COMPREHENSIVE PROGRAM REVIEW TEMPLATE

I - MAIN

Overview
Academic Year: 2025-2026
Originator : David Argudo
Division: Division 20 - Science, Technology, Engineering, and Math
Department: STEM

II - CO-CONTRIBUTORS

1) Jennifer Nari
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III - PROGRAM MISSION AND ACCOMPLISHMENTS

Gavilan College Mission Statement: *Through equitable access and comprehensive support in a welcoming inclusive environment, Gavilan College guides students of diverse backgrounds to achieve academically and pursue lifelong learning. We prepare students for transfer success, career advancement, and meaningful community participation*.

1. Provide a brief overview of how the program contributes to accomplishing the mission of Gavilan College. In addition to a basic overview of your program's structure and services, be specific in connecting your program's services to elements of the mission statement (300 words or less).
   The Engineering and Physics program at Gavilan College advances the College's mission by providing equitable access to rigorous, transfer-level STEM education while offering comprehensive academic, social, and professional support in a welcoming and inclusive environment. The program serves a high proportion of Hispanic, first-generation, and low-income students and is designed to prepare them for successful transfer to four-year institutions, entry into high-demand STEM careers, and meaningful participation in the regional workforce.

The program offers lower-division, transferable coursework in physics and engineering aligned with intersegmental model curricula and major transfer pathways. Students benefit from a structured sequence of courses, hybrid and in-person laboratory experiences, and applied, project-based learning that emphasizes problem solving, computational thinking, and hands-on experimentation. Instructional practices intentionally reduce barriers to participation by emphasizing clarity of expectations, active learning, and multiple forms of academic support.

Over the past several years, the program has expanded beyond traditional coursework to include

high-impact practices such as undergraduate research, faculty-led internships, industry-informed projects, and transfer-focused professional development. Partnerships with regional universities, including San José State University and California State University, Monterey Bay, have strengthened transfer pathways and provided students with authentic research and internship experiences. These opportunities support student persistence, build STEM identity, and increase transfer readiness.

The program also contributes to Gavilan's mission by fostering an inclusive learning community that values diversity, collaboration, and student voice. Efforts include culturally responsive teaching practices, outreach to local high schools through dual enrollment, and collaboration with student support programs such as MESA. Together, these initiatives support academic success, reduce equity gaps, and create clear, attainable pathways for students to pursue lifelong learning and upward mobility through STEM education.

2. On the PIPR website, locate and review your previous program plan and subsequent annual updates. After reviewing, enter your previous goals below and comment on the progress/accomplishments of each goal. (Enter each goal separately)
   During the 2024–2025 academic year, the Engineering and Physical Sciences program focused on expanding access to STEM pathways, strengthening instructional capacity, and integrating career-connected learning to support student persistence and transfer.

Expanding access and strengthening STEM pathways.
The program implemented integrated and bilingual outreach strategies to increase awareness of STEM pathways and connect students early to academic and support resources. Activities include participation of Faculty in the Welcome Week, Ram-O-Rama, Bienvenida, classroom outreach, and partnerships with local high schools. A major highlight was the Annual STEM Symposium in August 2025, where more than 60 students presented research posters to an audience of approximately 200 attendees, including families and community members. In addition, Gavilan students presented internship research at a partner-hosted symposium at California State University, Monterey Bay, where the Gavilan team received the Best Poster award. Enrollment in Introduction to Engineering (ENGR 10) continued to grow, with 85 students enrolled across fall, spring, and summer terms. The course was redesigned to include a hands-on lab component, offered year-round, and expanded through dual enrollment at local high schools.

Strengthening instructional capacity and experiential learning.
The program has advanced curriculum and infrastructure improvements aligned with workforce needs. A new Computer and Electrical Engineering track was developed to support high-demand, high-wage career pathways, particularly in semiconductor-related fields. Engineering laboratories were upgraded with modern instructional equipment, expanding hands-on learning, and supporting future offerings such as ENGR 3 (Circuits). To reduce access barriers, the STEM technology lending library continued to provide essential academic resources, serving 278 students during the year. The program also expanded hybrid and HyFlex instructional models to balance flexibility with in-person engagement and community building.

Integrating transfer, career planning, and work-based learning.

Career and transfer preparation were embedded throughout the student experience. Students received structured counseling, mentoring, and résumé support, and participated in university visits and professional conferences. In Summer 2025, 72 students engaged in work-based learning and undergraduate research experiences, including internships at San José State University, Gavilan College, CSU Monterey Bay, UCSF, and through pilot faculty-led micro-internships. Ongoing collaboration with four-year institutions strengthened curricular alignment and transfer preparation, contributing to improved persistence, skill development, and transfer readiness among engineering and physical science students.

3. Have the services or courses of your program changed over the past three years? Please explain (300 words or less).
   Yes. Over the past three years, the Engineering and Physical Sciences program has undergone significant curricular, instructional, and service-related changes to improve access, strengthen student success, and better align with transfer and workforce expectations.

At the curriculum level, the program redesigned and expanded its engineering and physics offerings to create clearer, more attainable transfer pathways. A major change was the development and expansion of **Introduction to Engineering (ENGR 10)** as a year-round course with an integrated laboratory component offered in the fall, spring, and summer terms. ENGR 10 emphasizes hands-on engineering projects, early exposure to engineering careers, and computational thinking, and has expanded through dual-enrollment partnerships with local high schools. In addition, the program launched a **Computer and Electrical Engineering track**, aligning coursework with high-demand, high-wage regional workforce needs, including semiconductor-related fields. Key engineering courses were updated to incorporate programming, data analysis, and AI-assisted tools to better prepare students for transfer and modern engineering practice. Reflecting increased student demand and improved pathway alignment, **Physics 4A (Mechanics)** is now offered in **two sections each spring**, serving **more than 65 students**, strengthening the calculus-based physics pipeline for engineering and physical science majors.

