

Physical Sciences

Annual Program Planning Report

Astronomy/Physics

Chemistry

Earth and Ocean Sciences

2023

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2023 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2022-23

PROGRAM: ASTR/PHYS

CLUSTER: STEM

LAST YEAR CPPR COMPLETED: 2019

NEXT SCHEDULED CPPR:

2024 CURRENT DATE: 2/8/2022

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 ([download from this 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 degrees and/or certificates:

AS-T – Physics, AS – Physics – Note: we will be deactivating the AS – Physics since the AS-T is a subset of the AS degree.

GENERAL PROGRAM UPDATE

Describe significant changes, if any, to program mission, purpose or direction. *If there are not any, indicate: NONE.*

The only year-over-year change to the program is the increased dual enrollment requests from local high schools. We currently have requests for at least three sections from San Luis Coastal and two sections from Paso Robles school districts.

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 \(Insert Aggregated Data Chart\)](#)

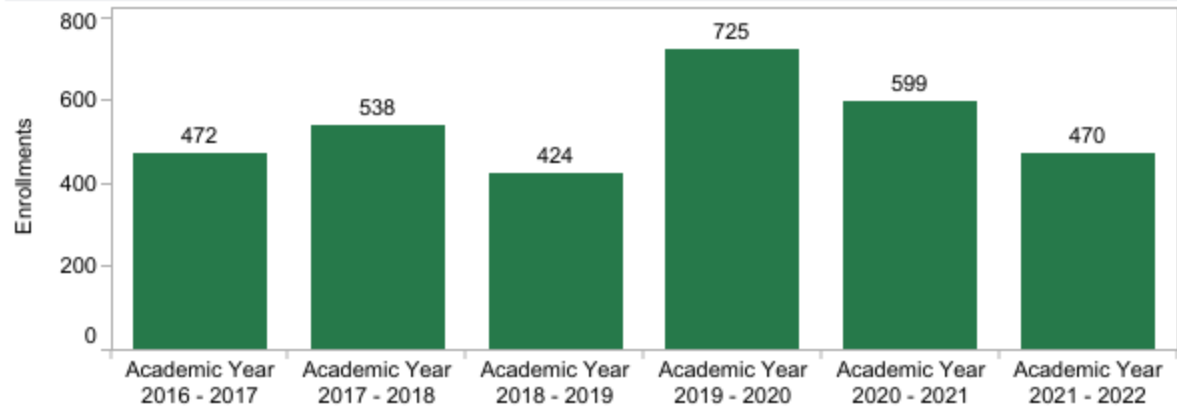
Insert the data chart and explain observed differences between the program and the college.

SLOCCCD Program Review Data - Enrollment

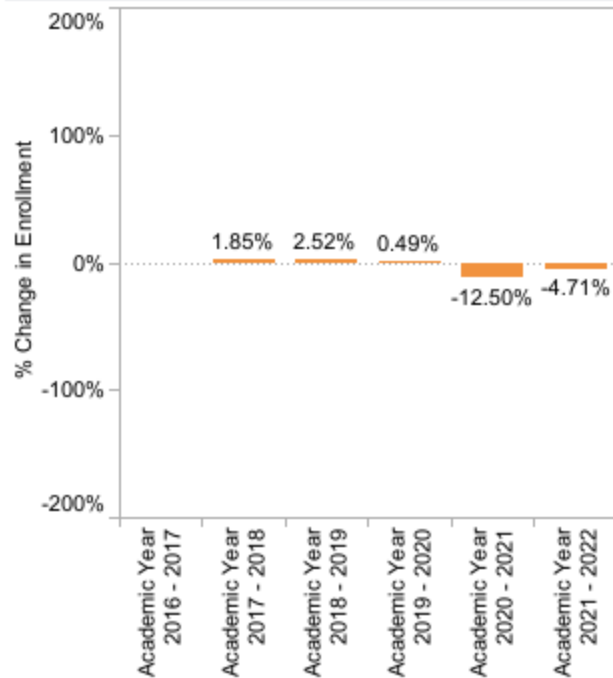
Department: Astronomy Course: All Dual Enrollment: All Prison: All

