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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
2021-2022

Are you completing a comprehensive or annual PRP?
Comprehensive

Division Name
Mathematics, Science and Engineering

Department Name
Earth, Space, and Environmental Sciences

Department Chair Name
Sean Figg

Discipline Name
Geography (GEOG)

Department Chair email
sfigg@palomar.edu

Please list the names and positions of everyone who helped to complete this document.
-Wing Cheung (Professor, Geography; Department Chair)
-Catherine Jain (Professor, Geography)
-Steve Crook (Assistant Professor, Geography)

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

Discipline Mission statement
The Geography Program encourages the discovery, application, and dissemination of geographical knowledge concerning Earth's physical and human environments in order to promote scientific thought, global citizenship, and environmental stewardship. We offer a variety of certificates and associate's degrees to serve students with diverse academic and career objectives. Our geography courses are part of the AA-T in geography, and also satisfy requirements in CSUSM's environmental studies and liberal studies majors. We also offer certificates in geographic information systems and drone technology, and integrated service learning and internship components into our programs to prepare students for gainful employment.

Describe how your mission statement aligns with and contributes to the College's Vision and Mission.
The Geography Program's mission closely aligns with the College's Vision and Mission in its emphasis on supporting our students to succeed academically and gain career-relevant skills that are applicable at the local, regional, and global level. Geography as a discipline is uniquely focused on promoting an understanding of how the world works with particular attention to the development of scientific, environmental, and cultural literacy. With these guiding principles in mind, we offer a student-focused environment with attention to diversity, equity and inclusion in both subject matter and teaching methods employed. Furthermore, our wide range of associate degree and certificate offerings can open doors to both in-demand workforce opportunities in geographic information systems and drone technology and transfer pathways to popular majors including environmental studies, geography, geographic information science, and liberal studies. All of the above offer specific opportunities for service learning and lifelong learners that link us closely to our local communities and regional organizations.

(click here for information on how to create a mission statement)

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

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

List all degrees and certificates offered within this discipline.
-Geographic Information Systems (CA)
-Advanced Geographic Information Systems (AS, CA)
-Environmental Studies (CA)
-Geography (AA-T)
-Drone Operations (CA)

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 two links below. An arrow will appear in the spreadsheet pointing to the data you will enter.

1) **Permanent Faculty and Staff Count**

 2) **FTEF LINK**

How many permanent or full-time faculty support your discipline (program)?
3

For this past fall semester, what was your Full-time FTEF assigned to teach classes?
2.2

For this past fall semester, what was your Part-time FTEF assigned to teach classes?
1.51

List the classified and other permanent staff positions that support this discipline.
Instructional Assistant IV 10%

List additional hourly staff that support this discipline and/or department

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

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 degrees and certificates. They are developed in consultation with our counterparts at key transfer institutions for our students (i.e. SDSU, CSUSM), or with industry partners who serve on our GIS and Drone Technology advisory councils.

Describe your program's plan for assessing program learning outcomes.
We will assess our program learning outcomes over a 3-year cycle by reviewing student performance in our key transfer classes and/or student performance in professional internships. We will also speak with employers/internship supervisors and our counterparts at transfer institutions in order to gather anecdote evidence to complement our quantitative assessments.

Summarize the major findings of your program outcomes assessments.
Students have met or exceeded all of the program outcomes in our discipline. Specifically, the percentage of Geography students who successful transferred exceeded our target, and 100% of our industry partners agreed that their GIS internship students were technically prepared for their internships.

Depending on the degree or transfer goals of our students, there are three different GE pathways to choose from:

- Associate Degree GE Requirements

- CSU GE Requirements

- IGETC Requirements

Palomar College has identified a set of General Education/Institutional Learning Outcomes (GE/ILOs), 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 GE/ILOs? In your response, please specify which GE/ILO(s) your discipline supports. You should refer to the GE/ILOs your program outcomes are mapped to in Nuventive.
A number of courses in the Geography discipline support the following General Education/Institutional Learning Outcomes:
-Quantitative Literacy
-Inquiry and Analysis
-Critical Thinking
-Information Literacy
-Teamwork and Problem Solving
-Intercultural Knowledge
-Ethical Reasoning
-Civic Knowledge and Engagement

Summarize the major findings from your course outcomes assessments that are related to the GE/ILOsducation/Institutional Learning Outcomes that your discipline supports. You should refer to the GE/ILOs your course outcomes are mapped to in Nuventive.
The assessment of the learning outcomes for our courses indicate that students are satisfactorily gaining the quantitative literacy, analytical, and critical thinking skills that we expected them to take away from our courses. In addition to standard classroom instruction, we also take students to information literacy instructional sessions at the library (pre-COVID), which students regarded as valuable and informative. Moreover, we also engage our students in service-learning activities in some of our classes in order to enhance their teamwork, ethical reasoning, civic engagement, and problem-solving skills. The surveys completed by participating students were overwhelmingly positive, with all of the students commenting that they will recommend service-learning to other students, and service-learning improved their understanding of the classroom materials.