Instructionally, the program shifted toward a balanced mix of face-to-face, hybrid, and HyFlex modalities. This transition was informed by post-pandemic student needs and aims to preserve flexibility while maintaining strong engagement and a sense of community. Engineering and physics laboratories were upgraded with modern equipment, enabling expanded hands-on instruction and supporting future offerings such as **ENGR 3 (Circuits)**. A STEM technology lending library was also expanded to reduce access barriers related to hardware, textbooks, and connectivity.

In terms of services, the program strengthened integration with counseling, tutoring, and career support. Embedded tutors, faculty mentors, and a dedicated STEM counselor supported students across key gateway courses. Undergraduate research, internships, and work-based learning

opportunities were scaled substantially, providing students with authentic academic and professional experiences. Together, these changes reflect a shift toward a more holistic, student-centered STEM program that emphasizes access, equity, experiential learning, and transfer readiness.

IV - STUDENT AND PROGRAM OUTCOMES

College Goal for Student Achievement

The following questions refer to data regarding student achievement. To access program review data, go to the Program Review Data Matrix website .

1. **(Instructional Only)** Find your program's course success information. Consider your program success rate trends over the last three years. Compare your overall success to the college average. Are these rates what you expected after comparing with the college average? Are there any large gaps? Is there anything surprising about the data? What trends are suggested by the data?

   The college-wide average course success rate is approximately 72%, providing an appropriate institutional benchmark for evaluating Engineering and Physical Sciences outcomes.

   Over the past three years, course success rates in the Engineering and Physical Sciences program have compared favorably to institutional averages, particularly in the calculus-based physics sequence. **Physics 4A–4C success rates consistently range between approximately 85% and 95%**, exceeding the college-wide average and reflecting strong instructional alignment, appropriate prerequisite sequencing, and effective academic support.

   Engineering course success rates have historically been lower than physics, which is expected given the rigor, project-based structure, and smaller cohort sizes. **Engineering course success has ranged from approximately 65% to 80%**, with recent offerings trending upward following curriculum redesign, expanded laboratory instruction, and clearer pathway alignment. Courses that incorporate hands-on labs and hybrid delivery formats consistently demonstrate stronger success outcomes than fully online offerings. Overall, these success patterns align with expectations for a transfer-focused STEM program and indicate that recent curricular and instructional changes are positively impacting student outcomes.

2. **(Instructional Only)** Now find your program's persistence information. Consider your retention rate trends over the last three years. Compare your overall retention to the college average.

   Retention rates for students in Engineering and Physical Sciences remain strong and are comparable to, and in many cases exceed, institutional averages. **Program retention rates typically range from approximately 88% to over 92%**, with particularly strong persistence among students enrolled in the calculus-based physics and engineering pathways.

Persistence is highest for students who successfully complete transfer-level mathematics and Physics 4A within their first year. While engineering cohorts exhibit some year-to-year variability due to small enrollment sizes, multi-year trends show stable or improving persistence, especially for students who engage with tutoring, counseling, and faculty mentoring.

3. Are these rates what you expected after comparing with the college average? Are there any large gaps? Is there anything surprising about the data? What trends are suggested by the data.

   These success and retention rates are consistent with expectations when compared to institutional averages and the academic rigor of the program. No unexpected gaps were identified. Instead, the data suggest that **students perform best when coursework is sequenced appropriately, includes in-person laboratory components, and is supported by structured academic services**. Continued attention to the mathematics pipeline remains essential, as math enrollment and completion strongly influence persistence in engineering and physics pathways.

Success

The following questions refer to data regarding student achievement. To access instructional program review data, go to the Program Review Data Matrix website.

4. **(Instructional Only)** What are your set goals for course success? Do your individual course and program rates meet this goal? Helpful Question: If your rates for success are lower than your goals, what are your plans to improve them (200 words or less)?
   The program's goal is to **sustain an overall course success rate of approximately 80% or higher**, consistent with college benchmarks while maintaining rigor. The calculus-based physics sequence consistently meets or exceeds this goal. Engineering courses that fall below the target are being addressed through expanded hands-on instruction, improved scaffolding of complex projects, increased use of embedded tutors, and closer coordination with counseling and STEM support services.

5. How many students did your area serve (if you don't have an exact count, please provide an estimate)? How did they perform in comparison to those that did not use your services, if applicable? (200 words or less)
   The Engineering and Physical Sciences program serves **several hundred students**

annually across physics and engineering coursework. Including Astronomy, Physics, Physical Science and Engineering, the total from 2022-2026 is 1000 unduplicated headcount. Considering only physics and engineering, the unduplicated headcount is 456 students. Students who utilize program services—such as tutoring, mentoring, laboratory access, and work-based learning—demonstrate **higher success and retention rates** than students who do not, particularly in gateway courses such as PHYS 4A and ENGR 10.

6. Given this information, how has your service or area supported student success and retention over the past three years? (200 words or less)
   Over the past three years, student success has been supported through instructional redesign, expanded laboratory capacity, embedded tutoring, faculty mentoring, and access to technology resources. These supports have been especially impactful in the calculus-based physics sequence and in engineering courses that emphasize experiential learning. Undergraduate research, internships, and work-based learning opportunities have further strengthened student engagement, STEM identity, and transfer readiness.

7. In your area, what trends do you see and what initiatives need to be developed to support success and retention? (200 words or less).
   Key trends include **strong and growing enrollment in Physics 4A**, now offered in two spring sections serving more than 65 students, sustained success in the calculus-based physics sequence, and increasing demand for applied engineering coursework. Ongoing challenges include math pipeline enrollment and maintaining instructional quality across modalities. Future initiatives will focus on strengthening early pathway courses, expanding hybrid laboratory instruction, and further aligning engineering curricula with transfer and workforce expectations.

V - EQUITY

Gavilan College has identified the following populations as experiencing disproportionate outcomes: Males, African American, Native American, Students with Disabilities and Foster Youth.

1. Examine your equity data over the last three years. Comment on what your program has done to address any differences or gaps in the past three years. What has worked? What has not worked? (200 words or less) Helpful Questions: What current factors or potential causes can be connected to these areas of disproportional impact? How might your program or department address student equity gaps? How can your area help increase disproportionate student success? (200 words or less)?

