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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

Geology (GEOL)

Department Chair email

sfigg@palomar.edu

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

Sean Figg

Website address for your discipline<https://www2.palomar.edu/pages/geology/>**Discipline Mission statement**

The Geology Program at Palomar College consists of the study of the dynamic processes that shape Earth. Geology incorporates a multidisciplinary approach to describe and solve various problems, including those related to human interaction with natural systems, geologic hazards, and resources. The mission of this program is to develop fundamental geologic knowledge and instill skills for life-long learning in a constantly changing regional, global, and scientific community. The program strives to provide an engaging learning environment and high-quality, field-orientated educational opportunities in science for a diverse student population to fulfill general education requirements or transfer requirements for California universities, ultimately leading to careers in geoscience-related fields.

Describe how your mission statement aligns with and contributes to the College's Vision and Mission.

Part of the geology mission statement is to "provide an engaging learning environment and high-quality, field-orientated educational opportunities in science for a diverse student population to fulfill general education requirements or transfer requirements for California universities." Both mission statements are designed to provide engaging teaching and learning environments for diverse students. The geology program strives to accomplish this by engaging students with rock and mineral samples and providing opportunities for field courses. Geology provides an excellent opportunity for diverse student backgrounds. Students use geologic maps to share the rock units of their place of origin. Students also discuss the cultural, religious, and spiritual significance of specific associated with rocks and minerals.

The geology program statement also aligns with Palomar's vision of "transforming lives for the better," as the program is designed to develop fundamental geologic knowledge and skills for life-long learning. Students study the ongoing geologic process of the Southern California area, such as earthquakes related to the San Andreas and the erosion rates of coastal cliffs. Once aware of the issues, students re-evaluate their disaster preparedness in case of future emergencies.

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

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.

Geology (AS)

Geology (AS-T)

BASIC PROGRAM INFORMATION: FACULTY AND STAFFING RESOURCES

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

To help you answer questions in this section, you will need the 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)?

1

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

0.40

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

0.87

List the classified and other permanent staff positions that support this discipline.

Abby Corona- ADA- 6.67%. Technically, the ESES does not have ADA support and is not listed in the Permanent Faculty and Staff Count. The MSE division could use additional ADA support.

Tony Kopec -ISA-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?

The geology program SLO's are designed to relate to all of the sub-fields in geology (Geochemistry, Hydrology, Paleontology, etc...). SLO's such as Mineral/Rock Identification, Interpret Geologic Structures/Processes, and Tectonic/Geomorphic Synthesis relate to numerous concepts across all sub-fields. Meeting the SLO's ensures that geology students will have a competent foundation of geologic knowledge regardless of the sub-field they wish to pursue once they leave the program at Palomar College. Students that meet these assessments are prepared for entry-level geology positions.

The majority of students that declare geology for a major aim to transfer to four-year universities; SLO's such as Communication of Geologic Concepts, Geologic Application of the Scientific Method, and Transfer Skills ensure adequate preparation for transfer. These are designed to increase student success after transfer as students delve deeper into more complicated geologic concepts.

Higher-level learning objectives build upon these fundamental concepts; the solid foundation students obtain at Palomar College enables student success for transfer or future careers.

Describe your program's plan for assessing program learning outcomes.

Each SLO is assessed on a three-year rotational basis. SLO's that are not met are assessed the following semester. Suppose multiple instructors record classes are not meeting the criteria for certain SLO's. In that case, they are reevaluated, and instructors in the geology program (full and part-time) meet to discuss improving the instructional methods. Assessments are divided between the Fall and Spring semesters. The assessment methods used by the geology program are a mixture of embedded test questions, sample identification, interpretation of diagrams, essays/papers, and field investigations. Since Palomar's student body is so diverse, multiple assessment methods are needed for multiple learning styles.

Summarize the major findings of your program outcomes assessments.

Students perform above the required specification, maintaining an average of 76% on most SLO's for GEOL 100. Students enrolled in GEOL 110, GEOL 150, and GEOL 195 had a higher percentage (~80%) of meeting SLO's requirements than those in GEOL 100.

