



C U Y A M A C A
• C O L L E G E •

Annual Update Report

Academic - Physics (PHYC) - (MS&E)

Make high quality content available in multiple formats (online both -- synchronous and asynchronous, in-person, HyFlex) (Goal 2)

Program Goal: Make high quality content available in multiple formats (online both -- synchronous and asynchronous, in-person, HyFlex)

Goal Status: Active

Mapping

2022 - 2028 Strategic Plan: (X)

- **Eliminate Equity Gaps in Course Success:** Make high quality content available in multiple formats (online both -- synchronous and asynchronous, in-person, HyFlex) (X)
- **Increase Completion and Eliminate Equity Gaps:** Make high quality content available in multiple formats (online both -- synchronous and asynchronous, in-person, HyFlex) (X)
- **Increase Persistence and Eliminate Equity Gaps:** Make high quality content available in multiple formats (online both -- synchronous and asynchronous, in-person, HyFlex) (X)

Summary of Progress or Results

Summary Date: 09/23/2024

Summary of Progress or Results: Our efforts to make high-quality content available in multiple formats have advanced significantly.

We have continued to enroll faculty in SEED, EMTLI, and external programs to ensure comprehensive professional development for teaching in all modalities. To enhance support for HyFlex courses, we have added more teaching assistants (TAs), which has improved the learning experience for students by providing additional assistance and engagement opportunities.

We have also made significant strides in equitable teaching practices by supporting flexible grading, deadlines, projects, and inquiry-based learning approaches, all reinforced through ongoing PD. Coordination among instructors has improved, fostering consistency and shared strategies for delivering content across different course formats.

Our content library has expanded with more recorded lecture materials being stored and distributed through Canvas and YouTube. This year, we have focused on restructuring many of our courses to adopt a flipped classroom model, allowing students to engage with lecture content beforehand and use class time for active learning and problem-solving.

Additionally, we are actively working on the physics Zero Textbook Cost (ZTC) grant and now have two fully ZTC courses available. This initiative underscores our commitment to reducing student expenses and ensuring equitable access to high-quality educational resources.

Reporting Period: 2024 - 2025

Status: In Progress - will carry forward into next year

Action steps for this academic year.:

- Professional Development – Continue to enroll faculty in SEED, EMTLI, humanizing STEM

Summary of Progress or Results

- Content Library - storage and distribution to students and faculty, finish lecture recordings for all courses, put in Canvas Commons
- Need: FT Faculty, additional Lab Tech, Money for CoP, PD support

Rewrite and organize online labs and match them with the in person labs (Goal 3)

Program Goal: Rewrite and organize online labs and match them with the in person labs

Goal Status: Active

Mapping

2022 - 2028 Strategic Plan: (X)

- **Eliminate Equity Gaps in Course Success:** Rewrite and organize online labs and match them with the in person labs (X)
- **Increase Completion and Eliminate Equity Gaps:** Rewrite and organize online labs and match them with the in person labs (X)
- **Increase Equitable Access:** Rewrite and organize online labs and match them with the in person labs (X)
- **Increase Persistence and Eliminate Equity Gaps:** Rewrite and organize online labs and match them with the in person labs (X)

Summary of Progress or Results

Summary Date: 09/23/2024

Summary of Progress or Results: Compiled a database of all new labs including in person and online. Started redeveloping all physics 201, 202, 203 labs using existing equipment. We have about half the 203 labs done, and less than 25% of the 201 and 202 labs.

Reporting Period: 2024 - 2025

Status: In Progress - will carry forward into next year

Action steps for this academic year.:

- We will develop new Physics 201, 202, and 203 labs to meet UCSD's articulation requests. We will replace 25-50% of our current single-week cookbook labs with inquiry-based labs that take multiple weeks and are heavy on data analysis. This will require:
 1. significant staff contribution and coordination
 2. lab tech support,
 3. new equipment.
- We hope to bring more astronomy labs back to in-person (because duh, stars are cool) This will require:
 1. New FT faculty

Summary of Progress or Results

2. more lab tech support,
3. new equipment.

Need: FT Faculty, Lab Tech, CoP money, Lab kits, Astronomy maintenance and upgrades

New Goal 1: STEM 101 (Goal 4)

Program Goal: New Goal 1: STEM 101

Goal Status: Active

Mapping

2022 - 2028 Strategic Plan: (X)

- **Eliminate Equity Gaps in Course Success:** New Goal 1: STEM 101 (X)
- **Increase Equitable Access:** New Goal 1: STEM 101 (X)

Summary of Progress or Results

Summary Date: 09/23/2024

Summary of Progress or Results: Attempted to run some of these as short term classes but we are struggling with enrollment.