Institutional course success data show a **college-wide success rate of 77%**. Several student groups experience notable equity gaps at the institutional level, including **Foster Youth (67%, –10 percentage points)**, **Black students (70%, –7 points)**, **Native American students (71%, –6 points)**, and **Latinx students (75%, –3 points)** . These gaps indicate persistent disproportionate

impact across the institution.

In contrast, program-level equity data for the calculus-based physics sequence (PHYS 4B, 7 sections, 178 students) demonstrate **stronger overall and more equitable outcomes**. The program success rate is **83%**, which is **6 percentage points above the institutional average** . Equity gaps for major student populations are small: **Latinx students show a –3 percentage point gap (82%)**, while **White students show no gap (83%)**, and **Asian students exceed the program average (+11 points)**. Gender-based gaps are negligible (–2 points for both male and female students), and students receiving financial aid outperform non–financial aid students by **4 percentage points**.

Larger gaps observed for Black students (–34 points), Veterans (–59 points), and Foster Youth reflect **very small sample sizes (N ≤ 4)** and are not statistically stable. Overall, the program demonstrates substantially **reduced equity gaps compared to institutional patterns**, suggesting that structured pathways, required in-person engagement, and integrated academic supports are effective in mitigating disproportionate impact.

2. **(Instruction Only)** Find your Distance Education success information. If distance education is offered, consider any gaps in success rates between distance education and face-to-face courses. Do you notice any trends? Do these rates differ? If disparity exists, how do you plan on closing the achievement gaps between distance education and face-to-face courses (300 words or less)?

Institutional equity data indicate that students experiencing the largest success gaps—particularly Foster Youth, Black students, Native American students, and financially vulnerable students—are the same populations most at risk of being disproportionately impacted by fully online instruction in rigorous STEM courses . While the institutional dataset does not disaggregate success by modality, these patterns provide important context for instructional decision-making.

At the program level, the calculus-based physics sequence requires in-person laboratory engagement and structured instructional interaction. Program equity outcomes suggest that this modality choice contributes directly to improved success and reduced equity gaps. Overall success in PHYS 4B is **83%**, and equity gaps for major populations remain within **±3 percentage points**, compared to institutional gaps of up to **10 percentage points** for similar groups.

These findings have informed a deliberate programmatic shift away from fully online delivery for advanced engineering and physics courses. Instead, the program prioritizes **hybrid and face-to-face formats with required laboratories**, embedded tutoring, and increased faculty presence. Expanded access to technology through the STEM lending library further supports students who may otherwise face barriers to success in partially online environments. Collectively, these strategies aim to preserve flexibility while preventing distance education from exacerbating institutional equity gaps.

3. Our 2023 Equal Employment Opportunity (EEO) Plan States: *"Gavilan Joint Community*

College District (District) is dedicated to proactively cultivating and sustaining a welcoming and inclusive work environment. The District aspires to be Diverse, Purposeful, Inclusive, and Equitable, as reflected in the District's Principles of Community. The District values the worth and dignity of every person, the pursuit of truth, the acquisition of knowledge, and the nurture of democratic citizenship. These values provide the foundation for an environment of civility, honesty, cooperation, and professionalism."

What is your area doing to support district efforts in creating an inclusive college environment? With what programs are you partnering? Did you identify barriers and institute change? How are you creating/ ensuring diversity in your program or in the classroom? **(300 words or less)** *(Some examples might be sponsoring cultural events and diverse speakers on issues dealing with diversity, exploring how to infuse diversity into the classroom and curriculum, integrating diversity into the evaluation of employees, promoting learning opportunities and personal growth in the area of diversity, or evaluating how the physical environment can be responsive to diverse employee and student populations.)*

The Engineering and Physical Sciences program actively supports an inclusive college environment by aligning instructional practices and student services with documented equity needs. Institutional data show equity gaps ranging from **–3 to –10 percentage points** for several student populations . In response, the program emphasizes instructional structures that have demonstrably reduced these gaps at the program level.

Faculty engage in inclusive and humanizing STEM teaching practices that emphasize transparency, collaborative problem solving, and multiple opportunities for formative feedback. Curriculum design prioritizes hands-on learning and structured sequencing, which has resulted in **higher overall success and smaller equity gaps** in calculus-based physics compared to institutional averages. Partnerships with MESA, counseling, and the STEM CAP Success Team provide coordinated academic and social support, particularly for students navigating transfer-level math and STEM coursework simultaneously.

Inclusive outreach efforts—including bilingual engagement, high school partnerships, and the Annual STEM Symposium—reinforce STEM identity and normalize transfer and research pathways for historically underserved students. Barriers related to cost and access are addressed through Zero Textbook Cost materials where feasible and expanded technology lending. These practices contribute to an inclusive learning environment in which equity gaps are actively monitored and addressed through data-informed program design.

4. How do you plan on addressing issues of student and employee equity? In other words, how do you plan on creating opportunities for success of students who have historically been underserved? How do you plan to address EEO outcomes in your employee hires?

Building on program-level equity outcomes that outperform institutional averages, the program aims to **maintain overall success rates above 80%** while reducing equity gaps for major student populations to **within ±3 percentage points**. Continued emphasis will be placed on hybrid laboratory-based instruction, embedded tutoring, and early pathway stabilization through

courses such as ENGR 10.

Employee equity efforts will focus on inclusive hiring and retention practices that prioritize instructional effectiveness, industry experience, and commitment to student-centered teaching. Ongoing professional development in inclusive pedagogy and cross-institutional collaboration will support equitable working conditions while sustaining high-quality instruction. Together, these strategies will support continued progress toward equitable outcomes for both students and employees.

VI - LEARNING AND AREA OUTCOME

Have you reviewed all your Learning and Area Outcomes to ensure that they remain relevant for evaluating the performance of your area?

1. Are your SLOs, PLOs, SAOs, and ILOs mapped in CurriQunet? NO
2. Are your SLOs, PLOs or SAOs up-to-date in CurriQunet? NO
3. Have all of your SLOs, PLOs or SAOs been assessed in the last five years? NO
4. Have you reviewed all of your SLOs/SAOs to ensure that they remain relevant for evaluating the performance of your program? NO
5. If you answered No to any of the above questions, what is your plan to bring SLOs/PLOs/SAOs into compliance?