Region: All

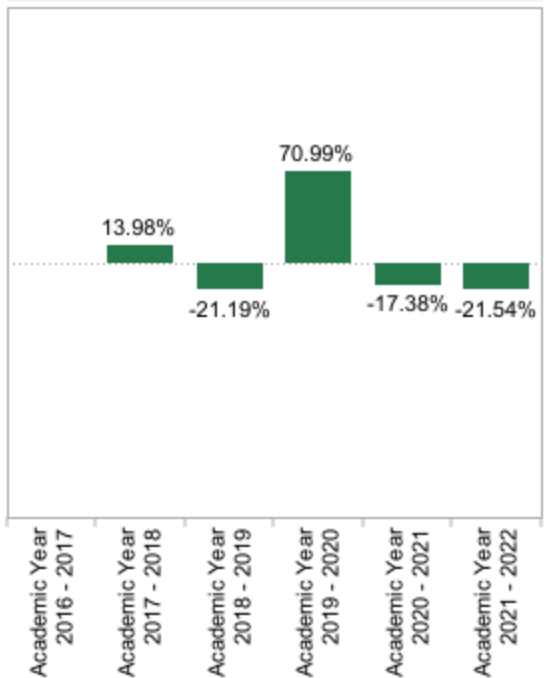
Astronomy Enrollments



% Change - Overall College Enrollments



% Change - Astronomy



SLOCCCD Program Review Data - Enrollment

Department:
Astronomy

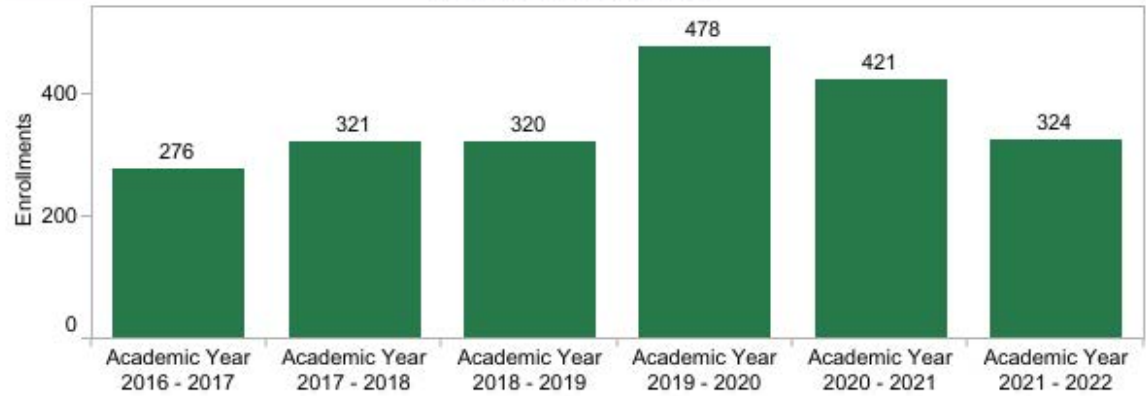
Course:
ASTR 210

Dual Enrollment:
All

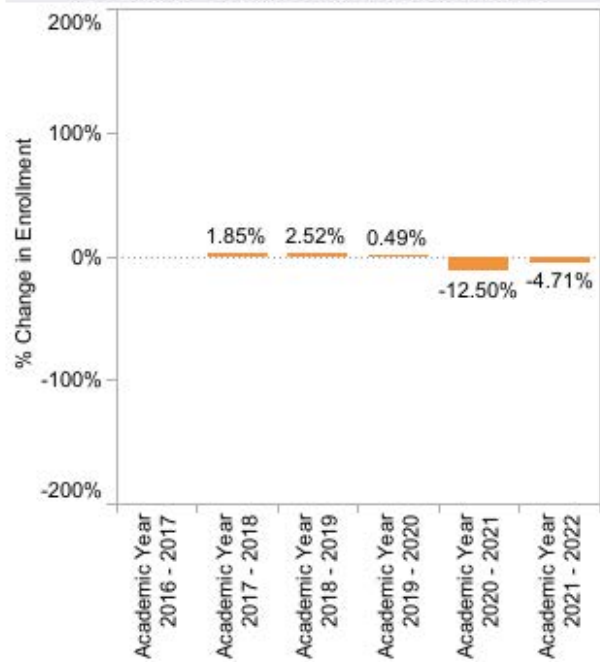
Prison:
All

Region: All

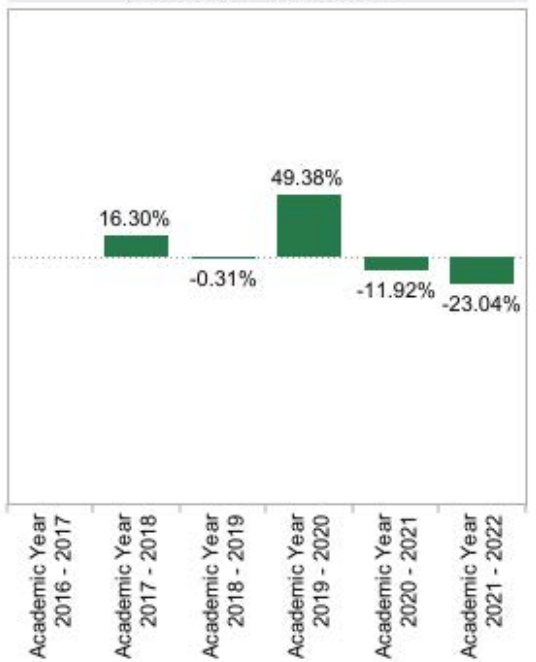
Astronomy Enrollments



% Change - Overall College Enrollments



% Change - Astronomy



SLOCCCD Program Review Data - Enrollment

Department:
Astronomy

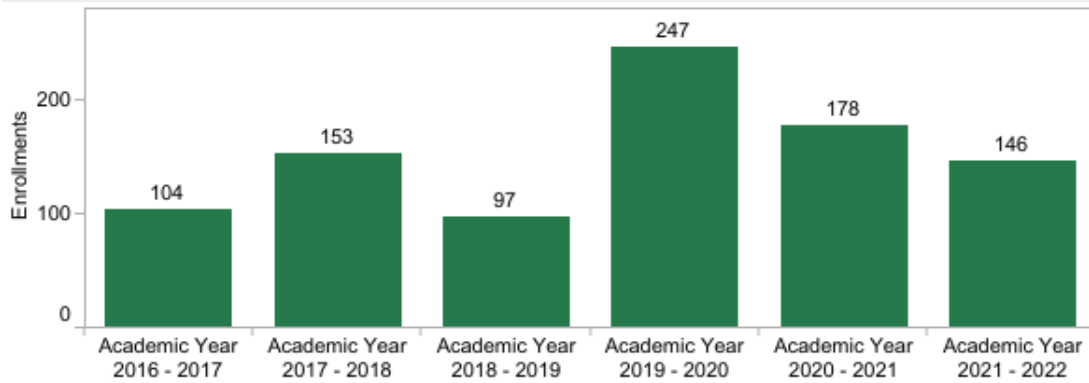
Course:
ASTR 210L

Dual Enrollment:
All

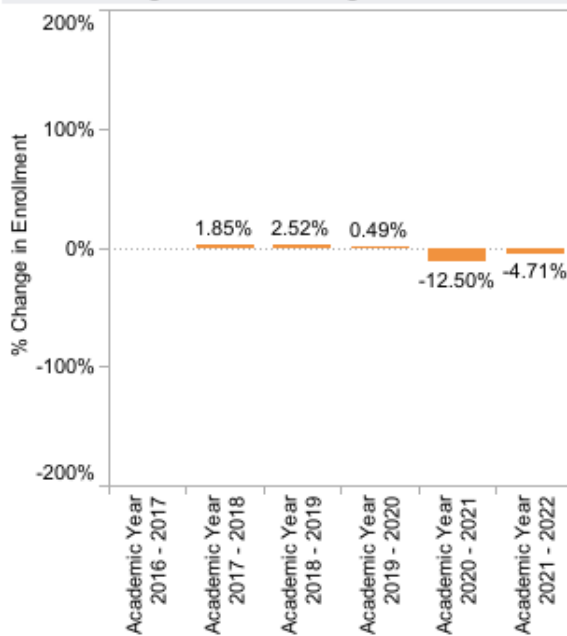
Prison:
All

Region:
All

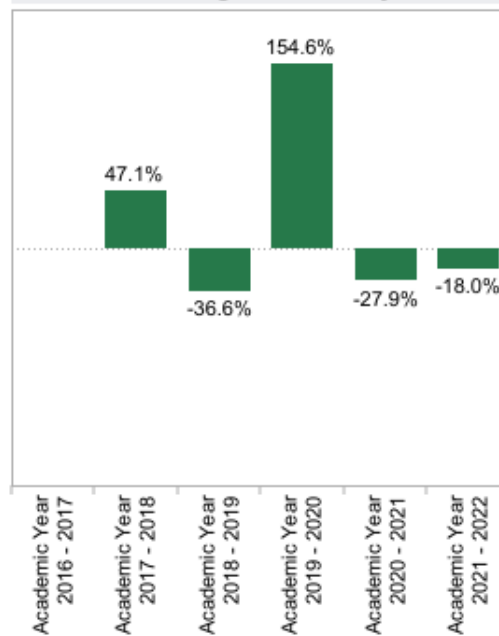
Astronomy Enrollments



% Change - Overall College Enrollments



% Change - Astronomy



SLOCCCD Program Review Data - Enrollment

Department: Astronomy **Course:** ASTR 299 **Dual Enrollment:** All **Prison:** All

Region: All

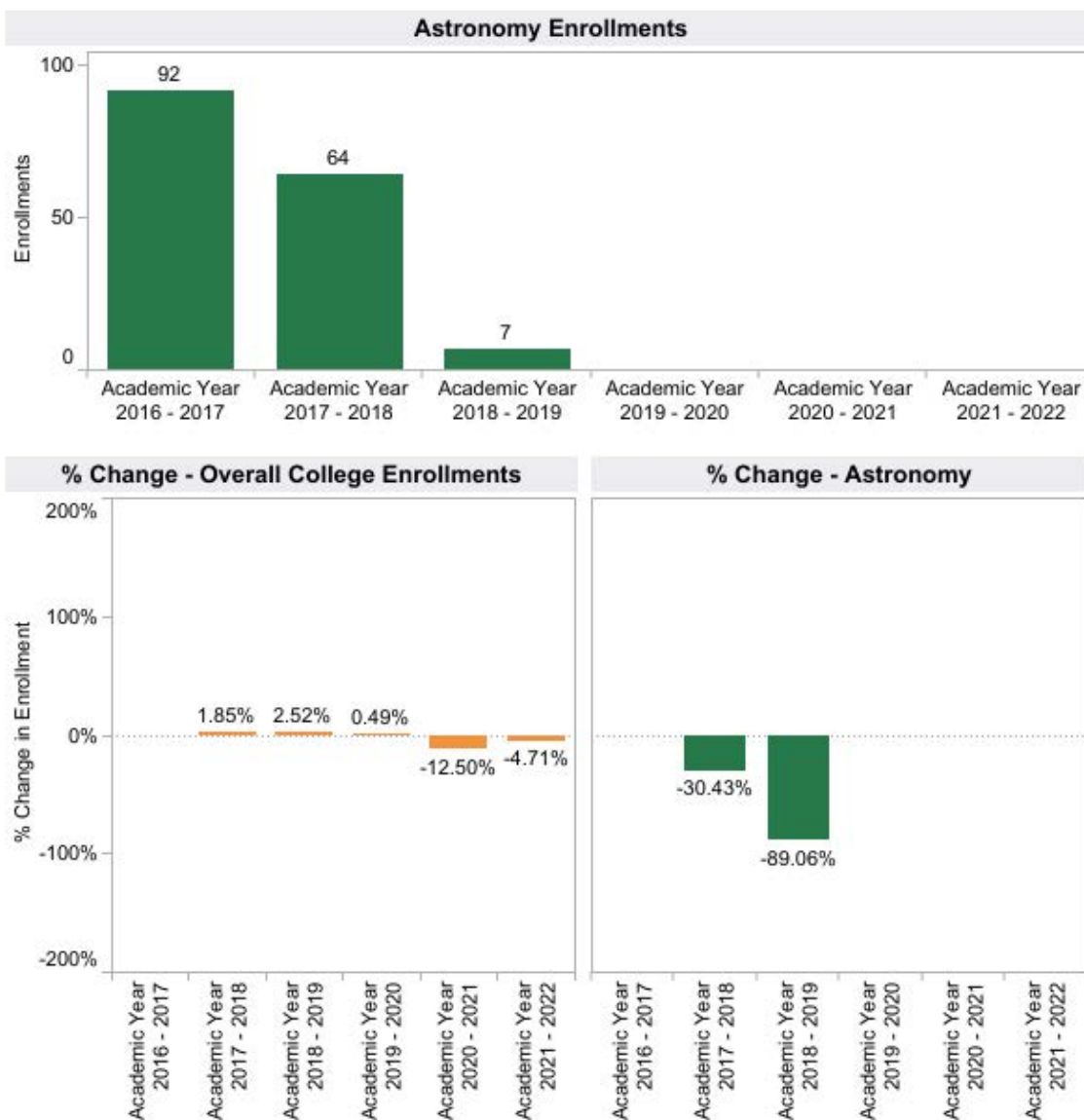


Figure 1: Astronomy Enrollments

(a)-(b) Overall ASTR 210 and ASTR 210L enrollments have been relatively steady, with a notable increase in 2019-2020 for both courses compared to the college overall, and a similar downturn for 2020-2021.

(c) Positive and negative change fluctuations occurred in ASTR 210L enrollments up through spring 2020 due to a high degree of variability in the NC campus section enrollment, which was offered only intermittently at that campus. From spring 2022 onwards, ASTR 210L is solely offered as an asynchronous DE course.

(d) The large enrollment numbers for ASTR 299 in 2016-2017 and 2017-2018 is when it was made available as a distance education course; however the steep decline in 2018-2019 and the zero enrollment in 2019-2020 onwards is due to it no longer being offered from the lack of part-time faculty available to teach that course.

(e) Distance and in-person ASTR210 and ASTR210L courses offered for incarcerated students comprised a measurable portion of the total course enrollments from 2019-2022, but this portion will likely decline due to planned closure of one wing of the nearby state prison as well as lack of part-time faculty available to teach these courses.

