

Entry #: 62 - Mathematics, Science and Engineering**Status:** Submitted**Submitted:** 3/19/2024 9:40 AM

DRAFT

OVERVIEW OF PROGRAM REVIEW AND PLANNING FOR INSTRUCTIONAL PROGRAMS

Program Review and Planning is about evaluating and assessing programs and documenting plans for improving student success rates. Through review of and reflection on key program elements, Program Review and Planning identifies program strengths and strategies necessary to improve the academic discipline, program, and/or services to support student success.

The College also uses Program Review and Planning as the conduit to request resources (human, technology, facilities and funding) to further help improve and support programs.

ALL PROGRAMS WILL COMPLETE AN ANNUAL PROGRAM REVIEW FOR 2023-2024.

BASIC PROGRAM INFORMATION

Division Name

Mathematics, Science and Engineering

Department Name

Computer Science and Information Systems

Microsoft_List_ID**Discipline Name**

Computer Science and Information Systems - Computer Science (CSCI)

Department Chair Name

Terrie Canon

Department Chair email

tcanon@palomar.edu

Please list the names and positions of everyone who helped to complete this document.

Duy Nguyen, Professor

Tony Smith, Professor

Website address for your discipline<https://www.palomar.edu/csit/computer-science-as-ca/>**Discipline Mission statement**

The mission of the Computer Science program at Palomar College is to present our students with up-to-date computer science curricula and pedagogy, ensure they have a solid foundation in the core computer science concepts, equip them with problem solving and decision-making skills, and provide a strong foundation for transfer into a four year program, as well as lifelong learning in the field of computer science.

[\(Click here for information on how to create a mission statement.\)](#)

Does your discipline have at least one degree or certificate associated with it?

Yes

Are any of your programs TOP coded as vocational (CTE/CE)?

Yes

List all degrees and certificates offered within this discipline.

Computer Science AS, CA

BASIC PROGRAM INFORMATION: FACULTY AND STAFFING RESOURCES

In this section, you will identify how many faculty and staff support your discipline's programs. This information is considered when you request permanent staff and faculty hires. It is also useful as you evaluate your program and the human resources and talent you have to support our students.

To help you answer questions in this section, you will need the links shown in red.

Enter the number of permanent or full-time faculty support your discipline (program)?

2

For this past fall semester, what was your Full-time FTEF assigned to teach classes?

3.20

For this past fall semester, what was your Part-time FTEF assigned to teach classes? (Part-time FTEF = PT hourly and overload.)

5.13

List the classified and other permanent staff positions that support this discipline. If possible, include number of months and percentage workload.

Department ADA 30%

List additional hourly staff that support this discipline and/or department. Include weekly hours.

COURSE INFORMATION

In this section, you will review how students perform in the courses you offer as part of your program. The Chancellor's Office Vision for Success goals focus on eliminating equity gaps and increasing timely completions. Examining, reflecting upon, and developing strategies to improve course success rates is one way to help the college meet its Vision for Success Goals and support our students in reaching theirs.

Data are provided to help you examine differences in course success rates (C or better) across student demographic categories (e.g., gender) and course type (e.g., face-to-face, online).

After you complete your review of course success data, you are asked to confirm that you have assessed each course SLO within the past three years.

[Link: Course Data](#)

COURSE SUCCESS AND RETENTION

Have your overall course success rates increased, decreased, or stayed the same over the last 5 years?

Increased

Was this expected? Please explain.

Success rates have increased markedly recently, from a low of 56.0% in Fall 2019, to 67.8% in Fall 2023, our highest rate so far. This is as expected, as students and instructors become more familiar and comfortable with education post Covid-19 conditions.

Have your overall course retention rates increased, decreased, or stayed the same over the last 5 years?

Increased

Was this expected? Please explain.

Course retention rates have increased slightly over the last 5 years, currently at 90.7%, our highest yet. Previous years have typically been around 87%.

Are there differences in success or retention rates in the following groups? (choose all that apply)

Modality (Online, Face to Face, Hyflex, etc.)

Ethnicity

Age

Modality: What did you find and why do you think differences based on the modality in which courses were offered exists? What do you need to help close the gap? (Please specify the modalities in which you see gaps, i.e. online synchronous or asynchronous, face-to-face, hybrid, hyflex, etc.)