Student Learning Outcomes assessment in Engineering and Physical Sciences has been limited over the past several years due to institutional changes in the SLO assessment process and reporting systems. During this transition period, the college has been revising its assessment framework, timelines, and documentation procedures, which affected the consistency of program-level SLO evaluation. As a result, comprehensive SLO assessment data have not been formally collected or reported for this program during the past five years.

With the college's implementation of a revised assessment process and integration of SLO tracking within the Canvas learning management system, the program will resume systematic SLO assessment beginning in the current academic year. Faculty will use the updated institutional framework to align course-level outcomes with program-level outcomes, collect assessment evidence through Canvas-based tools, and document results using the standardized reporting process.

The program's immediate focus will be on assessing core competencies in scientific reasoning, quantitative problem-solving, and application of engineering and physics principles. Assessment results will be reviewed collectively by faculty to identify strengths, areas for improvement, and opportunities to better align instruction, laboratory experiences, and evaluation methods.

This renewed assessment cycle will support continuous improvement of student learning, ensure compliance with institutional processes, and provide more consistent evidence of student achievement in future program review cycles.

VII - OUTCOME ASSESSMENTS

Review Outcomes data located in CurricUNET Assessment Area. After you have examined your results, what do your findings suggest?

1. Student Learning Outcomes (SLO) or Service Area Outcomes (SAO) Review the SLOs or SAOs assessment data located in CurriQunet. What improvement do you plan to implement based on your assessment data and when will you implement these changes and how will you know they are successful?

Program Learning Outcomes assessment has not been conducted in recent years due to institutional revisions to the SLO/PLO assessment framework and reporting processes. With the college's new assessment system now in place and integrated into Canvas, the Engineering and Physical Sciences program will begin formal PLO assessment in the Spring term.

Faculty will align course-level outcomes with program-level outcomes and use Canvas-based assessment tools to collect and document evidence of student learning. Initial assessment efforts will focus on core program competencies, including scientific reasoning, quantitative problem-solving, application of engineering and physics principles, and effective communication of technical concepts.

Assessment results will be reviewed collaboratively by faculty to identify strengths, areas for improvement, and opportunities for instructional refinement. This process will establish a sustainable assessment cycle and provide baseline data for future program review and continuous improvement efforts.

2. Institutional Learning Outcomes (ILO) How do your SLOs/SAOs support the college ILOs or how do your PLOs support the college ILOs? Be specific.
   see answer to part 1 section VII.
3. Are you meeting your SLO/SAO success outcomes? What patterns stand out in your results? If your SLO/SAO results are lower than expected, what are your plans to improve them?
   see answer to part 1 section VII

VIII - CURRICULUM AND COURSE OFFERINGS ANALYSIS

1. Are there plans for new courses or educational awards (degrees/certificates) in this program? If so, please describe the new course(s) or award(s) you intend to propose (200 words or less).

Yes. The program plans to continue refining and expanding curriculum to support transfer readiness and workforce alignment. Recent curricular development has included the expansion of **Introduction to Engineering (ENGR 10)** as a year-round offering with an integrated laboratory component, providing early exposure to engineering design, computational thinking, and hands-on problem solving. Building on this foundation, the program is exploring development of additional coursework that strengthens preparation in programming, data analysis, and applications relevant to computer and electrical engineering pathways.

The program has also established a **Computer and Electrical Engineering track** that aligns with regional workforce needs, including semiconductor-related industries. Future proposals may include course enhancements or new offerings that support this pathway, particularly in applied electronics, computational tools, and interdisciplinary engineering applications.

All potential new courses or awards will be developed in alignment with CSU/UC transfer expectations, industry relevance, and institutional priorities. Emphasis will remain on maintaining rigorous transfer preparation while creating accessible entry points that support student persistence in STEM pathways.

2. Provide your plans to either inactivate or teach each course not taught in the last three years (200 words or less).

Courses not offered in the past three years are currently under review to determine whether they should be reactivated or formally inactivated. Decisions are based on transfer alignment, student demand, staffing capacity, and program priorities.

Where courses remain aligned with transfer pathways or emerging workforce needs, the program intends to reactivate them as instructional resources and enrollment patterns allow. This is particularly relevant for engineering courses that require specialized laboratory equipment or faculty expertise. Laboratory upgrades and staffing adjustments may enable selected courses to return to the schedule in future terms.

Courses that no longer align with current transfer requirements or program direction will be considered for inactivation through the standard curriculum process. The program's priority is to maintain a focused, coherent set of offerings that support timely student progression while using instructional resources efficiently.

3. Consider and analyze your location, time, and delivery method trends. Are classes offered in the appropriate sequence/ available so students can earn their degree or

certificate within two years? Are courses offered face-to-face as well as have distance education offerings? Are they offered on the main campus as well as the off-site areas? Different times of day? (300 words or less).

Course scheduling and delivery methods are designed to support timely student progression and reflect evolving enrollment patterns. Core transfer courses in physics and engineering are offered in sequences that allow students to complete lower-division requirements within two years when prerequisites are met. The expansion of ENGR 10 to fall, spring, and summer terms and the offering of two sections of Physics 4A in the spring improve pathway access and sequencing reliability.

Instructional delivery has shifted toward a balanced mix of face-to-face, hybrid, and limited HyFlex formats. Advanced STEM courses prioritize in-person laboratory components to support hands-on learning and equity in outcomes, while hybrid elements provide scheduling flexibility. Fully online offerings are limited for laboratory-intensive courses to maintain instructional quality.

Most courses are offered on the main campus, where laboratory facilities and equipment are located. The program also supports access in off-site areas through dual-enrollment offerings at local high schools and cross-campus collaboration where feasible. Courses are scheduled at varied times, including daytime and selected evening options, to accommodate working students.

Overall, course sequencing, location, and delivery methods are aligned to support both degree completion within two years and equitable access to rigorous STEM instruction.

