Status: **Reviewed**

Entry #: 246

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OVERVIEW OF PROGRAM REVIEW AND PLANNING FOR INSTRUCTIONAL PROGRAMS

Program Review is about documenting the plans you have for improving student success in your program and sharing that information with the community. Through the review of and reflection on key program elements, program review and planning identifies program strengths as well as strategies necessary to improve the academic discipline, program, or service to support student success. With our new Guided Pathways plan, this review becomes even more crucial for the success of our students and college.

We are using the Strengths, Opportunities, Aspirations, Results (SOAR) strategic planning technique to help us focus on our current strengths and opportunities, create a vision of future aspirations, and consider the results of this approach.

BASIC PROGRAM INFORMATION

Academic Year
2020-2021

Are you completing a comprehensive or annual PRP?
Comprehensive

Department Name
Computer Science and Information Systems

Discipline Name
Computer Science and Information Systems - Computer Science (CSCI)

Department Chair Name
Tony Smith

Division Name
Mathematics, Science and Engineering

Website address for your discipline
https://www2.palomar.edu/pages/csit/

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)?
No

List all degrees and certificates offered within this discipline.
Computer Science AS, CA
Computer Science with Emphasis in Video Gaming AS, CA

Please list the names and positions of everyone who helped to complete this document.
Professor Duy Nguyen
Prof Tony Smith

Use the link to provided to help answer the staffing questions below. This form requires a login and password to access. Please use your Palomar email and password to log in.

Link: Permanent Employees Staff Count

Full-time Faculty (total number of FT faculty in your discipline)
2

Full-time Faculty (FTEF)   **Part-time faculty (FTEF)**
2.73   6.60

Classified and other permanent staff positions that support this discipline
Department ADA 30%
Systems Analyst 30%

Additional hourly staff that support this discipline and/or department
Computer Lab Tutors (25)
Computer Lab Assistants (20)

PROGRAM INFORMATION

In this section you are asked to consider your programs, their learning outcomes, the annual number of completions, goals for completions and enrollment and efficiency trends.

PROGRAM LEARNING OUTCOMES

Begin this section by reviewing the Program Review reports for programs and courses in Nuventive Improve (TracDat). All active course and program learning outcomes should be systematically assessed over a 3-year cycle. First, look at program learning outcomes.

- **Program** = Leads to a degree or certificate
- **Discipline** = A group of courses within a discipline

*Programs will be able to complete program completion and outcome questions.

How well do your program's learning outcomes communicate the scope and depth of the degree/certificate offered?
Our Computer Science program remains strong and current and our program learning outcomes communicate the depth of our degree/certificate program. We place students into internships, when available, and the program provides a strong foundation for students entering the workforce. However, as the field of Computer Science is very competitive, the main focus of our discipline is to encourage our students to enter a college or university to obtain a 4-year Computer Science degree.

How do they align with employer and transfer expectations?
Employers expect our students to be able to maintain existing computer programs, and to be able to design, code, test and deploy new computer system solutions. Our transfer institutions have similar expectations of skills, with an additional requirement for theoretical depth and understanding. Our program learning outcomes are designed around all of these requirements, and cover this range of expectations.

Describe your program's plan for assessing program learning outcomes.
There are 4 CSCI program level SLOs. We have planned to evaluate one of these program SLOs per year. This year we will be assessing the "Design solution" program learning outcome, where students will be able to make the right choices of language, platform, and data structures for a computer programming solution based on their knowledge of the elements of program design.

Summarize the major findings of your program outcomes assessments.
Exams, homework assignments, and/or computer programming assignments are used to assess the success of course SLOs and we believe that our methods for assessing course and program SLOs are effective and working well. Assessment results indicate that our courses and programs are quite effective. We find that our students who transfer to 4-year Computer Science degree programs are routinely praised by their new schools (per CSUSM Computer Science faculty and several other 4-year schools across the state).

