2025 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2025 **PROGRAM(S): ASTRONOMY AND PHYSICS**
CLUSTER: 1 - STEM **AREA OF STUDY: STEM**
LAST YEAR CPPR COMPLETED: 2024 NEXT SCHEDULED CPPR: 2029 CURRENT DATE: 2/5/2025

The Annual Program Planning Worksheet (APPW) is the process for:

- reviewing, analyzing and assessing programs on an annual basis
- documenting relevant program changes, trends, and plans for the upcoming year
- identifying program needs, if any, that will become part of the program's **Resource Plan**, which can be downloaded from the **IPPR Program Review Documents Folder**. Please review the **Resource Allocation Rubric** when preparing the resource plan.
- highlighting specific program accomplishments and updates since last year's APPW
- tracking progress on a Program Sustainability Plan if established previously

Note: Degrees and/or certificates for the ***same*** program ***may be consolidated*** into one APPW.

This APPW encompasses the following programs of study (degrees and/or certificates):

Physics, AS; Physics AS-T

GENERAL PROGRAM UPDATE

Describe changes and improvements to the program, such as changes to the mission, purpose, or direction. In particular, indicate any changes that have been made to address equity gaps.

The largest change to the calculus-based physics sequence has been a retooling of the labs. During the COVID-19 pandemic, all labs were moved to fully online. Moving out of the pandemic, we are working to find the right balance of simulated labs and wet labs so that student success is maximized. We also are working to ensure that the lab experience is the same from instructor-to-instructor and section-to-section by creating pre-lab videos and lab instructions that can be accessed by all instructors.

We have increased access and our capacity to increase access through the hiring of an additional full-time, tenure-track faculty member who will be adding Cuesta-led High School Dual Enrollment (CLDE) sections at local high schools. In 2025-26, we anticipate adding two new sections at a new site (San Luis Obispo High School) and adding another class section at an existing site (Arroyo Grande High School).

A new course modality under active trial testing are asynchronous distance education trigonometry-based physics courses during the Summer semester. Summer physics classes provide an option for students needing this course as a prerequisite to enable them to take certain Fall classes or as a requirement to apply to some professional programs. The intense

Summer schedule limits the number of students able to utilize this option in face-to-face modality. Offering an asynchronous online option can increase access to this important course for many students. Current trials have included the use of zero-cost textbooks (ZTC) and OEI alignment through the CVC exchange to increase equity and access. Further refinements are necessary before determining the efficacy of this modality as a permanent offering.

PROGRAM SUSTAINABILITY PLAN UPDATE

Was a Program Sustainability Plan established in your program's most recent Comprehensive Program Plan and Review?

Yes ☐ If yes, please complete the Program Sustainability Plan Progress Report below.
No ☒ If no, you do not need to complete a Progress Report.

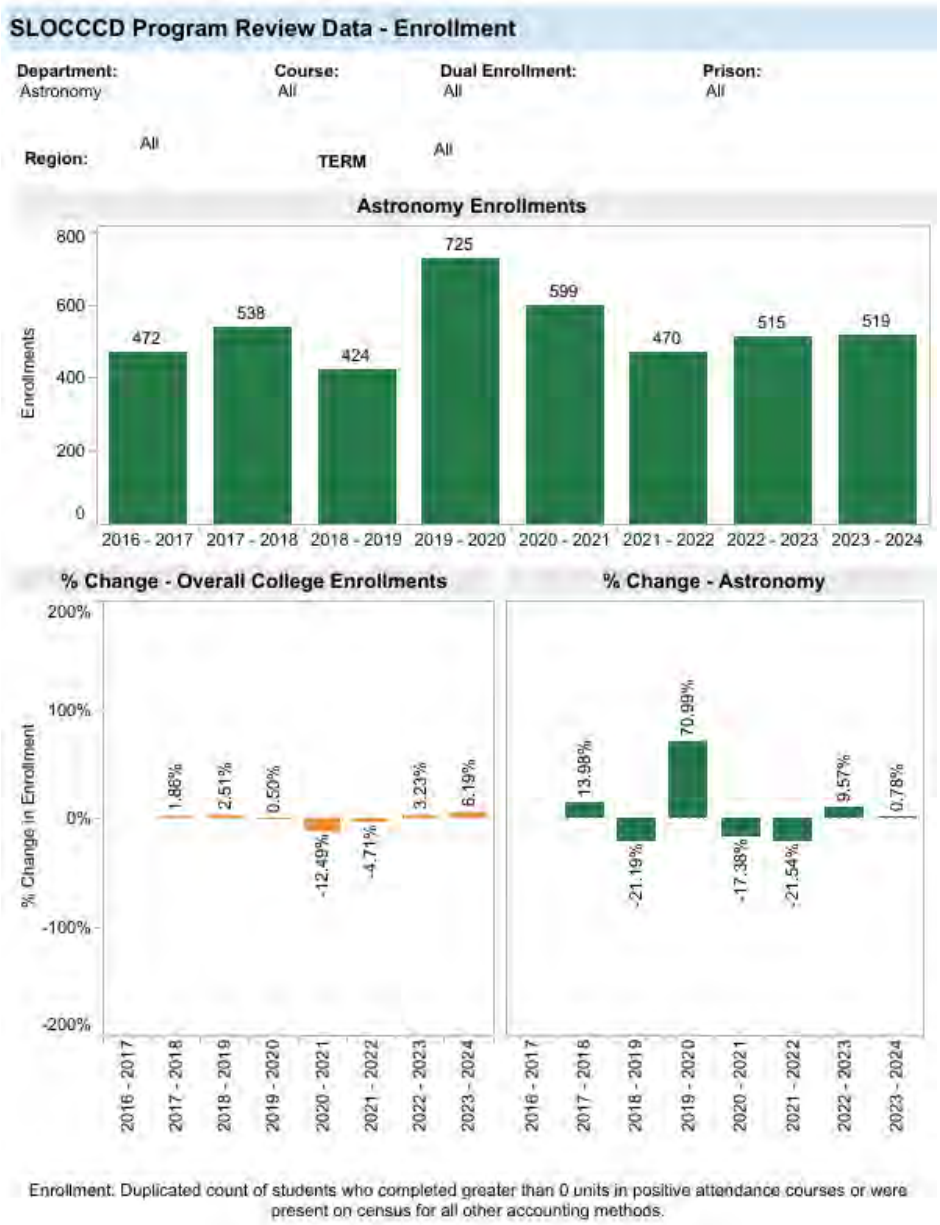
If you selected yes, please complete the Program Sustainability Plan Progress Report below after you complete the Data Analysis section. That data collection and analysis will help you to update, if necessary, your Program Sustainability Plan.

DATA ANALYSIS AND PROGRAM-SPECIFIC MEASUREMENTS

Your responses to the prompts for the data elements below should be for the entire program. If this APPW is for multiple degrees and/or certificates, then you MAY want to comment on each degree and/or certificate or discuss them holistically for the entire program being sure to highlight relevant trends for particular degrees and/or certificates if necessary. Responses in this document need only reference the most recent year's available data.

A. **General Enrollment (Insert Aggregated Data Chart)**

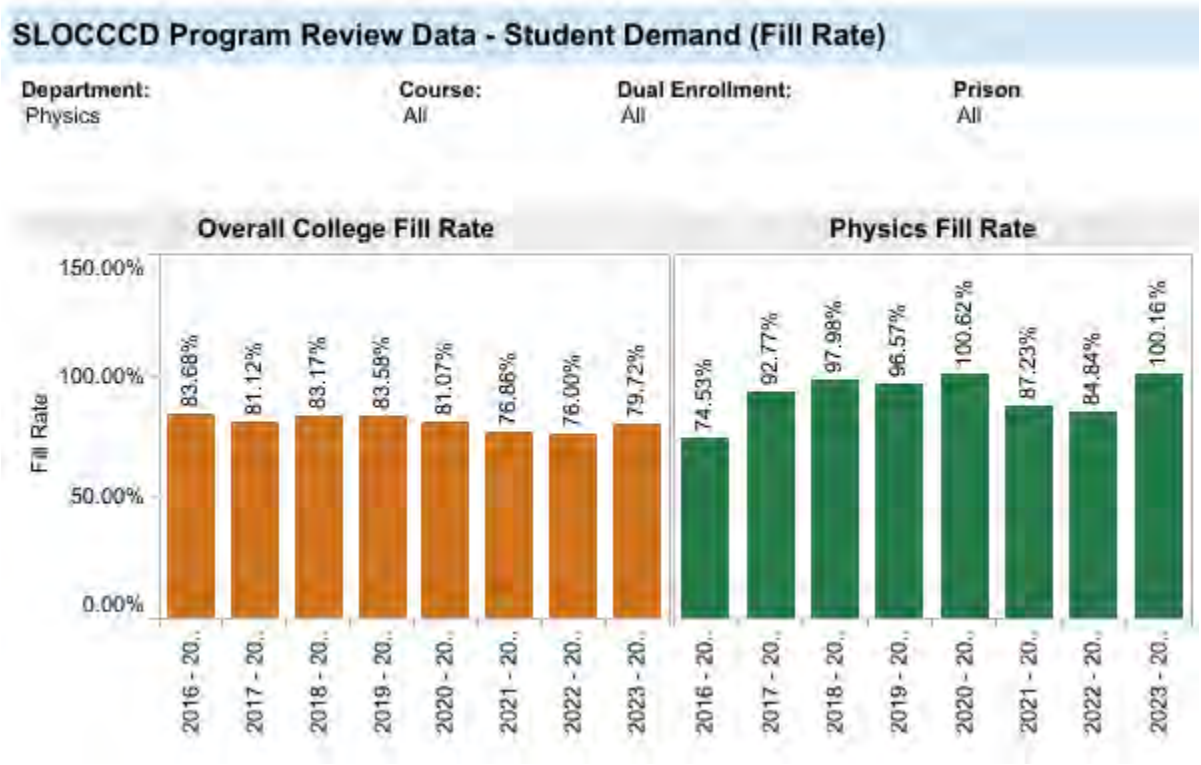
This past year, the overall PHYS enrollments increased to 610. This is the largest number shown in the past eight years (with the exception of the lockdown year). This is largely due to the increase in PHYS 208B and dual enrollment headcount which accounted for 38 and 34 additional students respectively, year-over-year.