SLOCCCD Program Review Data - Enrollment

Department:
Physics

Course:
All

Dual Enrollment:
All

Prison:
All

Region: All



Figure 2: Physics Enrollments

Looking at the overall enrollments in physics, there is a dramatic year-over-year decrease in 2021-22. The decrease from 2019-20 is a little over 5%. We cannot know whether this is due to the COVID-19 pandemic, but it seems reasonable that students realized that they learn better in a

face-to-face modality and were waiting to take courses in-person in future semesters. Enrollments were down in all courses. Students enrolled in dual enrollment PHYS 205A and PHYS 205B courses also decreased during 2021-22. This is consistent with the decrease experienced in other dual enrollment courses offered.

B. [General Student Demand \(Fill Rate\) \(Insert Aggregated Data Chart\)](#)

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

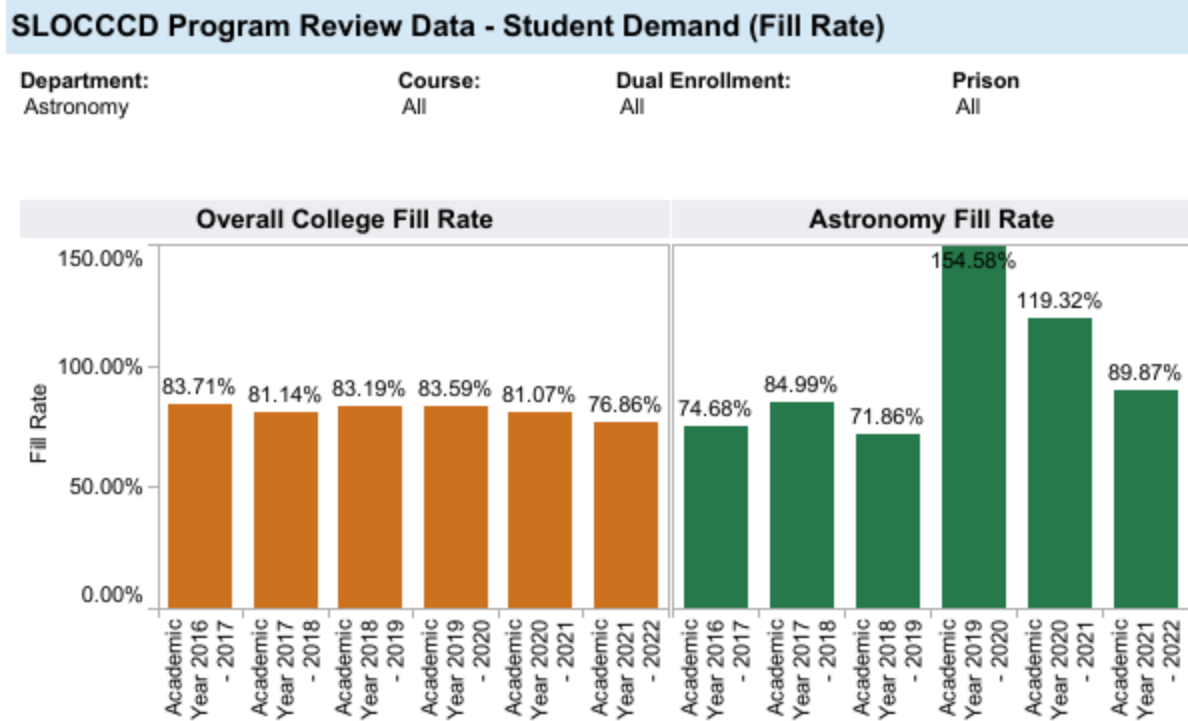


Figure 3: Astronomy Fill Rate Compared to the Overall Fill Rate

Overall, astronomy fill rates mirror the District overall fill rate, with a much higher fill rates for 2019-2020 (153.52%), and for 2020-2021 (119.32%).

SLOCCCD Program Review Data - Student Demand (Fill Rate)

Department:
Physics

Course:
All

Dual Enrollment:
All

Prison
All

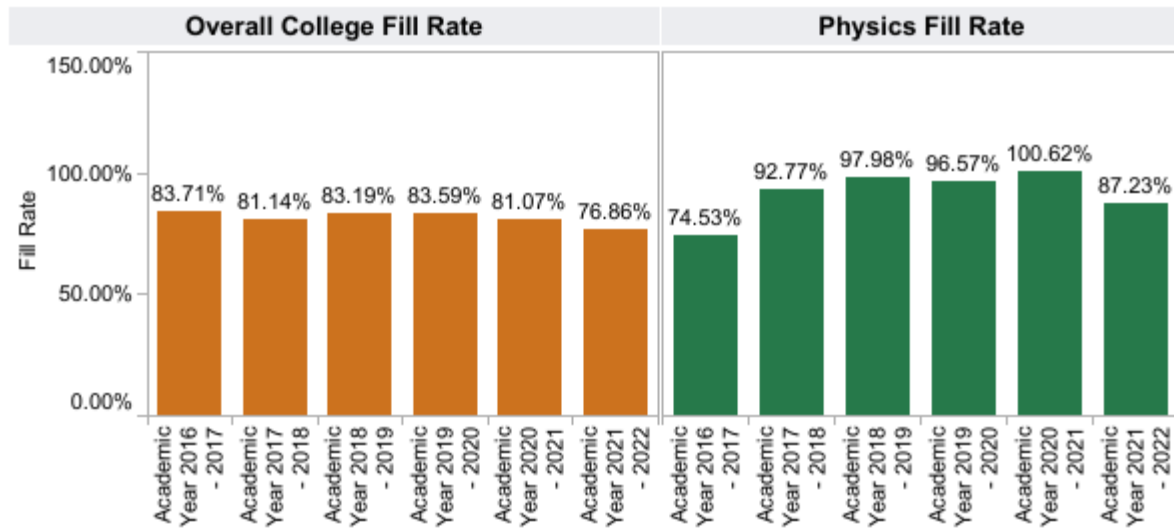


Figure 4: Physics Fill Rate Compared to the Overall Fill Rate

The fill rate in physics remains above the overall college fill rate. The lowest fill rate was in PHYS 208C. We will need to develop scheduling strategies to increase the fill rate in this course. The drop in fill rate is due to lower demand for courses during the 2021-22 school year. It is difficult to manage lower demand while maintaining the same fill rate due to the capacity that individual sections add to the total number of seats available.

C. [General Efficiency \(FTES/FTEF\) \(Insert Aggregated Data Chart\)](#)

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

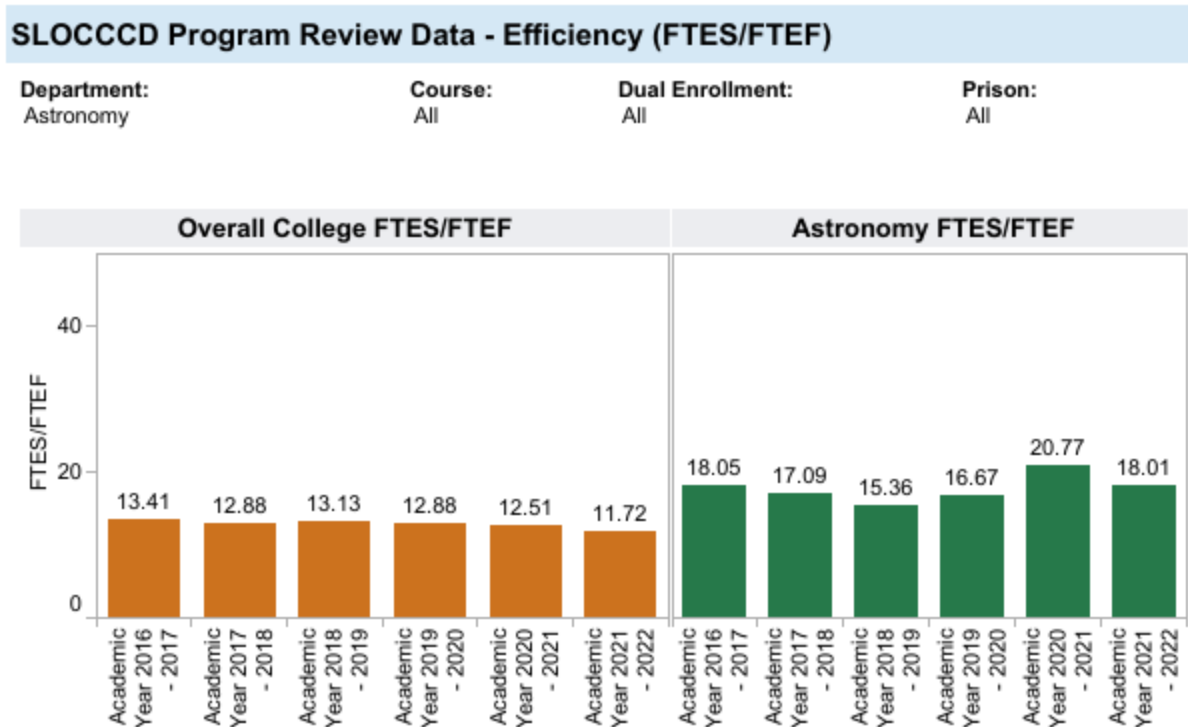


Figure 5: Astronomy Efficiency

The overall efficiency of astronomy courses is very high compared to the District efficiency over the past six-year history, due to large lectures of 45-75 students in many ASTR 210 lecture sections, and ASTR 210L lab sections being run at/or near capacity (28+ students).

