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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?
Annual

Department Name
Earth, Space, and Environmental Sciences

Discipline Name
Astronomy (ASTR)

Department Chair Name
Sean Figg

Division Name
Mathematics, Science and Engineering

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

Discipline Mission statement
The mission of the Astronomy Program at Palomar College is to educate our students in the fundamental science of astronomy as a way to understand our universe. We achieve this mission by providing high-quality educational opportunities in astronomy for a diverse student population who wish to achieve general education science credit, earn a certificate of achievement, or to fulfill transfer requirements for a degree in astronomy at California universities. As one of the core STEM disciplines, our astronomy courses promote the understanding of basic science and physical processes to create a science-literate society and encourage student participation in STEM disciplines and careers.

(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.
Certificate of Achievement (CA) - Astronomy

Please list the names and positions of everyone who helped to complete this document.
Mark Lane (Professor of Astronomy & Planetarium Director)
W. Scott Kardel (Associate Professor of Astronomy and Assistant Planetarium Director)

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)
1.8

Part-time faculty (FTEF)
0

Classified and other permanent staff positions that support this discipline
ADA 20%; Instructional Assistant IV 10%

Additional hourly staff that support this discipline and/or department
None

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?
We believe that our program learning outcomes are comprehensive and communicate the scope and depths of our transfer courses and certificates. They are developed in consultation with our counterparts at key transfer institutions for our students (i.e. SDSU, CSUSM).

How do they align with employer and transfer expectations?
The program learning outcomes were designed with the transfer student in mind. We have had numerous students the last several years that have transferred into astronomy programs at 4-year schools across the region.

Describe your program's plan for assessing program learning outcomes.
We assess our program learning outcomes over a 3-year cycle by reviewing student performance in our key transfer classes. Changes in learning assessments are considered and made if they are not effective in summarizing outcomes.

Summarize the major findings of your program outcomes assessments.
Students have met or exceeded all of our program outcome assessments except one. We are struggling with getting students to pass the SLO on the seasons. We are currently working on a strategy that will better assess the students in a way that will more accurately quantify this outcome.

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.
AS - ASTR (1 student)
CA - ASTR (2 students)

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

What factors have influenced your completion trends?
With only three years of data available we continue to have small numbers of completions in the AS degree which was discontinued in the 2017-18 school year. The Astronomy CA has remained at 1 or 2 students per year. Essentially no one in the real world requires or values an Astronomy CA for employment or transfer, so few students, even those who transfer to four-year schools as astronomy majors, apply for the CA.

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)?
Over the last five years Astronomy has seen a growth in its success rate (44->51%) and its retention rate (91%->94%).

How have these factors presented challenges for your program(s)?
The lact of a perceived value of the Astronomy CA for transfer or employment will likely keep our numbers small.

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?
50.0%

Why did you choose this standard?
Astronomy can be a difficult subject for many students. It requires students to have some K-12 science experience that many students are currently lacking. When choosing a general education course to take to fulfill their GE requirements, many choose astronomy not realizing that they will have to work harder than other non-science courses. Even with careful and patient instruction, many of these students perform at a lower level than they otherwise would in non-science courses. It is important that our astronomy program at Palomar College adheres to the standards that CSU and UC schools demand in their astronomy courses if we are to maintain articulation agreements with the university system.

One development that is becoming apparent is an increase in the number of our students who are receiving financial aid. Although this allows them access to college that they might not otherwise afford, many of these students enroll in astronomy not expecting a subject that is rigorous and challenging. To keep their financial assistance, they must be enrolled at the end of the semester but many of them stop showing up to class and effectively drop out without officially dropping the course. Many "FW"s are assigned at the end of the semester which drags down our success rate.

For these reasons it is unrealistic to expect that the astronomy discipline will meet the standard for Discipline Course Success Rate that the rest of the college holds. The data provided by the Institutional Research and Planning database shows that a 50% success rate for the astronomy discipline is a realistic goal for astronomy. At this time we are averaging around 50% and we feel that we can keep a 50% rate a reality and a norm for the discipline.

What is your stretch goal for course success rates?
52.0%

How did you decide upon the goal?
We believe that we can increase our course success rate but our plan of action will take some time before results are apparent. We believe that a small increase to the existing rate is a reasonable stretch goal. If we are successful, we can increase the next stretch goal and so on.