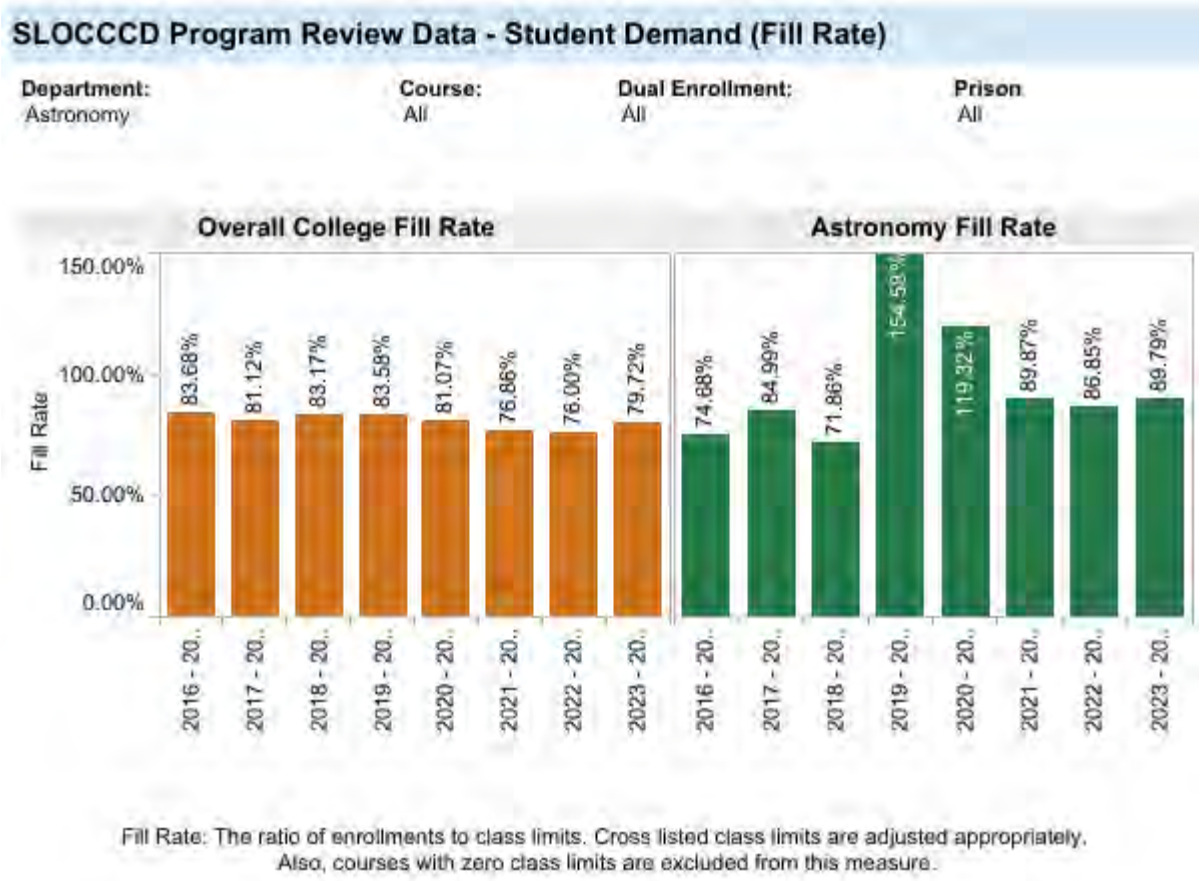
Enrollment. Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

Compared to this past year, the overall ASTR enrollments this year held steady (515 to 519). There was a large decrease in ASTR enrollment which occurred during the pandemic, which is consistent with decreases witnessed college wide during that time. Enrollments began to rebound during the 2022-23 academic year, and with the most current fill rate trends and sections offered, ASTR enrollments appear to have stabilized.

B. **General Student Demand (Fill Rate) (Insert Aggregated Data Chart)**



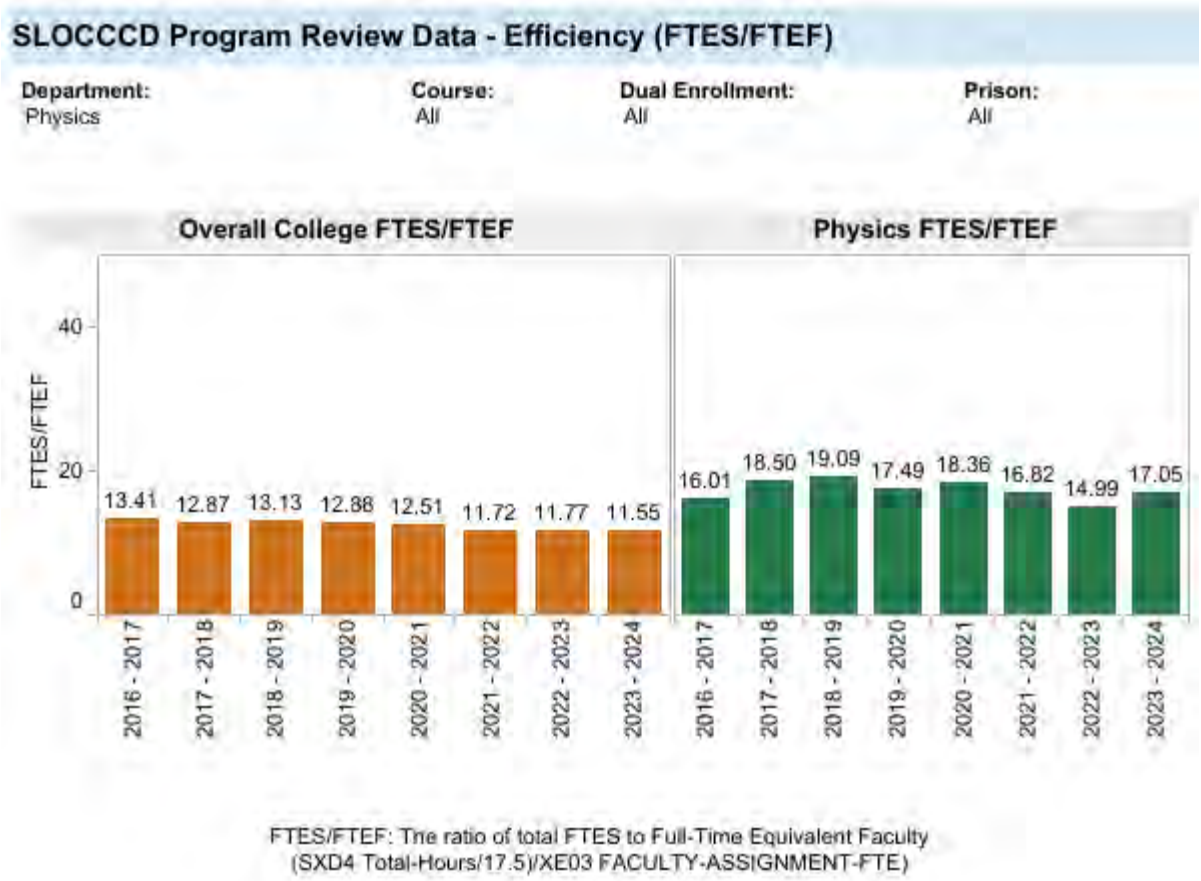
Demand for PHYS courses has remained very high. The average fill rate for PHYS courses in the most recent reporting period is over 100%.