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 do they align with employer and transfer expectations?
We work hard to ensure that our programs align with employer and transfer expectations by maintaining regular contacts with our academic and industry counterparts. Specifically, we regularly review our articulation agreements and curriculum with our transfer partners to ensure that our transfer students are well prepared, and we also ask employers to provide feedback on emerging industry trends that we need to prepare students for.

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, you will reflect upon the number of completions students earned for EACH degree/certificate you offer. As required for accreditation, you are also asked to set a standard which represents the lowest acceptable number of completions and a stretch goal for increasing the number of awards.

Link to **Program: Completions**

Copy and paste five years of completion data for each of your discipline's degrees and certificates.
11 AA-T Degree in Geography, 20 AS Degree in Advanced GIS, 40 CA in Advanced GIS, 32 CP in GIS (converted to CA in 2021-2022), 12 CA in Drone Operations (inception 2018-19), 15 CA/CP in Environmental Studies (converted from CP to CA in 2020-21). See yearly breakdown below:

Geography AA-T \\ 1 (16-17) 0 (17-18) 2 (18-19) 4 (19-20) 4 (20-21) 11 (16-21 Total)

Adv Geographic Info Systems AS \\ 3 (16-17) 6 (17-18) 3 (18-19) 2 (19-20) 6 (20-21) 20 (16-21 Total)

Adv Geographic Info Systems CA \\ 8 (16-17) 11 (17-18) 7 (18-19) 7 (19-20) 7 (20-21) 40 (16-21 Total)

Geographic Info Systems CP \\ 10 (16-17) 6 (17-18) 2 (18-19) 9 (19-20) 5 (20-21) 32 (16-21 Total)

Drone Operations CA\\ NA (16-17) NA (17-18) 8 (18-19) 2 (19-20) 2 (20-21) 12 (16-21 Total)

Environmental Studies CP/CA \\ 2 (16-17) 2 (17-18) 4 (18-19) 4 (19-20) 3 (20-21) 15 (16-21 Total)

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?
Overall, the completion trend for our programs has been remarkably stable and even positive to some extent. Although the number of completions in our discipline in 2020-2021 (27) is one fewer than the previous year, the drop in certificate completion from 22 in 2019-2020 to 17 in 2020-2021 was compensated by a 67% increase in Associate's degree completion. This positive trend reflects our faculty and curriculum's ability to attract and retain students in our programs, as well as deepening student interest in our discipline.

The economy continues to have the biggest impact on our completion trend. Since most of our degree and certificate completion came from the technical/vocational sub-disciplines of GIS, we have noticed that as the economy improves or recovers, many students are able to secure employment after taking a few classes without even completing the degree or the certificate. The same trend goes for the technical sub-discipline of Drone Operations, which has additionally been adversely impacted by COVID lockdowns and restrictions, as its curriculum (e.g. flight operation) cannot be easily taken online.

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

Our accrediting body, ACCJC, and the Federal Department of Education requires that colleges establish standards and goals for student success and completion.

A program-set standard for completion represents the lowest number of program completion you deem acceptable for your program. 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.

What is your program standard for program completion?
25

Why did you choose this standard?
Based on the completion of the degree and certificates in our disciplines over the last six years, we have seen on average a completion rate of 25 students annually, which seems to be a realistic goal. Specifically, as previously mentioned, the completion rate in our vocational-oriented programs such as GIS and Drone Operations are highly susceptible to labor market demand. Meanwhile, the potential completion rate in our transfer-oriented programs such as GEOG AA-T is unknown since CSUSM just launched their Geography B.A. program in Fall 2021.

A program stretch goal for completions is the number of completions you aspire to award for each program in your discipline.

To determine your stretch goal, consider the number of annual completions you typically award over time, then consider strategies or efforts you are making to increase completions in your program. Then identify the NUMBER you want to set as your goal.