Reporting Period: 2024 - 2025

Status: Not Started

Action steps for this academic year.:

Trying a summer model.

Need more marketing, some resources like money for food, supplies, TAs.

Physics ZTC

Program Goal: Develop zero cost textbook strategies for PHYC 110, 201, 202, 203

Goal Status: Active

Mapping

2022 - 2028 Strategic Plan: (X)

- **Eliminate Equity Gaps in Course Success:** Develop zero cost textbook strategies for PHYC 110, 201, 202, 203 (X)
- **Increase Equitable Access:** Develop zero cost textbook strategies for PHYC 110, 201, 202, 203 (X)

Summary of Progress or Results

Summary Date: 11/06/2024

Summary of Progress or Results: We have Physics 110 and 201 done

Reporting Period: 2024 - 2025

Status: In Progress - will carry forward into next year

Action steps for this academic year.:

Still working on Physics 202, 203.

Need faculty funding, resources provided by ZTC grant.

Program Overview and Update

Lead Author

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Collaborator(s)

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Dean/Manager(s)

Tammi Marshall

Initial Collaboration Date with Dean

11/06/2024

Please summarize the changes, additions, and achievements that have occurred in your program since the last program review.

This year, the Physics and Astronomy department has continued to uphold its student-centered philosophy. Our professional development (PD) efforts remain a priority, with significant participation in the Equity-Minded Teaching and Learning Institute (EMTLI) and our community of practice (SEED), which have consistently nurtured faculty creativity, adaptability, and student engagement. We have also maintained our commitment to offering courses in multiple modalities, ensuring that students have flexible and accessible learning opportunities tailored to their needs.

Growth and Student Access

The department is still experiencing sustained growth in enrollment, reflecting the increasing demand and relevance of our programs. We are proud to report that equitable access for students remains strong in both race and gender, supported by our diverse course formats, including hybrid, HyFlex, synchronous, and asynchronous options. We have leaned most heavily into the hyflex as student demand for in person and the growing problems with AI have shifted our offerings away from fully online, but we continue to work to provide high quality flexibility for students.

New Developments - More in-person labs, better personnel, ZTC, and a new course

- A significant positive change this year has been the success of our lab technician, whose coordination skills, support, and dedication have greatly contributed to the smooth functioning of our department. In addition, we have been able to employ work-study students to assist with the extensive backlog of lab equipment inventory—a challenge we faced due to poor record-keeping in previous years. This added support has been essential for maintaining an organized and efficient laboratory environment.
- We are currently working on the Physics OER project and have 2 fully ZTC courses now.
- We have also expanded our course offerings to include Physics 110, both in-person and online. These new classes have been well-received, with high enrollment and positive feedback from students seeking more foundational physics education. Although these classes have negatively impacted our equity gaps in success (we have larger issues with non-majors than majors but are working on this), they have contributed to our enrollment and access growth.
- We are also shifting more of our courses back to in person. In Physics we have now surpassed our pre-pandemic in person offerings while still providing a few fully online sections. In astronomy we are returning more slowly due to demand and inadequate lab support/equipment.

Ongoing Challenges - Workload and Labs

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Despite these advancements, certain challenges persist. The workload for the department chair remains disproportionately high and does not reflect the department growth, as the demands of curriculum oversight, program management, and faculty support have grown with our enrollment.

Lab issues:

- Budget - Our lab budget has not kept pace with the increased enrollment and the shift to bringing more courses back to in-person formats. This budgetary shortfall strains our ability to provide quality education and maintain lab resources effectively, and severely impacts our mission of providing quality, student-driven, project-based learning to students.
- Astronomy - We also have significant challenges running in person astronomy labs as we need a lab technician some days spanning 12-14 hours and we only have one person. Additionally the storage, setup, and maintenance of the telescopes is really not great.
- Understaffing - A continued concern is the reliance on our sole lab technician. While their performance has been exceptional, the department is vulnerable if this individual were to leave. The institutional knowledge they possess is invaluable, and without additional support or succession planning, the department risks significant operational setbacks.

In summary, while we celebrate ongoing growth, strong student access, and new program successes, we remain mindful of the resource and workload challenges that require attention to sustain our trajectory of excellence.

Assessment and Student Achievement

After looking at the SLO information for the past year in Nuventive Improve, are you are on track for the 4-year assessment cycle?

Yes

Which courses have not been assessed in the last 4 years?

Only the courses we have discontinued.

Please share any outcomes assessment projects your program has worked on in the last year, including SLOs on Canvas, PLOs by ACP, Equitable Assessment Strategies (innovative collective/common assessments, project-based, work-based learning, student-centered, etc.), or other.