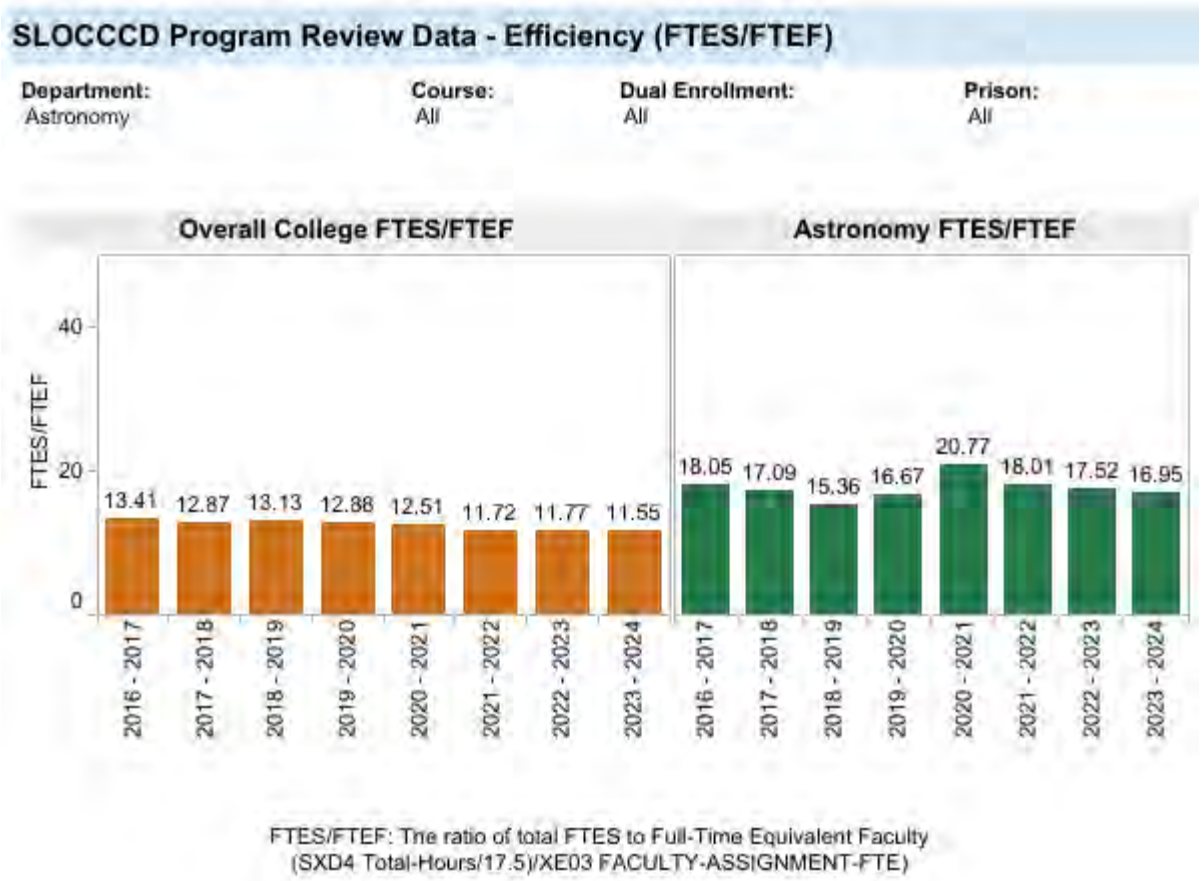
ASTR fill rates, post-pandemic, are above any of the five-year overall college fill rates. Nearly all sections have been full or overenrolled, historically there has been an ASTR 210 lecture section offered in a large lecture hall with a maximum enrollment capacity (96) twice as large as other lecture sections (50), but holding with the same number of actual enrolled students. The fill rate is expected to slightly increase even with the same number of students and course offerings as that one large lecture hall section has been moved to a smaller classroom with a commensurate decrease in maximum enrollment capacity.

C. **General Efficiency (FTES/FTEF) (Insert Aggregated Data Chart)**

Insert the data chart and explain observed differences between the program and the college.



Efficiency in PHYS courses remains well above the college average. This is largely due to the fact that lab sections are combined into single lecture sections. PHYS faculty also have combined lecture sections for Cuesta-led Dual Enrollment courses when it makes pedagogical sense. This contributes to the high efficiency that we see for the PHYS department.



Efficiency in ASTR courses is consistently 5% higher than the college ranging from a five-year low of 15.36 FETS/FTEF in 2018-19 to 20.77 in 2020-21, and recently (2021 onwards) has been on a very slight downward trend that matches a similar trend in the college-wide efficiency rate.

D. **Student Success—Course Completion by Modality (Insert Data Chart)**

Insert the data chart and explain observed differences between the program and the college.

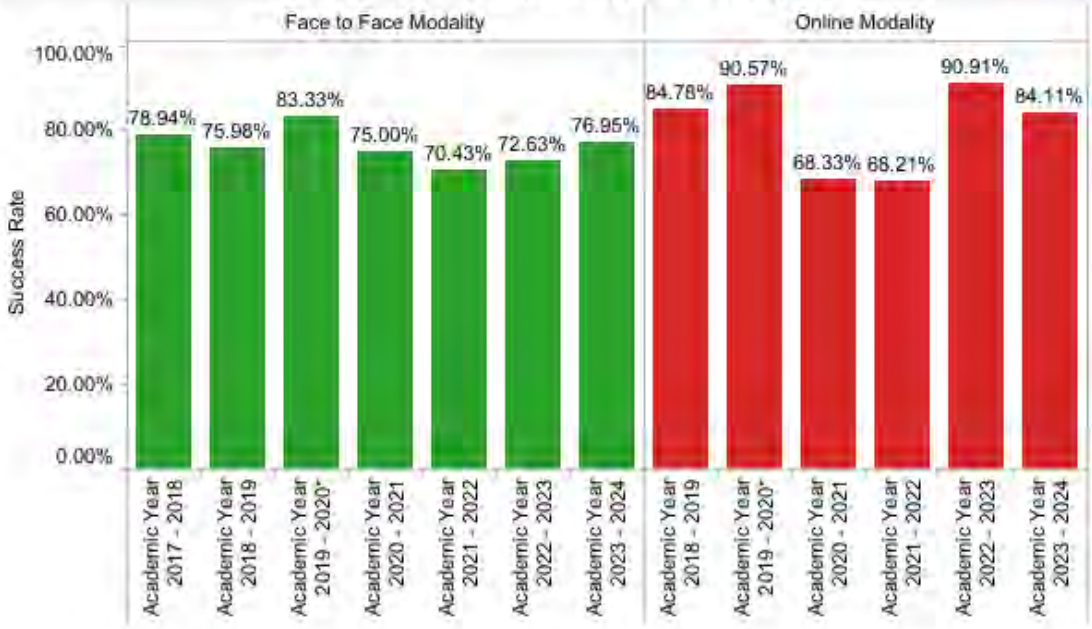
SLOCCCD Program Review Data: Successful Course Completion

Select Department: Physics

Course: All

Legend: Face to Face Modality, Online Modality

Successful Course Competion by Modality -Physics



Successful Course Competion by Modality Table - Physics

		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022	Academic Year 2022 - 2023	Academic Year 2023 - 2024
Face to Face Modality	Department S..	78.94%	75.98%	83.33%	75.00%	70.43%	72.63%	76.95%
	Total Depart..	603.0	535.0	539.0	36.0	188.0	466.0	504.0
Online Modality	Department S..		84.78%	90.57%	68.33%	68.21%	90.91%	84.11%
	Total Depart..		46.0	53.0	610.0	372.0	77.0	108.0

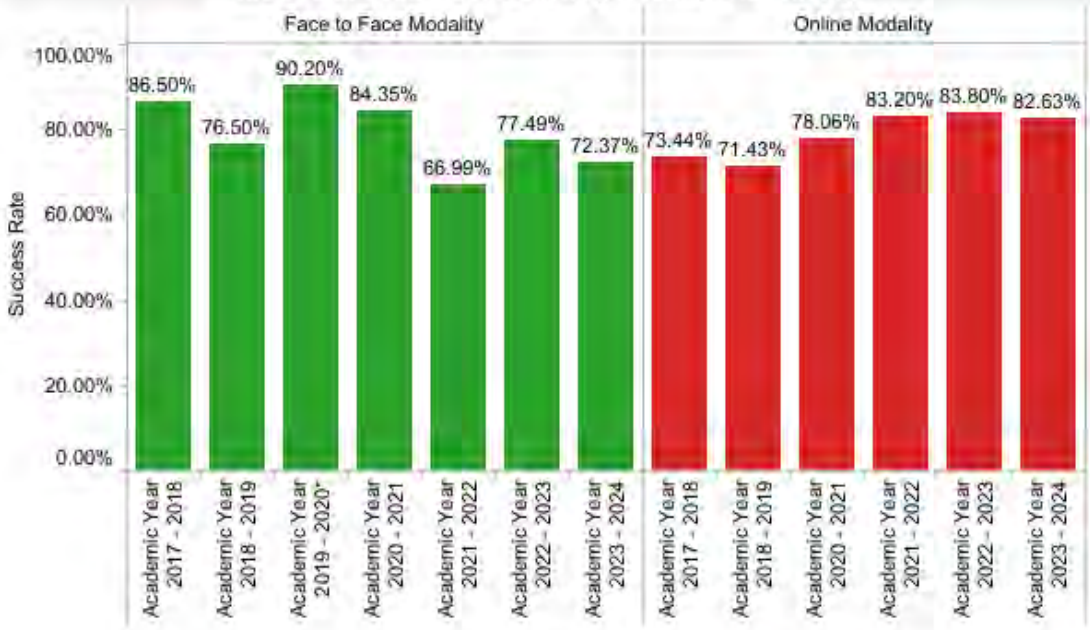
For PHYS classes, recent online course completion rates have returned to pre-pandemic levels. This is not surprising since the majority of the online courses are Cuesta-led dual enrollment courses. Students in these high school courses were disproportionately affected by the pandemic. Pre- and post-pandemic online completion rates far exceeded the overall college completion rates. This is largely due to the success of the Cuesta-led dual enrollment model.