What is your stretch goal for program completion?
30

How did you decide upon your stretch goal?
With the implementation of course mapping and meta-majors, we believe that faculty and counselors will be able to better track students as they progress through the programs in our disciplines. Consequently, courses required for programs in our discipline can be scheduled and offered in a more deliberate manner. We believe that these changes along with the launch of the Geography B.A. program at CSUSM will have a positive impact on student retention and program completion.

ENROLLMENT AND EFFICIENCY TRENDS

Your courses and offerings represent the path students take to complete their goals. Palomar has a very diverse set of programs and offerings and students have many paths they can take to earn a degree, certificate, or transfer.

In addition to student success and completion, enrollment trends, resources (FTEF), and efficiency metrics like FTES/FTEF are factors reviewed by the college when considering needs for staffing and program support. Evaluating these metrics also helps the College when developing class schedules to meet the needs of students.

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).

In this section, you will examine your enrollments over time and resources (FTEF) utilized to support or generate those enrollments.

This information can be found by looking at enrollment efficiencies.

Link to Program: Enrollment Trends

Have your enrollment trends increased, decreased, or stayed the same for your discipline over the past five years? (check box)
Increased

Have your efficiency trends increased, decreased, or stayed the same for your discipline over the past five years? (Check box)
Increased

Were these trends expected? Please explain.
The Enrollment for Geography was 649 (Fall-15), 560 (Fall-16), 555 (Fall-17), 630 (Fall-18), and 700 (Fall-19). IRP is not reporting Fall-20 data because it is not reliable.

The WSCH per FTEF for Geography was 455 (Fall-15), 458 (Fall-16), 511 (Fall-17), 572 (Fall-18), and 578 (Fall-19).

The Fill Rate for Geography was 75% (Fall-15), 70% (Fall-16), 75% (Fall-17), 91% (Fall-18), and 91% (Fall-19).

Our fill rate and enrollment increased significantly over the past five years despite the declining enrollment trend reported across the state.

Our WSCH per FTEF rate has been consistently outperforming the college's overall rate with the exception of Fall 2016. Specifically, it should be noted that our WSCH per FTEF rate increased by 27% between Fall-15 and Fall-19.

With the hiring of our new full time Geographer in the 2018-2019 school year, we were able to more aggressively promote our discipline and extracurricular activities (field trips, field courses) to students. The positive impacts of our efforts were expected and reflected in our positive enrollment trends.

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 found the combination of institutional support (especially from the Palomar College Foundation), generosity of our industry partners, and our collaborations with colleagues from other colleges and universities to be instrumental to the success of our programs. Specifically, many of the students in our GIS courses relied on the computer hardware and grants provided by the Palomar College Foundation in order to continue with their courses especially at the start of the COVID-19 pandemic. In addition, our industry and governmental partners (e.g. NSF, Department of Labor, FAA) have been extremely generous with their time in support of our programs. They have participated as guest speakers in our courses, partaken in advisory committees that assess and review our technical curriculum, and provided a number of internships, jobs, and service-learning projects for our students. Lastly, our continued collaborations with colleagues from other colleges and universities have led to the creation of new transfer pathways for our students at ASU and CSUSM, as well as new grant opportunities that provided vital resources for our discipline and programs.

What factors have presented challenges for your program(s)? Describe the impact of these challenges.
It goes without saying that COVID-19 has presented unprecedented challenges for many programs. In particular, local health regulations have limited our ability to meet and interact with students, which may adversely impact program completion and retention in the long run. Furthermore, we are unable to participate in school fairs and outreach events to recruit new students for our programs.

Other ongoing challenges for our program is the lack of sufficient support staff and inadequate communication. Ever since our academic department assistant (ADA) retired back in Spring 2020, we have been assigned a (superb) temporary ADA who is stretched across three departments. As a result, faculty have to shift their sole focus from student success in our programs to take on tasks that were previously completed by the ADA (data entry, classroom assignment). Moreover, there have been a lot of changes (classroom technologies, registration process) that were implemented without adequate advanced communication with the faculty. This resulted in confusion in the classroom and amongst students who try to register for classes, thus reflecting poorly on the programs and potentially hurting enrollment. Low-enrollment within two weeks of the start date of the semester forces faculty to spend time on marketing/advertising efforts in order to save classes from cuts. In the event the class(es) are cut, the reshuffling of classes to make base load, and the loss of adjunct faculty that results, is time-consuming and demoralizing, especially given that all remaining sections in that course usually end up full, with students on the waitlist. The evidence shows that the cut sections probably would have filled as well, which would have avoided the negative impacts stated above.