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.

The SLO's for the geology support at least one aspect of Palomar's GE/ILO's. Most connect across several GE/ILO's.

1. Communication A & B: several SLO's such as rock origins, geologic structures, plate tectonics, geologic identification, and field observations.
2. Computation A: earthquakes require interpreting seismic data to calculate speed, distance, and seismic wave travel time.
3. Creative, Critical, and Analytical Thinking: earthquakes, geomorphic processes, rock/mineral identification, dinosaur phylogeny, tectonic processes, geologic identification, field observations, and volcanoes.
4. Community, Multicultural/Global Consciousness and Responsibility: earthquakes, volcanoes, and rock types. Cultural awareness of specific geologic processes has different cultural significance (intercultural). The use and mining operations of earth materials relate to ethical awareness.
5. Foundation of knowledge: rock/mineral identification, earthquakes, volcanoes, tectonic processes, and geologic structures. Every geology class reinforces the foundation of geologic knowledge.
6. Integrative learning: The SLO's for the program's regional field, such as geologic identification and field observations, fit well into this category.

Summarize the major findings from your course outcomes assessments that are related to the GE/ILOs education/Institutional Learning Outcomes that your discipline supports. You should refer to the GE/ILOs your course outcomes are mapped to in Nuventive.

The SLO's for the geology support at least one aspect of Palomar's GE/ILO's. Many SLO's, such as earthquakes, connect across several GE/ILO's. Nearly every SLO relates to oral and visual communication along with foundational knowledge. Being able to understand and explain introductory to moderate geological concepts is the primary goal of the program.

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?

Employers expect graduates with an Associate's (A.S.) degree in geology to have a general understanding of geologic concepts. Students demonstrate their understanding of these concepts through the current program learning outcomes Mineral/Rock Identification, Interpret Geologic Structures/Processes, and Tectonic/Geomorphic Synthesis. Upon completing an associate's degree, graduates will meet the qualifications for many entry-level geology positions, including research assistant, staff geologist, geology technician, GIS technician, and database analysis.

Typically, an associate's degree in geology provides a pathway for a bachelor's degree at a four-year university. In addition to the concepts listed above, universities expect students to be proficient in communication and concept application at the time of transfer. Program learning outcomes of the Associate's Degree in Science for Transfer (AS-T) include Communication of Geologic Concepts, Geologic Application of the Scientific Method, and Transfer Skills. The program learning outcomes for the AS-T degree ensure adequate preparation for transfer.

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.

2017-2018: 1 A.S. and 1 A.S.-T. A total of two degrees.

2018-2019: 1 A.S. and 2 A.S.-T. A total of three degrees.

2019-2020: 2 A.S.-T. A total of two degrees.

2020-2021: 2 A.S. and 1 A.S.-T. A total of three degrees.

Since 2017 the geology program has awarded ten degrees in 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?

The completion of geology degrees has increased since 2015 and remains relatively consistent over the past five years, with the program awarding two to three degrees per year. One of the main issues that the program faces is students transferring to the university level before completing the degree at Palomar College. The vast majority of students transfer from Palomar with one or two classes left to obtain a degree. Instead, they are accepted to a university, transfer, and complete the remaining courses at the university level. The increase in awarded degrees in the past four years was influenced by more outreach to potential graduates. All geology students expected to graduate were informed several times to complete the graduation application. Still, most do not obtain a degree due to already being accepted for transfer.

Are the courses in your discipline required for the completion of other degrees/certificates?

Yes

Please list them

Geology 100 and Lab is an optional course for an AA-T degree in Geography, Anthropology, and a AA degree in Archaeology. Geology 120 is required for a certificate in astronomy. Geology 158 is an optional course for the completion of a certificate in Unmanned Aircraft Systems (UAS) Technician. All geology courses are optional courses for a general studies degree.

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?

2

Why did you choose this standard?

This standard was chosen as a realistic number for a small program where students typically transfer before meeting the requirements for a degree from Palomar College.

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?

4

How did you decide upon your stretch goal?

