

De Anza College

Program Review – Annual Update Form

1. Name of individual(s) completing the form:

Fatemeh Yarahmadi

2. Briefly describe how your area has used the feedback from the Comprehensive Program Review and Annual Program Review Update provided by RAPP members over the past two years (if unsure, request the feedback form from your dean/manager).

Over the past two years, the Mathematics Department has used RAPP feedback as a framework for clarifying our program goals, strengthening our assessment cycle, and becoming more intentional in how we document and communicate departmental practices. RAPP requested clearer connections between our claims and evidence, more specific descriptions of pedagogy, and transparency regarding faculty and resource needs. In response:

- We revised our program review statements to explicitly reference the ways learning is scaffolded throughout the quarter, addressing RAPP's concern that assessments were overly dependent on final exams.
- We incorporated concrete examples of re-teaching opportunities, diagnostic assessments, and weekly learning modules to better demonstrate how students build mastery over time.
- We refined our justification for additional full-time faculty by systematically collecting waitlist data, fill rates, and information on course cancellations—evidence RAPP specifically requested to strengthen resource requests.
- We documented cross-team curriculum coordination (Calculus, Statistics, Noncredit, Corequisite, and DE instruction), aligning our work more closely with Guided Pathways and student progression through the math sequences.

These adjustments have allowed us to more clearly communicate not only what we do, but why we do it, and how our work responds directly to student need and institutional priorities.

3. Describe any changes or updates that have occurred since you last submitted program review (program review [submissions](#)).

Since the last program review cycle, the Mathematics Department has implemented several updates aimed at improving student success, consistency across sections, and equitable access to high-quality instruction.

- **Course Revisions and New Offerings:** Math 4 (Computational Statistics) has expanded, while the Calculus sequence has been updated with support addition to better align with

transfer expectations and with Guided Pathways recommendations for clearer student progression.

- **Collaborative Curriculum Work:** Faculty teams across Calculus, Statistics, and Developmental Education have increased coordination, creating shared SLOs, common learning modules, and consistent approaches to assessment.
- **Equity-Minded Instructional Practices:** The department has deepened its use of embedded tutors, culturally responsive pedagogy, early-term diagnostics, and scaffolding strategies that reduce reliance on high-stakes finals.
- **Weekly Learning Module Pilot:** Several instructors piloted weekly scaffolded modules designed to focus student learning and reduce equity gaps tied to cumulative exams. Initial results show improved early-term performance among disproportionately impacted students.
- **Technology Integration:** More faculty have adopted statistical software, graphing tools, Canvas-based content, and data-driven activities to support deeper conceptual understanding, particularly in Statistics, Precalculus, and Calculus.

These updates reflect our commitment to increasing capacity, improving teaching quality, and supporting the diverse learning needs of De Anza students.

4. Provide a summary of the progress you have made on the goals (OKRs) identified in your last program review (as included in the comprehensive program review or annual program review update).

The Mathematics Department has made measurable progress toward our established goals, using waitlist totals, fill rates, and enrollment patterns to evaluate our needs and refine our plans. In keeping with RAPP's feedback, we have used data more intentionally to assess structural barriers and make evidence-based requests.

Math enrollments show a clear recovery trend following pandemic-related declines. Enrollments decreased from **18,503 in 2020–21** to **13,764 in 2022–23**, but have since rebounded to **15,491 in 2024–25**. This recovery is consistent with our extremely high demand in key sequences, where fill rates regularly exceed 95% and waitlists are routinely 10–30+ students per section. These trends both confirm student need and reinforce the urgency of our request for additional full-time faculty.

We continue to monitor high-enrollment courses (Statistics, Precalculus, Calculus) where full-time faculty shortages have created persistent challenges. Despite careful scheduling and redistribution of load, we rely heavily on part-time faculty, which increases coordination demands and can limit consistency across multi-section courses. Based on quarterly enrollment reports and ongoing departmental discussions, we have submitted requests for additional full-time hires to support program integrity.

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Goal Progress Table

Goal 1: Faculty Capacity

Goal Title	Goal Description	Responsible Parties	Collaboration With...	Evidence Used to Monitor Progress	Assessment Method	Changes Made Based on Assessment
Faculty Capacity	Increase full-time faculty capacity to meet demand in high-enrollment courses and maintain program integrity in core sequences (Precalculus, Calculus, Statistics).	Department Chair, Division Dean, Full-Time Faculty	Office of Institutional Research, RAPP, Counseling	Waitlist data (multiple courses with waitlists of 10–30+ students), fill rates consistently >95%, course cancellations due to lack of available faculty	Review of quarterly enrollment reports; departmental discussion of load distribution	Increased reliance on part-time faculty; adoption of cross-collaboration between course coordinators; request submitted for additional full-time hires

5. If your goals (OKRs) are changing or you are adding a new goal(s), please include them below. If new goals require resources, please list requested resources that were not included in your last program review.