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 stresses the importance of reducing equity gaps through faster improvements of underrepresented groups.

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

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

Was this expected? Please explain.
Five years ago the success rate was 72% compared with Fall 2020 at 73%, which seems insignificant. Yes, we would expect success rates to stay about the same.

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.
The retention rate has stayed relatively stable over five years. Five years ago our retention rate was 92%. In Fall of 2020 it was 90%. This difference seems insignificant, although it is interesting to note that our retention rate didn't suffer much during Fall, 2020 (a COVID semester).

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

Age: Why do you think age differences exist? What do you need to help close the gap?
The 20-24 age group did not perform as well as older age groups. As a general group older students are likely more serious about their education and have more life experience to draw from, so this is not necessarily surprising nor anything that needs to be fixed. Success rates for all age groups were satisfactory.

Ethnicity: Why do you think ethnicity differences exist? What do you need to help close the gap?
All ethnic groups had a success rate of 70% or above except Hispanic (67%) and Black (45%). Retention rates for these two groups were 87% and 100%, respectively. Serious research across the college needs to be performed to understand why these numbers are suboptimal. We sincerely hope that ongoing efforts to assist BIPOC communities and promote DEI will help. Also, while the numbers of Hispanic students taking our classes are high, in Fall 2020 we had 11 Black students. A 45% success rate represents 5 people. This is not a large sample size.

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

Please share any best practice methods you use for online courses.
The differences are subtle. In some semesters, online has a slightly higher success rate and/or a slightly higher retention rate but in other semesters the reverse is true. None of the age-difference or ethnicity-difference values seem significant. Also, in 2020 we have no on-campus statistics to analyze.

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.

Link to Course Information

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%

Why did you choose this standard?
There is no legitimate reason to deviate from the college's institutional standard.

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

How did you decide upon the goal?
We have no reason to change it at this time.

COURSE STUDENT LEARNING OUTCOMES (SLOs)

Summarize the major findings of your course level student learning outcomes assessments.
Students are able to successfully pass the course assessments with success rates above 70%. After the assessment results have been compiled, the geography instructors meet to brainstorm best practices, share proven strategies for retention and engagement, and consider program-wide changes about pedagogy as a result of this reflection. By sharing the ways in which various instructors teach each SLO content area, there is an effort to ensure quality and consistency of instruction. In fact, some of these successful teaching techniques have been adopted by other instructors. In this way, the SLO assessments have improved our courses and program.

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?
The SLO assessment cycle represents a small fraction of what we actually assess in our classes regularly each semester. Anything not answered by a SLO assessment is likely addressed in the many other assessments we administer.

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 meet regularly with our adjunct instructors and share some best practices in teaching geography so that all of our instructors have tools to help students succeed.

Excluding courses that haven't been offered in the last three years, confirm that all of your courses have been assessed in the last three years.
Yes

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.

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.
We offer day, night, on-campus, education centers, full-semester, fast-track, online, and field courses in order to meet the needs of a wide variety of students. We offer lecture and lab classes back-to-back for the most efficient use of student time.

How do you work with other departments that require your course(s) for program completion?
We ensure that other departments offering classes in our programs are offering them regularly and at times that do not conflict with other required classes in the program.

Does your discipline offer cross-listed courses?
Yes

How do you work with the other department(s) to ensure consistent curriculum per the COR and minimum qualifications? How do you coordinate course scheduling and SLO assessment?
We routinely communicate with the department chair to ensure consistent curriculum and optimal course scheduling.
SLO assessment is conducted by the instructor of record and the data is shared with all interested parties for analysis.

Are there curriculum concerns that need to be resolved in your department? What are they?
No.

Are there courses that should be added or removed from your program - please explain?
The only class not regularly offered at this time is GEOG 125. However, our new full-time faculty member
anticipates offering this class in the near future so we would like to keep it on the books in order to avoid
the unnecessary paperwork involved in reinstatement.

How is the potential need for program/course deactivation addressed by the department?
Full-time faculty regularly review course outlines of record as well as SLO results to determine the continuing need for
specific courses.

Are there areas you would like to expand?
The GEOG AA-T has potential to grow. CSUSM is now offering a bachelor's degree in geography, effective Fall 2021.
Considering that around 80% of Palomar's transfer students transfer to CSUSM, the door is now open for this transfer
pathway to become much more popular.

Describe any data and/or information that you have considered as part of the evaluation of your program.
We utilize external information sources such as our high school partners, colleagues at CSUSM, and our industry
advisory
committee members when evaluating our programs.

