Program: Mathematics

Division: STEM

Date: 11/04/2024

Writer(s): The Math Department

SLO/SAO Point-Person: Jennie Graham

Audience: Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.

Uses: This Program Review will inform the audience about your program. It is also used in creating division summaries, determining college planning priorities, and determining the allocation of resources. The final use is to document the fulfillment of accreditation requirements.

Please note: Program Review is NOT a vehicle for making requests. All requests should be made through appropriate processes (e.g., Instructional Equipment Request Process) or directed to your dean or supervisor.

Time Frame: This Program Review should reflect your program status during the 23-24 academic year. It should describe plans starting now and continuing through 2024-25.

Helpful Links:

- ★ Tools for Writers - with contacts for help with specific sections.
- ★ Program Review Glossary - defines key terms you can review when writing.
- ★ Fall 2023 Program Reviews
- ★ Program Review FAQs

For help with your program review, please contact Karin Spirn at kspirn@laspositascollege.edu

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Sections

There are four sections to the document:

1. Review your program, including curriculum updates, accomplishments, challenges, and planning.
2. Data Analysis
3. SLO/SAO Review
4. Feedback on the PR template and process

Instructions

1. Please answer each question with enough detail to present your information, but it doesn't have to be long.
2. If the requested information does not apply to your program, write "Not Applicable."
3. Optional/suggested: Communicate with your dean while completing this document.
4. Send an electronic copy of this form to Program Review chair, Karin Spirn, and your Dean by Monday, Nov. 4, 2024

5. Even if you don't have much to report, we want to hear from you, so your voice is part of the college planning process.

Equity is a guiding principle. Here is the LPC definition:

Las Positas College will achieve equity by changing the impacts of structural racism, ableism, homophobia, and systematic poverty on student success and access to higher education, achieved through continuous evaluation and improvement of all services. We believe in a high-quality education focused on learning and an inclusive, culturally relevant environment that meets the diverse needs of all our students.

LPC Equity Definition: Equity is parity in student educational outcomes. It places student success and belonging for students of color and disproportionately impacted students at the center of focus.

Section 1: Your Program In 2024-2025

Please place an X next to N/A where relevant

A. Accomplishments: Identify your main accomplishments from the 23-24 academic year.

Some areas you ***may*** want to note in your explanation are:

- Did your accomplishments support your program's plans identified in recent PRs?
- Did they relate to guided pathways?
- Were they in support of the colleges equity definition?
- Did they connect to any of the college planning priorities?
- Did you receive any positive/negative feedback from students?
- Are there any innovations or new processes you'd like to integrate?
- Has your program changed in response to the SCFF model of college funding? (completions, increasing enrollment, offering certificates, degrees, etc.)?

N/A_____

- In response to AB1705, we developed two options for pre-calculus to help students who choose to take the prerequisite material be able to complete it in one semester instead of the current two semesters (math 30 and math 39) prerequisite pathway.
- Math 1 materials were developed based on OER and instructor materials so that it could be added to Math Emporium mode in Fall 2024.
- The tutorial center collaborated with the department to embed student tutors into many of the math emporium sections, concurrent support math sections and a few of the lecture classes.
- The department continued outreach and offered help with onboarding with the local high schools and adult schools.
- Summer geometry classes filled with our Local high school students.
- Synchronous evening math 3 class continues to be offered for local high school students.
- We continue to support math at the Middle College with orientations and other meetings.
- We continued to offer the AMATYC Student Math League competition with strong student attendance, and were the 7th ranked community college nationally for 2023-2024: https://amatyc.org/page/SMLScoreboard
- We held several meetings throughout the academic year called "cookies and conversations" to bring Equitable teaching practice into focus for both full and part time faculty.
- Math faculty collaborated with student services and Guided Pathways to update the GPS and recommended math classes offered in Degree Works (big thanks for Craig Kutil for taking on the bulk of that process) in preparation for the new placement standards from AB 1705 starting Fall 2025.