Reflecting on the major findings you summarized, what are some questions you still have about students' learning in your program that you have not yet been able to address with your outcomes assessments?
Our discipline focusses mainly on preparing students for transfer, so most of our assessments and feedback come from our transfer institutions, and the experiences of our transfer students. Our students are rarely seeking employment with our AS as a terminal degree, so we would still have questions about this population's experiences.

Depending on the degree or transfer goals of our students, they have the choice of three different GE pathways:

- Associate Degree GE Requirements

- CSU GE Requirements

- IGETC Requirements

Palomar College has identified a set of General Education/Institutional Learning Outcomes, which represent the overall set of abilities and qualities a student graduating from Palomar should possess. Click here for a link to Palomar's GE/ILOs.

Next, review your course outcomes as they relate to Palomar's GE/ILOs.

How do the courses in your discipline support General Education/ Institutional Learning Outcomes? In your response, please specify which GE/ILO(s) your discipline supports.
Our discipline supports the Palomar GE/ILOs of Computation; Creative, Critical and Analytical Thinking; and Foundation Knowledge of Discipline. Our students are required to learn the foundational skills of Computer Science; to analyze a problem; create a new solution; and implement the solution computationally.

Summarize the major findings from your course outcomes assessments that are related to the General Education/Institutional Learning Outcomes that your discipline supports.
The major findings of our course outcomes assessments related to the Palomar GE/ILOs for our discipline are that the assessments are relevant and we are meeting our objectives.

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. This year, our funding formula has also changed reflecting this emphasis, providing additional funding as a function of the number of completions.

In this section we will identify a program standard and a stretch goal (what you would like to move toward) for program completions.

The standards represent the lowest number of program completions deemed acceptable by the College. In other words, if you were to notice a drop below the set standard, you would seek further information to examine why this occurred and strategies to increase completions.

In this section we will identify a program standard and a stretch goal (what you would like to move toward) for programs.

List the number of completions for each degree/certificate for the previous year.
Data show 33 Computer Science degree/certificate completions for 2019-20. That is down from the previous year 2018-19, but this year had our highest number of completions shown from 2013-14 to present. However, these numbers do not tell the whole story as many of our Computer Science students transfer to 4-year Computer Science programs without picking up a Palomar degree/certificate.

Have your program completions Increased, decreased, or stayed the same over the last 5 years?
Stayed the same

What factors have influenced your completion trends?
* Refined our program course offerings.
* Scheduling of classes has become more efficient as shown by load factor data. We have set up a class schedule that offers all of our core classes in day, night and distance education formats.
* Received funding to embed tutors in many of our classes.
* Work closely with adjunct faculty on developing class content shown in Course Outline of Record.
* Aligning our program with a Computer Science STEM pathway.
* We have recently transferred into a more appropriate Division for our program, MSE, and are now focusing on working with other STEM departments in the new division.
* One factor that will negatively impact our completion rate is the Computer Science program mapping that was completed for the STEM grant with CSUSM. The mapping did not allow enough coursework for completion of a Computer Science degree/certificate before transfer. Administration was notified about the issue but a response has not yet been forthcoming.

Are the courses in your discipline required for the completion of other degrees/certificates?
No

Do you have programs with 7 or fewer completions in the last 5 years?
No

What is your program standard for program completion?
30

Why did you choose this standard?
Analysis of the last 6 years of data show this as an appropriate level.

What is your Stretch goal for program completion?
35

How did you decide upon your stretch goal?
Program completions have to increase, for the new funding formula.

ENROLLMENT AND EFFICIENCY TRENDS

Palomar College uses the WSCH/FTEF ratio as one indicator of overall efficiency in addition to the overall fill-rate for courses.

Although the college efficiency goal is 525 WSCH/FTEF and 85% fill-rate (minimal), there are many factors that affect efficiency (i.e. seat count / facilities / accreditation restrictions).