Awarding for degrees is the next logical goal for the geology program. The program has not had completion of four degrees in the past five years. With the return of in-person instruction and the potential expansion of the program at the centers, four completions is an achievable goal.

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 overall enrollment and efficiency trends have increased over the past five years. There is a noticeable difference in enrollment and efficiency in Fall 2019, which corresponds to Professor Figg's sabbatical. Except for Fall 2019, an increase in enrollment and efficiency was expected. Professor Figg has worked hard to grow the geology program, increase course offerings, and generally make a science course "less scary" for students. Other influences include adjustment of course days/times for maximum student enrollment, outreach events, and promotion of classes through banners and flyers.

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.

The movement of rotational classes from a three-hour night class to a morning section significantly increased enrollment. Enrollment in GEOL 150 and GEOL 110 increased from the usual 15 students to 25. A significant success of the program is through word of mouth by the student body. The full-time and part-time geology instructors have a high reputation with the students. While the workload can be challenging, the "knowledge, availability, and enthusiasm for geology" is a frequent comment on student evaluations. Before the onset of COVID-19, campus and community outreach events on campus increased the interest in the geology program. The geology program has used creative services for banners and flyers to promote classes. The addition of the GEOL 158 as part of the drone technology program has also increased enrollment. Many environmental science and geology majors take the course because of the industry potential sUAS (small unmanned aircraft systems).

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

The main challenge for the geology program remains that most students transfer to a university before completing a degree at Palomar College. The impact is a low degree completion number that does not accurately reflect the number of geology majors at Palomar College. In addition, students that transfer before a degree completion negatively impact the calculation of the program FTEF and funding. Hopefully, in the future, the state will consider transfer students along with degree completions.

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

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?

This standard was chosen to remain consistent with the college's institutional standards.

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

Stayed the same

Was this expected? Please explain.

This trend has been expected. The overall success rate for the geology program has remained relatively consistent, averaging 76% over the past five years. There is a significant decrease in student success for GEOL 100L between Fall 2019 and Fall 2020. The decrease is the result of conducting a physical lab course through distance education. Many students struggled with the online lab format and dropped with the hope of taking an in-person class in a future semester.

What is your stretch goal for course success rates?

80.0%

How did you decide upon the goal?

Over the past five years, 80% is a reasonable stretch goal based on the overall success rate. The last stretch goal of 85% was too optimistic. The goal has been adjusted but will still increase the overall student success rate and can be met without compromising program expectations/standards.

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 geology program has had a high student retention rate with an average of 94% over the past five years. There has been some slight fluctuation between semesters, with the lowest rate of 92% and a high of 97%. Despite the minor fluctuations, the geology program is proud of the overall retention rate.

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

Gender

Age

Ethnicity

Gender: Why do you think gender differences exist? What do you need to help close the gap?

The overall success rate for females has remained constant at 80%. The success rate for men has generally increased over the past five years from 70.3% in 2015 to 77.3% in 2019. There is a noticeable dip in male success rate in the Fall of 2020, likely due to COVID-19.

Age: Why do you think age differences exist? What do you need to help close the gap?

According to the data, the success rate is significantly higher for students over the age of 50. All of the other age groups are similar, with a success rate of 75%. Many of the 50 or older students are taking the class for enjoyment and typically are not juggling a full class load like many younger students. The overall retention rate remains relatively consistent.

Ethnicity: Why do you think ethnicity differences exist? What do you need to help close the gap?

The success rate and retention rates have remained constant over the past five years. One note on ethnicity, the geology program is under-represented with students that identify as Asian. Complex terminology and definitions in geology are a barrier for ESL students. The geology program has created an abbreviated glossary for the primary term students should know. Translation software has also assisted with the terminology issue. While the methods mention help, the geology program does not get many Asian students. Increased ESL support within the classroom and marketing/advertisement to diverse students populations would help increase the diversity of the geology program.

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

No

Please share any best practice methods you use for online courses.