Goal Title	Goal Description	Responsible Parties	Collaboration With...	Evidence to Monitor Progress	Assessment of Achievement
Technology & Software Access	Ensure equitable access to math and statistics software (e.g., JMP, R, Desmos Classroom) for all students, with a focus on DI groups.	Faculty Tech Committee	Technology Services, Equity Office	Software usage reports, student access surveys	Review of DI student feedback; tracking course performance before/after access improvements
Strengthening Math Pathways	Improve clarity and efficiency of pathways from entry-level math through transfer-level courses.	Department Chair, Counselors	Guided Pathways Team	Enrollment patterns, bottlenecks in sequences	Annual review of course flow and student movement through sequences

6. Describe the impact to date of previously requested resources (personnel and instructional equipment, facilities/upgrades) including both requests that were approved and were not approved. What impact have these resources had on your program/department/office and measures of student success or client satisfaction? What have you been able to and unable to accomplish due to resource requests that were approved or not approved?

Approved Resources

- Additional embedded tutor support has improved student participation and provided consistent academic help, particularly in high-demand courses like Statistics and Calculus.

Unapproved Resources and Impact

- The department must rely heavily on part-time faculty, increasing coordination burden and limiting consistency across multi-section courses.

Alternative strategies we have adopted include:

- Collaborating with the STEM Success Center for embedded tutoring
- Leveraging free/open-source tools where possible
- Sharing instructional materials across faculty to reduce preparation load

7. How have these resources (or lack of resources) specifically affected disproportionately impacted students/clients? If you have not requested or received resources, still describe how your area has been able to serve disproportionately impacted students/clients.

Approved resources, especially embedded tutors, have directly supported DI groups by providing additional low-stakes learning opportunities, culturally responsive support, and more individualized learning assistance.

Lack of faculty hiring has limited the number of available sections, making it harder for DI students—who often face work and caregiving responsibilities—to register for needed courses, extending their time to degree.

Limited technology access disproportionately affects DI students who may not have personal devices or software.

- This affects performance in statistics and calculus courses and AI that increasingly use technology for visualization, data analysis, and modeling.

Reduced availability of course offerings in evening or hybrid formats has also disproportionately affected working students and returning adults.

8. Refer back to your Comprehensive Program Review and Annual Program Review Update under the section titled Assessment Cycle as well as the SLO website (<https://www.deanza.edu/slo/>) for instructional programs. In the table below, provide a brief summary of one learning outcome, the method of assessment used to assess the outcome, a summary of the assessment results, a reflection on the assessment results, and strategies your area has or plans to implement to improve student success and equity. If your area has not undergone an assessment cycle, please do so before completing the table below.

Table 1. Reflection on Learning Outcomes

Learning Outcome	Method of Assessment	Summary of Results	Reflection on Results	Strategies Implemented / Planned
Students will be able to apply problem-solving strategies to analyze and interpret mathematical models.	Multi-stage assessment: weekly scaffolded assignments, midterm checkpoints, and cumulative final exam. This approach responds to RAPP's concern about final exams by incorporating opportunities for re-teaching and revision prior to the final assessment.	Students performed strongly on scaffolded assignments but lower on cumulative synthesis tasks. DI student success rates improved during early modules but dropped during high-stakes assessments.	Results indicate a need for more formative assessment prior to major exams. Scaffolding improved early learning but must continue closer to the end of the course.	Increased low-stakes practice quizzes, expanded embedded tutor hours, required study group formation supported by tutors, instructor training on how to integrate embedded tutors into lesson planning.