This information can be found by going to the "Program" page in the PRP Data Dashboard.

What was your enrollment trend over the last 5 years?
Stayed the same

What was your efficiency trend over the last 5 years?
Increased

Were these trends expected? Please explain.
Our enrollments have stayed roughly the same over the past 5 years, except that the last data reported showed a large, unexpected increase in Fall 2019. We are unsure how to account for this, and think it wise to consider our enrollment trend as staying the same. For fill rate we have been at or almost at the college goal for the past 5 years, and with a recent trend of increasing fill rate. Our WSCH per FTEF trend is also increasing, although here it is currently almost at the college goal.

Program Information Summary

Consider your program outcome assessments, completions, and enrollment/efficiency trends, as well as other internal and external factors.

How have these factors contributed to the success of your program(s)?
Our program overall has generally been holding steady on these indicators.

How have these factors presented challenges for your program(s)?
The pandemic has presented challenges for all programs.

The Chancellor's Office Vision for Success stresses the importance of reducing equity gaps through faster improvements of underrepresented groups.

ACCJC also requires that colleges establish institutional and program level standards in the area of success rates. These standards represent the lowest success rate deemed acceptable by the College. In other words, if you were to notice a drop below the rate, you would seek further information to examine why the drop occurred and strategies to address the rate.

Click on this link to review the course success rates (A, B, C, or Credit) for your discipline.

In this section we will identify a course success rate standards and a stretch goal (what you would like to move toward) for programs.

Course Success Rates by gender, age, ethnicity, special population, location, and modality (You can access the Student Equity Plan on the SSEC website https://www2.palomar.edu/pages/ssec/)

COURSE INFORMATION

COURSE SUCCESS AND RETENTION

What is your program's standard for Discipline COURSE Success Rate?
70.0%

Why did you choose this standard?
We chose the College institutional standard. However, historic CSCI Total Success Rate data shows that in the past we have not met this standard. The most recent total success rates have been flat e.g.: 59% in Fall 2017, 55% in Fall 2018 and 56% in Fall 2019.

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

Was this expected? Please explain.
Our overall success rate has stayed remarkably consistent over the past 6 years of data. This is as expected, demonstrates that this discipline remains particularly challenging.

What is your stretch goal for course success rates?
70.0%

How did you decide upon the goal?
The College institutional standard

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

Was this expected? Please explain.
Our overall retention rate has stayed consistent high, around the mid-80%s over the past 6 years of data. This is to be expected.

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

Gender: Why do you think gender differences exist? What do you need to help close the gap?
Women do better than men. Probably because relatively few women enter the program. These students are typically more able and more motivated than the general case.

Are there differences in success/retention between on-campus and online courses?
Yes

Please share any best practice methods you use for online courses.
Instructors online must provide to their students:
-content – every week, preferably original
-contact – instructor/student contact every week

COURSE LEARNING OUTCOMES

How is course assessment coordinated across sections and over time?
At ends of term, discipline specialists email all instructors for their assessment results.

How have you improved course-level assessment methods since the last PRP?
More timely in asking for results and entering into TracDat.

Summarize the major findings of your course outcomes assessments.
Major findings of our student learning outcomes assessments for our five CSCI required courses are encouraging:

-the best overall assessment results are for our introductory CSCI 112 Programming Fundamentals I and the advanced CSCI 210 Data Structures courses, each at around mid-90s% in our most recent findings

-overall assessment results of our CSCI 212 Machine Organization and Assembly Language course is the lowest, but at around 70%, this is felt to be an acceptable result for a challenging, very technical course

-the two remaining required courses have overall assessment results of around mid-80s%, which is acceptable

Reflecting on the major findings you summarized, what are some questions you still have about student learning in your courses that you have not yet been able to address with your outcomes assessments?
We are interested in questions regarding those students who do not plan to transfer to a 4-year school, instead intend to enter the workforce immediately. What skills are most in demand amongst this population, and how do we accommodate this, since demands change literally semester by semester in Computer Science.