To answer the next two questions, you will need to review your program maps and program information in the 2021-2022
Catalog.

Is the content in the program mapper accurate?
No

What needs to be corrected in the mapper?
We think the mapper is correct now but it took a bit of work. First of all, Geography is both a physical and social science
and we offer classes in both realms. It is also CTE (GIS and drones). The discipline needed to be listed under all of
these options. Also, quite a few years ago we created a transfer pathway certificate to CSUSM for their environmental
studies bachelor's program. It consists of the lower-division major requirements and we also advised students to
complete the rest of their GE before transfer. Much confusion ensued when the college created its own "CSU Transfer-
Environmental Studies" program without understanding the duplication. However, we think it is straightened out. At this
point if students choose the right class they can earn both degrees, but if they choose the wrong class they will only earn
one of the degrees. It is best for students to consult our faculty with any questions as I think we have the best handle on
the differences between the programs.

Is the content in the catalog accurate?
Yes

Has your department or discipline started having discussions about embedding diversity related issues or content in your curriculum?
Yes

If yes, describe your efforts. If no, what type of training or help do you need to do this work?
Many of our classes such as Human Geography, World Regional Geography, and GIS already contain diversity-related
content as they involve the study of diverse peoples of the world as well as demographic data.

CAREER AND LABOR MARKET DATA

The following websites are for CTE related data:

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

What have you done to integrate work-based learning?
We give our students the option of completing service-learning projects as a part of their class assignments. We are also requiring students in the GIS and Drone Technology programs to complete an internship in order to get their certificate or degree.

How does your work-based learning help your students learn how to do some of the tasks associated with the potential occupations?
Our survey of students shows that work-based learning such as service-learning and internships have enhanced our students' troubleshooting and technical abilities, as well as their workplace competencies such as teamwork, reliability, and professionalism.

What is the regional three-year projected occupational growth for your program(s)?
According to data provided by O*NET Online, the labor demand for all of the occupations associated with our discipline will experience at least a 5% growth between 2019 and 2029:

-Geographic Information Systems Technologists and Technicians (Faster than average 5%-7%)
-Cartographers & Photogrammetrists (Faster than average 5%-7%)
-Remote Sensing Technicians (Faster than average 5%-7%)
-Park Naturalists (Faster than average 5%-7%)
-Life, Physical, and Social Science Technicians, All Other (Faster than average 5%-7%)

What is being done at the program level to assist students with job placement and workforce preparedness?
Aside from advisory meetings, professional conferences, service-learning partnerships, we also connect with employers to identify potential job opportunities by participating in in-person and virtual conferences. In addition, we maintain a database of internship opportunities, and our internship coordinator reviews each student's resume and attempts to match students with internships that seem to be a good fit. We also maintain a job database for our students that is updated at least once a month.

When was your program's last advisory meeting held? What significant information was learned from that meeting?
GIS Advisory Committee Meeting (4/23/2021)

There is a lot of competition for entry-level GIS position due to layoffs related to COVID. Students need to either have a strong technical specialty (e.g. database, programming) and/or strong interview skills to get a position. Specifically, candidates should research the company prior to the interview, address qualifications and include keywords in their applications to get past HR screening, and demonstrate how their background and experience will help the company grow. It is a good idea for students to conduct mock interviews with assistance from the Career Center.

Job candidates should also have demonstrated experience related to the position they are applying for. Students can get experience prior to graduation by doing internships, volunteering, or coming up with projects to demonstrate their experience and interest in particular GIS sectors. Students may also need to contend with short-term opportunities that may not be ideal in order to build their experience in a particular GIS sector.

What are the San Diego County/Imperial County Job Openings?
Since the occupation profiles from O*NET do not align with those from the region's Center of Excellence (COE), we have listed below a sample of occupations from the COE that are related to our discipline as well as their annual job openings between 2018 and 2028:

-Surveying and Mapping Technicians +568
-Environmental Science and Protection Technicians +500
-Forest and Conservation Technicians +852
-Life, Physical, and Social Science Technicians, All Other +1,403
-Aerospace Engineering and Operations Technicians +278

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? If so, how would the new or emerging careers impact your future planning?
The diversity of programs within our discipline prepare students for a variety of careers, such as:
-Geographic Information Systems Technologists and Technicians
-Cartographers & Photogrammetrists
-Remote Sensing Technicians
-Park Naturalists
-Life, Physical, and Social Science Technicians, All Other

According to data provided by O*NET Online, all of the occupations listed above have a bright outlook and are growing faster than average. All of these occupations require some kind of postsecondary education, ranging from post-secondary certificate to bachelor's degree. This is why we have been aggressively developing articulation and transfer pathways in order to provide options for students wishing to enter careers that typically require a bachelor's degree.