For each online course, the geology program provides:

A class orientation module or class meeting includes the student learning contract, a walkthrough of using Canvas, tips for time management, and more. The modules are presented in a clear and organized manner, with each week being a separate module. Each module follows the same pattern: a topic overview, PowerPoint, instructor-created videos, additional resources, and assignments due. Students actively participate in the course through discussion boards. The instructor provides feedback on every assignment or lab. Exams and quizzes are timed with questions and answers shuffled to ensure academic integrity. Rock, mineral, and fossil samples have been digitized using photogrammetry. Photogrammetry allows for the creation of 3D virtual models, allowing for annotation and guided questions.

COURSE STUDENT LEARNING OUTCOMES (SLOs)**Summarize the major findings of your course level student learning outcomes assessments.**

Students perform above the required specification, maintaining an average of 74% on most SLO's for GEOL 100. Students enrolled in GEOL 110, GEOL 150, and GEOL 195 had a higher percentage rate of meeting SLO's requirements than those in GEOL 100.

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?

One question focuses on mineral and rock identification between online and in-person classes. Students enrolled in face-to-face class settings have a higher success rate than online students. Would the requirement of a small mineral/rock kit increase the student success rate for distance education classes?

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?

Due to the rotating nature of the GEOL 195 field courses, there is a lack of SLO data. Many of the courses have not been offered in the previous five years. Due to COVID-19, the geology program has not been able to offer field courses since March 2020. Field course SLO's will need to be evaluated every time the course runs. Even if the SLO data is beyond five years, the program will have a routine assessment system.

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.

The geology program schedules the highest enrollment courses during the most optimal class times between 8:00 am, and 11:00 am for lecture courses. The lecture courses are stacked with lab course which is held directly after, this block scheduling attracts students from the previous lecture. Lecture and lab are almost always at or over capacity. Nearly all geology classes use the 16-week full semester format. GEOL 158 is offered as an 8-week fast-track course. In summer, GEOL 100 is offered as a six-week course.

How do you work with other departments that require your course(s) for program completion?

The geology program has discussed course scheduling with programs such as astronomy, oceanography, drone technology, and to lesser extent anthropology, and archaeology to ensure that sufficient class sections are offered by each program to accommodate student needs.

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?

There are two courses in the geology program that are cross-listed: GEOL 120 and GEOL 158. GEOL 158 is an online course cross-listed with graphics and geography. GEOL 158 is an online course and is the first course students take for the drone technology program. It is a degree requirement and is taken simultaneously as the slight skills class offered by graphics and communication. Geology 120 is cross-listed with astronomy; students must take GEOL 100 the semester before taking GEOL 120.

Are there curriculum concerns that need to be resolved in your department? What are they?

One concern is the oceanography and geology programs. Since both are now listed under the Earth Science FSA, it may be optimal to combine the two programs into one.

Are there courses that should be added or removed from your program - please explain?

The earth science course will likely be deactivated in the upcoming semesters. CSUSM is phasing out its earth science courses. Geography now counts as credits for geography, environmental science, and elementary education programs at CSUSM.

How is the potential need for program/course deactivation addressed by the department?

The deactivation of courses is addressed during department meetings.

Are there areas you would like to expand?

There is potential to expand geology course offerings to the various centers at Palomar College. Before moving forward with the centers, issues such as storage sample purchasing need to be addressed.

Describe any data and/or information that you have considered as part of the evaluation of your program.

The geology program continually evaluates data from transferring students. The majority of geology majors transfer to SDSU, Humboldt, and Riverside. Using this data, the geology program at Palomar College can emphasize the knowledge and skills requested by the university to ensure student preparedness upon transfer.

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?

Yes

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?

The geology program has assignments that connect student backgrounds to geology. The course examines the geology of a student's place of origin and how similar rock units are found worldwide. GEOL 110: Geology of National Parks discusses the cultural and spiritual importance of rocks and minerals found in National Parks. Discussions include the sacred nature of lava in Hawaiiin culture and the cultural significance of the Anasazi cliff dwelling in Mesa Verde National Park. The geology instructors continue to work on more ways to include diverse backgrounds into the course materials.

