in staffing levels (for example, the addition, loss or reassignment of faculty/staff), in particular how those changes impact student success. Do you notice any disproportionate impact on any student populations? If no changes have occurred please write "not applicable."

The program currently does not have a permanent instructor. The engineering instructor (Dr. Ramki) is experienced and qualified to teach several of the PALT classes but additional instructors will be needed as and when specific classes in the program are offered in future. Two adjunct instructors were hired to teach several classes over the AY22-23 and AY23-24 periods.

9. SLOs and PLOs

9A. SLO Assessment - Compliance

Are all active courses being systematically assessed over a three-year cycle? Refer to the Program's /Department's Three-Year Assessment Plan and describe how the plan is completed across sections and over time.

Courses are being assessed when offered.

9B. SLO Assessment - Impact

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

When a course is offered, its SLO is beingb assessed. All assessment in this first cycle met the success criterion. However, based on the enrollments, success criterion should be modified if the number of enrolled students in the classes will increase.

9C. PLO Assessment

Describe your program's Program Learning Outcomes assessment plan using your Program/Department's Three Year Assessment Plan. Summarize the major findings of your PLO assessments. What are some improvements that have been implemented as a result of PLO assessment?

While there was insufficient numnber of enrollees in the program, the programs PLOS were assessed using the 3 different classes for which the instructor was able to assess SLOS (PALT 401, 402 anD 404). Note that three other

classes were taught bu adjunct faculty who did not collect SLO assessmentin information in the first round of offerings (PALT 403, 405, and 406)

Looking Ahead: Program Planning and Goals

In this portion of program review, you will develop action plans based on your enrollment, retention, and success data (questions #6 and 7) for the most disproportionately impacted students. • Please note: your action plans will reflect the program's assessment of which equity issues need to or can be addressed. • Please note: action plans are measurable so that we can examine their success or failure, not because they are guaranteed to be successful. As part of our culture of continuous improvement, we encourage programs to pursue action plans that might or might not be successful. Successes and failures can both provide valuable information for programs.

10A. Improving Enrollment

What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections),curriculum, marketing, and articulation of pathways to improve enrollment, particularly for disproportionately impacted student groups identified in Question 6? If applicable, include plans for faculty recruitment and faculty training.

Program coordinator and Engineering Instructor, Dr. Ramki Kalyanaraman has had several meetings with Dean of Sci and Tech, discussions with Workforce Director, annual discussions with Advisory Board Members as well as periodic email feedback from the board members on the pressing question of enrollments. Some important themes have emerged that could provide a path for the program moving forward.

1. The primary student demographic over the programs offerings has been overwhelmingly graduates or currently-employed, i.e. those who have degrees but currently unemployed, or are currently employed, as compared to a recent high school graduate. This had had significant consequences to the program, which, as stated in the mission, was designed primarily keeping High School Students in mind.

2. The program is being offered like a more traditional college program, i.e. day time classes during the weekdays. This approach does not suit potential students who are currently working and would like to pursue program for career changes or promotions. **One solution to this could be to offer the program as evening and/or weekend program.**

3. The "college-like" program also means that classes need to largely be taken in a sequence due to need to fulfill pre-requisites for classes with course numbers higher than 402. This provides challenges to potential students who are looking for a specific class that could potentially improve their salary structure or promotion chances in a current job. For example, the PALT 403 class has 402 as a Pre-req, but this class is highly attractive to Industry workers as it provides a very cost-effective way to learn Industry-Standard Optics Software. While individual students can go through the process of over-riding the pre-reqs, this is not an optimal way as several potential students from industry dropped out due to the significant paperwork involved, not only pre-req related but also just registering to take a college class.

4. Over the course of this program, a handful of potential industry and national lab employees indicated interest in specific classes of the program but ultimately did not register due to the multi-step process required to take a community college class if they have not done so previously. **If the district could offer a significantly streamlined process for such adult learners, enrollments will be positively impacted.**

5. Several industry employees reached out to take specific classes. However, either the offering day/times, offering modality (like in-person on campus vs online), and/or the paperwork to take a college class turned out to be significant barriers. **One solution that seems to be an attractive one is to offer smaller and much more streamlined certifications in a flexible format (like a hybrid class with in-person or remote possibility) at the East Palo Alto Office location.**

6. Marketing of the program was carried out through several channels. A professional video was made and sent to our local high school districts, counselors and to our board members. However, given lack of enrollment from local high schools and the overall small enrollments, it is not clear what marketing modality is going to be successful moving forward. **The best traction seemed to be when the industry employees advertised the program and classes within their own companies**.

10B. Improving Retention and Success Rates

What changes does your program propose to make to improve student course retention and success, particularly for disproportionately impacted students identified in Question 7? How can the college help you improve student retention and success? Consider course offerings, curricular and/or pedagogical changes. You are encouraged to collaborate with the Director of Equity and/or Faculty Equity Coordinator to develop strategies for addressing equity gaps and to include those here. Examples of possible strategies include trials of new equitable grading strategies, use of OER/ZTC textbooks, surveys to capture student voices and needs in the classroom, new or improved partnerships with student services, and/or plans for faculty recruitment and faculty training.

There is not much data to report. A total of 7 different students enrolled in 6 different PALT course offerings across three semester from Fall 2022 through Fall 2023. 6 of these students successfully completed each class they took. One of the students left mid-way through Fall 22 semester due to personal circumstances.

There is really not much to discuss here due to the limited data.

10C. Improvements Based on SLOs and PLOs

What specific strategies do you plan to implement, based upon the results of your SLO and PLO assessment, and how do you anticipate those changes will contribute to more equitable outcomes?

It is too early to make major changes here given the small enrollments and consequently the minimal data available

Supporting Information

General Supporting Documents

palt-lmi-report-2024-25.pdf;
photonics-degree-certs-rpt-2020-25.xlsx;
palt-course-enrollment-data-2020-2025.xlsx;
photonics-laser-tech-pos-report-2020-2025.xlsx

Resource Requests