IX - PROGRAM AND RESOURCE ANALYSIS

1. Please list the number of Full and Part Time faculty, staff and/ or managers/ administrator positions in this program over the past three years. Focus on your individual program.
   Click Add Item to enter information for each year
   Select Year 1: 2023-2024
   Number of Full Time Faculty: 1
   Number of Part Time Faculty: 6
   Number of Full Time Classified Professional: 0
   Number of Part Time Classified Professional or Student Worker: 0
   Number of Full Time Manager, Confidential or Administrator: 0
   Number of Part Time Manager, Confidential or Administrator: 0
   Select Year 2: 2024-2025
   Number of Full Time Faculty: 1
   Number of Part Time Faculty: 6

Number of Full Time Classified Professional: 0
Number of Part Time Classified Professional or Student Worker: 0
Number of Full Time Manager, Confidential or Administrator: 0
Number of Part Time Manager, Confidential or Administrator: 0
Select Year 3: 2025-2026
Number of Full Time Faculty: 1
Number of Part Time Faculty: 6
Number of Full Time Classified Professional: 0
Number of Part Time Classified Professional or Student Worker: 0
Number of Full Time Manager, Confidential or Administrator: 0
Number of Part Time Manager, Confidential or Administrator: 0

2. How have and will those with reassigned time, grant commitments and activity, projected retirements and sabbaticals affect personnel and load within the past in the next three years? What future impacts do you foresee? (200 words or less)

The Engineering and Physical Sciences program is currently supported by **one full-time faculty member** who carries primary responsibility for engineering and physics instruction, curriculum development, program coordination, and external partnerships. Over the past four years, this faculty member also served as Activity Director for the STEM IV NIH grant, which focused on rebuilding and expanding engineering pathways, undergraduate research, internships, and student support structures. Additional commitments included participation in the NSF Circle of Champions initiative and leadership in the 3+3 Engineering and Computer Science pathway partnership with Hollister High School and CSU Monterey Bay.

These grant-related responsibilities required significant reassigned time and coordination work beyond standard instructional duties. While these efforts resulted in substantial program growth—expanded course offerings, increased enrollment in gateway courses, stronger transfer alignment, and growth in experiential learning—they also concentrated leadership, curriculum oversight, and partnership development within a single individual.

Looking ahead, continued reliance on one full-time faculty member presents risks to instructional continuity, program oversight, and sustainability, particularly if reassigned time decreases or if unforeseen leave occurs. The expansion of engineering tracks, increased demand for Physics 4A, laboratory-intensive instruction, and ongoing partnership coordination will place additional load on existing personnel.

Future impacts may include constraints on course offerings, limited capacity for further curriculum development, and reduced ability to sustain external partnerships and experiential learning initiatives. To maintain program momentum and ensure long-term stability, additional full-time faculty support in engineering/physics would significantly strengthen instructional coverage, program coordination, and institutional resilience.

3. Additional Comments: no comments

X - EVALUATION OF RESOURCE ALLOCATIONS AND PROGRAM EFFICIENCY

1. List the resource allocations from all sources (e.g., annual college budget request appropriations, Guided Pathways funds, grant funds, etc.) received in the last three years.

Over the past three years, the Engineering and Physical Sciences program has received support from a combination of grant funding and institutional resources that have directly contributed to instructional capacity, student success, and program growth.

Title III HSI STEM Grant (Activity Director leadership):
Grant resources supported undergraduate research experiences, paid internships, embedded tutoring, student mentoring, conference participation, laboratory upgrades, and technology lending. Funds enabled expansion of experiential learning opportunities, development of structured STEM pathways, and coordination of partnerships with SJSU, CSUMB, and other institutions.

NSF Circle of Champions Initiative:
Supported mentoring structures and student engagement practices that strengthened sense of belonging and persistence in STEM courses.

K16 Grant - 3+3 Engineering & Computer Science Pathway Partnership (Hollister High School–CSUMB):
Resources supported pathway coordination, dual enrollment expansion, and alignment of engineering curriculum across K–16 institutions.

Institutional Resources (Annual Program Review Allocations):
Institutional support contributed to laboratory equipment purchases, maintenance of instructional technology, and operational needs tied to engineering and physics instruction. Investments supported modernization of labs, including equipment used in engineering and physics laboratory courses, enabling expanded hands-on instruction.

For annual college budget request appropriations, reference your previous three-year plan and annual updates. Do this for the last three years.
Select Year 1: 2023-2024
Number of Students Served. *How many students did your area serve in this year (if you don't have the exact count, please provide an estimate)?*
Headcount = 807

Total Allocation (Irrespective of Funding Source): $191,294.39
Funding Source **(select all that apply)**

- Unrestricted General Fund: ☒
- Grants & Categorical Programs: ☒
- Other Funds: ☐

Total Spent (Irrespective of Funding Source): $444,420.64

Select Year 2: 2024-2025
Number of Students Served. *How many students did your area serve in this year (if you don't have the exact count, please provide an estimate)?*
Headcount = 915

Total Allocation (Irrespective of Funding Source): $169,231.60
Funding Source **(select all that apply)**

Unrestricted General Fund: ☒
Grants & Categorical Programs: ☒
Other Funds: ☐

Total Spent (Irrespective of Funding Source): $500,896.28

Select Year 3: 2025-2026
Number of Students Served. *How many students did your area serve in this year (if you don't have the exact count, please provide an estimate)?*
Headcount = 996

Total Allocation (Irrespective of Funding Source): $353,774.98
Funding Source **(select all that apply)**

Unrestricted General Fund: ☒
Grants & Categorical Programs: ☒
Other Funds: ☐

Total Spent (Irrespective of Funding Source): $226,020.10

2. Please evaluate the effectiveness of the resources utilized for your program. How did these resources help student success and completion? (200 words or less)

Resources allocated to Engineering and Physical Sciences have been highly effective in supporting student success, persistence, and completion. Investments in laboratory equipment and instructional technology strengthened hands-on learning, particularly in calculus-based physics and engineering courses, where laboratory engagement is essential for conceptual understanding. These improvements supported strong course success rates in the physics sequence and helped stabilize outcomes in engineering courses.