Success and retention are noticeably better for Distance Education than for On Campus classes. This is because our major of Computer Science naturally attracts students comfortable with the online format.

Age: What did you find and why do you think age differences exist? What do you need to help close the gap?

In general, younger students do better than older students. Probably inevitable, due to the older students having job and family responsibilities in addition to their course work.

Ethnicity: What did you find and why do you think ethnicity differences exist? What do you need to help close the gap?

There is a large difference in success rates across ethnicities, from a high of 76% to a low of 44%. Instructors and tutors corresponding more with student ethnicity would help here.

Please share methods that your department is using to improve retention and success rates in your courses. If you are focusing on a specific group like online students or a demographic group please include that information in your answer.

Encouraging more student engagement, with a department social gathering at the beginning of a semester. Department open computer labs, with tutoring available for our courses. Tutors embedded in online courses.

COURSE STUDENT LEARNING OUTCOMES (SLOs)**Excluding courses that haven't been offered in the last three years, do you confirm that all of your courses have been assessed since August 2020 (Result Summary Date)?**

Yes

Upload a copy of your SLO report from Nuventive ("Report 0. Last Result Date and Action Date for All Active Course Outcomes")

[0. Course SLO Report_ Last Result Date and Action Date for All Active Course Outcomes.xls](#)
10.5 KB

**PROGRAM INFORMATION**

In this section, you are asked to consider and evaluate your programs, including the annual number of completions, and their program learning outcomes,

PROGRAM COMPLETIONS

Student success is at the core of what we do in assisting students in achieving their goals.

The Chancellor's Office Vision for Success stresses the importance of Program Completion as a major goal for our students. In addition, transfer and career readiness are key components of Palomar College's mission statement.

Link: [Program Completions](#)

Access the link above titled "Program Completions" and copy and paste five years of completion data for each of your discipline's degrees and certificates.

Academic Year AT APD Student Count Column Labels

Row Labels 2016-17 2017-18 2018-19 2019-20 2020-21 2021-22

AA/AS

Associate in Science Degree 7 14 22 15 22 22

AA/AS Total 7 14 22 15 22 22

Certificate

Certificate of Achievement 15 24 22 18 33 31

Certificate of Proficiency 3 1

Certificate Total 18 24 22 18 34 31

Grand Total 25 38 44 33 56 53

PROGRAM LEARNING OUTCOMES

Do you confirm that all of your programs have been assessed since August 2020 (Result Summary Date)?

Yes

Upload a copy of your SLO report from Nuventive ("Report 2. Last result, action, and follow-up date for each active program outcome").



[2. Last Result, Action, and Follow-up Date for Each Active Course Outcome.xls](#)

9.5 KB



Program Review Reflection and Summary

In this section you are asked to evaluate your programs by considering their program learning outcome assessments, the annual number of completions, and any other internal or external factors that had an impact on your program.

What factors have contributed to the success of your program(s)? Describe how they have contributed.

Students and instructors in our program have been more able than most to adapt to learning and teaching online. This format is more convenient for more people in our area, attracting growth in our enrollment.

What factors have presented challenges for your program(s)? Describe the impact of these challenges.

Finding adjunct instructors is the biggest challenge for our program. Demand for Computer Science courses is high and we want to add more sections, but would be unable to find qualified instructors to teach them. The problem is that people with the technical skills to teach our classes can make more money elsewhere.

CAREER AND LABOR MARKET DATA

The Chancellor's Office Vision for Success stresses the importance of increasing the percent of exiting students who report being employed in their field of study. It is important for us to consider how **all** of our programs connect to future careers.

Go to this website <https://www.onetonline.org/> and enter your discipline in the bubble on the top right for ideas about potential occupations. Click on an example to see more detail.

The following websites are for CTE related data:

- [Centers of Excellence](#) (many other data resources besides supply and demand) Password: GetLMI
- [LaunchBoard](#)
- [LaunchBoard Resource Library](#)
- [Chancellor's Office Data Mart](#)
- [Career Coach-San Diego Workforce Partnership](#)
- [EDD Labor Market Info](#)
- [Career One Stop](#)

What kinds of careers are available for people who complete your programs (and/or transfer)? (Refer to O*net Link below) Are there any new or emerging careers? If so, how would the new or emerging careers impact your future planning?