B. Challenges, Pain Points, and Needs

What significant or ongoing challenges or obstacles did your Program face during the 23-24 academic year, especially related to accomplishing program goals/plans? Consider funding, staffing, materials, facilities, outside requirements such as legislative mandates, working on equity gaps, etc. Highlight/identify any challenges mentioned in previous reviews.

N/A_____

- One of our most enduring challenges is a shortage of full-time faculty. Despite losing positions to retirees (including a reassignment of one of our math faculty to a different position) and campaigning annually for these positions to be backfilled, we have not had a new hire in the department in many years. Workload distribution and availability for talking new initiatives remains an issue. All our full-time faculty are stretched thin with responsibilities and our part-time faculty, while helpful, cannot fill in these gaps adequately (as their time commitments are limited).

- While the department is in the development stage of offering Credit by Exam (CBE) for two of our classes because we know it is the right thing to do for our students, the reality of what will happen when the courses are approved is unknown. There is a lack of time and compensation for faculty to grade these exams, especially since most of these tests will likely occur mid-to-late in the Spring semester, and possibly while faculty are on break.

- While the department wishes to further explore OER and ZCT/LCT options for students, full-time faculty are stretched thin with their time, making it challenging to find opportunities to explore these. We also recognize that OER/ZCT/LCT are not always the best option for students, so we have to find the appropriate balance between offering these textbooks and other paid options such as Pearson. Pearson's tiered pricing model continues to present challenges of its own, with students having to pay for access repeatedly in some cases.

- Strong enrollments in the Fall 2023 semester encouraged the department to add additional classes to the spring schedule, however, enrollments for the Spring semester were much lower than expected. At least, we thought they were. Due to the policy of cancelling classes that are under-enrolled, which is fair due to funding uncertainty, the department ended up turning away students who, anecdotally, were either slow to enroll or were hopeful to be added into a course from a very long waitlist. Unfortunately, when they did not get into their first choice, there were no other classes for them to enroll in due to the cancellations. It may be that considering reducing

the waitlist cap on classes is the correct route to take with these classes to help spread out enrollments.

- The state's aggressive push of AB 1705 and related curricular changes has been overwhelming. It seems like every year the math department is being asked to reinvent itself, which creates a lack of curricular stability, predictability, and makes pathways and options confusing for students and counseling faculty.

- HyFlex mode courses are on the decline in the Math Department. While we still believe that it is important to offer our Concurrent Support classes in that mode, there are only a handful of instructors who prefer to teach their lecture classes in that mode. Instructors who have tried to use that mode in the past have reported chronically low in-person attendance and lack of stable/good technology as issues.

- Striking the proper balance between traditional lecture and online classes continues to present a challenge from an enrollment standpoint. While the department understands we cannot return to pre-pandemic levels for distance education, we also cannot give in to the surge in demand because that may not be what is best pedagogically for students in a math class as evidenced by institutional research data showing that student attrition is an issue in online asynchronous instructional modalities even as soon as census.

- An overarching challenge is balancing the diverse educational needs with effective course deliveries under limited resources and support structures. Furthermore, AB 1705 and inadequate state funding has adversely impacted many students who lack sufficient preparation for our transfer-level courses. Concurrent support and Math Jam can only do so much, and our faculty are stretched thin trying to offer these services as efficiently and effectively as possible.

- The lack of funding for paid substitutes creates an undue burden on faculty needing a substitute, but unable to find a suitable trade arrangement.

C. Planning: What are your program's most important plans, either new or continuing?

N/A_____

- The department recruited a team of full-time and part-time faculty who will be compensated using AB 1705 planning money from the state to review calculus 1 material and create a department video library of support videos ranging from Algebra 1 concepts to calculus which will be integrated into the concurrent support classes, online homework system and our LPC

department website. The team started work on planning over summer 2024 and will continue the work through Fall 2025.