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 link above) Are there any new or emerging careers? If so, how would the new or emerging careers impact your future planning?

Areas of expected growth:

Geological Technicians, Except Hydrologic Technicians
 Geoscientists, Except Hydrologists and Geographers
 Hydrologists
 Natural Sciences Managers
 Helpers--Extraction Workers
 Earth Drillers, Except Oil and Gas
 Explosives Workers, Ordnance Handling Experts, and Blasters
 Environmental Restoration Planners
 Environmental Scientists and Specialists, Including Health
 Remote Sensing Technicians
 Soil and Plant Scientists
 Conservation Scientists
 Physicists
 Urban and Regional Planners
 Environmental Science and Protection Technicians
 Rotary Drill Operators, Oil, and Gas

Other Areas:

Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
 Mining and Geological Engineers, Including Mining Safety Engineers
 Environmental Science Teachers, Postsecondary
 Civil Engineers
 Architectural and Civil Drafters
 Engineering Teachers, Postsecondary
 Geographers
 Remote Sensing Scientists and Technologists
 Precision Agriculture Technicians

Remote sensing is a growing career in the field of geology. Developments in technology are replacing aspects of traditional fieldwork. Palomar College has a well-established GIS program that includes a remote sensing class. All geology students are encouraged to take GIS classes as it is a highly desirable skill for geology professions.

Several of the geologic careers shows an increase in demand. Including hydrology, geologic sample test technicians, GIS technicians, environmental scientists, engineers, and more. Students that complete the geology associate's degree at Palomar College will be qualified for positions as sample test technicians, environmental scientists, and GIS technicians.

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

Analytical skills
 Communication skills
 Ability to understand basic engineering principles
 Critical Thinking
 Passion about the geological and natural environment
 Mapping techniques
 Flexibility and versatility
 Enthusiasm, patience, and perseverance
 Information Ordering
 Written and oral comprehension
 Ability to work with teams of people from a wide range of backgrounds

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

Students are required to meet the basic qualifications for all KSA's mentioned in the previous question. The program is designed, so each course builds on its predecessor. For example, geologic mapping skills are introduced at the 100 level; students must interpret symbols and structures on a map. The next course (Geol 150) guides students through making a geologic map and stratigraphic column from given data sets. Ultimately, during the field studies course (Geol 195), geology majors use geologic tools and skills to take measurements and relate their findings to a professionally published geologic map.

Work Based Learning

Applied and work-based learning (WBL) allows students to apply classroom content in professional settings while gaining real-world 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

What have you done to integrate work-based learning?

The geology field courses (GEOL 195) allow students to apply conceptual knowledge in the field. Students will conduct investigations and practice the field techniques conducted by professional geologists.

How does your work-based learning help your students learn how to do some of the tasks associated with the potential occupations?

Field courses provide students an opportunity to practice techniques such as scientific inquiry, mapping exercises, the use of geologic tools (such as Brunton Compass), measure geologic features, interpret stratigraphy, identify faults, and discuss the geologic process that leads to these features. Through these exercises, students get to experience the work conducted by professional geologists.

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

The geology program communicates with local geology chapters (SDAG and SCAG); the program makes announcements at local meetings and sends emails about upcoming courses, field courses, and events such as Earth Science Day. In return, the local geology chapters send information about upcoming events, internships, and jobs that are passed along to the students at Palomar College. The geology program participates in STEM outreach, Earth Science Day, and GIS day. The department's geology webpage (<https://www2.palomar.edu/pages/geology/>) informs community members of upcoming courses and field courses.

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

Increase Enrollment in GEOL 110 and 150

Is this a new or existing goal?

Existing

Goal Status

Ongoing

How will you complete this goal?

The geology program plans to increase marketing for the lower enrollment courses such as GEOL 110 Geology of Natural Parks and GEOL 150 Dinosaur and Earth History. The program will consult with creative services about banners and flyers to advertise the courses. GEOL 110 is in the process of being approved for distance education (DE). Typically, GEOL 110 and 150 are taught as night courses; the courses will be moved to more optimal time slots.