Students with a computer science degree have a wide range of career options. For those who complete the B.S. in computer science, they can join the defense sector at companies like General Atomic, Northrop Grumman, Boeing, Raytheon, Lockheed, L3-Harris, Leidos, Booz Allen Hamilton, etc. and at commercial companies like Qualcomm, Apple, Microsoft, Facebook, Amazon, Google, etc... These companies are actively hiring software programmers/engineers, algorithms developer - data analytics, data science - to process big data.

What are the associated knowledge, skills, abilities (KSA's) needed for the occupations listed above? (click examples in the link above to get ideas)

To be successful at these companies, students have to be good at developing software in a variety of computer programming languages like C/C++, Java, Python, etc.. Students who pursue the software development jobs will need skills in embedded processing that require knowledge such as assembly programming (CSCI 212), VHDL programming for Field Programmable Gate Array (FPGA), C++ CUDA programming for Graphical Processing Units (GPUs), etc. Students who wish to pursue careers in algorithm development - data analytics, data science - will need to learn the programming languages listed in addition to such tools as machine learning and artificial intelligence.

How does your program help students build these KSA's?

The computer science program prepares students with knowledge of the programming languages including C, C++, Java, and Assembler. Our data structure class prepares them to apply their knowledge of programming languages to implement algorithms to store and process big data. Our new courses in Artificial Intelligence and Machine Learning will prepare the students to pursue a career track in data analytics and data science.

The following four questions are for CTE programs only. If you are not a CTE program, please go back to the BASIC INFORMATION tab and select "no" for "Are any of your programs TOP coded as vocational (CTE/CE)?"

What is the regional three-year projected occupational growth for your program(s)?

New job opportunities are less likely in the future.

What is being done at the program level to assist students with job placement and workforce preparedness?

The computer science department actively work with some of the big defense companies such as Boeing, Raytheon, and Northrop Grumman. Twice a year, Northrop Grumman interview our students for 12-week internships where our students will continue in school full-time while working at a Northrop facility on a part-time (10-120 hours/week) basis. Numerous companies have also actively seek out our department with job openings for our students. Our department is engaged with the local IEEE chapter, and work collaboratively with CSUSM and Mira Costa College, to get our students involved in IEEE memberships and expose them to companies that actively seek our computer science students during IEEE career fairs. We also actively go out to give presentations at career fair day at some of the local high schools to introduce high school students to the Palomar Computer Science Department. We hold regular meetings with our collaborators at CSUSM and Mira Costa College to discuss course offering and articulation to develop a curriculum that maximizes our students transferability to a CSU/UC.

When was your program's last advisory meeting held? What significant information was learned from that meeting?

The program's last meeting of the local SD4C industry advisory panel was held 4/28/2023. Significant information was learned about the impact of AI (i.e. ChatGPT, Bard, Co-Pilot) on computer programming courses and teaching.

What are the San Diego County/Imperial County Job Openings?

In California, employment as a Computer Programmer in 2020 was estimated as 24,400 employees, long term projected employment in 2030 is projected at 23,700 employees, a projected decline of 3% over the 10 years.

PROGRAM GOALS

Progress on Prior PRP Goals

In the most recent PRP cycle, you identified a set of goals. Provide an update to your most recent PRP goals.

[Click here for previous PRPs with goal information.](#)

Prior PRP Goals**Prior Year PRP Goal 1****Brief Description**

Expand the computer science discipline to offer data science related courses (e.g., machine learning). These courses provide our students with skills highly sought by employers and will improve the students' chances of getting internships and landing permanent jobs upon graduation.

Goal Status

Completed

Add any comments related to your work on prior goal (e.g., success, challenges, reasons for eliminating a goal). Describe Outcomes, if any.

A new Data Science AA degree program has been successfully created and launched, beginning Fall 2024!

Prior Year PRP Goal 2**Brief Description**

Purchase education robotic kits that can be programmed using the raspberry pi.

Goal Status

Completed

Add any comments related to your work on prior goal (e.g., success, challenges, reasons for eliminating a goal). Describe Outcomes, if any.