- In preparation for creating a reasonable discipline plan for Fall 2025's new placement by selected major scheme, the department reached out to Institutional Research to help decide the best number of Math 30/39 courses vs. Math 1 courses to offer each semester.
- Work with Engr. Tech and Middle college to determine which precalculus class would be the best option for their students.
- The continuation of more professional training sessions around student equity.
- Updating the evening Instructional Assistant position to have hours in the afternoon, five days a week to have better student coverage for both concurrent support and Emporium.
- We began discussions last year about the process of creating exams for students to earn credit by examination for both calculus 1 and calculus 2. CBE will help our concurrent enrollment students find a spot in the summer calculus 2 and calculus 3 classes and our international students unable to verify completion of calculus 1 and 2 in their home country. This coming year, we will complete the creation of the exams and submit the update for the curriculum.
- Updating the concurrent support class faculty training to better capture the mindset and function of faculty in those classes.

D. Identify any college, district, or legislative barriers to your program's equity work. What suggestions do you have for minimizing or eliminating these barriers?

N/A_____

Barrier:
The AB 705 and AB 1705 laws in principle contribute to equity by starting students in a similar/the same math course, but disparity in students' preparation creates a new equity barrier. Post-AB 705, we are especially seeing this with students in the STEM track/Calculus sequence, with some students entering calculus with minimal or even zero background in trigonometry and minimal algebra preparation. We expect that the implementation of AB 1705 will only worsen these inequities. During the semester, concurrent support classes were developed to help fill in the gaps in student understanding, but the limited personnel in the concurrent support classes means that only the most vocal of students tend to get the help that they need. With one instructor per 35 students and maybe a student tutor, many of the most vulnerable students in need of that support slip through the cracks. Before the semester starts, MathJam has offered students confidence in joining their math class as well as encouraged students to join concurrent support classes during the semester, but the program is not as well funded, nor attended as it was in the past.

Suggestion:
We would like to expand our concurrent support offerings, but limited FTEF makes that challenging. However, with more classified personnel (or current personnel with expanded hours), we could make the

Integrated Learning Center/Math Learning Center a true learning center that is open not just during the support classes, but also in between classes to students more opportunity for support.

Barrier:
Reaching all part-time faculty in a meaningful way to help educate and encourage equitable teaching and engagement with their students. As a department, we hold regular meetings for these purposes, but attendance includes faculty who generally "get it" without reaching the faculty who likely need it.

Suggestion:
No idea. It seems that unless something is contractually required, it is impossible to get folks involved. Even when it is contractually required, such as professional responsibility hours, PT faculty have choices about how to apply those hours, if they even bother to do them. PT faculty often teach at 3 to 5 colleges in multiple districts with little time to spend on something they may consider frivolous or unnecessary for completing their job.
Barrier:
Only Full-Time faculty can be trained to be Puente (and may Umoja) faculty. To grow those programs, we need the ability to have more qualified, interested faculty trained to work within those learning communities, but due to outside of the classroom events and activities, many faculty do not want to be trained. In addition to that, the training happens during breaks and faculty are not compensated for attending.

Suggestion:
Again, no idea. It would be nice to say that all FT faculty should be trained and willing to teach on of the cohort classes because that is the right thing to do for our students, but the reality is that the FT faculty who can and want to do it, have done so. The rest feel like they have too much to do already and/or are just on board for what is dictated by the contract. Ideally though, we are growing the department back up to at least the 15 faculty that we had years ago with an eye toward hiring faculty who are eager to be a part of learning communities, honors program courses, concurrent support, equity projects and more. Less ideally, there is a magical pot of money somewhere to help compensate for all volunteered hours put into being part of the learning communities. Opening the training to PT faculty is the purview of the Puente Program, so nothing to be done about that at this time.

E. Curriculum Updates

Reasons for updating include that it is required every two (CTE) or five (non-CTE) years, there is a program or college need, starting a new program, or new legislation.