Outcome(s) expected (qualitative/quantitative)

In spring 2020, GEOL150 moved to a 9:35 am time slot on Mondays and Wednesdays. The course saw an enrollment increase of ten students. With an increase in the course advertisement, the program is hopeful enrollment will increase when the course is offered again in spring 2023. By offering GEOL 110: The Geology of National Parks online, the program hopes to attach a larger audience of the general student population.

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

Geology 110 and 150 are part of the geology program-guided pathway. Offering GEOL 110 online provides an opportunity to reach a broader and more diverse student population. Geology 150 is a required course for the Geology A.S.-T degree and transfer to the university system and aligns with the college's mission of transfer readiness.

Expected Goal Completion Date

5/31/2023

Goal 2

Brief Description

Increased Degree Completion Rates

Is this a new or existing goal?

New

How will you complete this goal?

Most students pursue the Geology A.S.-T degree but transfer before degrees completion. The launch of the geology program mapper will increase the efficiency in which students complete a geology degree at Palomar College. Assistance and collaboration with the counseling department will be essential in guiding students through the geology program. The geology program will take a more active role in graduation application advertisements, ensuring geology majors are aware of the graduation deadlines.

Outcome(s) expected (qualitative/quantitative)

An increase in the number of Geology A.S. and A.S.-T degrees awarded.

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

The geology program goal of increasing degrees awarded is in direct alignment with Palomar College's vision of success to increase among all students, the number who earned an associate degree or associate degree for transfer and transfer readiness.

Expected Goal Completion Date

5/31/2025

Goal 3**Brief Description**

Merger of the Geology and Oceanography Programs

Is this a new or existing goal?

New

How will you complete this goal?

The ESES department chair will initiate a discussion with the Dean of the Math, Science, and Engineering (MSE) about incorporating oceanography into the geology program. The ESES department will follow the necessary steps outlined by the administration to combine the geology and oceanography programs.

Outcome(s) expected (qualitative/quantitative)

Due to class reductions, FTEF in oceanography and geology has fallen. Combining the geology and oceanography programs would result in a stronger FTEF showing. Combining the two programs will also eliminate a separate oceanography PRP and provide a combined budget for the program.

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

In 2020 the California Community College's Chancellor's office combined the programs of geology and oceanography under the earth science umbrella. Oceanography by itself does not lead to an undergraduate degree or certificate, as it is traditionally a Master's or Ph.D. area of study. Oceanography is an elective of the geology A.S and A.S.-T.

Expected Goal Completion Date

5/31/2023

Goal 4**Brief Description**

Development of Online Geology Course

Is this a new or existing goal?

Existing

Goal Status

Completed

How will you complete this goal?

Full-time and part-time instructors in the geology program developed an Online Geology 100 course. Geology faculty created an online curriculum, assignments, discussion, and original videos. The online section of geology launched in Fall 2019. The online class uses Online Educational Resources (OER) materials to help reduce student costs.

Outcome(s) expected (qualitative/quantitative)

The geology program will offer sections of Geology 100 lecture online. One course section will be offered at first to ensure its successful implementation and identify potential issues.

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

Part of the geology program mission focuses on developing "life-long learning skills for a constantly changing regional, global, and scientific community." Online classes have proven to be a part of the path forward in education. The geology program at Palomar College strives to offer high-quality instruction in an online format without compromising academic standards.

Expected Goal Completion Date

8/17/2021

RESOURCES

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

The section is organized into the following four parts:

PART 1: Staffing Needs (Faculty and Additional Staff)

PART 2: Budget Review

PART 3: Technology and Facilities Needs

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

PART 1: STAFFING NEEDS

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

Are you requesting additional full-time faculty?

Yes

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.