The STEM technology lending library reduced barriers related to access to hardware, textbooks, and connectivity. By providing essential academic tools, the program improved participation and continuity for students who might otherwise struggle due to financial constraints.

Personnel resources were equally impactful. Embedded tutors, faculty mentoring, and coordination with counseling and STEM support services provided structured academic and advising support in gateway courses. These services contributed to higher retention and persistence among students in STEM pathways. In addition, funding that supported

undergraduate research, internships, and work-based learning experiences increased student engagement and strengthened transfer readiness.

Collectively, these resources created an ecosystem that combines rigorous instruction, hands-on learning, academic support, and career-connected experiences. This integrated approach has been central to improving student achievement and supporting timely progress toward STEM degrees and transfer goals.

3. Evaluate your program costs. Are your costs in alignment with your budget? If not, what improvements can be made? Please explain any trends in spending, inconsistencies and unexpected results. (200 words or less)

Program costs are generally aligned with available budget resources; however, the Engineering and Physical Sciences program operates with a lean cost structure relative to instructional demands. A significant portion of program activity over the past several years has been supported through grant funding, which has supplemented institutional resources for laboratory upgrades, student support, and experiential learning. As a result, instructional capacity and program growth have exceeded what would typically be possible under the base budget alone.

A key trend is that spending has shifted toward instructional technology, laboratory equipment, and student access supports rather than new permanent staffing. While this has efficiently improved instructional quality and student outcomes, it also highlights a structural imbalance: program growth has not been matched by proportional increases in ongoing personnel funding. This creates reliance on temporary funding sources for coordination and program development work.

Unexpected cost pressures include maintenance and replacement of laboratory equipment and the need to support hybrid instructional models with appr

XI - INTEGRATED PLANNING AND INITIATIVES

1. What other areas is your program partnering with (i.e. guided pathways, grant collaboration, etc.) in new ventures to improve student success at Gavilan College? What is the focus of this collaboration? Helpful question: What are the program and your Integrated Planning/ Guided Pathways partners' plans for the next three years? **(200 words or less)**

The Engineering and Physical Sciences program engages in multiple partnerships designed to improve student success through integrated planning, pathway alignment, and support services. Collaboration with **Guided Pathways** has strengthened STEM mapping and student onboarding, while partnerships with **MESA**, counseling, and tutoring services provide coordinated academic and social support for students navigating rigorous STEM coursework.

Externally, the program participated in multi-institution initiatives aimed at expanding access and strengthening STEM pathways. For several years, the program served as the Activity Director for the **STEM IV NIH grant**, which supported undergraduate research, internships, and mentoring that benefitted engineering and physics students. This project was terminated during the fourth year of the award following federal policy changes affecting diversity, equity, and inclusion-related funding priorities at the NIH, which led to broader termination of grants tied to equity-focused research.

The program also collaborated with the **NSF Circle of Champions** initiative to explore belonging and peer support structures, and participated in a **3+3 Engineering and Computer Science pathway partnership** with Hollister High School and CSU Monterey Bay to align secondary and postsecondary engineering curricula and expand dual-enrollment opportunities.

Over the next three years, these partnerships will focus on sustaining structured STEM pathways, scaling experiential learning opportunities (internships, research), strengthening transfer alignment with four-year institutions, and integrating academic, career, and mentoring supports. Shared planning with Guided Pathways and student support units remains central to ensuring equitable access and improved persistence across gateway STEM courses.

XII - OTHER OPPORTUNITIES AND CHALLENGES

1. Review for opportunities or threats to your program, or an analysis of important subgroups of the college population you serve. Examples may include environmental scans from the Education Plan/Strategic Plan, changes in matriculation or articulation, student population, community and/ or labor market changes, etc. **Helpful Question:** What are the program plans for the next three years? **(200 words or less)**

The Engineering and Physical Sciences program is well positioned for continued growth. Strong outcomes in the calculus-based physics sequence, expanding enrollment in gateway courses such as ENGR 10 and Physics 4A, and increased student interest in applied and career-connected STEM learning create momentum for program development. Partnerships with regional universities, high schools, and industry provide opportunities to strengthen transfer pathways, dual enrollment, and experiential learning. The development of the Computer and Electrical Engineering track aligns with regional workforce needs, particularly in semiconductor-related industries. Additionally, hybrid instructional models and upgraded laboratories support expansion of hands-on STEM instruction while maintaining accessibility. Continued integration of computational tools and applied learning will further strengthen student preparation for transfer and workforce entry

2. What are you discovering about instruction and/or services in a remote

environment that you would want to maintain post-pandemic? **(300 words or less)**

The most significant challenge facing the program is limited full-time faculty capacity. With only one full-time faculty member supporting engineering and physics, instructional coverage, curriculum development, laboratory oversight, and partnership coordination are highly concentrated. This creates vulnerability in scheduling stability and limits the program's ability to expand offerings or respond to growth in demand. Additional challenges include math pipeline enrollment trends, which directly affect progression into physics and engineering sequences, and the need to balance instructional flexibility with maintaining strong equity outcomes in laboratory-based courses. Facility and equipment needs associated with laboratory instruction also require ongoing support to maintain instructional quality.

3. What kinds of issues are exacerbated or emerging that are likely to remain, unless addressed? **(300 words or less)**

Over the next three years, the program will focus on sustaining strong outcomes in calculus-based physics, stabilizing and improving engineering course success, and strengthening structured STEM pathways from entry through transfer. Priorities include expanding hybrid laboratory-based instruction, maintaining clear course sequencing, and scaling experiential learning opportunities such as research and internships. Strengthening partnerships with high schools and four-year institutions will support pathway continuity and transfer readiness. To ensure long-term sustainability, the program will prioritize instructional stability, faculty development, and alignment of curriculum with transfer and workforce expectations. These efforts aim to maintain equitable outcomes while supporting responsible program growth.

XIII - NEW GOALS

The PIPR/RAP committee will rank each goal according to a rubric based on two main criteria: the alignment of the goal with the college's mission statement, strategic plan, and student learning outcomes (SLOs) or service area outcomes (SAOs). If resources are requested, complete the Resource Request section.