SLOCCCD Program Review Data: Successful Course Completion

Select Department: Astronomy

Course: All

Legend: Face to Face Modality, Online Modality



Successful Course Competion by Modality Table - Astronomy

		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022	Academic Year 2022 - 2023	Academic Year 2023 - 2024
Face to Face Modality	Department S..	86.50%	76.50%	90.20%	84.35%	66.99%	77.49%	72.37%
	Total Depart..	474.0	418.0	725.0	121.0	105.0	231.0	259.0
Online Modality	Department S..	73.44%	71.43%		78.06%	83.20%	83.80%	82.63%
	Total Depart..	64.0	7.0		479.0	365.0	284.0	260.0

Pre-pandemic, only ASTR 299 was offered online, so online-modality completion rates for that course only would be reflected in the 2017-2018 and 2018-2019 statistics. ASTR 210 and ASTR 210L were then still only offered face to face.

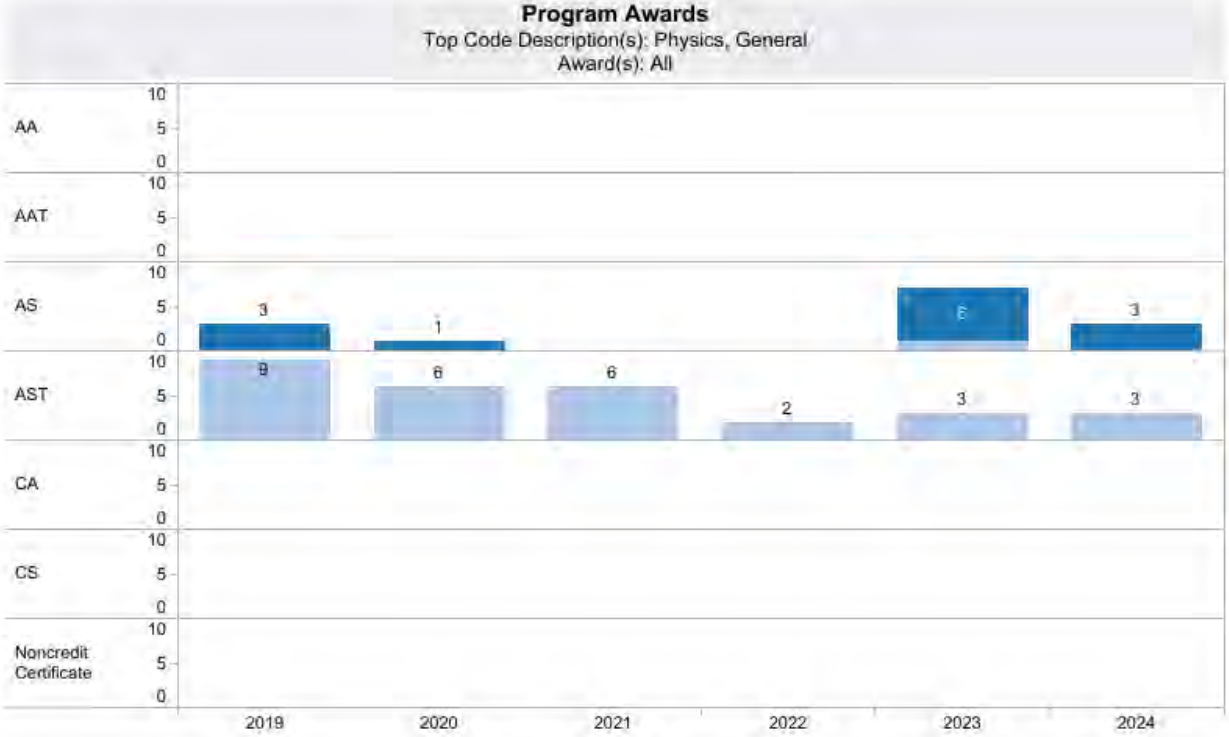
Post-pandemic, ASTR 210 and ASTR 210L are now taught online in addition to ASTR 299, so online-modality completion rates reflect all these courses, while there remain two face-to-face modality ASTR 210 sections. Overall, course completion rates for the online modality are greater than the face-to-face modality.

E. **Degrees and Certificates Awarded (Insert Data Chart)**

Insert the data chart and explain observed differences between the program and the college.

SLOCCCD Program Review Data: Degrees and Certificates Awarded

Program: Physics, General
Award Type: All
Area of Study All



Program Awards Table

Award Type	Award	2019	2020	2021	2022	2023	2024
AS	Physics (AS)	3	1			6	3
	Physics (AST)					1	
	Total	3	1			7	3
AST	Physics (AST)	9	6	6	2	3	3
	Total	9	6	6	2	3	3

Program Awards: The number of degress and certificates awarded by program type

Very few PHYS degrees are awarded each year although a high number of students complete the PHYS 208A, B, C sequence. It is hoped that programmatic changes will result in a larger number of degrees being awarded through auto-awarding of degrees.

Students with plans to ultimately seek medical degrees may be unaware that physics majors historically have achieved some of the highest MCAT test scores. Greater efforts to share this detail might increase interest in the physics program among students who would not previously have considered pursuing a physics degree.

F. **General Student Success – Course Completion (Insert Aggregated Data Chart)**

Insert the data chart and explain observed differences between the program and the college.

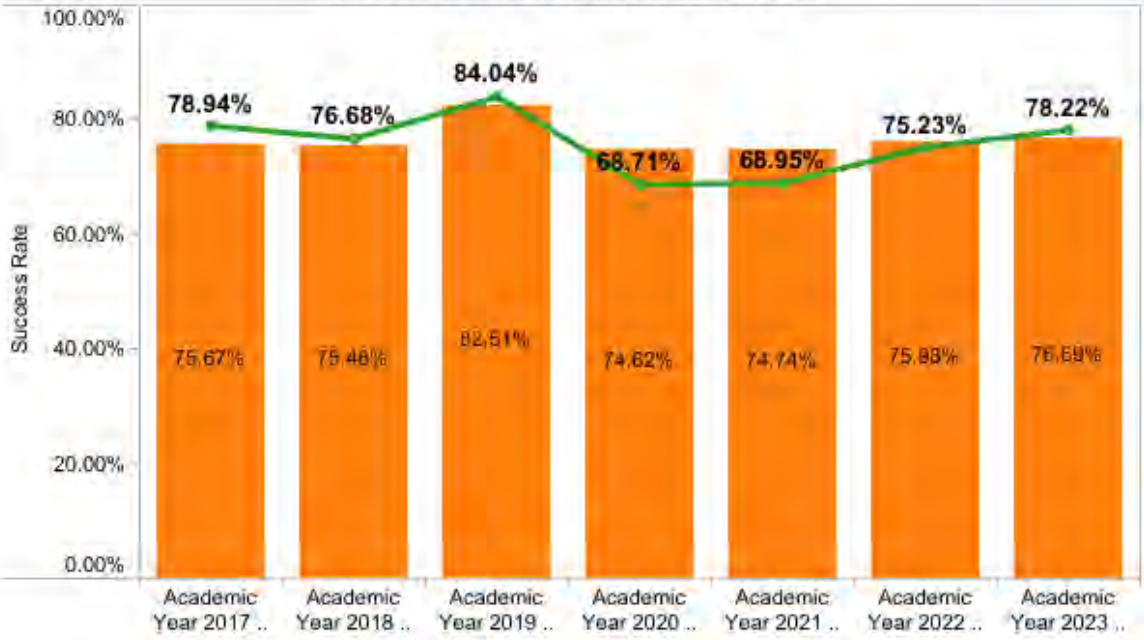
SLOCCCD Program Review Data: Successful Course Completion

Select Department: Physics

TERM All

COURSE All

Measure Names
- Department Success Rate
- Overall College Success Rate



Physics Success Rate Table

	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022	Academic Year 2022 - 2023	Academic Year 2023 - 2024
Department Success..	78.94%	76.68%	84.04%	68.71%	68.95%	75.23%	78.22%
Total Enrollments	603	581	592	646	560	543	612

Success: The Percentage of student enrollments resulting in a final grade of "C" or better

The success rate for PHYS courses was negatively impacted by the COVID-19 pandemic and the requisite change from face-to-face offerings to online. The success rate is increasing as we move farther away from the pandemic years.