In light of the growing demand for unmanned aircraft system (drone) operators, we have worked with the FAA and the Department of Labor to update the labor market information on O*NET Online. This helps us ensure that these new opportunities created by the drone industry are accurately captured in the O*NET database, which is subsequently used to inform our program planning and curriculum review.

What are the associated knowledge, skills, abilities (KSA's) needed for the occupations listed above? (click examples in the link above to get ideas)
According to O*NET OnLine (https://www.onetonline.org/), we have listed some of the recurring knowledge, skills, and abilities identified for the occupations that are associated with our discipline:

KNOWLEDGE
-Geography
-Customer and Personal Service
-Computer and Electronics
-Engineering and Technology
-Production and Processing
-English Language
-Mathematics
-Design
-Administration and Management
-Mechanical
-Law and Government

SKILLS
-Reading Comprehension
-Critical Thinking
-Troubleshooting
-Writing
-Complex Problem Solving
-Active Listening

-Active Learning
-Speaking
-Judgement and Decision Making
-Monitoring
-Coordination
-Repairing
-Equipment Maintenance

ABILITIES
-Inductive Reasoning
-Near Vision
-Oral Comprehension
-Deductive Reasoning
-Written Comprehension
-Information Ordering
-Problem Sensitivity

How does your program help students build these KSA's?
Through a combination of lecture, lab exercises, writing and reading assignments, field trips, field courses, service-learning projects, and internships, we believe that our courses and programs encourage students to acquire and/or refine the KSA's listed above. For example, our GIS service-learning projects require students to work as a team with an outside entity on their semester projects. These projects reinforce the students' knowledge in Geography, customer service, computer, technology, English language, mathematics, design, and administration and management. They also enhance students' skills in writing, reading comprehension, critical thinking, troubleshooting, speaking, coordination, as well as judgement and decision making. For example, we had students who have completed internships with the FAA, and they were asked to present their output to a national audience. Lastly, depending on the need of the particular service-learning partner, students develop abilities in inductive and deductive reasoning in order to analyze and interpret data for their service-learning clients.

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?
Yes

How do you engage with the community to keep them apprised of opportunities in your program?
We have regular advisory committee meetings with GIS and Drone Technology industry partners. We also attend and present (in-person and virtually) at professional conferences in order to share our work and recruit new internship and service-learning partners.

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.

If you require any additional resources beyond your exiting budget, please be sure to request those resources in the next section titled "Resources".

Goals

Goal 1

Brief Description
Develop California Naturalist certification in partnership with UCANR

Is this a new or existing goal?
New

How will you complete this goal?
We will offer this course in Fall 2021 as a 8-week fast-track option. Development includes scouting multiple locations in San Diego County and Imperial County and developing field curriculum to align with objectives of UCANR California Naturalist program.

Outcome(s) expected (qualitative/quantitative)
We expect to have at least ten students complete their certification by December, 2021.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
This class offers students valuable field experience in conservation of natural resources where they learn through practical application in a setting with a low student/teacher ratio. In the college's mission statement it states, "We are committed to helping our students ...contribute as individuals and global citizens living responsibly..." Part of living as a responsible global citizen is to be scientifically educated in environmental problems and practical solutions.

Expected Goal Completion Date
12/14/2021

Goal 2

Brief Description
Align department offerings with those of CSUSM as they expand their geography program

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

How will you complete this goal?
We regularly meet with our CSUSM counterparts to streamline transfer pathways and review articulation agreements.

Outcome(s) expected (qualitative/quantitative)
Increased enrollment for the GEOG AA-T degree.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
The college is heavily invested in creating and maintaining transfer pathways with CSUSM and other four-year institutions.

Expected Goal Completion Date
5/31/2022

Goal 3

Brief Description
Adopt no and low cost textbooks for certain courses in the geography program

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

How will you complete this goal?
This goal is completed for three courses so far (GEOG 134, GEOG 136, GEOG 100L) and will be completed for GEOG 105.

Outcome(s) expected (qualitative/quantitative)
An additional course, GEOG 105, will have no/low cost materials.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
We hope to improve access to programs and services for our diverse student body, making it easier for them to complete their studies with a decreased financial burden.