When or Where: Why do you think differences based on when or where the course is offered exists? What do you need to help close the gap?
We are seeing a drop off in our evening enrollments. This might be related to labor forces since a stronger economy means fewer students returning to school - many of these returning students are older and would normally prefer a night class.

Age: Why do you think age differences exist? What do you need to help close the gap?
Our older students are significantly more successful than our younger ones. Possibly they have the study skills and level of commitment necessary to be more successful in our courses.

COURSE LEARNING OUTCOMES

How have you improved course-level assessment methods since the last PRP?
Our last PRP was completed last spring. SLO assessment methods have remained the same since then.

Summarize the major findings of your course outcomes assessments.
Overall our students are meeting or exceeding our minimum standards for SLO success with one nagging exception - the seasons. This has been a long standing failure in our SLOs and we have a strategy to change the way we assess the SLO questions regarding the seasons in a way that might raise the success rate for this outcome.

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

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

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?
There are few careers in astronomy in the traditional sense. Compared to other sciences, professional astronomers are few and far between. However, astronomy (19-2011.00) is listed as having a "Bright Outlook."

Most astronomers need to get their PhD to be employed in the field working at a university or observatory working as an instructor or researcher. However their are also positions in public outreach at observatories and planeteria explaining astronomy to the general public.

Other related careers listed are:
19-1021.00 Biochemists and Biophysicists
25-1051.00 Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
25-1054.00 Physics Teachers, Postsecondary
17-3029.01 Non-Destructive Testing Specialists

What are the associated knowledge, skills, abilities (KSA's) needed for the occupations listed above? (click examples in the link above to get ideas)
The KSAs needed for employment in the above fields are knowledge of astronomy, physics and mathematics.

In addition to astronomy knowledge needed includes:
Physics
Mathematics
Computers and Electronics
English Language
Education and Training

Skills needed include:
Science
Active Learning
Critical Thinking
Reading Comprehension
Mathematics

Abilities needed include:
Deductive Reasoning
Inductive Reasoning
Mathematical Reasoning
Near Vision
Oral Comprehension

How does your program help students build these KSA's?
By completing courses in astronomy at Palomar College, successful students have a basic background in science and fundamental astronomical concepts that, when combined with the proper knowledge in physics and mathematics, will enable them to continue their education at other 4-year institutions. Many of these KSAs are fundamental items (English Language, Speech Clarity, Reading Comprehension) that a student learns in a variety of classes while obtaining a college degree.

The required lecture, lab exercises, writing and reading assignments should encourage students to acquire and/or enhance the KSA's listed above.

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?
Advertisement at Palomar College Planetarium. Community outreach.

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
Revise program requirements for the Astronomy Certificate

Is this a new or existing goal?
Existing

Goal Status
No longer a goal

How will you complete this goal?
The plan in Spring 2019 was to Revise the astronomy certificate to make it more attractive to students by placing a greater emphasis on astronomy and less on advanced mathematics and physics, but articulation concerns have shown that this is not an option.

Outcome(s) expected (qualitative/quantitative)

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?

Expected Goal Completion Date
9/16/2019

Goal 2

Brief Description
Increase enrollments for the ASTR105L courses

Is this a new or existing goal?
Existing

Goal Status
Ongoing

How will you complete this goal?
In recent semesters, we have had a difficult time reaching minimum enrollments for the night section of astronomy lab. We moved the night lab to a daytime slot as an experiment to see if enrollments become more robust and they did.

We have also worked to advertise the course more effectively, and are considering offering some hands on activities (using telescopes, etc.) that hopefully will encourage more students to enroll.

During online instruction of Fall 2020 enrollments in the ASTR105L course were 100% full.

Outcome(s) expected (qualitative/quantitative)
Increased enrollments in both lab sections with more robust enrollment numbers early on during open enrollments.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Our experience is that students who enroll in both the astronomy lecture and lab classes are more successful in the lecture class. Encouraging more students to take the lab class will allow us to serve more students providing a pathway for them to be more successful in the lecture sections increasing both success rates and retention rates.

Expected Goal Completion Date
8/23/2021

Goal 3

Brief Description
Offer an online version of the ASTR 100 course

Is this a new or existing goal?
Existing

Goal Status
Completed

How will you complete this goal?
Complete all necessary training and logistical requirements (Curriculum Review, etc.) necessary to offer an online ASTR 100 course.