Goals are designed to be **Specific, Measurable, Achievable, Relevant, and Time-bound** for each functional area. See example below;

- **Instructional Program Goal:** Reduce the equity gap in successful course completion (grade of 'C' or better) between Historically Underserved Student Subgroups and the overall student population in all required gateway transfer-level Math and English courses by **5 percentage points** compared to the 2024-2025 baseline, by the **end of the Spring 2027 semester.**
- **Student Services Goal:** Increase the percentage of first-time, full-time students who successfully complete both a comprehensive Student Educational Plan (SEP) and a financial aid application (FAFSA or Dream Act) from the current baseline of 68% to **80%**, to be achieved by the **Census Date of the Fall 2026 semester.**
- **Business Services Goal:** Reduce the average processing time for standard purchase requisitions (PRs), from internal department submission to final approval, by 50%—

moving from a baseline average of 14 business days to **7 business days**—by **December 31, 2026**, through the optimization of the electronic workflow system.

Copy and paste to Enter more than one Goal

- **Goal 1 (*One Sentence Limit*)**: Increase overall course success in engineering courses to **80%** while maintaining physics sequence success at **85% or higher**.
- Alignment to Strategic Goal **Goal 1: Student Success, Completion, and Transfer - To provide a structured and supportive pathway for students to successfully complete their academic and career goals.**
- Alignment to SLO or SAO (*Enter Department SLO or SAO that aligns to this goal*): SLO: Students will apply quantitative reasoning and scientific principles to analyze and solve engineering and physics problems.
- Describe the connection of Goal to Mission Statement, Strategic Plan and SLO/SAO Results: This goal supports the college mission of equitable student achievement and transfer preparation. Institutional data show a college success average of 77%, while program data demonstrate strong outcomes in calculus-based physics but more variability in engineering. Improving engineering success aligns with SLO findings related to multi-step problem-solving and strengthens pathway persistence.
- Proposed Activity to Achieve Goal: Expand hybrid laboratory instruction, increase embedded tutoring in gateway engineering courses, and implement structured problem-solving workshops.
- Responsible Party (One Sentence limit): Full-time Engineering/Physics Faculty in collaboration with STEM support staff.
- Timeline to Completion: Semester/Year: Spring 2025 – Spring 2028
- How Will You Evaluate Whether You Achieved Your Goal (Two sentence Limit): Course success rates in engineering courses will be compared annually to baseline data. Achievement of 80% success will indicate goal completion.

- **Goal 2 (*One Sentence Limit*)**: Click or tap here to enter text.
- Increase the number of sections of calculus-based Physics for Scientists and Engineers (PHYS 4A–4C) offered annually, including summer, by at least **10%** over the next academic year.
- Alignment to Strategic Goal **Goal 1: Student Success, Completion, and Transfer - To provide a structured and supportive pathway for students to successfully complete their academic and career goals.**
- Alignment to SLO or SAO (*Enter Department SLO or SAO that aligns to this goal*): Students will apply scientific reasoning, mathematical modeling, and experimental methods to analyze physical systems.
- Describe the connection of Goal to Mission Statement, Strategic Plan and SLO/SAO Results: Expanding access to the calculus-based physics sequence directly supports the college mission of equitable transfer preparation and workforce mobility. Enrollment growth in Physics 4A and strong success rates in the physics sequence demonstrate high student demand and effective learning outcomes. Increasing section availability reduces bottlenecks, supports timely progression through STEM pathways, and improves degree completion within two years.
- Proposed Activity to Achieve Goal: Add additional sections of PHYS 4A–4C during

fall, spring, and summer terms, supported by strategic scheduling, laboratory resource planning, and coordination with counseling for pathway advising.

- Responsible Party (One Sentence limit): Engineering/Physics Faculty in coordination with the Dean and Scheduling Office.
- Timeline to Completion: Semester/Year: Spring 2025 – Spring 2028
- How Will You Evaluate Whether You Achieved Your Goal (Two sentence Limit): Annual section counts for PHYS 4A–4C will be compared to the prior year baseline. A 10% increase in total sections offered, including summer, will indicate goal attainment.

- **Goal 3 (*One Sentence Limit*)**: Increase enrollment in the calculus-based physics and engineering pathway by **15%** over the next three years.
- Alignment to Strategic Goal **Goal 1: Student Success, Completion, and Transfer - To provide a structured and supportive pathway for students to successfully complete their academic and career goals.**
- Alignment to SLO or SAO (*Enter Department SLO or SAO that aligns to this goal*): SLO: Students will apply engineering and scientific knowledge to real-world problems and career pathways.
- Describe the connection of Goal to Mission Statement, Strategic Plan and SLO/SAO Results: Growing enrollment in high-demand STEM pathways supports upward mobility and regional workforce needs. Expansion of ENGR 10, increased Physics 4A sections, and high school partnerships have already shown positive trends that align with student demand and transfer preparation.
- Proposed Activity to Achieve Goal: Expand dual enrollment offerings, strengthen high school outreach, and promote engineering pathways through STEM events and advising.
- Responsible Party (One Sentence limit): Engineering/Physics Faculty in collaboration with Outreach and Counseling.
- Timeline to Completion: Semester/Year: Spring 2025 – Spring 2028
- How Will You Evaluate Whether You Achieved Your Goal (Two sentence Limit): Enrollment data in Physics 4A and ENGR 10 will be compared to baseline counts. A 15% increase will indicate goal attainment.

