2022-23 Instructional Program Review and Planning

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.

BASIC PROGRAM INFORMATION

Academic Year

2022-23

Are you completing a comprehensive or annual PRP?

Annual

Division Name

Mathematics, Science and Engineering

Department Name

Physics/Engineering

Choose your department. If you don't see it, you may add it by typing it in the box.

Discipline Name

Physics (PHYS)

Choose your discipline. If you don't see it, you may add it by typing it in the box.

Department Chair Name

Hector Garcia Villa

Department Chair email

hgarciavilla@palomar.edu

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

Hector Garcia Villa, PHYSENGR department Chair.

Website address for your discipline

https://www2.palomar.edu/pages/physics/

Discipline Mission statement

The Department has not developed an agreed on mission statement for this discipline. This will be a goal for the coming

year. A suitable stand-in is presented here:

Physics lies at the core of all scientific and technical disciplines. Our mission is to provide students with an outstanding

learning experience in which they develop strong analytical, quantitative, and problem solving skills with a deep

appreciation of the role physics plays in technical innovations and understanding the world we live in. We strive to

provide an engaging teaching and learning environment for students of diverse origins, experiences, needs, abilities, and

goals. We support and encourage students who intend to transfer as well as students pursuing career and technical

training. We seek educational empowerment in all we do. We provide students with rigorous and comprehensive courses

that allow them to perform at a high level while also fostering curiosity and excitement about the physical world. We also

provide an exciting learning opportunity for non-physics and non-science majors that provides basic understanding of

physics and problem-solving skills

[(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 ◉ No

Are any of your programs TOP coded as vocational (CTE/CE)?
○ Yes ◉ No

BASIC PROGRAM NFORMATION: 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)?

3

Enter a number.

Link: [Permanent Faculty and Staff Count](#)

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

2.0

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

Link: ***FTEF Data***

4.40

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

ADA: Abby Corona, 10% time, 12 month
ISA: Tony Kopec, 25% time, 12 month

Link: *Permanent Faculty and Staff Count*

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

Randy Parker, 20 hours/week

PROGRAM INFORMATION

In this section, you are asked to consider and evaluate your programs, including their program 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. 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 do they align with employer and transfer expectations?

The vast majority of our students seek transfer to a 4-year institution, to complete a B.S. degree in Science or
Engineering. Very few are interested in an A.S., since it would require more GE credits than they need to complete their
major.

We feel confident that our SLOs reflect the transfer requirements and expectations our students need. We have revamped some of our SLOs, and are working on some others.

Program Information Summary

In this section you are asked to evaluate your programs by considering their program learning outcome assessments, the annual number of completions, goals for completions, enrollment and efficiency trends 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.

- We hired two new full-time faculty, they are starting their 4th year. They have been developing new curriculum (especially lab curriculum), which greatly helps our students succeed.

- We have a strong pool of part-time faculty, from different fields of physics. They bring private sector and research
experience as well as a vast teaching experience.

- The College has provided resources in the past few years to update the laboratory curriculum in several of our classes
(some of the equipment dated from the 1980s). This is helping our students learn the skills they will need to transfer, and
to join the workforce.

- This year we have a temporary lab assistant, which is greatly helping in some of our labs.

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

- A big challenge has been the lack of a dedicated ISA (lab technician). We share Tony Kopec 50% with the Earth
Sciences department, which gives Physics and Engineering 25% each. Currently, our full-time faculty spends many
unpaid hours taking care of the labs, equipment and organization of the lab rooms. This is not sustainable long term,
especially as our programs grow and we move back to campus for F2F teaching.

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 about the assessment of student learning outcomes at the course level, progress you have made in these assessments, and changes you have implemented as a result.

COURSE SUCCESS AND RETENTION

ACCJC also requires that colleges establish institutional and program level standards and stretch goals for course success rates.

Program-set standards for course success rates represent the lowest success rate deemed acceptable by your discipline. 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. The College's institution-

set standard for course success rates is 70%

Program-set stretch goals for course success rates represent the success rates you aspire your students to achieve.

The data includes overall success (% C or better) and retention rates (% No Ws) . The data tables include course 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/)

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

70.0%

The College's institutional standard for course success rate is 70%.To access college success rates. Click on the link below.

Link: Course Success Rate Information

UPDATE 9/26/2022: The Course data links are under construction and will be operational shortly. This note will be removed when then link becomes functional again. Apologies for the inconvenience.

Why did you choose this standard?

We feel is a good compromise between two factors: on the one hand, our students have completed several pre-
requisites and are therefore better prepared to do difficult college-level work. On the other hand, our courses are usually
demanding, since they are required for all STEM degrees, and tend to count towards the students' major.

What is your stretch goal for course success rates?

80.0%

How did you decide upon the goal?

For the same reasons stated above, it is important that we provide a welcoming and accessible offering of courses for
those seeking careers in STEM. We feel it is important to make careers in STEM available to the community we serve,
especially to groups that have been under-represented in those fields.