REQUEST FOR ADDITIONAL FULL-TIME FACULTY

Faculty Request 1

Title of Full-Time Faculty position you are requesting

Oceanography Instructor

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

The success of district goals such as Guided Pathways and SEM relies on disciplines being able to provide excellence in learning opportunities (consistent standards/quality of instruction as well as curriculum development) which, in turn, leads to enhanced student retention and success. This, of course completely overlaps with discipline and department goals. With the retirement of Patty Deen in December 2018 and Al Trujillo in May 2020, the Oceanography Program currently has one full-time faculty member, Lisa Yon. Lisa has 40% of her teaching load in oceanography and is responsible for coordinating OCN Lab schedules/activities and curriculum updates, including the update of the latest edition of the OCN 100 lab manual. However, Dr. Yon also oversees the Earth Science Program and has 60% of her teaching load in that discipline including being responsible for ES curriculum updates. As a result, 84% of the courses offered in oceanography are taught by part-time faculty. Currently, 100% of oceanography lectures and 50% of oceanography labs are taught by part-time faculty. The geology program also has only one full-time faculty member.

Currently, 66% of the geology courses are taught by adjuncts. Thus, in order to maintain consistent standards/quality of instruction, considerable time is invested in the hiring, training, and evaluation part-time faculty who often go on to other jobs thus necessitating an on-going cycle of hiring, training, and evaluation. This is not an efficient way to maintain consistent standards/quality of instruction nor does it lend itself to maintaining acceptable levels of student retention and success.

District goals also include increasing student access to educational opportunities through increased offerings at satellite campuses. Beginning Fall 2018, offerings at the Rancho Bernardo Center included both an OCN lecture and lab. As there is no designated instructional support assistant at this satellite campus, the logistics of setting up labs and equipment fell to the discipline faculty. During the Fall 2018 semester, Lisa Yon spent over 20 hours setting up equipment/supplies at the Rancho Bernardo campus and meeting regularly with the part-time faculty teaching at the new campus to ensure a smooth transition. SEM goals important at the RB Center include recruitment/marketing (making students aware of the opportunities) and providing a positive classroom experience (via well-qualified faculty) with the goal of retention and success for enrolled students. A committed full-time faculty member would greatly assist in achieving this goal.

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

Although our current part-time Faculty are talented instructors and show a dedication to the program, they are not a replacement for a full-time faculty member. Finding qualified part-time faculty who can teach according to designated course offerings is challenging; Lisa Yon has spent considerable time this past year reviewing applicant credentials for the part-time teaching pool in both Oceanography and Earth Science. Should an applicant be qualified, we still face challenges in scheduling due to the fact that part-time faculty fall into two categories:

- They teach for us in addition to holding a full-time job elsewhere and thus can only teach evening classes.
- They are part-time instructors at several regional colleges and thus we compete with other colleges for their hourly availability.

Currently, two regional community colleges are in the process of hiring full-time replacements for their Oceanography faculty who retired within the last year. Three of our current part-time faculty have applied for these positions and we may be losing their talents as a result. A separate part-time faculty member has already informed us that they have accepted a full-time position elsewhere and will not be returning for any future teaching assignments.

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

The passing of California AB 1725 set the goal of a 75:25 ratio requiring full-time faculty to teach 75% of a college's offerings. In Oceanography, due to the nature of expanded teaching assignments in Earth Science and Geology, we have struggled to meet this goal. With the retirement of Patty Deen and Al Trujillo, we will be looking at an average of less than 20% of Oceanography courses being taught by full-time faculty. Part-time faculty teach 100% of oceanography lectures and 50% of oceanography labs, figures that are far below goal set by AB 1725. Considering the academic role that Patty Deen served in Geology as well, the data provided by the College speaks volumes. Currently, the average Full-time Equivalent Faculty in Oceanography (3.13 over six years) and Geology (1.40 over six years) indicates that typical course offerings require the equivalent of 4.5 full-time faculty members. We are clearly understaffed with only 2 full-time faculty members across both Oceanography and Geology disciplines and as the text of AB 1725 states "the quality, quantity and composition of full-time faculty have the most immediate and direct impact on the quality of instruction."

