Program Review and Planning

OVERVIEW OF PROGRAM REVIEW AND PLANNING FOR INSTRUCTIONAL PROGRAMS

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

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

BASIC PROGRAM INFORMATION

Academic Year
2018-2019

Are you completing a comprehensive or annual PRP?
Annual

Department Name
Chemistry

Discipline Name
Chemistry (CHEM)

Department Chair Name
Jennifer Zabzdyr

Division Name
Mathematics, Science and Engineering

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

Discipline Mission statement
The mission of the Palomar College Chemistry Department is to support student learning for success. Our primary goal is preparing our diverse student population for the pursuit of Bachelor degrees in Chemistry, as well as other Natural Science degrees with which they may enter the workplace. We provide students with the fundamental concepts, knowledge and laboratory techniques in a healthy and safe environment.

(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 vocational (CTE/CE)?
No

List all degrees and certificates offered within this discipline.
AS

Please list the names and positions of everyone who helped to complete this document.
Jennifer Zabzdyr, Chemistry Chair

Full-time faculty (FTEF)
5.27

Part-time faculty (FTEF)
10.00

Classified & other staff positions that support this discipline
Abby Corona (ADA)--12 months, 90%
Tsung Lee (ISA-IV for the San Marcos campus)--12 months, 100%
Angelica Orlova (ISA-IV for the RB campus)--12 months, 100%
Donna Aviles (ISA-IV for the Fallbrook campus)--12 months, 100%

Additional hourly staff that support this discipline and/or department
Student workers for the chemical storeroom of the San Marcos campus.

2 students per hour for a total of 59.18 hours per week

PROGRAM INFORMATION

PROGRAM OUTCOMES

Begin this section by reviewing the Program Review reports for courses and programs in TracDat. All active course and program outcomes should be systematically assessed over a 3-year cycle.

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

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

How well do your program's learning outcomes communicate the scope and depth of the degree/certificate offered and align with employer and transfer expectations?
The program learning outcomes are

(1) Chemical Lab Technique: Successful students will be able to set up and execute general and intermediate chemical reactions in the lab using a chemical technique.
(2) Application of the Scientific Method: Successful students will be able to apply the scientific method by stating a question, performing experiments and/or analyzing a data presentation.

Problem solving using the scientific method and being capable of using chemical lab techniques are key requirements of a degree of any type in chemistry. They are necessary skills for transfer students to have,so that they are prepared for the more advanced upper division chemistry coursework.

Describe your program's plan for assessing program learning outcomes.
(1) Chemical Lab Technique: Laboratory Students will prepare specifically-selected, written lab reports for which a rubric will be followed. The instructor will observe student technique/performance and evaluate it against a standard protocol. Successful students will score 70% or higher.

(2) Scientific Method: In laboratory classes, students will prepare specifically-selected, written lab reports for which a rubric will be followed. The instructor will observe student technique/performance and evaluate it against a standard protocol. In lecture classes, students will be evaluated using embedded questions on final exams. Successful students will score 70% or higher. Students in the final course in the program (CHEM 221) will be given a comprehensive (national), final examination administered by the American Chemical Society and evaluate it against the national score results. Successful students will score in the 60th percentile or higher on the ACS exam.

Summarize the major findings of your program outcomes assessments.
(1) Chemical lab technique: At the last assessment, 79% of students scored 70% or higher.

(2) Scientific method: At the last assessment,79% of students scored in the 60th percentile or higher on the ACS exam.

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

- Associate Degree GE Requirements
- CSU GE Requirements
- IGETC Requirements

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

PROGRAM COMPLETIONS

Student success is at the core of what we do in assisting students in achieving their goals.

The Chancellor's Office Vision for Success stresses the importance of Program Completion as a major goal for our students. In addition, transfer and career readiness are key components of Palomar College's mission statement. This year, our funding formula has also changed reflecting this emphasis, providing additional funding as a function of the number of completions.

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

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

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

List the number of completions for each degree/certificate for the previous year.
zero

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?
Most students who complete chemistry courses are not chemistry majors. As such, they have zero interest or need in obtaining an AS degree in chemistry. They would be more likely to obtain an AS degree in their designated major.

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

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

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

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

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

COURSE INFORMATION

COURSE SUCCESS AND RETENTION

What is your program's standard for Discipline COURSE Success Rate?
66.0%

Why did you choose this standard?
Chemistry is a very challenging subject so success rates are traditionally lower than the campus standard, as seen in our success rates over the past 5 years (66% to 68%). A more realistic success rate would be 2/3 of all students (66%).

What is your Stretch goal for COURSE success rates?
66.0%

How did you decide upon the goal?
66% success rate is already reasonable. It is vitally important to the department to maintain academic rigor so that our students are prepared to transfer as upper division chemistry students.