SLOCCCD Program Review Data - Efficiency (FTES/FTEF)

Department:
Physics

Course:
All

Dual Enrollment:
All

Prison:
All

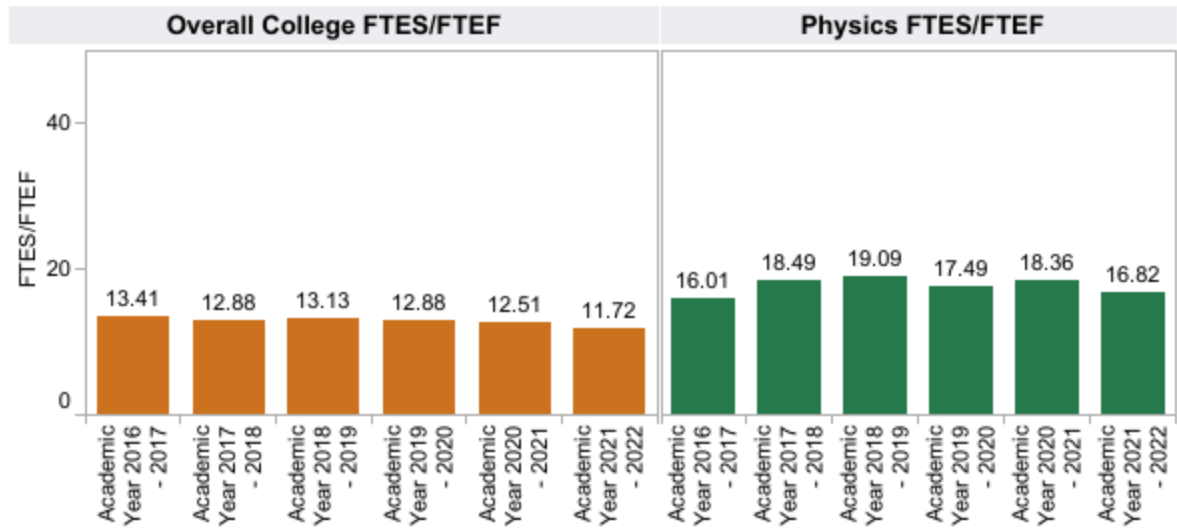


Figure 6: Physics Efficiency

Physics course efficiencies remain well above the overall college efficiency. This is due to program faculty agreeing to teach large lectures that branch out into individual labs.

D. [Student Success—Course Completion by Modality \(Insert Data Chart\)](#)

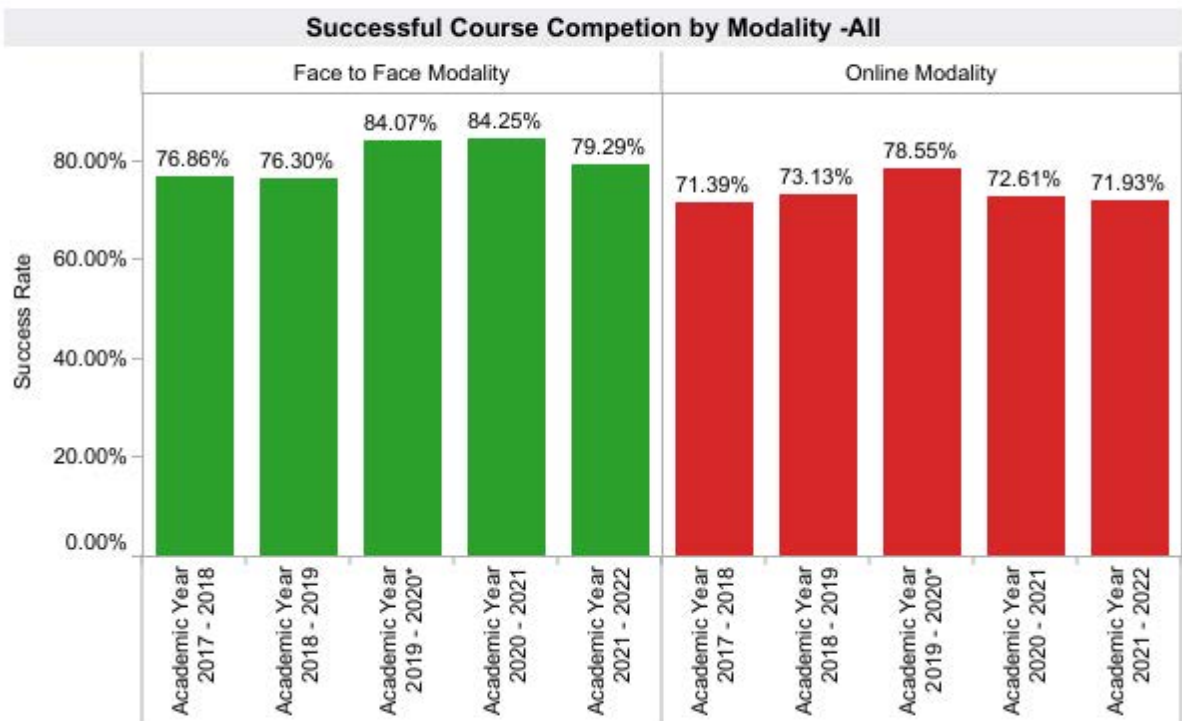
Insert the data chart and explain observed differences between the program and the college.