1. Are you planning to update any curriculum in 24-25?
   Yes_X___ No____

2. Comments (Optional):
    a. We have some non-credit classes that need their equity language and textbooks updated.
    b. Adding CBE to Math 1 and Math 2

3. Please review your program maps. Do you need to make any modifications?
   Yes____ No__X__

4. If yes, compare each Program Map to your current course offerings and sequencing. Pay close attention to prerequisite information, and classes offered only during certain semesters.
    a) If your map requires a **non-curricular change** (i.e., course sequencing), consult your **Pathway counseling faculty liaison** to initiate changes.
    b) **If your map requires a curricular change** (Program modifications) - these are initiated through the Curriculum Committee.

    Any questions? Contact the Curriculum Chair or the Curriculum and SLO Specialist.

Section 2: Data Analysis – Quantitative and Qualitative

A. IR Data Review: Discuss any significant trends in the data provided by the Office of Institutional Research and Planning (or any other data you use for decision-making and planning).

*(**Note**: Not all Programs have IR data available; if your program does not have a data packet or dashboard data, you may note that in the response box and reach out to the IR team.)*

Here are a few samples of data to review and reference if that's helpful.

- IR Data packets are available here (Posted Fall 24)
- Academic & Career Pathway Specific data (Posted Fall 24)
- Your program's survey data
- Transfer data
- Course Set Standard Overview & Success Rates Dashboard are in the middle of this page

Success rates in our two most-enrolled courses (Math 1 and Math 40) have remained relatively consistent from AY 18-19 through AY 23-24. When comparing DE versus non-DE instruction in those two courses, success rates were similar for this past academic year (Math 1 non-DE 64.4% vs DE 69.2%; Math 40 non-DE 63.2% vs DE 59.1%). It would be nice to be able to look at a demographic breakdown of success rates for Math 1 and Math 40, but it is understandable that we may run into FERPA issues at that level of detail.

Looking at the demographics for the Mathematics program at large, there are a few interesting trends in the data that may be worth keeping an eye on over the next few years. One is that our percentage of students below age 19 has increased from 50% in F19 to 65% in F23. That 15% jump seems significant and may perhaps be attributed to an increase in enrollments from Middle College. In terms of Race-

Ethnicity during AY 23-24, our Asian and Latino populations became the majority groups for the first time (29% Latino majority in F23, 28% Asian majority in S24). We have been working with the growing Puente program, providing dedicated math instructors to help support our Latino students.

B. Program-Set Standard (Instructional Programs Only):

The program-set standard is a baseline that alerts programs if their student success rates have dipped suddenly. 95% of the rolling 5-year average. There are valid reasons a program does not meet the Program Set Standard; when a program does not meet this standard, they are asked to examine possible reasons and note any actions that should be taken, if appropriate. | Program-set standard data can be found on this page.

1. Did your program meet its program-set standard for successful course completion?

   Yes_✓_ No____

2. If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.
   Program set-standard was met (standard was 55.5%, success rate was 63.1%)

Section 3: SLOs/SAOs: Assessment of Student Learning and Support

Program Review is the college's major data source on student learning and support and is, therefore, regularly reviewed. *Each year, programs must discuss their PSLOs, CSLOs, or Service Area Outcomes (SAOs.) This helps us to see how our students are progressing in their learning.* For assistance with these questions and instructions on running reports using eLumen, click here.

Please complete at least one of the following three sections based on what is appropriate for your program. Check at least one below:

- X **C1: Instructional Programs with PSLOs (disaggregated PSLOs)**
- ☐ C2: Instructional Programs with CSLOs *(Departments without degrees, non-major courses, and/or other courses up for assessment)*
- ☐ C3: Non-Instructional Programs (SAOs)

C1: Instructional Programs with PSLOs (disaggregated PSLOs)

To assess PSLOs within eLumen, CSLOs must be correctly mapped to only one PSLO, and every mapped CSLO must have assessment data. Please review the items below and proceed accordingly.