What are some improvements in your courses that have been, or can be, pursued based on the key findings from your course learning outcomes assessments?
We are thinking about adding new courses in current, leading-edge subjects, such as Machine Learning 2 and Python 2. Also, a new joint degree in Data Science, with the Math Department.

PROGRAM CURRICULUM ALIGNMENT, MAPPING, SCHEDULING, & PLANNING

The Chancellor's Office Vision for Success stresses the importance of decreasing the average number of units accumulated by CCC students earning degrees.

Palomar College's Guided Pathways plan includes clarifying paths for students by sequencing course offerings so that they support scaffolding and timely completion. Our goal is to ensure learning through:

- The mapping and assessment of clear program outcomes that are also aligned to employer and/or transfer institution expectations.
- Engaging and applied learning experiences.
- Effective instructional practices to support students in achieving success.

How do your course outcomes help your students achieve their program outcomes?
Our course outcomes are successfully aligned with our program outcomes, to help our students achieve their goals

How do your degree maps and scheduling strategy ensure scaffolding (how all parts build on each other in a progressive, intentional way)? How do you share the maps with students?
Our degree maps and scheduling strategy are built around the principle that a student will be able to complete our program within 4 semesters. Our maps are shared with students via the standard Palomar Pathways Mapper webpage. Our scheduling ensures that there are always classroom and online alternatives available for all of our required core courses, every semester.

What is your departmental strategy on how you schedule your courses including the time of day you offer courses? Do you use 4-week, 8-week, or block scheduling (putting required classes near each other) to organize required classes to meet the needs of disproportionately impacted students? Please explain.
Our advanced courses are offered fully-online as well as during the day and in the evening. We schedule all of our courses over a two-day per week period, with one day for lecture and the second day for half lecture/half laboratory. We try to give working students the opportunity to take these classes by offering them in the evenings. During the regular semester, our advance courses are offered on the regular 16-week schedule.

Most of our beginning course (CSCI 112) sections are offered fully-online, in the evenings, and during the day. We also offer a few of the CSCI 112 sections using the 4-week and 8-week schedule. The shorten schedule is to offer more advanced students the ability to learn the materials at a faster pace.

How do you work with other departments that require your course(s) for program completion?
Our courses are not required for completion by any other department. However, we actively work with the math department to align our courses with theirs, and to develop a new cross-discipline major in data science.

Does your discipline offer cross-listed courses?
No

Are there curriculum concerns that need to be resolved in your department? What are they?
None at this time.

Are there courses that should be added or removed from your program - please explain?
Machine Learning (CSCI 290) - Proposed for Fall 2021

Artificial intelligence and machine learning are transformative technologies that our students must be allowed to explore. These technologies are critical to bachelor degrees in Computer Science and Data Science. This course will also serve the new Marine Corp Data Science program starting in Fall 2021. This course will strengthen the program by providing students with advanced training in an industry critical technology area.

How is the potential need for program/course deactivation addressed by the department?
Our department actively track enrollment in our courses. Courses that consistently have to be dropped from the schedule for more than two semesters will be marked for deactivation after a thorough discussion with everyone in the department for concurrence.

Is your department pursuing non credit or not-for credit options at this time?
No

Are there areas you would like to expand?
Our department would like to expand the artificial intelligence and machine learning field within our department. The courses to be offered in these areas will support a future discipline in data science and provide our students with more course options in a transformative technology area critically needed in industry.

Click here for information about Noncredit and Community Education

Is your department offering online classes?
Yes

How do you consider student needs when determining which classes and how many classes should be offered online versus face-to-face?
We try to maximize student student participation in our online versus face-to-face course offerings. For online courses, we look to 1. increased access for students who may live a significant distance away and not be able to reasonably attend on-campus classes; and 2. Attract students who might not participate in higher education at all for various reasons, such as shyness, physical disability, home responsibilities, learning-style preferences, etc.