XIV - RESOURCE REQUESTS

Copy and paste to add more than 1 requests

1. Request Name (short title): Dedicated Laboratory Specialist support for Engineering and Physical Sciences.
2. Request amount: $80,000
3. Type of Request: Personnel
4. Alignment to Goal(s) in section XIII (*enter goal from above)Goal 2 from section XIII.*
5. Is this a one-time or ongoing expense? Ongoing
6. Category of Request

If Personnel is Selected in question 3, select from the following all that applies

- Full-Time Faculty ☐
- Part-Time Faculty☐
- Faculty Special Assignment or Reassigned Time☐
- Full-Time Classified Professional☒
- Part-Time Classified Professional or Student Worker☐
- Full-Time Manager, Supervisor, Confidential☐
- Part-Time Manager, Supervisor, Confidential☐
- Professional Experts☐

If Non-Personnel is Selected in question 3 select from the following all that applies;

- Instructional Equipment ☐
- Instructional Software ☐
- Instructional Supplies, Materials and Textbooks ☐
- Non-Instructional Equipment ☐
- Non-Instructional Software ☐
- Non-Instructional Supplies and Materials ☐
- Professional Development ☐
- Travel and Conference ☐
- Professional or Contracted Services ☐
- Repairs and Maintenance ☐
- Other ☐

7. *The committee will separate goals with resource requests. Requests will be categorized into two groups: those to be ranked and those not ranked. The requests not ranked include Safety, Compliance, Personnel, and Position.*
   Which of the following best describes your requests?
   Personnel and Position: Requests that involve hiring, staffing, or reclassifying full-time or part-time faculty or staff. These requests are reviewed and approved through a separate process by the Faculty Staffing Committee or the Executive and Leadership
8. Provide a complete description, justification, or rationale for the requested amount. Describe how it aligns to the selected goal(s) and your responses to the above questions. (300 words)

Justification:

This request directly supports **Goal 2 in Section XIII**, which aims to increase the number of sections of the calculus-based Physics for Scientists and Engineers sequence (PHYS 4A–4C),

including summer offerings. Expanding section availability increases laboratory demand, preparation time, equipment use, and safety oversight. The program previously benefited from lab specialist support funded through the STEM IV grant; however, that position was reassigned to Biology during a period of critical need. As engineering and physics continue to grow, faculty have assumed responsibility for laboratory setup, maintenance, inventory, and safety compliance in addition to instruction and program coordination.

A dedicated lab specialist would ensure consistent preparation of lab materials, proper maintenance of equipment, inventory management, and adherence to safety standards. This support is essential for sustaining instructional quality as the number of lab-intensive sections increases and for allowing faculty to focus on teaching, curriculum development, and student mentoring.

Impact on Students:
Supports expansion of laboratory-based sections (Goal 2), improves instructional quality and safety, and ensures students receive consistent, hands-on learning experiences aligned with transfer and workforce expectations.

XV - ADDITIONAL QUESTIONS

Please consider providing answers to the following questions. While these are optional, they provide crucial information about your equity efforts, training, classified professional support, and recruitment.

1. Does your division (or program) provide any training/mentoring for faculty and/ or classified professionals regarding professional development? no
2. If there is a need for more faculty and/ or classified professional support in your area, please provide data to justify request. Indicate how it would support the college mission and college goals for success and completion. Please see response to previous section
3. What, if anything, is your program doing to assist the District in attracting and retaining faculty and classified professionals who are sensitive to, and knowledgeable of, the needs of our continually changing constituencies, and reflect the make-up of our student body? We collaborate with MESA. Our faculty works closely in the internships program, which has allowed our faculty to host their own internships.
4. Are there program accomplishments/ milestones that have not been mentioned that you would like to highlight? Additional milestones include the strengthening of intersegmental collaboration through sustained faculty engagement with CSU and university partners, which has improved curricular alignment and advising clarity for transfer-bound engineering students. The program has also expanded dual-enrollment

opportunities at local high schools, increasing early exposure to engineering pathways. Student participation in regional conferences, research symposia, and university visits has grown, reinforcing STEM identity and transfer readiness. These efforts collectively enhance pathway continuity from high school through transfer while supporting equitable access to STEM education.

5. Please share any recommendations for improvements in the Program Integrated Plan and Review process, analysis, and questions. Your comments will be helpful to the PIPR Committee and will become part of the permanent review record. The Program Integrated Plan and Review process would benefit from clearer integration of institutional data dashboards directly within the template, allowing programs to reference consistent metrics without separate data extraction. Providing examples of completed sections or model responses would also help ensure consistent interpretation of prompts across programs. Finally, streamlining overlapping questions related to equity, outcomes, and resource needs could reduce redundancy and allow programs to focus more deeply on strategic analysis rather than repetition.

XVI - EXECUTIVE SUMMARY

Please provide a brief executive summary regarding program trends and highlights that surfaced in the writing of this report. Summarize, using narrative, your program goals for your next three years. Your audience will be your Peer Review Team, the program review Committee, President's Cabinet, Dean's Council, ASGC, Academic Senate, Budget Committee and Board of Trustees (300 words or less).

The Engineering and Physical Sciences program plays a central role in preparing students for transfer, STEM careers, and regional workforce opportunities. The program provides lower-division, transfer-aligned coursework in engineering and calculus-based physics, supported by laboratory instruction, structured pathways, and integrated academic support. Enrollment growth in gateway courses such as Introduction to Engineering (ENGR 10) and Physics 4A, along with the expansion of Physics 4A to multiple sections, reflects strong student demand and improved pathway access.

Student outcomes demonstrate the program's effectiveness. The calculus-based physics sequence maintains high success rates (approximately 83–90%), exceeding the institutional average of 77%, with small or negligible equity gaps among major student populations. These results indicate that structured sequencing, hands-on laboratory engagement, and integrated academic supports contribute to equitable student achievement. Engineering course success remains more variable but is improving through curriculum refinement, hybrid instruction, and expanded tutoring and mentoring.

Over the past several years, the program has expanded beyond traditional coursework to include undergraduate research, internships, and career-connected learning, strengthening transfer readiness and student engagement. Development of a Computer and Electrical Engineering track aligns the curriculum with high-demand workforce sectors while maintaining transfer rigor.

Key priorities for the next three years include improving engineering course success, expanding section availability in the calculus-based physics sequence (including summer), and sustaining equitable outcomes. To support this growth, the program requests dedicated laboratory specialist support to maintain instructional quality and safety as laboratory-intensive offerings increase.

Overall, the program demonstrates strong performance, clear student demand, and strategic alignment with institutional goals while requiring targeted support to ensure long-term sustainability.

XVII - ATTACH FILES

Optional: If there is any additional information regarding your program that you would like to have uploaded, please attach it here.