SLOCCCD Program Review Data: Successful Course Completion

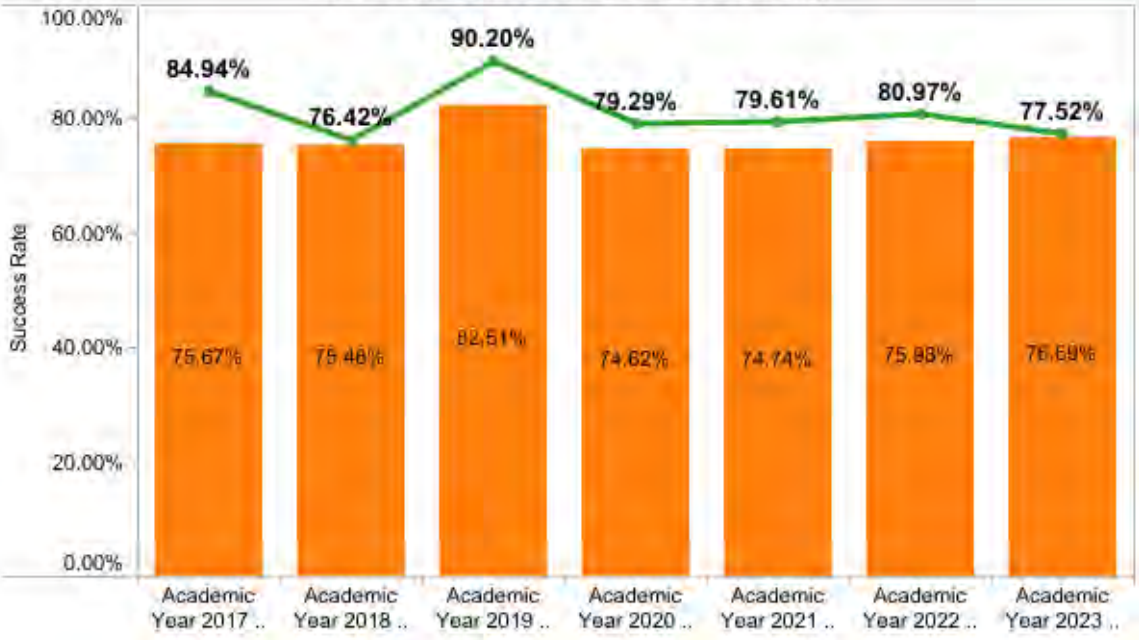
Select Department:
Astronomy

TERM
All

COURSE
All

Measure Names
Department Success Rate
Overall College Success Rate

Successful Course Completion - Astronomy



Astronomy Success Rate Table

	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022	Academic Year 2022 - 2023	Academic Year 2023 - 2024
Department Success..	84.94%	76.42%	90.20%	79.29%	79.61%	80.97%	77.52%
Total Enrollments	538	425	725	600	470	515	519

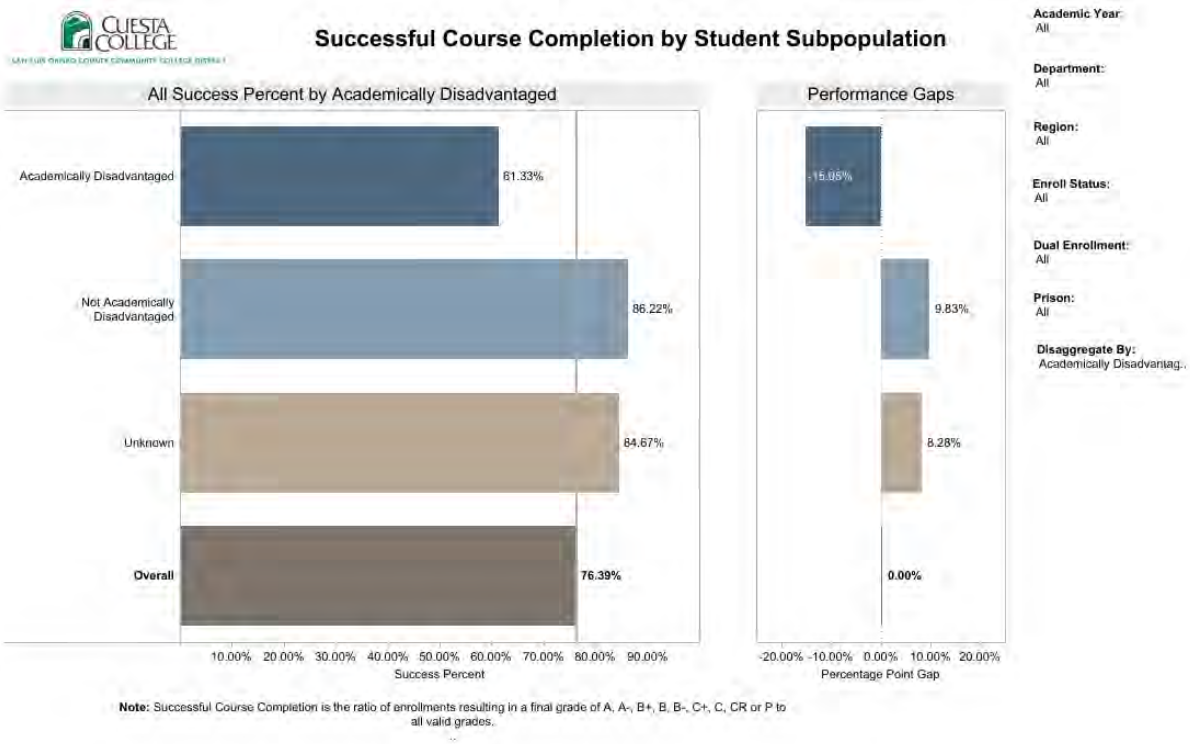
Success: The Percentage of student enrollments resulting in a final grade of "C" or better

Overall for all modalities, ASTR courses have maintained completion rates matching or higher than college-wide completion rates.

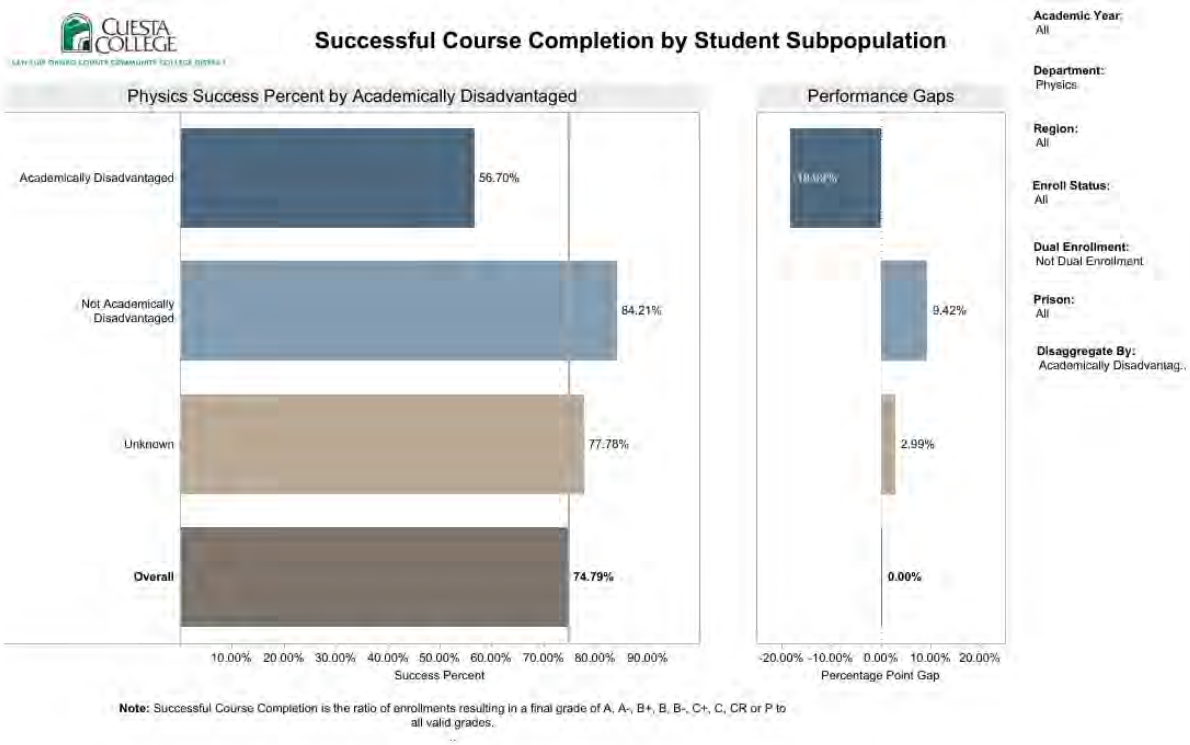
G. Review the **Disaggregated Student Success** charts; include any charts that you will reference. Describe any departmental or pedagogical outcomes that have occurred as a result of programmatic discussion regarding the data presented.