Our courses are well suited to be fully-online because our students can learn and study for this class using materials from online lectures and other websites, participate in group discussions online, and do all the labs on their home laptop – so they do not need to be physically inside a classroom. Students can demonstrate mastery of different machine learning technology through computer laboratory exercises done on their home computer equipped with freely available software.

Our approach is to offer one fully-online course for each face-to-face course to give students every opportunity possible. Students who like the traditional class settings, or are better at learning in a face-to-face environment, have the option to enroll in the face-to-face sections.

Describe other data and/or information that you have considered as part of the evaluation of your program
Other factors that we looked at include: CSU and UC accreditation, labor market outlook and requirements.

CAREER AND LABOR MARKET DATA

Do you want more information about or need assistance integrating work-based learning into your program?
No

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.

What kinds of careers are available for people who complete your programs (and/or transfer)? (Refer to link above) Are there any new or emerging careers and 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 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 programing 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.

Work Based Learning

Applied and work-based learning (WBL) allows students to apply classroom content in professional settings while gaining real-word experience. WBL exists on a continuum that reflects the progress of experiences from awareness-building to training. Students often cycle back through the continuum many times throughout college and throughout their career. Faculty play a critical role in ensuring these experiences are embedded into curriculum and support learning.

Have you incorporated work based learning (work experience, internships, and/or service learning) into your program?
No

How do you engage with the community to keep them apprised of opportunities in your program?
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.

Program Goals

In the previous sections, you identified opportunities for improvement. Using these opportunities, develop 3-year SMART goals for your department. Goals should be Specific, Measurable, Attainable, Relevant, Time-Specific. Ensure your goals align with the mission of your department and/or the College's strategic plan.

Please list all discipline goals for this three-year planning cycle. Click here for previous PRPs and goal information.

Goals

Goal 1

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.

Is this a new or existing goal?
Existing

Goal Status
Ongoing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
While other departments utilize computers to supplement their curriculum, computers are the essence of the Computer Science curriculum. It is a fact that our curriculum is literally defined by the laboratory environment in which it is offered. Without this support, the department's ability to accomplish its goals is significantly diminished.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
To best serve our students and meet their preparation needs at the highest level of competence, we must provide a learning environment that effectively mirrors the current technology of the real world. In order to be able to develop and support a viable, relevant and innovative curriculum that attracts and retains students, the Computer Science discipline must have the necessary, on-going financial support to maintain state-of-the-art laboratories. Achieving this goal will will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
8/31/2023

Goal 2

Brief Description
A new Instructional Support Assistant position has long been required to work in the CSIT Department computer labs. Essential duties include support of computing resources in the labs; support of student learning in the labs.

Is this a new or existing goal?
Existing

Goal Status
Ongoing

How will you complete this goal?
Requesting new ISA position.

Outcome(s) expected (qualitative/quantitative)
Assist CSIT Systems Analyst in setups and configurations of CSIT computer labs.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Support students learning by supplementing the concepts taught in the classroom with extra hands on laboratory work. Achieving this goal will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
12/31/2022

Goal 3

Brief Description
Hire one permanent full-time Computer Science faculty members.

Is this a new or existing goal?	**Goal Status**
Existing	No longer a goal

How will you complete this goal?
Classes in Computer Science continue to be very popular. While the Computer Science program shows great success, often many students are turned away. We simply cannot find enough qualified adjuncts to teach our classes as the technical requirements for Computer Science adjuncts are quite high. It's been 20 years since we have been able to hire new CSCI faculty and we're hopeful that the Computer Science discipline will get to the top of the hiring list, especially since one of our full-time faculty recently retired.