Expected Goal Completion Date
12/31/2022

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?
Yes

REQUEST FOR ADDITIONAL CLASSIFIED, CAST, AA

Staff, CAST, AA request 1

Title of position
Department ADA

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

How does the position fill a critical need for current, future, or critical operations? e.g. accreditation, health and safety, regulatory, legal mandates, institutional priorities, program trend analyses of growth/stability
Our previous ADA retired in Spring 2020, and we have been fortunate to receive the assistance of our current temporary ADA. Although our current ADA is very capable, she is stretched thin between three departments (ESES, Physics and Engineering, Chemistry). Consequently, many administrative duties (e.g. assisting department chairs with budget development [since no such training is offered to new department chairs], routine inspection of classrooms in our area, helping faculty and students with registration or records questions [since faculty does not have access to student records such as transcript], assisting faculty in coordination of outreach events such as DroneCon or Industry Advisory Meetings) crucial to the health and safety as well as growth/stability of the department had to be abandoned despite their significance.

Does the position assist in establishing more efficient District operations through either of the following: reorganization/restructuring OR use of technology?
Yes, having an ADA with institutional memory and deep understanding of the District's administrative process will definitely help establish more efficient District operations and reduce the likelihood of costly mistakes. As mentioned before, although department chairs are tasks with administrative duties such as scheduling, budget development, approval of purchases, etc., minimal training is offered to new department chairs in any of these areas. To compound the problem, the regular term length of a department chair as outlined in the PFF contract is two years, so there is not much time for department chair to acquire the necessary institutional memory or develop an understanding of Palomar's administrative process. Hence, an ADA with experience in all of these areas often assists, explains, and even trains department chairs in all of these administrative tasks. Without an ADA's assistance, it is conceivable that department chairs may unintentionally approve actions or purchases that can expose the District to complaints, lawsuits, or audits.

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

Describe how this position helps implement or support your three-year PRP plan.
It will help us navigate and comply with District policies (e.g. contracts, purchasing, marketing) governing how we promote our programs and acquire equipment needed for our courses.

Strategic Plan 2022 Objective

1:1	1:2	1:3	1:5
2:2	3:3	3:4	3:5
4:3			

If the position is not approved, what is your plan?
We will have to shift our some of our focus from promoting our programs and developing new initiatives (grants, articulation, transfer pathways) to learn how to perform administrative tasks on a trial and error basis.

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 budget considerations you would like your dean/supervisor to be aware of for the upcoming year?
Yes

What budget considerations would you like your dean/supervisor to be aware of or to consider? Please be as specific as possible. For example, if you need an increase in the 40000 account and a decrease in the 23000 account, describe what increase your department needs, how much, and a description of why the department needs the adjustment.
It is especially crucial that we have sufficient funds in our 500010 accounts, as a majority of those funds are used for renewing our software licenses for our GIS, Drone, and Meteorology classes.

-Harris Geospatial ENVI (GEOG 140, 120): $699
-Esri ArcGIS license (All GIS classes) payable to FCCC: $2,500
-Esri Drone2Map (GEOG 132, 140): $750
-Pix4D (GEOG 132, 140): $670
-AMS License (GEOG 110): $124.2

Total minimum required (based on 2020 estimates) for software licenses: $4,743.2

As we transition from virtual learning back to in-person learning, additional funds will be needed in the 500010 accounts to reimburse instructors for mileage for field trips and additional travel related expenses (cabins, campsite) during longer field courses.

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

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?
DJI Phantom 4 Multispectral RTK Drone

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.
This is a drone equipped with a multispectral sensor and a real-time kinetic (RTK) GPS unit for precision mapping applications. This item will be used in our GEOG 140 (Introduction to Remote Sensing and Drone Data Processing) class to introduce students to different types of drone sensor technologies (SLO #2) that are able to detect different types of electromagnetic radiation (SLO #1). This item will also be used in our GEOG 132 (Database Management and Data Acquisition) course, which has an entire unit devoted to teaching students about RTK-GPS and its use in surveying and precision mapping. (see https://www.dronenerds.com/products/drones/enterprise-drones/phantom-4-enterprise/p4-multispectral-with-drtk.html)

Estimated Amount of Request.
$10,000.00

If any, list ongoing costs for the technology (licences, support, maintenance, etc.)
$0.00

Do you already have a budget for this request, or will you need additional funds?
No

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

What Strategic Plan 2022 Goal:Objective does this request align with?
2:2   2:4   3:4