SLOCCCD Program Review Data: Successful Course Completion

Select Department:
All

Course:
All

Legend:
■ Face to Face Modality
■ Online Modality

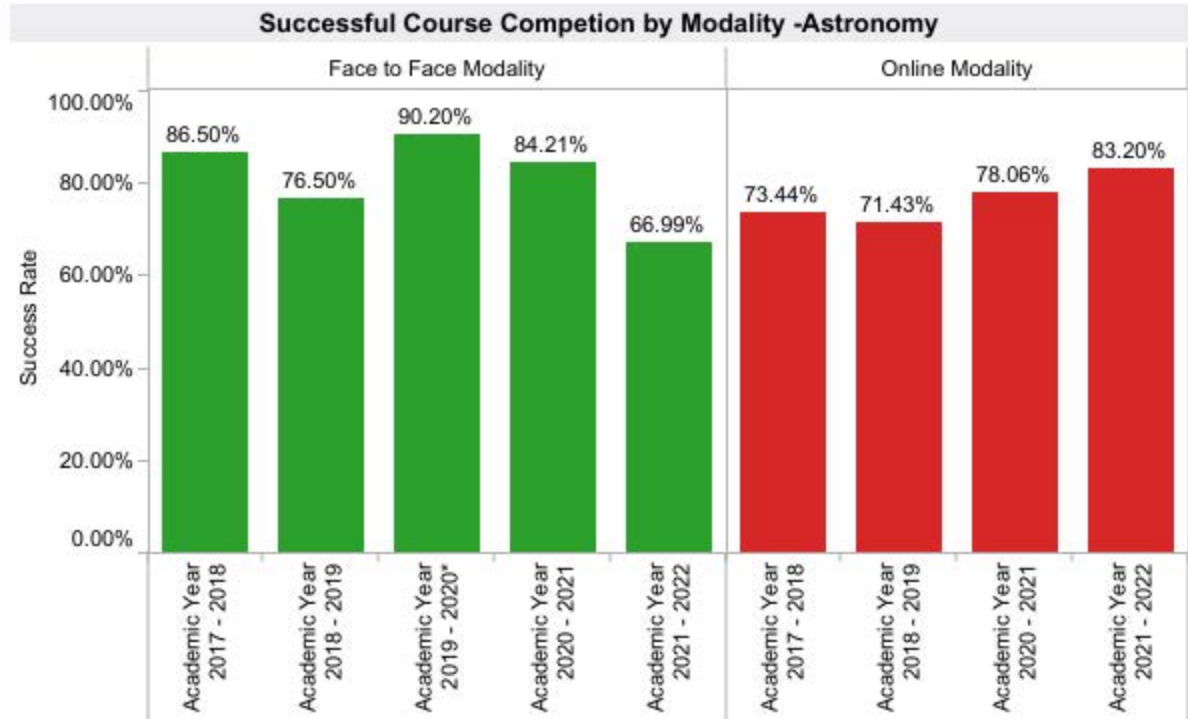


SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
All

Legend:
■ Face to Face Modality
■ Online Modality



Successful Course Completion by Modality Table - Astronomy

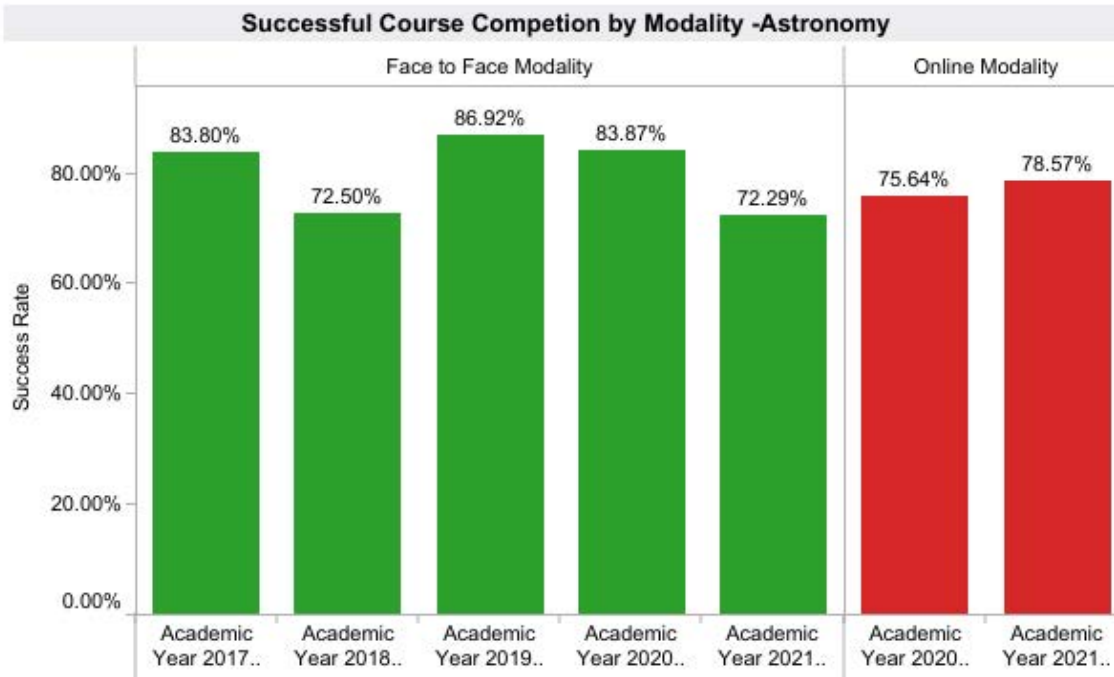
		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Face to Face Modality	Department Success Rate	86.50%	76.50%	90.20%	84.21%	66.99%
	Total Department Enrollments	474.0	418.0	725.0	120.0	105.0
Online Modality	Department Success Rate	73.44%	71.43%		78.06%	83.20%
	Total Department Enrollments	64.0	7.0		479.0	365.0

SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
ASTR210

Legend:
Face to Face Modality
Online Modality



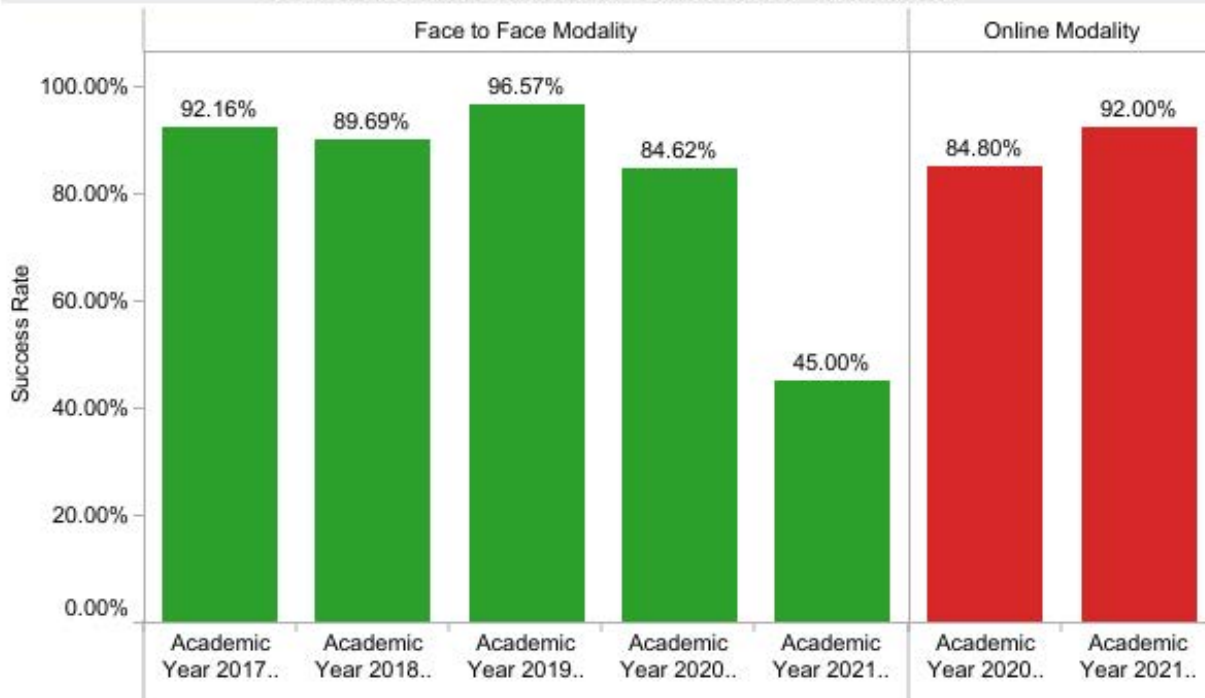
SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
ASTR210L

Legend:
■ Face to Face Modality
■ Online Modality

Successful Course Completion by Modality -Astronomy



SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
ASTR299

Legend:
■ Online Modality

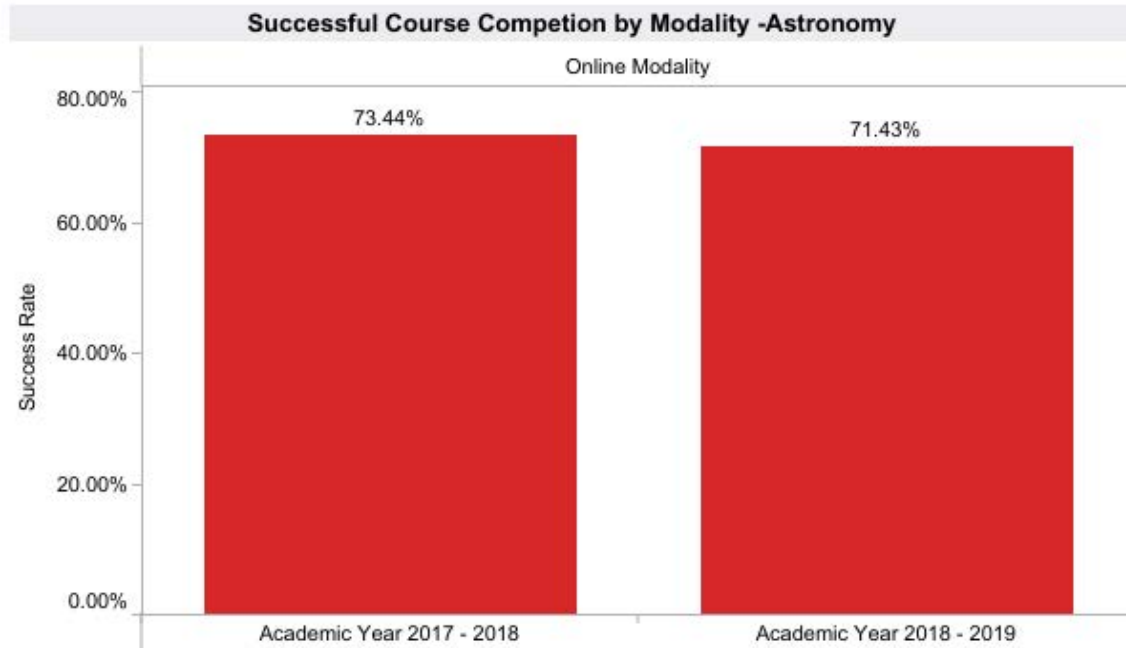


Figure 7: Astronomy Success Rate by Modality

(a)-(b) Compared to the District, all astronomy courses have comparable successful course completion rates.

(c)-(d) Notably the success rate for both ASTR 210 and ASTR 210L have trended upwards for online over in-person modalities, perhaps due to increased student familiarity to learning online at a self-paced rate from 2020-2021 onwards.

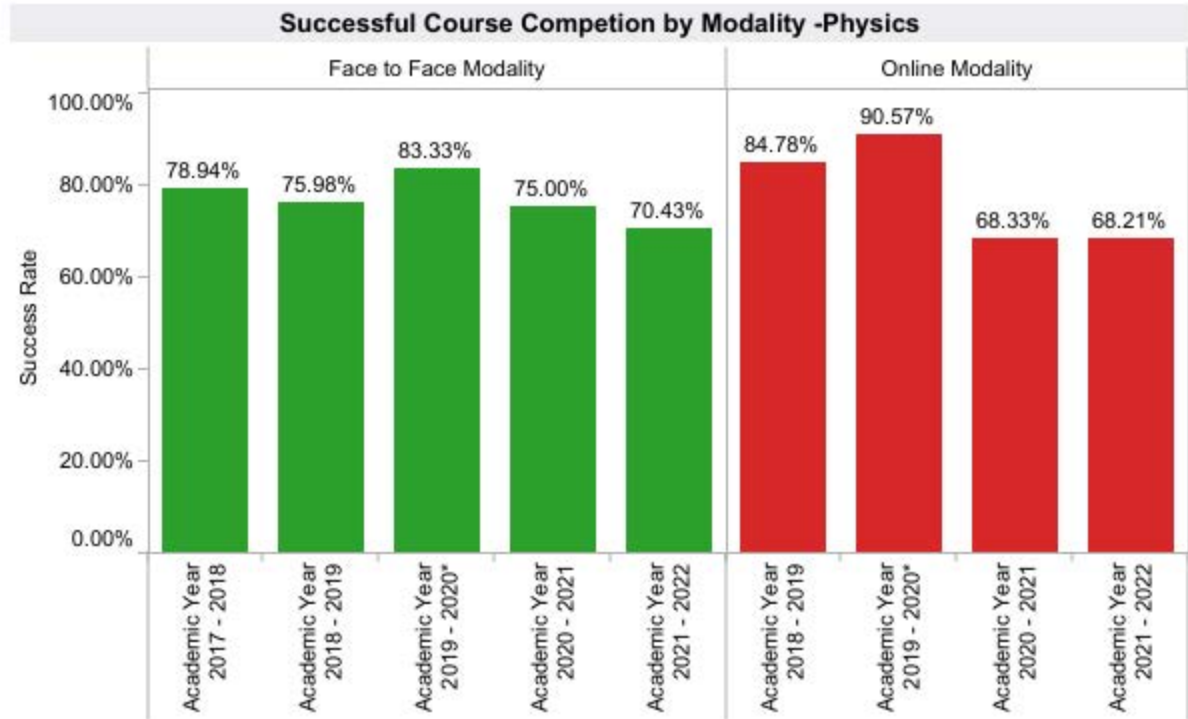
(e) ASTR 299 was only offered as a distance-learning course (starting in 2014-2015, and ending in 2018-2019), so there is no modality comparison within that course.

SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Physics

Course:
All

Legend:
■ Face to Face Modality
■ Online Modality



Successful Course Completion by Modality Table - Physics

		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Face to Face Modality	Department Success Rate	78.94%	75.98%	83.33%	75.00%	70.43%
	Total Department Enrollments	603.0	535.0	539.0	36.0	188.0
Online Modality	Department Success Rate	-	84.78%	90.57%	68.33%	68.21%
	Total Department Enrollments	-	46.0	53.0	610.0	372.0

Figure 8: Physics Success Rate by Modality

The success rates for face-to-face courses and face-to-face courses are very close. There is a sharp drop from 2019-20 to 2020-21. This also corresponded to a large increase in the number of enrollments in online courses due to the COVID-19 pandemic. Prior to the pandemic, the only online courses in physics were those offered as Cuesta-led dual enrollment courses at the high schools. These sections had very high success rates due to the manner in which instructional materials are delivered and in the way students are mentored. It should be noted that the success rates during the 2020-21 and 2021-22 timeframes are actually skewed higher due to changes in withdrawal policies put in place during the pandemic. It should also be noted that the success rates in physics courses are near the college-wide rates. The large decrease

E. [Degrees and Certificates Awarded \(Insert Data Chart\)](#)

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

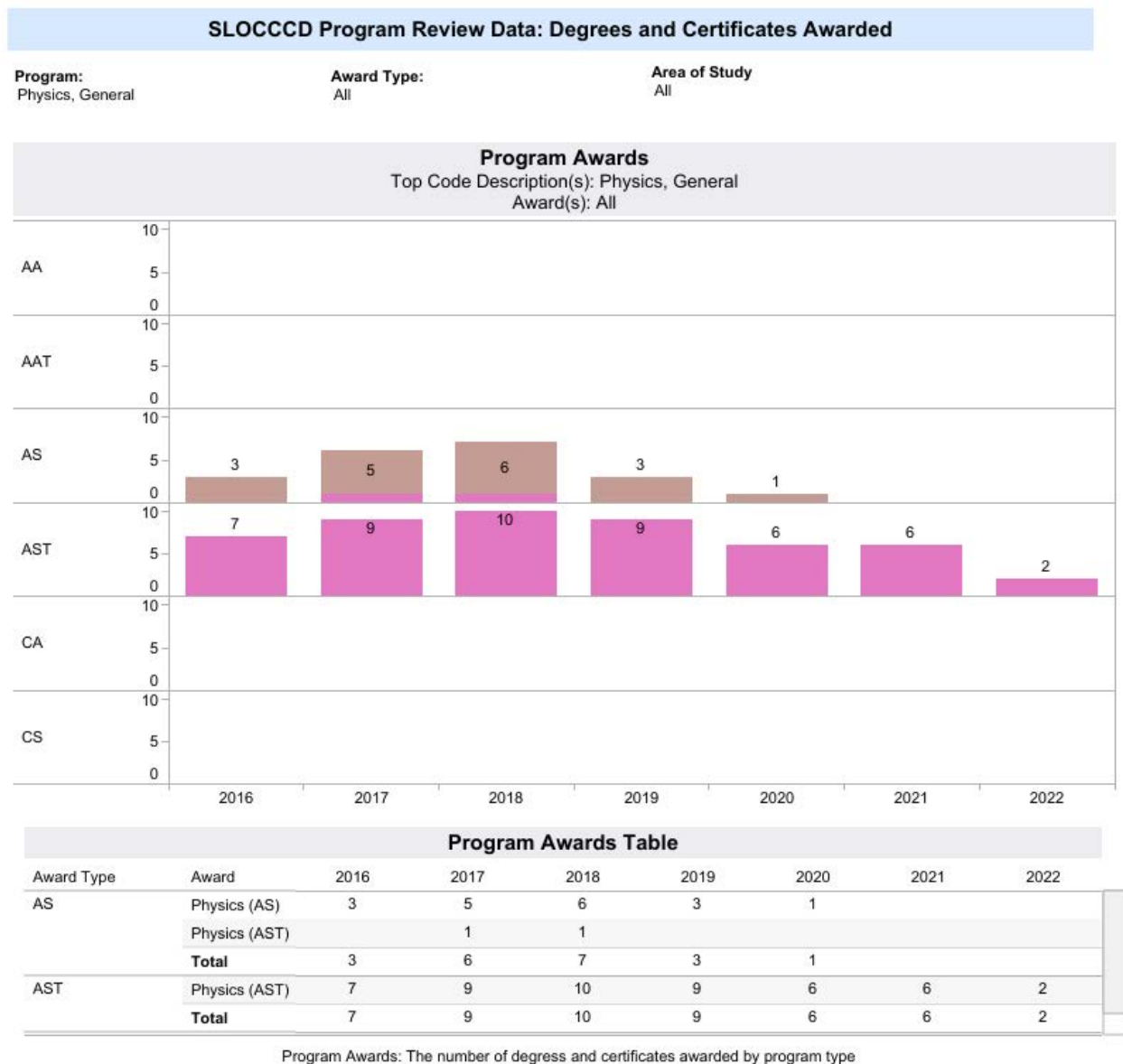


Figure 9: Physics Degrees by Year

Degrees awarded in physics decreased dramatically during the 2021-22 year, although the sample size is very small. The decrease in PHYS AD-T's mirrors the decrease in demand for PHYS 208C which is the capstone course for the PHYS AD-T and PHYS AS-T's. The data support the deactivation of the AS – Physics degree in favor of the AD-T.

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:
Astronomy

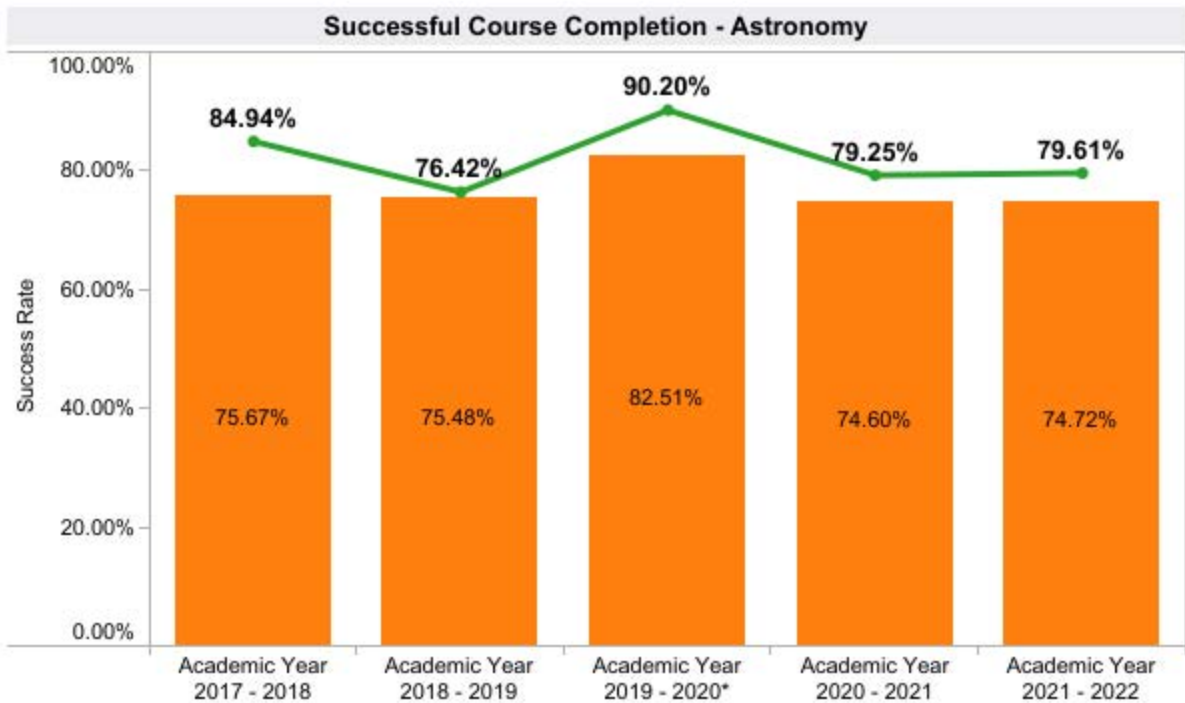
TERM
All

Measure Names

Department Success Rate

Overall College Success Rate

COURSE
All



Astronomy Success Rate Table

	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Department Success..	84.94%	76.42%	90.20%	79.25%	79.61%
Total Enrollments	538	425	725	599	470

Figure 10: Astronomy Success Rate Compared to the College-wide Success Rate

The student success rate in astronomy courses is higher than the college-wide rate.

SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Physics

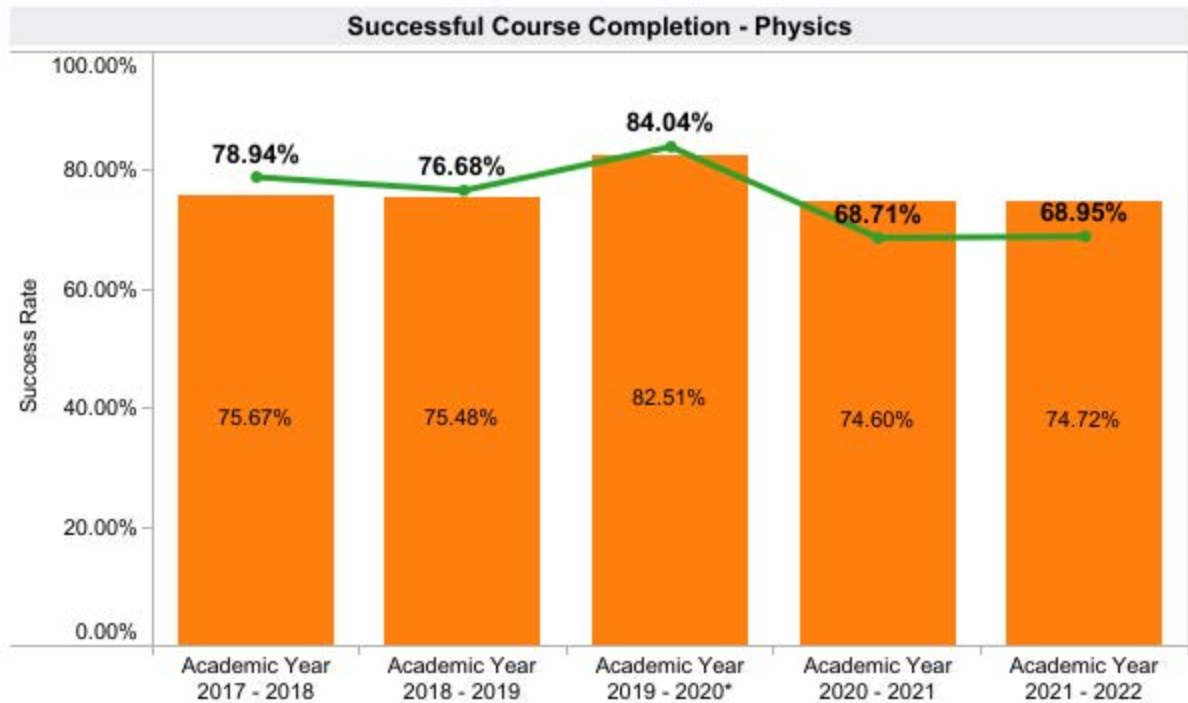
TERM
All

Measure Names

Department Success Rate

Overall College Success Rate

COURSE
All



Physics Success Rate Table

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

Figure 11: Physics Success Rate Compared to the College Success Rate

The success rate for physics courses was negatively impacted by the COVID-19 pandemic and the requisite change from face-to-face offerings to online. It is anticipated that the success rate will increase as we move farther away from the pandemic years, but the increase will not happen overnight; there are lingering effects on student success in prerequisite and support classes from the pandemic.

- 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?

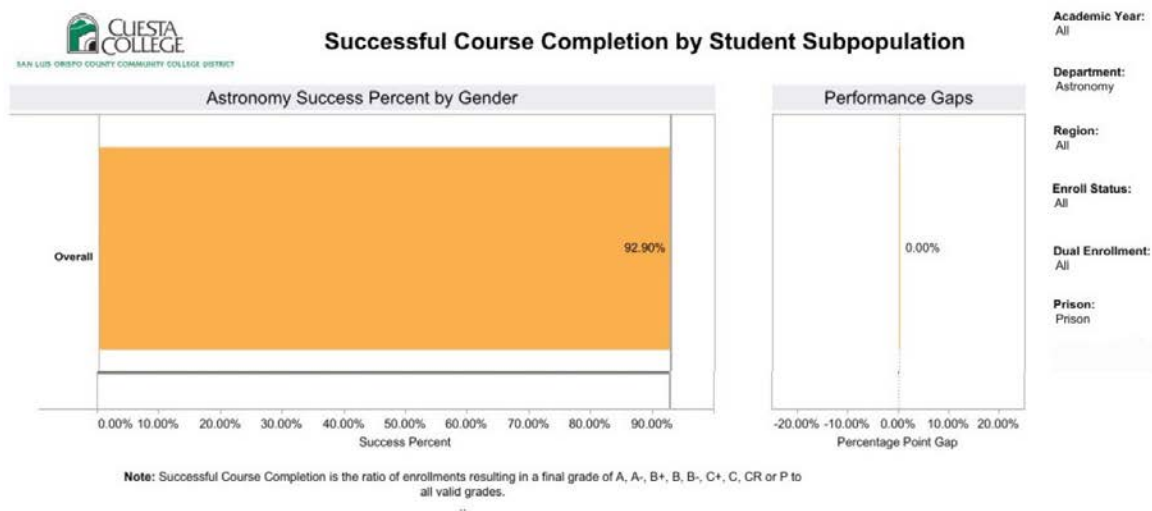
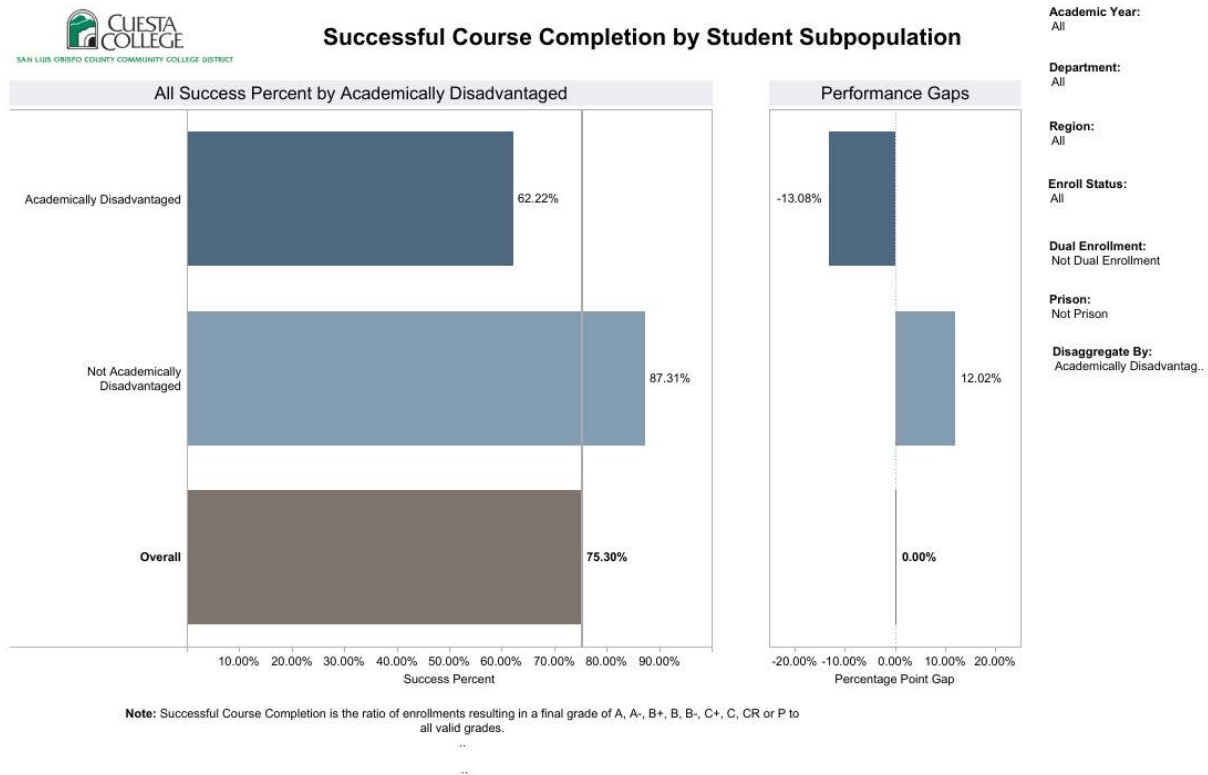


Figure 12: Astronomy Success Rates Disaggregated by Academic Preparation

(a)-(b) (Discussion of non-prison students)

For in-person modality astronomy courses, there is a large performance gap between academically disadvantaged students (62.22%) and those who are not (87.31%). This is an area where we continue to struggle to find solutions for our students. However, for DE astronomy courses, there is a slightly higher success rate for academically disadvantaged students (98.28%) compared to those who are not (94.75%), and the overall success rate for DE astronomy courses is higher (95.29%) than the success rate for in-person astronomy courses (75.30%). This suggests that there is a significant benefit for academically disadvantaged students to take astronomy courses through DE modality, compared to in-person.

(c) ASTR 210 and ASTR 210L are the only lab sciences offered to incarcerated Cuesta College students to meet the requirements for the AS transfer degree in sociology. As discussed above, the success rate for non-prison DE students in astronomy is 95.29%. The success rate for prison DE students in astronomy is 92.90%, which is probably not a statistical difference.