COURSE OUTCOMES

How have you improved course-level assessment methods since the last PRP?
Lab courses SLOs now require assessment of lab skills. Lab practical exams are given and students are assessed on how well they can perform lab skills without help from the instructor or other students.

Lecture courses now have more specific SLOs that can be more easily quantitatively assessed on a final exam across all sections.

Summarize the major findings of your course outcomes assessments.
Spring 2019 semester will be the first semester where the new lab SLOs will be assessed, so there is currently no data available.

Across all of our courses, between 75% and 90% of students are able to achieve the lecture SLOs.

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

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

CAREER AND LABOR MARKET DATA

The Chancellor's Office Vision for Success stresses the importance of increasing the percent of exiting students who report being employed in their field of study. It is important for us to consider how ***all*** of our programs connect to future careers.

Go to this website https://www.onetonline.org/ and enter your discipline in the bubble on the top right for ideas about potential occupations. Click on an example to see more detail.

What kinds of careers are available for people who complete your programs (and/or transfer)? (Refer to link above) Are there any new or emerging careers and if so how would the new or emerging careers impact your future planning?
Chemistry teachers, chemical technicians, chemists, professors, chemical engineers, biochemical engineers, soil/plant scientists, chemical equipment operators, medical/clinical lab technologists/technicians, biochemists, biophysicists, quality control/analysis. Careers with a bright outlook include medical/clinical lab technologists/technicians, biochemists, biophysicists, and quality control analysts.

What are the associated knowledge, skills, abilities (KSA's) needed for the occupations listed above? (click examples in the link above to get ideas)
Most require a minimum of a B.S. degree in chemistry or biochemistry. Some occupations require a graduate degree in chemistry or biochemistry. Knowledge, skills, and abilities will vary, but will include:

KNOWLEDGE
Chemistry — Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.
Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

SKILLS
Science — Using scientific rules and methods to solve problems.
Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
Reading Comprehension — Understanding written sentences and paragraphs in work related documents.
Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
Mathematics — Using mathematics to solve problems.

ABILITIES
Deductive Reasoning — The ability to apply general rules to specific problems to produce answers that make sense.
Inductive Reasoning — The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).
Oral Comprehension — The ability to listen to and understand information and ideas presented through spoken words and sentences.
Written Comprehension — The ability to read and understand information and ideas presented in writing.
Mathematical Reasoning — The ability to choose the right mathematical methods or formulas to solve a problem.

How does your program help students build these KSA's?
KNOWLEDGE: Our program teaches students the chemistry knowledge they will need in order to transfer and pursue a more advanced degree in chemistry or biochemistry.

SKILLS: Critical thinking is a key component of all our courses and one of our program SLOs. Problem solving, using the scientific method, is emphasized in all of our classes.

ABILITIES: Oral and written communication skills are learned in the lab, through the writing of lab reports and giving oral presentations.

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

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

How do you engage with the community to keep them apprised of opportunities in your program?
Outreach activities to local middle schools (Woodland Park Middle and San Marcos Middle).
STEM Conference: The chemistry department hosts workshops and shows to engage middle and high school students and their parents as a part of a wider conference in STEM education.
Other service learning activities that are hosted by the Chemistry Club.

Program Goals

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

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

Goals

Goal 1

Brief Description
To offer CHEM 220 and CHEM 221 in both fall and spring semesters.

Is this a new or existing goal?
New

How will you complete this goal?
During spring 2019 semester we opened one section of lecture and lab for CHEM 220. This is in addition to the two lab sections and one lecture section of CHEM 221. Starting fall 2019 semester, we will offer two lab and one lecture sections for both CHEM 220 and CHEM 221.

Outcome(s) expected (qualitative/quantitative)
Quantitative. We will be able to accommodate students who are taking organic chemistry off-sequence (CHEM 220 in the spring and CHEM 221 in the fall). In the past, we certainly lost some of these students to other colleges who did offer off-sequence organic chemistry.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Expanding our organic chemistry offerings will allow students to complete their program in a more timely manner. In the past, if students needed CHEM 220, they would have to wait until fall semester, which could delay their transfer/completion. Now, students will have the option to take it in spring and eliminate

that delay to program completion.

Expected Goal Completion Date
8/19/2019

Goal 2

Brief Description
Hire addition full-time general chemistry faculty to support the RB and Fallbrook campuses

Is this a new or existing goal?
Existing

Goal Status
Ongoing

How will you complete this goal?
Beg

Outcome(s) expected (qualitative/quantitative)
Qualitative and quantitative.

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Our general chemistry courses are among our largest and most difficult, especially CHEM 115/115L. Having additional full time faculty to staff the classes will provide a better quality of education to our students. It would increase the odds of students having the same lecture and lab instructor, which provides a higher level of consistency. Both of these are aligned with the strategic plan value of "excellence in teaching,learning,and service". Furthermore, full time faculty are more likely to participate in outreach activities, such as the STEM conference, to bring chemistry into the wider world. This aligns with the college strategic plan value of "physical presence and participation in the community".