We believe that the current enthusiasm for promoting STEM and the continued student support services being offered by
the College (STEM/MATH center, etc.) should allow us to meet this target.

COURSE STUDENT LEARNING OUTCOMES (SLOs)

Summarize the major findings of your course level student learning outcomes assessments.

PHYS 101:
73% of students passed the final exam. This went fairly well considering we were currently in an online modality and in the
middle of a pandemic

PHYS 121:
This SLO was demonstrated using the course comprehensive final exam on a pass/no pass basis.
83% of students passed the comprehensive final exam. The comprehensive final is a good means of assessing this
SLO, even during pandemic.

PHYS 201:
This SLO was demonstrated using the course comprehensive final exam on a pass/no pass basis.
88% of students passed the comprehensive final exam. The comprehensive final is a good means of assessing this
SLO, even during pandemic.

PHYS 230:
Students were asked to solve a problem involving a perfectly inelastic collision in two dimensions. 76% of students were
able to solve it. This results reflect an assessment given during the COVID-19 pandemic, so these students did not have
hand-on lab experience. A better result could have been obtained if labs had been available.

PHYS 231:
Students were asked to determine the electric field created by a uniformly charged rod. 87% of students scored 70% or
more.Students did well, but results were affected by the COVID-19 pandemic

Course level SLOs can be accessed through [Nuventive Improve](#)

Excluding courses that haven't been offered in the last three years, do you confirm that all of your courses have been assessed in the last three years.
⊙ Yes ○ No

This section is intentionally blank for annual PRPs. Please click "Next" to continue.

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.

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?

Physics majors are widely employed throughout industry. In addition to having specific knowledge and skill-set,
physicists bring a systems-thinking lens lens to projects and solving problems. Physicist work in all fields of science and
technology.

The three major employers of career physicists are academic institutions, laboratories, and private industries, with the
largest employer being the last. Physicists in academia or government labs tend to have titles such as Assistants,
Professors, Sr./Jr. Scientist, or postdocs. As per the American Institute of Physics, some 20% of new physics Ph.D.s
holds jobs in engineering development programs, while 14% turn to computer software and about 11% are in
business/education. A majority of physicists employed apply their skills and training to interdisciplinary sectors (e.g.
finance). Job titles for graduate physicists include Agricultural Scientist, Air Traffic Controller, Biophysicist, Computer
Programmer, Electrical Engineer, Environmental Analyst, Geophysicist, Medical Physicist, Meteorologist, Oceanographer, Physics Teacher/Professor/Researcher, Research Scientist, Reactor Physicist, Engineering Physicist,
Satellite Missions Analyst, Science Writer, Stratigrapher, Software Engineer, Systems Engineer, Microelectronics
Engineer, Radar Developer, Technical Consultant, etc.

Link: https://www.onetonline.org/

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

KNOWLEDGE

Physics — Knowledge and prediction of physical principles, laws, their interrelationships, and applications to
understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures
and processes.
See more occupations related to this knowledge.
Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
See more occupations related to this knowledge.
Engineering and Technology — Knowledge of the practical application of engineering science and technology. This
includes applying principles, techniques, procedures, and equipment to the design and production of various goods and
services.
See more occupations related to this knowledge.
Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer
hardware and software, including applications and programming.
See more occupations related to this knowledge.
English Language — Knowledge of the structure and content of the English language including the meaning and spelling
of words, rules of composition, and grammar.

SKILLS

Science — Using scientific rules and methods to solve problems.
See more occupations related to this skill.
Mathematics — Using mathematics to solve problems.
See more occupations related to this skill.
Reading Comprehension — Understanding written sentences and paragraphs in work related documents.
See more occupations related to this skill.
Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions,
conclusions or approaches to problems.
See more occupations related to this skill.
Speaking — Talking to others to convey information effectively.

ABILITIES

Mathematical Reasoning — The ability to choose the right mathematical methods or formulas to solve a problem.
See more occupations related to this ability.
Number Facility — The ability to add, subtract, multiply, or divide quickly and correctly.
See more occupations related to this ability.

PROGRAM GOALS

Progress on Prior PRP Goals

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

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

Prior PRP Goals

Goal 1

Brief Description

Recruit and hire highly qualified faculty, and guide them through the probationary process.

Goal Status
○ Completed ⊙ Ongoing ○ No longer a goal

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

Three years ago we hired two new faculty. They are undergoing the probationary process successfully, and we expect them to obtain tenure during this term.

Goal 2

Brief Description

Update and modernize curriculum

Goal Status
○ Completed ⊙ Ongoing ○ No longer a goal

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

We need both time and money to complete this goal. Faculty need to put time to think of new lab activities,
experiments, etc. Then the department needs money to purchase new lab equipment (some of it dates back to the
1960s), that better reflects current pedagogy and technology.

We have improved our lab curriculum in Physics 231, but Physics 230 is still a work in progress.

The Strategic Plan 2022 includes the College's Vision for Success (VfS) outcomes. Review the VfS goals and reflect on how your unit supports these outcomes. Identify one strategy your unit will implement to help the college meet these outcomes.