- If the CSLOs are mapped correctly and there is data for each CSLO, then continue to question 2.
- If the CSLOs have assessment data and the mapping needs to be completed, then complete the mapping within eLumen (See SLO Handbook, p. 7) and continue to question 2.

- If not all mapped CSLOs have assessment data, then you cannot assess the PSLO. In this case, continue to section C2.

1. Please review your 3-year plan and verify that all courses will be assessed by June 2026. (between Fall 2023 – Spring 2026)

   Will at least one SLO be assessed in each course by June 2026?
   Yes_X___ No____

   If not, please update your 3-year plan to include any courses you missed. If you plan to revise your 3-year plan, then send your updated plan to the Curriculum and SLO Specialist and the SLO Chair.

2. Based on your 3-year plan, list the PSLO(s) for the academic year 2023-2024 that your program selected to review and explain why these were chosen.

   After seeing the type of data collected during the last three years, for this cycle, we want to just focus on two of our PSLOs each semester for the full cycle. This way we can look at trends from semester to semester after making action items each fall during the closing of the loop meetings/discussions. The PLSOs are for modeling and problem solving.

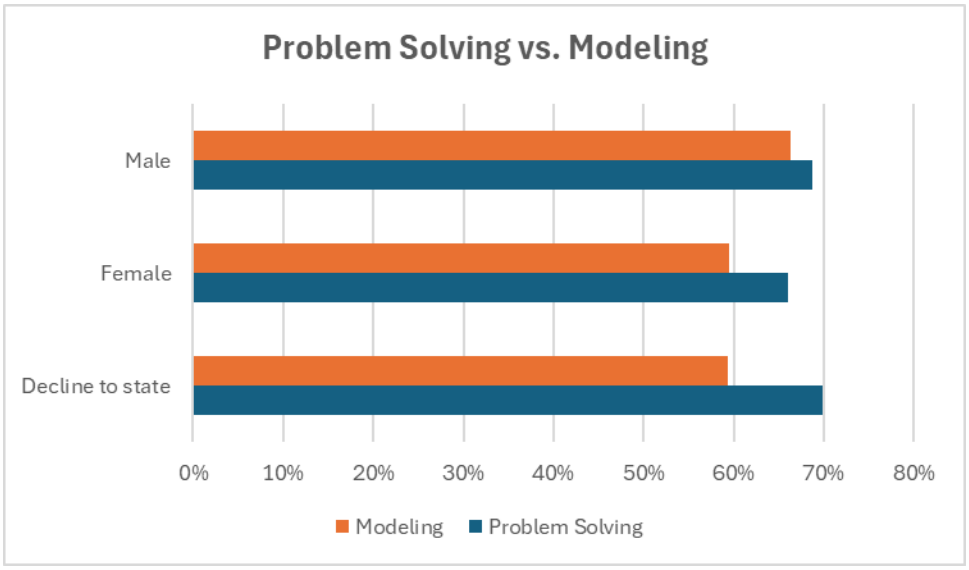
3. What percentage of faculty completed the planned CSLO assessments? (In eLumen, run a Faculty Participation report for 23-24).
   - _____62_____%

4. Analysis of PSLO(s): What conclusions can be drawn about student learning and equity in your program based on eLumen and/or other data? You may want to consider disaggregated data. When using eLumen See the Guide for instructions on how to disaggregate PSLO data.