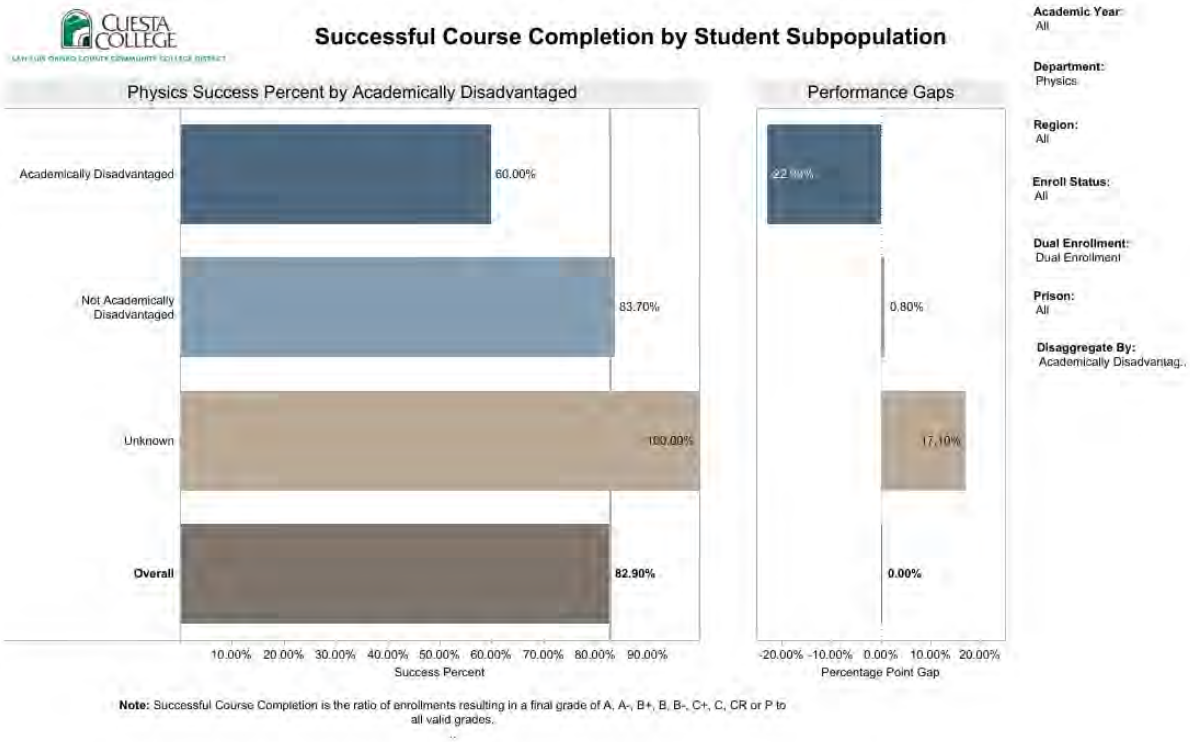
The following are some questions you might want to consider:

- What specific groups are experiencing inequities? What patterns do you notice in the data? How have the equity gaps changed since the previous academic year?
- What professional opportunities are your program faculty participating in to address closing equity gaps?
- What strategies, policies and/or practices in your program have you implemented or what could be improved to better support students who experience equity gaps?



College-wide there is a performance gap between the success rate for academically disadvantaged students (61.33%) and those who are not (86.22%).


CUESTA COLLEGE
Successful Course Completion by Student Subpopulation
Physics Success Percent by Academically Disadvantaged
Academically Disadvantaged
56.70%
Not Academically Disadvantaged
84.21%
Unknown
77.78%
Overall
74.79%
10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%
Success Percent
Performance Gaps
-18.49%
9.42%
2.99%
0.00%
-20.00% -10.00% 0.00% 10.00% 20.00%
Percentage Point Gap
Academic Year:
All
Department:
Physics
Region:
All
Enroll Status:
All
Dual Enrollment:
Not Dual Enrollment
Prison:
All
Disaggregate By:
Academically Disadvantag..
Note: Successful Course Completion is the ratio of enrollments resulting in a final grade of A, A-, B+, B, B-, C+, C, CR or P to all valid grades.

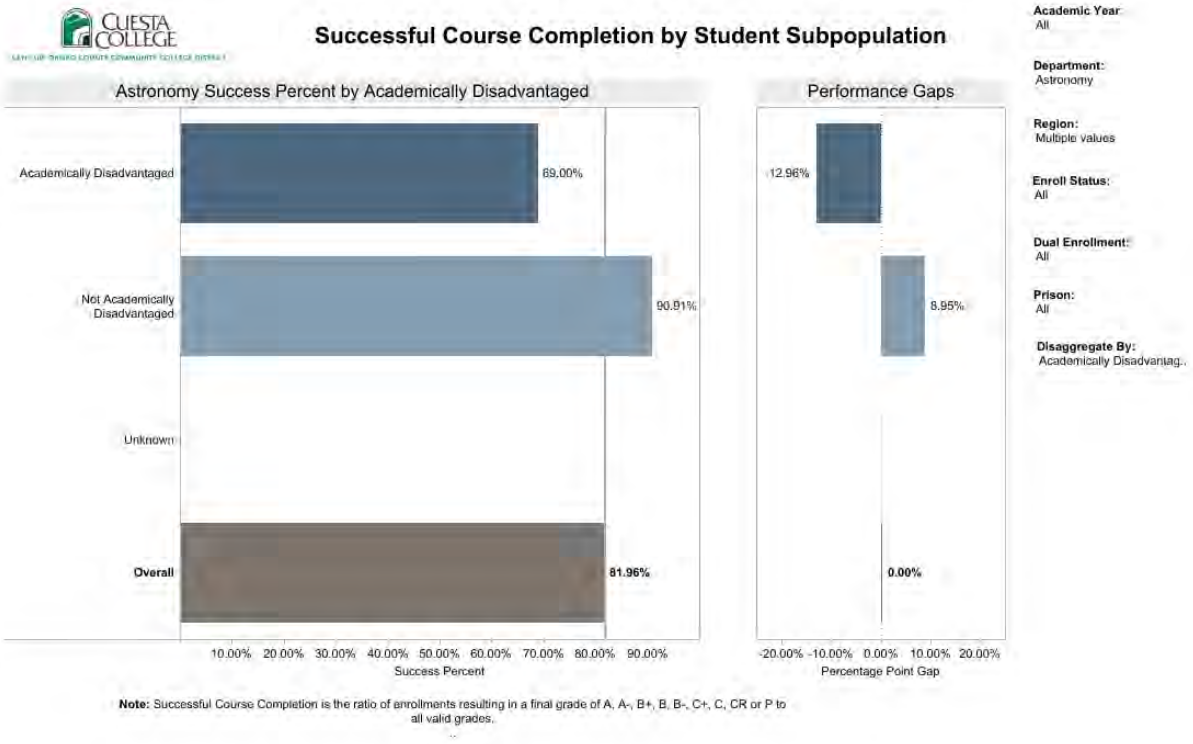

CUESTA COLLEGE
Successful Course Completion by Student Subpopulation
Physics Success Percent by Academically Disadvantaged
Academically Disadvantaged
60.00%
Not Academically Disadvantaged
83.70%
Unknown
100.00%
Overall
82.90%
10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%
Success Percent
Performance Gaps
-22.90%
0.80%
17.10%
0.00%
-20.00% -10.00% 0.00% 10.00% 20.00%
Percentage Point Gap
Academic Year:
All
Department:
Physics
Region:
All
Enroll Status:
All
Dual Enrollment:
Dual Enrollment
Prison:
All
Disaggregate By:
Academically Disadvantag..
Note: Successful Course Completion is the ratio of enrollments resulting in a final grade of A, A-, B+, B, B-, C+, C, CR or P to all valid grades.