VfS Goal 1: Our department constantly strives to have as many students as possible to complete our program. One challenge we face, especially in the first class of our majors sequence (Physics 230) is a larger than ideal drop rate. This could be remediated with better Math prepraration, especially with Calculus classes that target especifically our student population. VfS Goal 2: All of our students who complete our program are ready for transfer. They are routinely accepted at CSU, CalPoly and UC.

Click here to access the Strategic Plan 2022.

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

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 Strategic Plan 2022.

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 requestiong additional full-time faculty?
○ Yes ⊙ No

Are you requesting AA, CAST for Classified Staff?
⊙ Yes ○ No

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 - Lab technician

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

Is this request for a full-time or part-time position?
⊙ Full Time ○ Part-Time

Classified	○	

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.)

We need a full-time, dedicated ISA to serve as our lab technician. Currently we have one (Tony Kopec), shared 50%
with Earth Sciences. Thus, Physics gets about 25% of his time and Engineering another 25%. We have three Physics
labs, and it is impossible for our current ISA to serve all three. Therefore, our full-time faculty is spending lots of
unpaid time to clean, resupply, purchase equipment and maintain the lab facilities.

This is untenable in the long run, as faculty are already feeling burned out having to spend all this time in lab upkeep
on top of their contractual obligations.

Additionally, having a clean, well-maintained lab equipment would make the lab room environment healthier and safer.
There are electrical and mechanical instruments that can be hazardous if not maintained and stored properly.

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

No.

Is there funding that can help support the position outside of general funds?
○ Yes ⊙ No

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

It would allow faculty to devote their time to create and update the lab curriculum, which is in dire need right now in
the Physics department.

It would allow the full-time faculty in the department to have more time to coordinate courses and programs with our
transfer partners.

Strategic Plan 2022 Objective

☐ 1:1	☐ 1:2	☑ 1:3	☑ 1:4
☑ 1:5	☑ 2:1	☑ 2:2	☑ 2:3
☑ 2:4	☐ 3:1	☑ 3:2	☐ 3:3
☑ 3:4	☑ 3:5	☑ 4:1	☐ 4:2
☑ 4:3	☐ 5:1	☐ 5:2	

Refer to the Palomar College https://www2.palomar.edu/pages/strategicplanning/files/2020/01/FINAL-Strategic-Plan-2022.pdf

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

We do not have a back up plan. Possibly internal discussion within the department, and request release time to take
care of the lab rooms or cancel classes due to lack of lab maintenance.

PART 2: BUDGET REVIEW

Review your Budget/Expenditure reports for fiscal year 2019, 2020, 2021. 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 budet considerations you would like your dean/supervisor to be aware of for the upcoming year?
○ Yes ⊙ 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 ad 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 CTEE 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.

2. 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?
⊙ Yes ○ No

Technology Request

Technology Request 1

What are you requesting?

Matlab License.

Is this a request to replace technology or is it a request for new technology?

New Technology

Provide a detailed description of the the request. Inlude in your response:

a. Description of the need? (e.g., SLO/SAO Assessment, PRP data analysis)

In order to prepare Physics and many Engineering majors for transfer, we need to teach them how to use Matlab, since many schools are expecting them to know how to use it, and a Matlab class is a lower division requirement for many Engineering and Physics majors.

b. Who will be impacted by its implementation? (e.g., individual, groups, members of department)

It will be Physics and Engineering majors.

c. What are the expected outcomes or impacts of implementation?

- Using Matlab to solve Engineering and Physics problems
- Data analysis and visualization
- Analysis and processing of experimental data

d. Timeline of implementation

As soon as we obtain a license and the class is approved.

What is the anticipated cost for this request? If any, list ongoing costs for the technology (licences, support, maintenance, etc.).

The license for 50 students (about the expected need) is quoted by MathWorks at $1600.

Do you already have a budget for this request?

No

What PRP plan goal/objective does this request align with?

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

☐ 1:1	☐ 1:2	☐ 1:3	☐ 1:4
☐ 1:5	☐ 2:1	☑ 2:2	☑ 2:3
☑ 2:4	☐ 3:1	☐ 3:2	☐ 3:3
☐ 3:4	☐ 3:5	☐ 4:1	☐ 4:2
☐ 4:3	☐ 5:1	☐ 5:2	

Refer to the Palomar College STRATEGIC PLAN 2022

If you have multiple requests for technology and had to prioritize, what number would you give

this? (1 = Highest)

What impacts will this request have on the facilities/institution (e.g.,water/electrical/ADA compliance, changes to a facility)?

None, we just need the Matlab license.

Will you accept partial funding?
○ Yes ⊙ No

PART 4: FACILITIES REQUESTS

Do you have resource needs that require physical space or modification to physical space?
○ Yes ⊙ No
Please include only those facilities requests that could be accomplished within a one-year time frame and/or under a $75,000 estimated amount. Other facilities needs, such as buildings or remodels, should come through the long-range facilities planning process.

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?
○ Yes ⊙ No

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

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

hgarciavilla@palomar.edu