Outcome(s) expected (qualitative/quantitative)
Strengthen current program and focus on STEM pathways.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
To best serve our students and meet their preparation needs at the highest level of competence, we must provide qualified faculty to teach our classes without turning students away due to class size limitations. Achieving this goal will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
1/18/2019

Goal 4

Brief Description
Hire STEM Computer Science Tutors. Place tutors in our two introductory level courses, CSCI 112 and CSCI 114.

Is this a new or existing goal?	**Goal Status**
Existing	No longer a goal

How will you complete this goal?
Faculty are recommending their best students to work with faculty and students in the introductory level classes.

Outcome(s) expected (qualitative/quantitative)
Computer Science is notoriously difficult, particularly at the beginning stages, so having qualified tutors in the introductory level classes will significantly improve student success.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Embedded classroom tutors in the introductory level CSCI classes will significantly improve student success. Achieving this goal will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
12/31/2019

Goal 5

Brief Description
Purchase an additional GoPro Camera with accessories including memory cards, hard drives, and tripod

Goal Status

Ongoing

Is this a new or existing goal?

Existing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
Strengthen current program by providing online and in-house students with recorded in-house class lectures. Giving online students access to the same lecture materials that in-house students receive will significantly improve their success. Our department has started making live recording of our lectures available to all the students through a Palomar run 3C website. Both the online and in-house students have found these recorded lectures very helpful in their learning process.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Giving the students access to recorded class lectures will significantly improve student success. Achieving this goal will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
8/30/2021

Goal 6

Brief Description
Funds to support the Women in Computer Science Club (PWICS) sponsor students activities

Is this a new or existing goal?

Existing

Goal Status

Ongoing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
PWICS provides a source of encouragement and support for women pursuing a career in computer science. Funding to support PWICS will significantly help encourage and promote the advancement of women in computer science.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Improve diversity in learning environments, philosophies, cultures, beliefs, and people. Achieving this goal will raise more interests and awareness in women to pursue a career in computer science and will empower the students to succeed.

Expected Goal Completion Date
8/31/2013

Goal 7

Brief Description
Purchase advertising such as posters, outreach materials, etc. for our program

Is this a new or existing goal?

Existing

Goal Status

Ongoing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
Strengthen the department's outreach plan to attract more students.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Achieving this goal will ensure the fiscal stability of the college and increase enrollments in computer science.

Expected Goal Completion Date
12/31/2022

Goal 8

Brief Description
Purchase robotic devices

Is this a new or existing goal?   **Goal Status**

Existing   Ongoing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
Computer science has long been focused on software implementation. The ability to interface the software with robotic devices will provide the students with hands on experience applying the concepts and significantly raise their interests in learning.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Support students learning by supplementing the concepts taught in the classroom with hands on applications of the concepts. Achieving this goal will empower students to succeed in their chosen field and will cultivate an appreciation of learning.

Expected Goal Completion Date
12/31/2021

Goal 9

Brief Description
Purchase faculty computers and tablets to replace old, out of warranty equipment.

Is this a new or existing goal?   **Goal Status**

Existing   Ongoing

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
Strengthen current program by providing up-to-date computers and tablets for faculty. Current faculty equipment are old and out of warranty.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Faculty require up-to-date computers and tablets to be able to create and make available teaching materials, and to support student learning.

Expected Goal Completion Date
12/31/2023

Goal 10

Brief Description
Introduce a new machine learning course to serve as additional electives course for the department

Is this a new or existing goal?
New

How will you complete this goal?
Submit the course proposal into META.

Outcome(s) expected (qualitative/quantitative)
Artificial intelligence and machine learning are transformative technologies that our students must be allowed to explore. These technologies are critical to bachelor degrees in Computer Science and Data Science. This course will also serve the new Marine Corp Data Science program starting in Fall 2021.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
This course will strengthen the program by providing students with advanced training in an industry critical technology area.