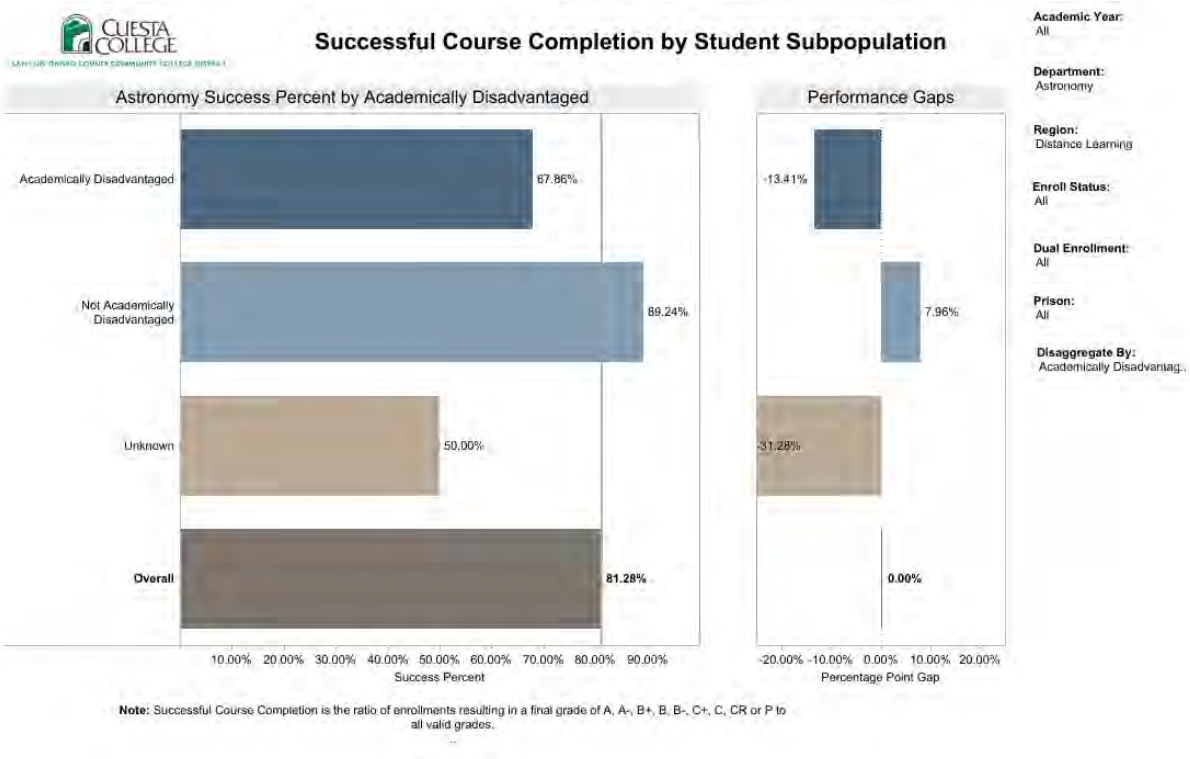
For non-dual enrollment PHYS courses, there is a performance gap between the success rate for academically disadvantaged students (56.70%) and those who are not (84.21%). For non-dual enrollment PHYS courses the success rate for academically disadvantaged students (56.70%) is lower than the college-wide success rate for academically disadvantaged students (61.33%).

For dual enrollment PHYS courses, there is a similar performance gap between the success rate for academically disadvantaged students (60.00%) and those who are not (83.70%). For dual enrollment PHYS courses the success rate for academically disadvantaged students (60.00%) is lower than the college-wide success rate for academically disadvantaged students (61.33%).

For dual enrollment PHYS courses the overall success rate (82.90%) is higher than the overall success rate for non-dual enrollment PHYS courses (74.79%). These results should be considered carefully, as dual enrollment classes are comprised of high school students at their respective high schools taking the PHYS 205A/B sequence over two years instead of two semesters.

The higher success rate expected for dual enrollment students provides rationale that additional efforts should be made to encourage high school counselors, teachers, and administrators to assist more academically disadvantaged students to enroll in these classes at their institutions as a way to further close equity gaps in physics courses.





For in-person modality ASTR courses, there is a performance gap between the success rate for academically disadvantaged students (69.00%) and those who are not (90.91%). For in-person modality, the ASTR success rate for academically disadvantaged students (69.00%) is lower than the college-wide success rate for academically disadvantaged students (61.33%).

For online modality ASTR courses, there are higher success rates for both academically disadvantaged students (67.86%) and those who are not (89.24%) compared to in-person modality students, and the disparity between academically disadvantaged students and those who are not is smaller for online astronomy courses compared to in-person courses. For online modality, the ASTR success rate for academically disadvantaged students (67.86%) is higher than the college-wide success rate for academically disadvantaged students (61.33%).

PROGRAMS AND CURRICULUM REVIEW PROGRESS

Section 1: Progress Check on Scheduled Curriculum Updates from CPPR

Directions:

For the following questions, please refer to #3 in Section 1 of the Programs and Curriculum Review Progress portion of last year's APPW.

1. List those programs of study (degrees and/or certificates) and courses that were scheduled for major or minor modification during the 2024 academic year in the 5-year calendar of the Curriculum Review Worksheet.

   NONE.

2. From the list generated in #1, identify those programs of study and courses that underwent the scheduled modifications during the 2024 academic year. Complete the table below for those items only.

Program of Study OR Prefix and Course #	**Major/Minor Modification (select one)**	**Date completed (semester and year)**
N/A		

3. From the list generated in #1, identify those programs of study and courses that did **not** undergo the modifications for which they were scheduled during the 2024 academic year. Complete the table below for those items only.

Program of Study OR Prefix and Course #	Past Due Date for Modification	Briefly state why modification was not completed on schedule	Re-scheduled date for modification (must be within 1 year)
N/A			

Section 2: Progress Check on Previously Out-of-Date Curriculum Updates from CPPR

Directions: For the following questions, please refer to #3 in Section 1 of the Programs

and Curriculum Review Progress portion of APPW from years before the previous academic year where incomplete curriculum updates were re-scheduled to be addressed in 2024.

1. List those programs of study and courses that are listed in the older APPW that were listed in #3. Complete the table below for those items only. If there were no courses included under #3 of previous APPW, please type "N/A" in the first box of the first row of the table.

Program of Study OR Prefix and Course #	Past Due Date for Modification	Re-scheduled date for modification	Completed (yes or no)
N/A			

2. From the list generated in #1, identify those programs of study and courses that did **not** undergo the modifications for which they were re-scheduled to during the 2024 academic year. Complete the table below for those items only. You may leave this table blank if you wrote "N/A" for the previous table.

Program of Study OR Prefix and Course #	Past Re-scheduled Due Date for Modification	Briefly state why modification was not completed as rescheduled	Second re-scheduled date for modification (must be within 6 months)
N/A			

OTHER RELEVANT PROGRAM DATA (OPTIONAL)

Provide and comment on any other data that is relevant to your program such as state or national certification/licensure exam results, employment data, etc. If necessary, describe origin and/or data collection methods used.

PROGRAM OUTCOMES ASSESSMENT CHECKLIST AND NARRATIVE

Checklist

☒ SLO assessment cycle calendar is up to date.

☒ All courses scheduled for assessment have been assessed in eLumen.

☒ Program Sustainability Plan progress report completed (if applicable).

NARRATIVE

Briefly describe program changes, if any, which have been implemented in the previous year as a direct result of the Program or Student Services Learning Outcomes Assessment. *If no program changes have been made as results of Program or Student Services Learning Outcomes Assessment, indicate: NONE.*

None.

PROGRAM PLANNING / FORECASTING FOR THE NEXT ACADEMIC YEAR

Briefly describe any program plans for the upcoming academic year. These may include but are not limited to the following: *(Note: you do not need to respond to each of the items below)*. *If there are no forecasted plans for the program, for the upcoming year, indicate: NONE.*

A. New or modified plans for achieving program-learning outcomes and addressing equity gaps
   Program faculty will continue to participate in STEM outreach events, hold office hours in the Student Success Center, and brainstorm to address equity gaps.
B. Anticipated changes in curriculum, scheduling or delivery modality
   None.
C. Levels, delivery or types of services
   None.
D. Facilities changes
   None.
E. Staffing projections
   Additional staff are required to meet current requests for Cuesta-led Dual Enrollment courses at local high schools
F. Other

PHYS 205A/B lab restructuring (piloted on SLO campus spring 2022)

This introductory physics lab (SLO campus in-person) has been restructured to incorporate new or extended components:

1. *Individual accountability (new)*
   Students must perform every and all individual tasks from equipment set-up, data collection, data analysis and graphing, and writing lab reports within 1.5 instructional hours. The intent is to enforce individual accountability and responsibility for performing all tasks to demonstrate competency. (This is in contrast to the previous structure where a comparable amount of equipment/data-taking tasks were shared among 2-4 students within 3.0 instructional hours.)

   (History: pre-pandemic labs had students working with partners or in groups of 3-4 on shared equipment, performing shared tasks designed to be completed within 3.0 instructional hours. During the pandemic there were only virtual labs to be completed individually. Post-pandemic labs returned to in-person learning in spring 2022, and required students to practice social distancing by working individually with separate equipment not in groups or with partners, and to perform a comparable amount but comprehensive set of individual tasks designed to be completed within 1.5 instruction hours.)
2. *Guided virtual and hands-on experiment sequences (new)*
   Students are assigned a sequence where a virtual lab is done with an online simulation, followed by one or several hands-on experiments. This can either occur in the same week (virtual followed immediately by hands-on), or over two-three weeks (virtual, then hands-on the following weeks). The intent is for students to see what quality data is expected to look like, and to explore changing parameters that would not be practical or possible with actual lab equipment. Then students are prepared to take data with actual lab equipment, experience the phenomenon in a concrete manner, and to connect this data with the data from the virtual lab.
3. *Specific guidance on "how-to" skills and expectations (extended)*
   Three labs are designed for students to fully learn and master each of these "how-to" skills: writing a claims-evidence-reasoning conclusion, writing an informal abstract, using a spreadsheet for calculations and graphing. This is intended to "level up" all students in these skills, and to make clear expectations of lab report standards. Students are given real-world examples of these conclusions and abstracts from actual physics education articles to analyze and emulate. Students are also guided through making a spreadsheet and graph on Google Sheets to ensure device cross-compatibility and ease of sharing.