We are using SLOs on Canvas which is nicer but still a pain to enter into the spreadsheet.

Student Achievement

Please discuss any equity gaps in access or success.

As of the current academic year, the Physics and Astronomy program at Cuyamaca College continues to prioritize equity and student success. Here's an updated overview:

Physics Department:

Key Insights on Access

- The Physics program is becoming more ethnically diverse, particularly with the increase in MENA and Asian students. The gender gap remains, with male students consistently making up the majority.
- The introduction of general education students has diversified the program, impacting educational goals and enrollment patterns.
- Post-pandemic shifts have influenced part-time versus full-time status, reflecting broader trends in student preferences for flexibility and varied learning modalities.

Gender Imbalance

- **Consistent Male Majority:** The PHYC program has maintained a predominantly male student body, even though female representation saw growth at certain points (e.g., 50% in Fall 2021). The proportion of female

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students has settled at around 40-42% by Fall 2023 and Spring 2024, still below the college-wide average of 54-55%. This is still an improvement over the previous decade in which female students were generally represented between 30-40%.

Impact of General Education Student Inclusion

- Starting in Fall 2023, the inclusion of more general education students via Physics 110 brought diverse backgrounds, goals, and interests different from those of students focusing on a science or engineering major. This change likely contributed to shifts in educational goals, including an increase in students with "Other" goals and fluctuations in part-time versus full-time enrollment.

Age Distribution

- **Dominance of Younger Age Groups:** The PHYC program continues to attract primarily younger students, especially those aged 20-24. This age group consistently makes up around 54-65% of the enrollment, which is higher than the college-wide average of 29-31%. The under-20 age group has also seen growth but remains below the college-wide proportion.
- **Limited Growth in Older Students:** Students aged 25 and older remain a smaller part of the PHYC population, despite making up a more significant portion of the college-wide demographic.

Educational Goals and Shifts

- **Strong Transfer Focus:** "Transfer with Degree" is the most common educational goal, though it has shown a slight decrease over time from 63-68% in early years to 60% by Fall 2023 and Spring 2024. This percentage is still higher than the college-wide 51%.
- **Increase in 'Other' Goals:** The proportion of students with "Other" educational goals has grown, indicating a diversification of academic pursuits, likely influenced by the increase in general education students joining the program.

Part-Time vs. Full-Time Enrollment

- **Shift Toward Part-Time Enrollment:** The number of part-time students (<12 units) in the PHYC program increased significantly, from around 25-29% in early years to 38-39% by 2023-2024. This shift mirrors the post-pandemic trend of students seeking more flexible learning options and aligns with the inclusion of general education students.
- **Full-Time Enrollment Decline:** Although full-time enrollment remains higher in the PHYC program compared to the college-wide average, it has decreased from 71-75% to 61-62% by 2023-2024.

Pandemic Impact and Transition Back to In-Person Learning

- **Online Transition in Spring 2020:** The sudden shift to online learning in Spring 2020 disrupted normal enrollment and participation patterns, potentially influencing student retention and demographics.
- **Return to In-Person Learning:** The gradual transition back to in-person classes starting in Spring 2021 may have contributed to the changes in part-time versus full-time enrollment, as students adapted to new learning environments and schedules.

Key Insights on Success

Our intro courses still have equity gaps although they have reduced over time. The largest and most consistent gaps are with **Hispanic/Latino students** which seem to have grown as we have added new faculty.

- **Physics 110 - Hispanic/Latino students** had success rates averaging **74.5%**, below the White Non-Hispanic average success rate of **82.5%**. This class is new and the gaps are lower for in person modalities.

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- **Physics 130 - Hispanic/Latino students** showed significant gaps, with an average success rate of **54%**, compared to White Non-Hispanic success rates averaging **72%**.
- **Physics 201**
 - **Hispanic/Latino students** had an average success rate of **57.5%**, while White Non-Hispanic students averaged **74%**.
 - **Asian students** in Spring 2024 had a **73%** success rate, below the White Non-Hispanic **84%**.

Astronomy Department:

- **Gender Access:** The department maintains a female student access rate of 54%, aligning closely with the college's demographic profile. There are no noted success gaps between genders.
- **Hispanic Students:** While access and success have generally improved, equity gaps appear inconsistently from semester to semester. The department is exploring targeted interventions to provide more consistent support and close these gaps.
- **African American and Pacific Islander Students:** The Astronomy department has not reported significant issues with access or success gaps for these groups.

What action will the department or discipline take to address these equity gaps?