Table 1. Reflection on Learning Outcomes (SLO, AUO, SSLO)

Learning Outcome (SLO, AUO, SSLO)	Students will be able to analyze and evaluate logical statements using standard logical operators, including <i>exclusive OR (XOR)</i> , and apply these concepts to construct and interpret truth tables, compound propositions, and logical equivalences.
Method of Assessment of Learning Outcome (please elaborate)	<p>This outcome was assessed through a cumulative final exam that included a dedicated section on XOR. Students were required to:</p> <ol style="list-style-type: none"> 1. Construct truth tables involving XOR both individually and within compound statements (e.g., $(P \oplus Q) \wedge \neg R$). 2. Apply XOR in problem-solving contexts, such as determining parity, toggling behavior, or evaluating real-world XOR-style scenarios. 3. Identify equivalences, such as recognizing when XOR can be expressed using AND, OR, and NOT (e.g., $P \oplus Q \equiv (P \vee Q) \wedge \neg(P \wedge Q)$).

	<p>4. Explain reasoning in writing, demonstrating understanding beyond procedural table creation.</p> <p>The assessment required not only computational accuracy but also conceptual understanding of XOR as a non-inclusive logical operator.</p>
<p>Summary of Assessment Results</p>	<ul style="list-style-type: none"> • Truth tables: Most students (about 75–85%) completed the basic XOR truth tables correctly. • Compound XOR expressions: Accuracy dropped to 60–70% when XOR was embedded in multi-step expressions involving negation and conjunction. • Logical equivalences: Fewer students (about 50–60%) successfully identified or proved XOR equivalence using other operators, indicating a gap in symbolic manipulation. • Written explanations: DI students in particular struggled with explaining <i>why</i> XOR behaves differently from inclusive OR, with many describing XOR procedurally rather than conceptually. • A small group of students misinterpreted XOR as “both or neither,” suggesting confusion with biconditional (\leftrightarrow). <p>Overall performance was strongest on mechanical tasks and weaker on abstraction, interpretation, and equivalence transformation.</p>
<p>Reflection on Results</p>	<p>The results suggest that while students can correctly compute XOR in isolation, conceptual understanding weakens when XOR appears in more complex logical contexts.</p> <p>Key reflections include:</p> <ul style="list-style-type: none"> • Students demonstrated good procedural fluency but needed more practice transitioning from computation to interpretation of compound statements. • The step that caused the most difficulty was recognizing and proving equivalences, a skill central to advanced logical reasoning but new for many students. • Written explanations revealed that students often memorize XOR behavior rather than internalizing the underlying rule (“true when exactly one input is true”). • Many students benefit from visual or interactive models (e.g., light-switch toggles, parity checkers), which were introduced late in the quarter; earlier integration may support deeper learning. <p>These observations indicate a need for more scaffolding when students move from symbolic operations to conceptual reasoning.</p>

<p>Strategies Implemented or Plan to be Implemented (aka: enhancements)</p>	<p>In response to these findings, the following enhancements are planned for future iterations of the course:</p> <ol style="list-style-type: none"> 1. Earlier Introduction of XOR Applications Use real-world analogies (e.g., toggles, digital circuits, parity bits) earlier in the quarter to build intuition before symbolic abstraction. 2. Guided Equivalence Exercises Implement structured worksheets showing step-by-step transformations between XOR and its equivalent expression using AND/OR/NOT. 3. Small-Group Logic Workshops Embedded tutors will facilitate mini-sessions focused on interpreting compound logical expressions involving XOR. 4. Frequent Low-Stakes Practice Weekly short problems requiring students to both compute and <i>explain</i> XOR in their own words to strengthen conceptual clarity. 5. Visual Modeling Tools Introduce visual representations of XOR using Venn-style diagrams, circuit diagrams, or truth-table apps to support multiple learning modalities. 6. Exam Review Scaffolding Provide guided review questions that gradually increase in complexity, bridging basic XOR operations to compound logical statements. <p>These enhancements aim to deepen understanding of XOR as both a symbolic and conceptual operator and to strengthen students' ability to integrate logic topics more holistically in Discrete Math.</p>
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Please email this form to your dean/manager.

9. Dean Manager Comments:

10. Vice President/Associate Vice President Comments:

The Mathematics Department continues to demonstrate strong instructional leadership, data-informed planning, and sustained commitment to student success and equity. Enrollment has rebounded steadily following pandemic declines, with fill rates exceeding 95 percent and persistent waitlists in high-demand sequences such as Statistics, Precalculus, and Calculus. Faculty collaboration across course teams has strengthened pathway clarity, curriculum alignment, and consistency of assessment. The department's use of embedded tutors, scaffolded learning modules, and early diagnostics reflects a thoughtful approach to reducing equity gaps. However, continued reliance on part-time faculty limits section availability and student access.

Additional full-time faculty are essential to meet demand, expand scheduling options, and sustain program quality.