These robotic kits have now been ordered, and it is hoped can be placed in use for Fall 2024.

Prior Year PRP Goal 3**Brief Description**

Purchase educational Matlab licenses for the computer lab for student to use as part of the new data science program.

Goal Status

Ongoing

Add any comments related to your work on prior goal (e.g., success, challenges, reasons for eliminating a goal). Describe Outcomes, if any.

not purchased at this time, working with Physics and Engineering as well to get the license.

Prior Year PRP Goal 4**Brief Description**

To share in the Palomar College funding resources in an appropriate and equitable manner that provides the Computer Science program with the financial capability to continually upgrade and maintain its equipment and laboratory environments in a status which effectively meets the need to provide compatibility with the constant and rapid change that is occurring in the world of computer technology.

Goal Status

Completed

Add any comments related to your work on prior goal (e.g., success, challenges, reasons for eliminating a goal). Describe Outcomes, if any.

New computers for two of the Department computer labs have been funded. It is hoped the new labs will be in use for Fall 2024.

Describe any changes to your goals or three-year plan as a result of this annual update.

Do you have any new goals you would like to add?

Yes

Establishing New Goals and Strategies for the Next Three Years

Goal 1

Brief Description

Hire 1 new full-time faculty specializing in the Computer Science program.

How will you complete this goal? Include Strategies and Timeline for Implementation.

Via the PRP process, to have new faculty in place within the next 2 years.

Outcome(s) expected (qualitative/quantitative)

The Computer Science program requires a minimum of 2 full-time specialists. Upcoming retirements within the next 2 years will reduce our full-timers to 1.

How does this goal align with your department mission statement, the college Vision Plan 2035, and /or Guided Pathways?

The department mission statement requires that we have sufficient full-time faculty to staff our Computer Science program.

Expected Goal Completion Date

8/1/2026

RESOURCES

Congratulations! You are nearing completion. In this section, you will consider the resources you need to implement your three-year program review plan and/or address any findings from your assessment of your discipline.

The section is organized into the following five parts:

PART 1: Staffing Needs (Faculty and Additional Staff)

PART 2: Budget Review

PART 3: Technology Needs

PART 4: Facilities Needs

PART 5: One Time Request for Other Needs (NonTechnology Equipment, Supplies, Operating Expenses, Travel)

Reflect upon the three year plan you created above, your current operations, and any upcoming factors (retirements, changes in legislation, and changes in policies or procedures) that will impact your unit. How will you allocate resources to implement your plan? Describe additional resources needed to improve the effectiveness of your unit/program. All resource requests must be aligned with the College's [Vision Plan 2035](#).

Summarize any reallocation/re-organization of resources you are making based upon your three-year plan, your current operations, and any other factors (e.g., legislation). Describe the impact of the reallocation of resources to your unit.

NOTE: All requests listed in the PRP will be reviewed by deans and supervisors, then forwarded to the appropriate review group for prioritization. A resource requests approved to move forward in the review process does NOT guarantee a position or funding.

PART 1: STAFFING NEEDS

Requests for faculty will follow the prioritization process currently in place in the Faculty Position Prioritization committee, which reports to the Education, Equity, and Student Success Council. Requests for new staff positions will be prioritized at the division level and reviewed at Exec.

Are you requesting additional full-time faculty?

Yes

REQUEST FOR ADDITIONAL FULL-TIME FACULTY

Faculty Request 1

Title of Full-Time Faculty position you are requesting

Assistant Professor of Computer Science

How will this faculty position help meet district (Guided Pathways, Strategic Plan, Strategic Enrollment Management etc.), department and/or discipline goals? Please be sure to tie this back to your PRP goals and three year plan.

Part of the CSIT department goals is to maintain a sufficient number of full-time faculty specialists in all of our different areas, including the Computer Science program. We have added a new CSCI PRP goal to secure this faculty position.

Is there a scarcity of qualified Part-Time Faculty (for example: Specialized degree/experience, emerging/rapidly changing technology, high demand)?

There is a severe shortage of Part-Time Faculty qualified to teach in the Computer Science program. The problem is that anyone with the technical background and skills able to do so can make more money in industry.

Are you requesting this position for accreditation, regulatory, legislative, health and safety requirements? Please explain.