To address these equity gaps and maintain progress, the program focuses on the following initiatives:

1. **Dedicated Counseling and Support:** Collaborate with STEM counseling and Puente and Emoja services to provide tailored support and resources for students from underrepresented backgrounds. This ensures that students receive individualized guidance and are aware of academic and personal resources available to them.
2. **Professional Development and Faculty Training:** Engage faculty in ongoing professional development programs such as the Equity-Minded Teaching and Learning Institute (EMTLI) and SEED. These programs equip faculty with strategies to promote equity and inclusive teaching practices, enhancing their ability to support diverse learners effectively.
3. **Embedded Support Systems:** Implement learning assistants and embedded tutoring in introductory courses to offer real-time academic support. This model provides students with additional instructional resources during critical learning periods, helping bridge knowledge gaps and improving academic outcomes.
4. **Flexible and Inclusive Course Design:** Maintain flexible grading policies, incorporate inquiry-based projects, and adopt a high-touch approach to student engagement. These strategies cater to diverse learning needs and foster a more inclusive classroom environment.
5. **Community and Resource Integration:** Connect students to support resources such as Cuyamaca Cares for basic needs assistance, embedding these resources into course structures. By integrating community resources, students can focus on their academic performance without being hindered by external challenges.

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Please describe any enrollment changes (increases/decreases) over the past year and the context for these changes.

- **PHYC-201 and PHYC-202:** Strong growth, with PHYC-201 increasing from 68 in Spring 2022 to 143 in Spring 2024, and PHYC-202 rising from 30 to 109 in the same period.
- **PHYC-203:** Limited and stable, with only 12 enrollments in Spring 2023. We now have a course rotation with Grossmont. The drop in enrollment here reflects changes in local transfer requirements as more students have shifted toward computer engineering rather than mechanical.
- **PHYC-110:** We began offering this course again after over 10 years. It has grown from 37 online students in Fall 2022 to 54 online and in-person students in Spring 2024.
- **PHYC-130 and 131:** Large post pandemic growth (2020-2022) followed by more modest growth over the last two years. We are gradually moving this class back to in-person without major enrollment losses.

What has this data revealed about the progress of the program review goals you set?

We are stretched pretty thin on chair time for planning, full-time faculty for curriculum, teaching, and serving the college, and seasoned part-time faculty. We need to focus on supporting and training faculty, especially our new faculty, and spending time and resources with the students we have, particularly now that we have improved access. Since we do not have a problem with enrollment, we have scaled back on recruiting and outreach to focus on supporting the students we have.

Distance Education Course Success (If Applicable)

If your department offers distance education classes, how do you ensure Regular and Substantive Interaction (RSI) is being implemented?

To ensure Regular and Substantive Interaction (RSI) is consistently implemented in Canvas, the Physics and Astronomy program employs the following evaluation strategies:

Evaluation Based

The primary strategies we use when evaluating faculty formally or informally (always consensual).

- **Canvas Analytics and Reports:** Regular monitoring of Canvas analytics allows instructors and department leadership to track student engagement, participation in discussions, and interaction with course materials. This data helps identify patterns that indicate whether RSI is being maintained.
- **Peer Reviews and Observations:** Faculty members participate in peer reviews and observations of each other's online courses. This process ensures adherence to RSI practices by evaluating the frequency and quality of interactions, feedback provided, and engagement prompts in the course content.

Recommended Best Practices for Faculty

We encourage these through department meetings and SEED (our CoP), but they are only really checked through evaluation.

- **Active Discussion Boards:** Instructors facilitate and participate in discussion forums to encourage peer-to-peer and student-instructor interactions. These discussions include prompts related to course material, inquiry-based questions, and opportunities for students to engage with real-world applications of physics and astronomy. These are usually on Canvas but some instructors use Discord.
- **Live Sessions and Office Hours:** Synchronous components such as live lectures, Q&A sessions, and office hours via video conferencing tools (Canvas, Zoom, or Discord) are scheduled regularly. This allows students to interact with instructors directly, ask questions, and gain immediate feedback.

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- **Interactive Assignments and Feedback:** Assignments are designed to be interactive, including problem-solving activities and inquiry-based projects. Faculty provide detailed feedback on submissions, highlighting strengths and areas for improvement to guide learning.
- **Embedded Support and Learning Assistants:** Courses often include embedded support, such as teaching assistants and learning assistants, who help facilitate discussions and provide additional interaction points for students.

Program Goals

Program Goals Status

Updated progress on my previous goals & added new.

Program Goals Mapping

Mapping for all active Program Goals complete.

Submission

Program Review response is complete and ready for review.

Yes - Response complete and ready for review