   Due to a glitch in eLumen, we were only able to gather data from Fall 2023, but it will be a good starting place for the cycle.
   Focusing fully on the AS-T classes we see these trends:

Problem Solving	Mastery/ Above Avg	n(E)	N
Decline to state	70%	37	53
Female	66%	187	283
Male	69%	228	332
Total	**68%**	**452**	**668**

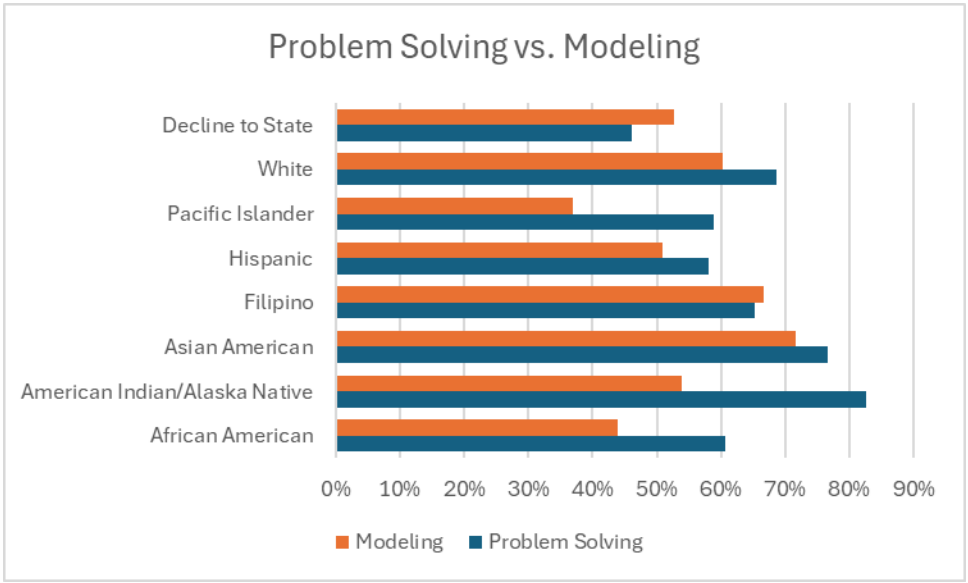
Modeling	Mastery/ Above Avg	n(E)	N
Decline to state	59%	41	69
Female	59%	207	348
Male	66%	289	436
Total	**63%**	**537**	**853**



Overall, it looks like students tend to need more support with modeling, which isn't unusual. Looking at the breakdown, the number of female students who meet the SLO is lower than the male students. It is perhaps something of note that the female students do not perform nearly as well on the modeling as the male students.

Problem Solving	Mastery/ Above Avg	n(E)	N
African American	61%	20	33
American Indian/Alaska Native	83%	19	23
Asian American	77%	183	239
Filipino	65%	43	66
Hispanic	58%	97	167
Pacific Islander	59%	10	17
White	69%	213	310
Decline to State	46%	6	13
Total	**68%**	**591**	**868**

Modeling	Mastery/ Above Avg	n(E)	N
African American	44%	18	41
American Indian/Alaska Native	54%	14	26
Asian American	72%	232	324
Filipino	67%	54	81
Hispanic	51%	106	208
Pacific Islander	37%	7	19
White	60%	234	388
Decline to State	53%	10	19
Total	**61%**	**675**	**1106**



Unlike with gender, the breakdown by ethnicity shows that there are a couple of categories where modeling exceeds problem solving, but problem solving is still met more so than modeling.

Investigating the courses that feed into this AS-T, we see the following breakdown:

Problem Solving	Mastery/ Above Avg.	n(E)	N
Math 1	53%	98	185
Math 2	56%	63	112
Math 3	77%	70	91
Math 5	83%	24	29
Math 7	81%	30	37
Math 40	58%	252	434

Modeling	Mastery/ Above Avg.	n(E)	N
Math 1	N/A		
Math 2	57%	64	112
Math 3	69%	63	91
Math 5	45%	13	29
Math 7	81%	30	37
Math 40	62%	270	434

As the students advance through the STEM track (starting in Math 1) their Problem-Solving skills steadily improve. For modeling, there isn't a clear picture of progress since both Math 5 and Math 7 come after math 2. We also only had one math 5 class that fall though, so we can't draw any conclusions just yet.

For Math 40, Statistics, the values are relatively low for Problem Solving, but the topic is covered early in the semester and not revisited throughout the course.