In addition to the legislative aspect, Oceanography and Geology disciplines have regularly collaborated in Regional Field Studies courses (GEOL 195), such as GEOL195B- Southern California Coast. Field courses are an essential part of any Geology Program and at Palomar College, the Geology Program offers both an A.S. and A.S.-T in Geology. Participation in a Field Course is part of the graduation requirements for the A.S. degree. The nature of these field courses is such that they require two faculty members for logistical and safety reasons.

Logistics and safety also play a role in the staffing of OCN 100 lab sections. With the retirement of Patty Deen and Al Trujillo, 50% of the lab offerings are now being taught by part-time faculty. Spring 2019 offerings necessitated the hiring of two new part-time faculty to teach OCN 100 lab sections. Considerable training time must be spent with these faculty to ensure proper set-up of labs (safety is a priority with labs such as Seawater Chemistry) and the logistics of field trips. About 25% of the lab meetings are field trips to regional coastal settings where students directly engage in observation of coastal processes, collect data for analysis, or learn about important topics such as mariculture or desalination. As part-time faculty members move on to new jobs, this again necessitates an on-going cycle of hiring, training, and evaluation. If the majority of teaching staff are associated with this "revolving door" scenario, the situation also places unreasonable demands on the program to maintain quality of instruction and to develop innovations in curriculum.

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

The Oceanography discipline has consisted of three full-time faculty since Fall 1997. Over time, however, the duties of the faculty have shifted in response to demand for increased offerings in specific Earth Science courses. Both Dr. Lisa Yon and Professor Patty Deen shifted 40-60% of their teaching load from Oceanography to Earth Science as well as to additional Geology courses including field courses. With the retirement of Professor Patty Deen in December 2018 and Al Trujillo in May 2020, there is a crucial need for a replacement full-time faculty member who can teach across Oceanography and Geology. Currently, the average Full-time Equivalent Faculty in Oceanography (3.13 over six years) and Geology (1.40 over six years) indicates that typical course offerings require the equivalent of 4.5 full-time faculty members. Thus, we are understaffed with only 2 full-time faculty members across both Oceanography and Geology disciplines.

Clearly hiring a full-time faculty member to support the goals across the Oceanography and Geology disciplines will enhance productivity in areas such as curriculum management including evaluation of both course and program learning outcomes. In addition, full-time faculty will be more involved in student, department, and institutional activities thus enhancing not only productivity but also the efficiency of the programs and course offerings. Full-time faculty members provide essential stability for program planning and curriculum development. They also provide levels of availability that students need outside of the classroom, such as involvement in course advisement and extracurricular activities (Geoscience Connection club, Earth Science Week activities). In addition, effectively expanding the program (Oceanography/Geology/Earth Science) to satellite campuses such as Rancho Bernardo requires the attention of full-time

faculty. If College/District plans include this goal, then support and allocation of resources must be provided for the hiring of a full-time faculty member as a replacement for a retired full-time faculty member.

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

Lisa Yon- 40% teaching load in oceanography. 60% teaching load in Earth Science.

Sean Figg- 40% release time as department chair.

Are you requesting new Classified, CAST or AA positions?

Yes

REQUEST FOR ADDITIONAL CLASSIFIED, CAST, AA**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.

The total roll-over budget for the geology program for the 2021-2022 academic year was \$150.00 in the 50000 accounts and zero in the 400000 accounts. The geology program is requesting an increase in funds to the 40000 accounts for instructional material and printing. With the return to on-campus learning, the printing budget, which was unused due to remote learning caused by COVID-19, will increase. Instructors will need to print new copies of exams, assignments, and handouts. The expected printing for the geology program would be \$500. Throughout COVID-19, the program used CARES funding to send geology lab kits to students. In anticipation of a large-scale return to campus, the geology program needs to update its supplies. The program is in constant need of glass plates for hardness testing of rocks and minerals. The geology lab boxes also need to be updated. Many of the samples previously bought in bulk are no longer available; for example, sphalerite in crystalline form and should be replaced with a different mineral. The geology program is requesting \$800-1,000 for instructional supplies.

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?

No

Part 4: Facilities Requests

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

No

PART 5: OTHER ONE-TIME NEEDS

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

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

No

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

Yes

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

sfigg@palomar.edu