Expected Goal Completion Date
3/31/2021

Goal 11

Brief Description
Support a multi discipline data science program between computer science, CSIT, and math

Is this a new or existing goal?
New

How will you complete this goal?
Work with CSIT and math department to structure the course requirements and staffing to align with industry standard and to CSU/UC transferability requirements. Leverage the Marine Corp Data Science program, to start in Fall 2021, as a starting point.

Outcome(s) expected (qualitative/quantitative)
Data science is rapidly growing as a new area of study in many universities, including CSU and UC, in response to industrial demand. A multi discipline data science program will strengthen and grow the department.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
This data science program will strengthen the program by providing students with training to help them transfer to a 4-year bachelor degree in data science. Knowledge of data science will also provide students will skills desperately needed in industry.

Expected Goal Completion Date
3/31/2022

Goal 12

Brief Description
Purchase Raspberry Pi 4

Is this a new or existing goal?
New

How will you complete this goal?
Submit Resource Request.

Outcome(s) expected (qualitative/quantitative)
Strengthen current program by providing up-to-date computing resource in the laboratory for students to use. Current Raspberry Pi 3s in the computer lab are outdated and need to be replaced.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Students who need to work on laboratory assignments for their computer science courses can use the up-to-date equipment to enhance their learning success.

Expected Goal Completion Date
6/30/2021

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 four parts:

PART 1: Staffing Needs (Faculty and Additional Staff)

PART 2: Budget Review

PART 3: Technology and Facilities Needs

PART 4: One Time Request for Other Needs (NonTechnology Equipment, Supplies, Operating Expenses, Travel)

PART 1: STAFFING NEEDS

Requests for faculty will follow the prioritization process currently in place in IPC, and the IPC SubCommittee. Requests for new staff positions will be prioritized at the division level and reviewed at Exec.

Are you requesting additional full-time faculty?
No

NOTE: If you are requesting full-time faculty, you must go back to the Labor Market section of the form to complete that section. It is required when requesting additional faculty positions.

Are you requesting new Classified, CAST or AA positions?
No

PART 2: BUDGET REVIEW

Review your Budget/Expenditure reports for 2018, 2019, 2020. Consider your three-year PRP plan.

Click on the link below to access directions to the *Available Budget Report* to complete this section.

How to Request the Available Budget Report

Reflecting on your three-year PRP plan, are there any budget considerations you would like your dean/supervisor to be aware of for the upcoming year?
No

NOTE: PARTS 3 and 4 – TECHNOLOGY, FACILITIES AND OTHER NEEDS

This year the College is implementing two new processes related to resource needs coming from the PRP process.

1. One-Time Fund Requests. The college is implementing a process for prioritizing and allocating funds for one-time needs/requests tied to Program Review and Planning. Prioritization will take place through participatory governance in planning councils and the Budget Committee. Then, a recommendation will be made to Exec for funding of request utilizing various funding sources.

   For more information about funding sources available, see IELM BLOCK GRANT, LOTTERY, PERKINS AND STRONG WORKFORCE GUIDELINES.

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

2. Technology and Facilities Review. From now on, ALL requests for technology will go through an institutional review process. If you request technology here, you will see a description of the process below.

PART 3: TECHNOLOGY AND FACILITIES NEEDS

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

Technology Request

Technology Request 1

What are you requesting?
Thirty-five Raspberry Pi 4s

Provide a detailed description of the item requested. What is it, and why do you need it? Please be as descriptive as possible. Include in your description how the requested item aligns with your discipline's PRP goals, analysis of PRP data, SLO/SAOs.
Raspberry Pi 4s are miniaturized computers, each costing $100, that are used in our laboratory to support students in CSCI 212. Students need to have access to the Raspberry Pi 4s to complete their lab assignments. The lab currently has thirty-five Raspberry Pi 3s that are outdated. This request has been added to our goals for 2021.