Replacement for faculty retirements within the next 2 years.

Utilizing your PRP data, please summarize the discipline productivity, efficiency, and any regional career education needs for this discipline.

The Computer Science program requires at least 2 full-time specialist faculty members. Upcoming retirements within the next 2 years will reduce our number of full-time faculty to 1.

Is your department affected by faculty on reassigned time? If so, please discuss.

No.

Are you requesting AA, CAST for Classified Staff?

Yes

REQUEST FOR ADDITIONAL CLASSIFIED, CAST, AA

Staff, CAST, AA request 1

This year, units are asked to identify new positions only as part of the PRP process. Vacant positions will be addressed outside of the PRP process.

If you are requesting STAFF, please fully complete this section. If not, you can skip to the next resource section. Click "+Add Staff, CAST, AA request" below for each additional request.

When considering the funds required for a position, consult the HR website for position salary schedule and the [Benefits Worksheet](#) for additional costs related to benefits for the position.

Title of new position

ISA III Lab manager

Is the position request for AA, CAST, or Classified staff?

Classified

Is this request for a full-time or part-time position?

Full Time

How does the position fill a critical need for current, future, or critical operations?(e.g. accreditation, health and safety, regulatory, legal mandates, institutional priorities, program trend analyses of growth/stability.)

Vital to staff CSIT Department computer labs.

Does the position assist in establishing more efficient District operations through either of the following: reorganization/restructuring OR use of technology?

Essential for more efficient operation of the CSIT Department computer labs.

Is there funding that can help support the position outside of general funds?

No

Describe how this position helps implement or support your three-year PRP plan.

Manages CSIT Department computer labs. Supports student learning with open labs and tutoring support.

Educational Vision Plan 2035 Objective

1:3

2:1

3:7

4:7

If the position is not moved forward for prioritization, how will you address this need?

Part-time temporary student employees.

PART 2: BUDGET REVIEW

Request that your ADA provide you with your *Available Budget Report* and complete this section.

Review your recent Budget/Expenditure reports and consider your three-year PRP plan.

Do you have any ongoing needs or needs to augment your regular budget?

No

PARTS 3, 4 and 5 – TECHNOLOGY, FACILITIES AND OTHER NEEDS

1. One-Time Fund Requests. Through the PRP process the college implements an approach for prioritizing and allocating one-time needs/requests. Prioritization takes place through the appropriate groups, leadership, and the Budget Committee. The executive team and Resource Allocation Committee consider various sources for funding PRP requests. Resource requests also inform the larger planning process like Scheduled Maintenance Plans, Staffing Plans, and institutional strategic planning.

For more information about funding sources available, see [IELM BLOCK GRANT, LOTTERY, PERKINS AND STRONG WORKFORCE GUIDELINES](#) (on the left menu of the webpage).

If you are a CTE program and think you may qualify for CTE funds for your PRP request(s), you are STRONGLY encouraged to answer the call for Perkins/Strong Workforce grant applications in February. Contact the Dean of CTE for additional information.

Consider submitting one-time requests only if you have verified that you cannot fund the request using your general discretionary funds or other funds.

1. Technology and Facilities Review. Requests for technology and facilities are assessed by the Deans and then, if appropriate forwarded to the proper institutional group (e.g., technology review committee, or facilities) for review and feedback.

PART 3: TECHNOLOGY NEEDS

Will you be requesting any technology (hardware/software) this upcoming year?

No

PART 4: FACILITIES REQUESTS

Do you have resource needs that require physical space or modification to physical space?

No

PART 5: OTHER ONE-TIME NEEDS

For more information about funding sources available, see [IELM BLOCK GRANT, LOTTERY, PERKINS AND STRONG WORKFORCE GUIDELINES](#). Please check with your department chair on the availability for this cycle.

Do you have one-time requests for other items (e.g., Non-technology equipment, supplies, operating expenses, travel) that your budget or other funding sources will NOT cover?

No

I confirm that all full-time faculty in this discipline have reviewed the PRP. The form is complete and ready to be submitted.

Yes

Enter your email address to receive a copy of the PRP to keep for your records.

awsmith@palomar.edu

Feedback and Review

Department Chair

I confirm that the PRP is complete.

No

Department Chair Name

Date