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?
Yes

Technology Request 2

What are you requesting?
Skydio X2E Color/Thermal

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.
This is a drone equipped with a thermal infrared sensor and autonomous flight capability. These capabilities will enable us to introduce student to real-world drone applications (e.g. electrical tower inspection, tree inspection, solar/roof inspection, emergency response, search and rescue) used by agencies that have already been hiring our drone program graduates. Furthermore, the autonomous flight capability will allow students to fly more complex missions to recreate structure for inspection purposes, while minimizing the likelihood of crashes and other operator errors. Lastly, this drone is also compliant with the US Federal Government's National Defense Authorization Act, which means that it qualifies for use by Federal agencies and Federal contractors (unlike Chinese made drone) due to national security reasons. This item will be used in our GEOG 140 (Introduction to Remote Sensing and Drone Data Processing) class to introduce students to different types of drone sensor technologies (SLO #2) that are able to detect different types of electromagnetic radiation (SLO #1). This item will also be used eventually in our GEOG 197 (Special Topics) course, as we acquire the necessary equipment to develop building/structure inspection curriculum with Federal Government approved drones per our advisory committee's recommendations. (see https://www.skydio.com/skydio-x2)

Estimated Amount of Request.
$17,463.00

If any, list ongoing costs for the technology (licences, support, maintenance, etc.)
$2,599.00

Do you already have a budget for this request, or will you need additional funds?
No

What PRP plan goal/objective does this request align with?
2

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

2:2   2:4   3:4

**If you have multiple requests for technology and had
to prioritize, what number would give this? (1 =
Highest)**
2

**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 11/19/2021.*
  - *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.*

Part 4: Facilities Requests

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

PART 5: OTHER ONE-TIME NEEDS

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

Do you have one-time requests for other items (e.g., Non-Technology Equipment, Supplies, Operating Expenses, Travel) that your budget or other funding sources will NOT cover?
Yes

Requests

Item 1

What are you requesting?
Esri Education Summit and User Conference

Estimated Amount of Request.   **Will you accept partial funding?**
$3,228.00   Yes

Budget Category
Travel Expenses for Faculty

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

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

1:1	2:4	3:3	3:4
4:1	4:2	4:3	

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.
This request is to cover the registration and travel expenses for two faculty to participate in and attend the Esri Education Summit (7/9-7/13/22) AND Esri International User Conference (7/11-7/15/22). In particular, faculty members will submit presentations for consideration for the Esri Education Summit. This is not only an opportunity for faculty to connect with and explore GIS education issues with colleagues from around the country and the world, but it also provides an opportunity for faculty to showcase student work, recruit new students, learn about latest technological and job trends in the GIS industry, and collaborate with industry partners to explore job and internship opportunities for students.

Cost estimates based on historical data, as 2022 registration hasn't opened yet:

Mileage (for 2 people, assuming IRS mileage rate of 57.5 cents/mile (2022) and 40 miles each way from Palomar College to San Diego Convention Center for 7 days): $644
Registration (for 2 people): $1,590
Meals and incidentals (for 2 people, assuming $71/day, 7 days): $994

Please upload a copy of the quote, if available.

Item 2

What are you requesting?
Commercial UAV Expo

Estimated Amount of Request.   **Will you accept partial funding?**
$2,776.00   Yes

Budget Category
Travel Expenses for Faculty

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

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

1:1	2:4	3:3	3:4
4:1	4:2	4:3	

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.
This request is to cover the registration and travel expenses for two faculty to participate in and attend the Commercial UAV Expo, which is scheduled for Sept 6-8, 2022 in Las Vegas. In particular, faculty members will participate in the University Pavilion and University Roundtable Discussion (a feature of conference that Palomar College faculty started in 2018) at the conference (https://www.expouav.com/university-pavilion/). This is not only an opportunity for faculty to connect and explore UAV/Drone education issues (e.g. liability, workforce preparedness, industry collaboration) with colleagues from around the country, but it also provides an opportunity for faculty to showcase student work, learn about latest technological advances and legal changes in the drone industry, and collaborate with industry partners to explore job and internship opportunities for students.

Lodging and food using Federal Governmental per diem rates (2021) for Las Vegas, NV

Mileage (for 2 people, assuming IRS mileage rate of 57.5 cents/mile (2022) and 300 miles each way from Palomar College to Caesar's Forum, Las Vegas): $690
Registration (for 2 people): $1,000
Lodging (for 2 people, assuming $120/night, 3 nights): $720
Meals and incidentals (for 2 people, assuming $61/day, 3 days): $366

Please upload a copy of the quote, if available.

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

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