Estimated Amount of Request.
$3,500.00

Will you fund the request through your budget or other sources?
Existing Budget

What PRP plan goal/objective does this request align with?
Purchase of Raspberry Pi 4

What Strategic Plan 2022 Goal:Objective does this request align with?
1:1

If you have multiple requests for technology and had to prioritize, what number would give this? (1 = Highest)
1

Do you think that your request for technology will require changes to a facility?
No

Note about technology requests:

All technology requests will now go through a review process before prioritization.

- *Your dean/director will send you a Technology Request Checklist (aka Technology Proposal Analysis Checklist).*
  - *You must complete this checklist and return it to your dean no later than 10/30/2020.*
  - *Once the dean approves the form and the request, the dean will send the document to the Technology Review Committee to determine IS resources needed, any integration issues, and/or potential overlap with existing technology.*
  - *The results of the review will be sent to the dean and chair with feedback.*
  - *The dean will determine whether or not the request moves forward for prioritization and/or implementation.*
    - *Requests for one-time funding will move forward for prioritization.*
    - *Requests that use funding from your department budget may move forward for purchase.*

Do you have resource needs that require physical space or modification to physical space?
No

PART 4: 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 the Program Review 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

Review

Chair Review

Chair Comments
Looks good.

Chair Name	**Chair Sign Date**
Tony Smith	10/29/2020

Dean Review

Strengths and successes of the discipline as evidenced by the data and analysis:
I appreciate the collaboration between the math department to align curriculum for computer science majors. Additionally the department has been very effective at working with related departments in creating a new degree to meet industry needs. The assessment of student outcomes is high (80%). The department does a wonderful job at placing students in internships and maintains community relationships to make these opportunities possible.

Areas of Concern, if any:
Success rates of students is consistently on the lower end of the scale.

Recommendations for improvement:
Since assessments of student outcomes are high I would recommend reevaluating SLO's to address a new set of content areas that may be problematic to students. Focusing on new aspects of the courses may help improve success rates. I would also recommend that the department work with their work based learning (WBL) liaison. Many of the projects/activities count as WBL but are not identified as such.

Dean Name	**Dean Sign Date**
Patricia Menchaca	11/4/2020

IPC Review

Strengths and successes of the discipline as evidenced by the data and analysis:
The collaboration between Palomar and other higher education institutions seem to be very valuable in providing continuity for students. The purchase of up-to-date computers/software is a great advantage for students trying to enter an ever-changing field.
Mid-80% retention is a very positive statistic.

Areas of Concern, if any:
No concerns.

Recommendations for improvement:
Due to funding changes –program completions are becoming imperative. Higher program/certificate completion rates would be best.

IPC Reviewer(s)	**IPC Review Date**
Najib Manea and Shanon Beach	12/4/2020

Vice President Review

Strengths and successes of the discipline as evidenced by the data and analysis:
collaboration with Math to inform curriculum; completions and enrollments holding steady

Areas of Concern, if any:
1. course success rate
2. no WBL
3. conversation re: deactivation -- lack of advisory council or proactive engagement with employers
4. lack of CTE top coding?

Recommendations for improvement:
1. Aim for higher course success rate by identifying areas in curriculum where many students struggle and consider changes to the way a certain topic is taught, supported, etc.; communicate these areas to tutoring as well so that they can be prepared to support what's happening in the classroom
2. reach out to Nichol Roe (along with your dean) to discuss WBL and Career Continuum; this will impact your conversation re: students who complete and go right into career as well as students who transfer first.
3. Is it clear to students what the course rotation is and when they should take their math? Is it communicated intentionally in the classes along the way?
4. #2 in this section should also help how better to connect with industry to inform your curriculum
5. Meet with dean and IS to discuss computer replacement plan already in place institutionally to provide input re: your needs
6. Meet with dean and STEM/MLC manager to discuss how better to support your discipline with tutoring; we're moving towards more centralized tutoring instead of creating more spaces.
7. Discuss with dean institutional support for addition of more electives to the schedule

Vice President Name	**Vice President Sign Date**
Shayla Sivert	1/3/2021