Expected Goal Completion Date
8/17/2020

Goal 3

Brief Description
Hire a second ISA-IV for the San Marcos campus

Is this a new or existing goal?
New

How will you complete this goal?
Beg?? In December 2018, one of our two ISAs (Corazon Cordova) retired, leaving only one ISA (Tsung Lee) to handle all of the lab classes on the main campus, in addition to handling chemical/equipment purchases, equipment repair, and upkeep. He staffs the chemical storeroom from 8am to 5pm. This means that we have no ISA to staff the storeroom for our evening labs. Our evening lab instructors are on their own and the storeroom has unsupervised student workers. This poses a safety issue for the students and our instructors. Furthermore, we currently offer 36-ish lab sections of CHEM 100, 110L, 115L, 104, 105, 220, and 221 on the main campus. That is a ridiculous number of courses to prep for one person, even with the very limited number of student workers to assist.

Outcome(s) expected (qualitative/quantitative)
Qualitative

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
Hiring a second ISA will help to improve the educational quality for our students and the work environment for our instructors, particularly those who teach evening labs. This align with the strategic plan value of "excellence in teaching,learning,and service".

Expected Goal Completion Date
12/16/2019

STAFFING AND RESOURCE NEEDS

Instructions

1. Refer to Strategic Plan.
2. See Data.
3. See career info (In PRP)

Are you requesting additional full-time faculty?
Yes

Are you requesting additional Staff, CAST or AA?
Yes

In the last ten years, what is the net change in number of FT Faculty in the department? (FT faculty loss vs. gain)
2

% of FTEF for on-going reassigned time (department chair, program director, coordinator, etc.)

2016-2017 % FTEF (on-going reassigned time)	2017-2018 % FTEF (on-going reassigned time)	2018-2019 % FTEF (on-going reassigned time)
20%	17%	14%

% of FTEF for temporary reassigned time (grant activity, sabbaticals, leaves, other reasons)

2016-2017 % FTEF (temporary reassigned time)	2017-2018 % FTEF (temporary reassigned time)	2018-2019 % FTEF (temporary reassigned time)
0%	0%	28%

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
Assistant Professor, General Chemistry

How will this faculty position help meet district (Guided Pathways, Strategic Enrollment Management etc.), department and/or discipline goals?
Our general chemistry courses are among our largest and most difficult. Having additional full time faculty to staff the classes will provide a better quality of education to our students. It would increase the

odds of students having the same lecture and lab instructor, which provides a higher level of consistency. Both of these are aligned with the strategic plan value of "excellence in teaching,learning,and service". Furthermore, full time faculty are more likely to participate in outreach activities, such as the STEM conference, to bring chemistry into the wider world. This aligns with the college strategic plan value of "physical presence and participation in the community".

Is there a scarcity of qualified Part-Time Faculty (for example: Specialized degree/experience, emerging/rapidly changing technology, high demand)
Yes. It is next to impossible to find good PT faculty to teach CHEM 115/115L, and to a lesser degree, CHEM 110/110L. This is due, in large part, to the fact that part time faculty are rarely assigned to teach these courses (especially CHEM 115/115L). As such, they have little to no experience in teaching a course that is challenging to teach and ranked by students as one of the most difficult to master. With the opening of the Fallbrook and RB campuses, our general chemistry offerings are ever increasing, including CHEM 115/115L.

Are you requesting this position for accreditation, regulatory, legislative, health and safety requirements? Please explain.
No.

Please summarize the discipline productivity, efficiency, and any regional career education needs for this discipline.
N/A

In the last ten years, what is the net change in number of Staff in the department? (loss vs. gain)
net loss of 1

REQUEST FOR ADDITIONAL STAFF, CAST, AA

Staff, CAST, AA request 1

Title of Staff position you are requesting
ISA-IV for San Marcos campus

How will this Staff position help meet district (Guided Pathways, Strategic Enrollment Management etc.), department and/or discipline goals?
In December 2018, one of our two ISAs (Corazon Cordova) retired, leaving only one ISA (Tsung Lee) to handle all of the lab classes on the main campus, in addition to handling chemical/equipment purchases, equipment repair, and upkeep. He staffs the chemical storeroom from 8am to 5pm. This means that we have no ISA to staff the storeroom for our evening labs. Our evening lab instructors are on their own and the storeroom has unsupervised student workers. This poses a safety issue for the students and our instructors. Furthermore, we currently offer 36-ish lab sections of CHEM 100, 110L, 115L, 104, 105, 220, and 221 on the main campus. That is a ridiculous number of courses to prep for one person, even with the very limited number of student workers to assist. Hiring a second ISA will help to improve the educational quality for our students, the safety of our student workers, and the work environment for our instructors, particularly those who teach evening labs. This align with the strategic plan value of "excellence in teaching,learning,and service".

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

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

No.