The pandemic of 2020 helped to force this goal to be completed.

Outcome(s) expected (qualitative/quantitative)
By offering an online version of the astronomy lecture course, we will serve students who are not geographically local who still want to earn credit from Palomar College. An online version of the course will offer students the flexibility of taking a course that will satisfy their GE requirements but might not be able to attend F2F lectures due to scheduling conflicts, etc.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Adding an online version of the course will allow us to serve a more diverse student body by being flexible to students with different learning styles, needs, and availability which will increase our enrollment numbers and perhaps even increase our success rates.

Expected Goal Completion Date
8/24/2020

Goal 4

Brief Description
Bring the donated 24-inch telescope back to operational life

Is this a new or existing goal?
New

How will you complete this goal?
The telescope was donated and is sitting in storage. Significant financial support will be needed to build an observatory on campus and to refurbish the telescope making it operational again. We suspect that due to the financial difficulties currently being experienced by the college, we will largely be looking for public financial support through donations, fundraising, etc.

Outcome(s) expected (qualitative/quantitative)
This telescope will be an excellent improvement to our astronomy program. It will allow us to incorporate hands-on, research quality observing into our courses and it will allow us to train career-path students in astronomy in the use of a research quality telescope and supporting equipment.

Secondly, this telescope will enhance our public outreach program by allowing the public to view through the telescope on special occasions.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Making this telescope operational again will provide a high quality educational opportunity in astronomy.

Providing hands-on learning using a research quality telescope will increase student interest in taking astronomy classes and provide a pathway for them to be more successful in the lecture sections increasing both success rates and retention rates.

Expected Goal Completion Date
6/1/2023

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?
No

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.
skardel@palomar.edu

Review

Chair Review

Chair Comments

Chair Name
Sean Figg

Chair Sign Date
10/19/2020

Dean Review

Strengths and successes of the discipline as evidenced by the data and analysis:
The program has done a wonderful job at evaluating student needs with respect to course scheduling and has made revisions to accommodate preferred schedules. The partnership with the planetarium and goals of the program (i.e. observatory) align well to strengthen the content of the courses and expose students to activities that they would otherwise not be exposed to.

Areas of Concern, if any:
The program has not identified work based learning (WBL) as a priority. Success rates in courses are low while most student learning outcomes are high.

Recommendations for improvement:
Work based learning is a guided pathways initiative. Many of the activities and partnerships already appear to fall under the category of WBL. I would recommend that the faculty connect with the division WBL liaison to document these WBL activities. Student success is low but the assessment of outcomes are high. I would like to recommend that the faculty reevaluate student learning outcomes to address a new content area that is consistently challenging for students.

Dean Name
Patricia Menchaca

Dean Sign Date
11/4/2020

IPC Review

Strengths and successes of the discipline as evidenced by the data and analysis:

Areas of Concern, if any:

Recommendations for improvement:

IPC Reviewer(s)

IPC Review Date

Vice President Review

Strengths and successes of the discipline as evidenced by the data and analysis:
such a unique and interesting program!; value to the K-12 and community at large; after all, the presence of our planetarium and the education brought to us by its presence ties so metaphorically into the very existence of Palomar College and the Comets!

Areas of Concern, if any:
1. no alignment with employer expectations
2. no WBL -- you mentioned lack of perceived value for Astronomy CA -- let's change that around!
3. assessing students on seasons -- not sure but maybe it's not the assessment but some part of the curriculum that could be addressed in a different way?
4. extremely low course success rates -- does there need to be a course or at least more foundational curriculum added into introductory course?

Recommendations for improvement:
1. meet with dean and Nichol Roe to discuss WBL and Career Continuum; it can definitely serve to support your area in bringing relevance to the forefront -- curious, but do you provide opportunities for any of your students to work in the planetarium beyond the store?
2. Continue to meet with Ben Mudgett to explore all options for curriculum changes without impact to transfer -- could involve a more general intro class for non-majors?
3. Make your goal outcomes more precise and easily measured
4. Discuss Telescope with dean and possible connection to Foundation assistance in fund raising to get that up and running! (even a repayment plan by continuing to raise funds ongoing once in place)

Vice President Name
Shayla Sivert

Vice President Sign Date
1/3/2021