PHYS 205A/B dual enrollment course refinement

Dual Enrollment physics courses in Cuesta's education district are offered primarily in the Cuesta-Led model where a Cuesta instructor's course material is delivered in an instructional partnership with a high school teacher. While the courses are nominally offered as Distance Education, in practice these dual enrollment physics courses have been seen higher success rates than other distance education courses in part because they are supported by daily instruction of a high school teacher, with hands-on lab experiments brought to the classrooms by the Cuesta instructor, and occasional guest lectures by the Cuesta instructor.

As the dual enrollment program continues to grow throughout the district, and new sites and high school teachers continue to be involved, it will be important to refine this instructional partnership. Some plans for the 2025-26 academic year include:

- Shifting to a Canvas-based quiz system for faster results, thus helping the high school teacher quickly identify students needing greater assistance and subject matter that may require additional supporting instruction
- Further refining the balance between lab experiments run at the school sites by the Cuesta instructor, those run by the high school teacher using equipment provided by Cuesta college, and the use of online lab experiment simulations to meet the lab component requirements of the course.
- Collaborating with the high school teachers to adapt Learning Assignment worksheets to match their individual teaching styles and classroom needs.

Experience has shown a large disparity in the range of classroom equipment, technology, and teaching aids available at different school sites. To provide an equitable experience for all students, it may be necessary for Cuesta to consider funding, in part or in entirety, some supportive teaching aids, such as white boards, video displays, overhead projectors, and other equipment and technology for certain high school sites.

PHYS 205A lab restructuring based on the dual-enrollment model (Piloted at Cuesta North County Campus in Fall 2024 and SLO Campus in Spring 2025)

An additional lab restructuring option has been tested with PHYS 205A at Cuesta's campuses this year, utilizing a face-to-face lecture plus a hybrid lab, modeled after the dual enrollment version of this course.

In the dual enrollment version of the course, as the students have a specific limited amount of classroom time available to them, it is not practical to expect 3 hours of lab work to be done entirely in person in the class. Instead, a set of hands-on experiments have been selected for each lab that can be done within a single classroom period by students working in groups of 2-3. This is then augmented by additional online experiments the students do individually as homework outside of the classroom.

A version of this lab delivery method is being tested on campus, where students work in pairs during a scheduled lab class time for half of their required lab work, and complete additional online lab experiments individually outside of the scheduled lab class time. As the high school dual enrollment version of this type of lab delivery has had several years of development and appears to have high success rates, it is anticipated it will be similarly successful when applied to Cuesta campus versions of the course, and early tests appear to confirm this.

As with the Individual Accountability restructured lab version of this course, reducing the number of hours the students must be present in the lab classroom to 1.5 likely allows for greater flexibility in student schedules. This may help overcome some time limitations certain students have in their days, such as those who work more hours at a job or who are parents or have other life responsibilities, and thus improve access to this course to a larger group of potential students.

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ASTR 210 restructuring (piloted spring 2025)

This introductory astronomy lecture has been restructured to incorporate new components:

1. *Self-paced learning (new)*
   Weekly modules are now self-paced with suggested due dates. Students are informed that the due dates are flexible, and should keep up with watching presentation videos, doing practice problems (with answers) that are checked-off on their Canvas to-do lists. Short formative quizzes can be retaken as many times to improve their grade (question banks are quite large, ranging from as few as 16 versions to 256 versions). Modules are set upon completion to unlock subsequent modules, so while due dates are flexible, assignments cannot be completed out of order.

2. *Evidence-based projects (new)*
   The majority (55%) of the course grade is assessed by completing evidence-based projects instead of exams. Students look up positions of the stars, moon, planets in the sky on their birthday, such that they have a set of data specific to them to analyze. Students are provided tools (starwheels, moon phase diagrams, solar system maps, lookup tables, nomograms) to analyze their data, and all evidence (birthday, sky position screenshots, diagram screenshots) must be provided for grading (40% of a project grade is providing the raw evidence, 60% is analyzing evidence; no analysis grade is given if the evidence is missing or appears to be a duplication of another student's work).

   This shift in assessment from exams to individual projects is intended to alleviate student anxiety over set exam dates, and to increase the security of assessment.

   (History: Through fall 2023-fall 2024 there has been a steady increase in student

cheating on the online exams (inappropriate student-student collaboration, use of artificial intelligence chatbots) that necessitated referrals to Student Services, and reprimands and penalties. Students also expressed anxiety over not being able to take the online exam at the appointed time and needed to be scheduled to take it at a later date, or excused.)

3. *Individualized algorithm-generated data for analysis (new)*
   Students are informed about inappropriate and appropriate use of artificial intelligence chatbots such as ChatGPT. AI-generated content must be specifically required by the assignment to generate planetary system data star properties for further analysis. This AI-generated content must be documented and verifiable by including sharing links to all prompts and replies, viewable by the instructor. The AI prompts generate "plausible" data (25% of this content is possibly hallucinated), and students analyze this data for self-consistency and validity for their evidence-based projects. Students must upload completed diagrams and lookup tables that currently (spring 2025) are beyond the capability of AI to analyze and generate answers.

   Submissions are checked and flagged for inappropriate use of AI-generated content (and/or plagiarism) for further review using the Canvas-embedded version of Turnitin.

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ASTR 210L restructuring (piloted fall 2024)

This introductory astronomy lab has been restructured to incorporate new or extended components:

1. *Self-paced learning (new)*
   Weekly modules are now self-paced with suggested due dates. Students are informed that the due dates are flexible, and should keep up with watching presentation videos, and completing assignments with an online planetarium (Stellarium, free), and with online robotic telescopes (Slooh.com, $25-$35/year account). Modules are set upon completion to unlock subsequent modules, so while due dates are flexible, assignments cannot be completed out of order.
2. *Evidence-based projects (new)*
   Students are required to provide evidence of looking up and tracking positions of the stars, moon, planets in the sky on their "birthday this year," such that they should all have different sets of data to analyze, and this prohibits recycling work from the previous year. This is done by uploading screenshots from the online planetarium software. Also student completion of observations and analysis using robotic telescopes is validated on Slooh.com by use of their teacher management system which tracks student progress and task completion.
3. *Hands-on projects (extended)*
   Students are required to purchase or borrow a binoculars (notably the Paso Robles Public Library has two-week loans on "hiking kits" that include a backpack, nature guides, and a binoculars). Suggested purchase is a 10 x 50 Harbor Freight binoculars

($20 on sale, regularly $30). Substitution for spotting scopes and telescopes is allowed. Students are guided through adjusting and using their binoculars during the day, comparing their specifications to other types of binoculars, and then plan and execute a "Night Sky Safari" to use their binoculars after completing the online planetarium module to train them on finding and tracking night sky objects.

(History: this was also previously required for students previous to fall 2024, but with a low-capability kit telescope that was previously very cheap ($5) but had increased in price ($20 + s/h) and decreased in availability (only one semi-reliable supplier), to the point it is comparable in price to a solid, introductory binoculars ($20-$30).)

4. *Citizen science (extended)*
   Students are required to make a contribution to citizen science by learning about light pollution's effects on the visible of faint and bright stars, and register on the Globe@Night science initiative website (free) to plan and execute a survey of counting stars on selected clear, moonless nights. Students also must provide a receipt of their observations through their Globe@Night accounts.

   (History: this was also previously required for students previous to fall 2024, but now has been specifically integrated with the mastery of the online planetarium website, and the binoculars "Night Sky Safari" projects.)

PROGRAM SUSTAINABILITY PLAN PROGRESS REPORT

This section only needs to be completed if a program has an existing Program Sustainability Plan. Indicate whether objectives established in your Program Sustainability Plan have been addressed or not, and if improvement targets have been met.

Area of Decline or Challenge	Identified Objective (Paste from PSP)	Planning Steps (Check all that apply)	Has the Improvement Target Been Met?
Enrollment		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**
Student Demand (Fill Rate)		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**

Efficiency (FTES/FTEF)		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**
Student Success – Course Completion		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**
Student Success — Course Modality		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**
Degrees and Certificates Awarded		☐ Identified ☐ Resources Allocated ☐ Implemented	**Select one**

If Program Sustainability Plan is still necessary, provide a brief description of how you plan to continue your PSP and update your PSP to remove any objectives that have been addressed and include any new objectives that are needed.