5. Based on discussions with others in your program, explain potential changes designed to improve student learning and close any equity gaps identified through the analysis of PSLO data. Please also note if you decide to update any CSLOs or PSLOs based on this analysis (If updating, then you may do this through eLumen, see the SLO Handbook if you need instructions on how to do this).

For Math 1: Problem Solving, in reflections, it was noted that:

- Trig functions continue to be a weakness of the majority of students. Students depend upon notes or formula sheets to work with trig identities when part of the integration
- Some students understood the u-substitution but could not execute the integration properly. Others did not use the correct substitution.

For Math 2: Problem Solving, in reflections, it was noted that:

- Students who scored below average had difficulty identifying that the integral was a partial fraction case.
- For the most part students did well. Some did not know how to solve the integral after finding the decomposition. Some students did not set up the decomposition properly.

For Math 3: Problem Solving, in reflection, it was noted that a significant part of the students solved the problems. Some struggles still with integration skills.

Form Math 40: Problem Solving, in reflection, it was noted:

- In general, it is a more complicated topic than some others, but the basic idea of one vs 'mean of a sample of many" having a smaller standard deviation is certainly something that all students should be able to understand and apply
- The main characteristic of students who had not mastered this was that they didn't spot the wording that indicated the Central Limit Theorem was needed. Emphasize "flags" in the language/wording of the problem when going through this material. Incorporate more relatable examples in lab to help internalize the concept.
- Some students ignored the sample size and its relevance. Consider designing note templates to have more standard normal model vs. CLT comparison practice problems.
- Students do not understand which process to use for the application problems. Discussions with students to help them decide which method to use, when and why.

6. If you experienced any challenges in completing your PSLO assessment process, please list those below along with any items that would help you improve this process in the future.

C2: Instructional Programs with only CSLOs - Departments without degrees, non-major courses, and/or other courses up for assessment

1. Please review your 3-year plan and verify that all courses will be assessed by June 2026. (between Fall 2023 – Spring 2026)

   Will all courses be assessed by June 2026?
   Yes____ No____

   If not, please update your 3-year plan to include any courses you missed or if you plan to revise your 3-year plan, then send your updated plan to the Curriculum and SLO Specialist, and the SLO Chair.

2. Based on your 3-year plan, list the CSLO(s) for the academic year 2023-2024 that your program selected to review.

3. What percentage of faculty completed the planned assessments for the selected CSLO? (In eLumen, run a Faculty Participation report for 23-24).

4. What conclusions can you draw from the CSLO data and reflections in eLumen. If you used any additional evidence or methods to answer this question, please explain.

5. Explain potential program changes designed to improve student learning. Please also note if you have decided to update any CSLOs or PSLOs based on analysis (If updating, then you may do this through eLumen, see the SLO Handbook if you need instructions on how to do this).

6. If you experienced any challenges in completing your CSLO assessment process, please list those in the box below, along with any items that would help you improve this process in the future.

C3: Non-Instructional Programs (SAOs)

1. Please review your 3-year plan and verify that all courses will be assessed by June 2026. (between Fall 2023 – Spring 2026)
   Will all courses be assessed by June 2026?

   Yes____ No____

   If not, please update your 3-year plan to include any courses you missed or if you plan to revise your 3-year plan, then send your updated plan to the Curriculum and SLO Specialist, and the SLO Chair.

2. Based on your 3-year plan, list the SAO(s) for the academic year 2023-2024 that your program selected to review.

3. Based on discussion with others in your area, what conclusions can be drawn from the SAO data and reflection questions from eLumen or other sources of data?

4. Explain any planned changes to improve outcomes in your service area. Please note if you have decided to update any SAOs based on this analysis.

5. If you experienced any challenges in completing your SAO assessment process, please list those below, along with any items that would help you improve this process in the future.

Section 4: Suggestions for the Program Review Committee (optional)

What questions or suggestions about this year's Program Review forms or process do you have?