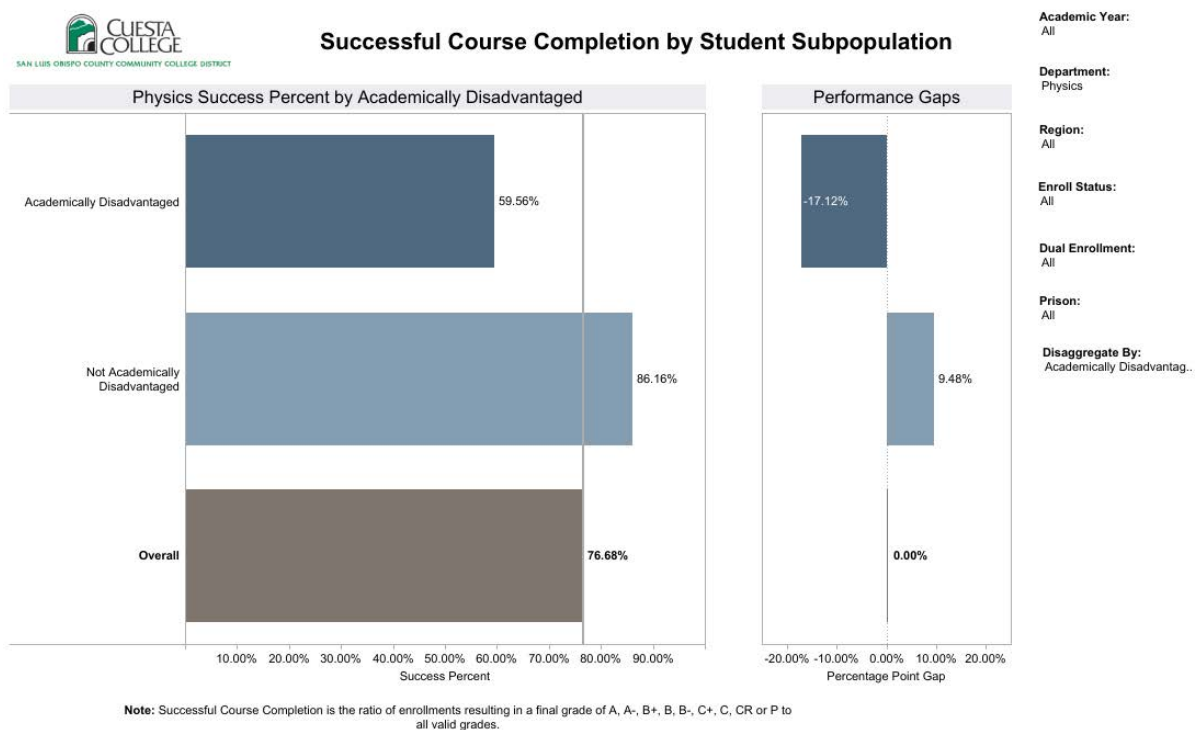
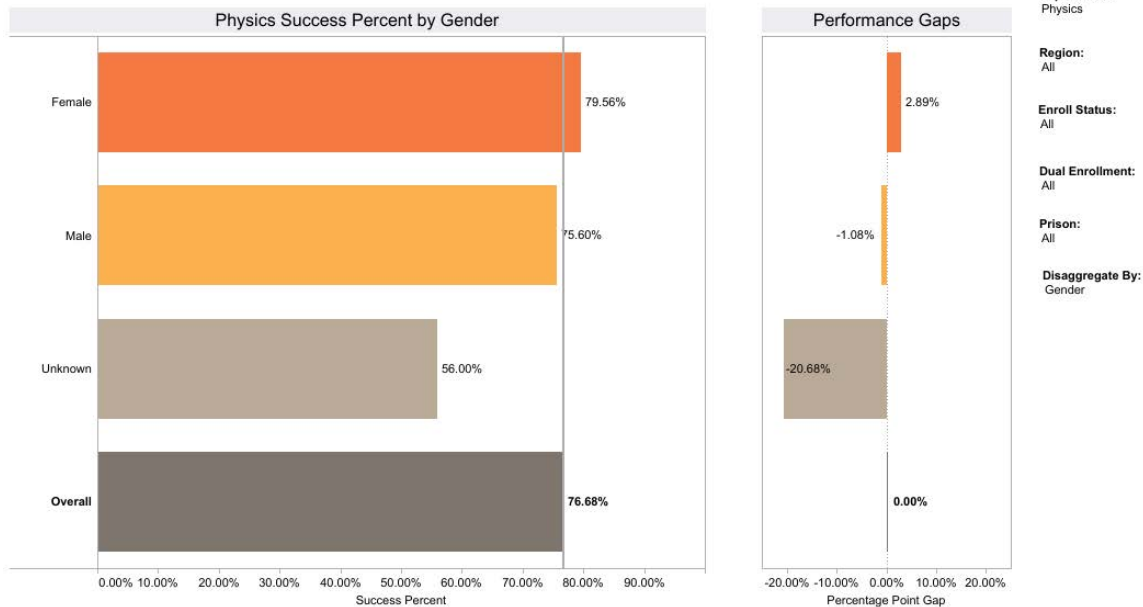


Figure 13: Physics Success Rates Disaggregated by Academic Preparation

It is clear that there is a large performance gap between academically disadvantaged students and those who are not. This is an area where we continue to struggle to find solutions for our students. Although we have support courses designed to assist students with mastery of PHYS 208A and PHYS 208B material, we find that many of the students who would benefit the most from such a course, do not enroll in the course. We have discussed setting laboratory time aside for problem solving activities and may do so to see if we can improve the success rate.

Successful Course Completion by Student Subpopulation



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.

Figure 13: Physics Success Rates Disaggregated by Gender

There is a statistically insignificant difference in performance gap between those individuals who identify as female versus those who identify as male. This is encouraging since STEM fields have traditionally been heavily populated by males. The large performance gap for those who did not specify how they identify is something that requires more information. It is speculated that the sample size is rather small and thus, can be skewed wildly by individual performance.

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.*

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
We will continue to use the experience gained in online assignments and labs during the COVID-19 pandemic to determine the best balance of online and face-to-face instruction and assignments to improve student success.
- B. Anticipated changes in curriculum, scheduling or delivery modality
The long-term impact of the COVID-19 pandemic on student demand is unknown, but it is anticipated that it will impact scheduling and modality.
- C. Levels, delivery or types of services
None.
- D. Facilities changes
We continue to require lecture spaces that can accommodate the large lecture sizes and technology required for physics classes. In addition, despite several attempts at fixing the problem, the roof in the 2100 building has leaked for some time. This puts very expensive laboratory equipment at risk and provides a hazardous environment for our lab technicians and others who use the space.
- E. Staffing projections
In order to meet student demand, especially from our high schools, we require a full-time, tenure-track faculty member.
- F. Other
None.

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		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Demand (Fill Rate)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Efficiency (FTES/FTEF)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success – Course Completion		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success — Course Modality		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Degrees and Certificates Awarded		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> 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.

2023 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2023

CLUSTER: STEM

NEXT SCHEDULED CPPR: 2024

PROGRAM: CHEMISTRY

LAST YEAR CPPR COMPLETED: 2018

CURRENT DATE: 2/21/2023

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

This APPW encompasses the following degrees and/or certificates:

Chemistry AS, Premedical Studies CA

GENERAL PROGRAM UPDATE

Describe significant changes, if any, to program mission, purpose or direction. *If there are not any, indicate: NONE.*

While we have not made any changes this year to our program mission, purpose, or direction, department members have agreed to review the mission and purpose as part of the comprehensive review next year.

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.

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H. [General Enrollment \(Insert Aggregated Data Chart\)](#)

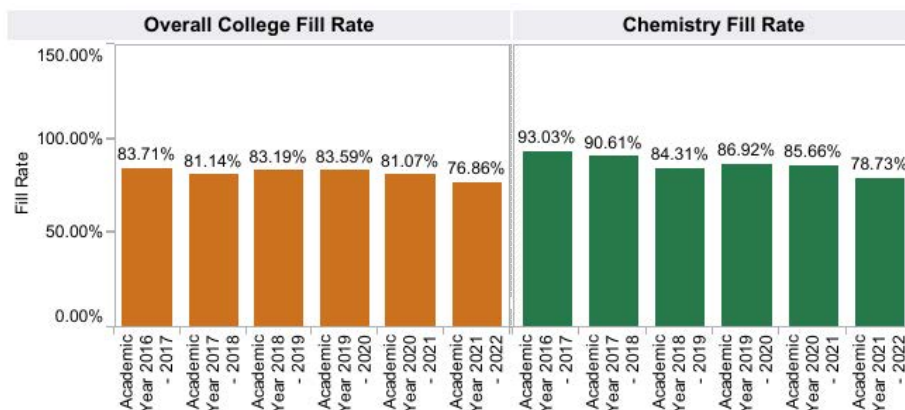
Insert the data chart and explain observed differences between the program and the college.



Chemistry experienced a drop in enrollment, as did most of the college. It is likely that COVID-19 played a part in the very large drop that was observed. When transitioning back into the in-person classroom from fully online, our department also pushed to be back in person sooner than most other programs to be able to have our labs back in person. Perhaps the transition back in-person was more rapid than student were prepared (or comfortable with) for which could account for such a large drop in enrollment. It was noted that enrollment in hybrid or fully in-person sections of courses was lower than the enrollment in DE offerings of the same course.

I. [General Student Demand \(Fill Rate\) \(Insert Aggregated Data Chart\)](#)

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

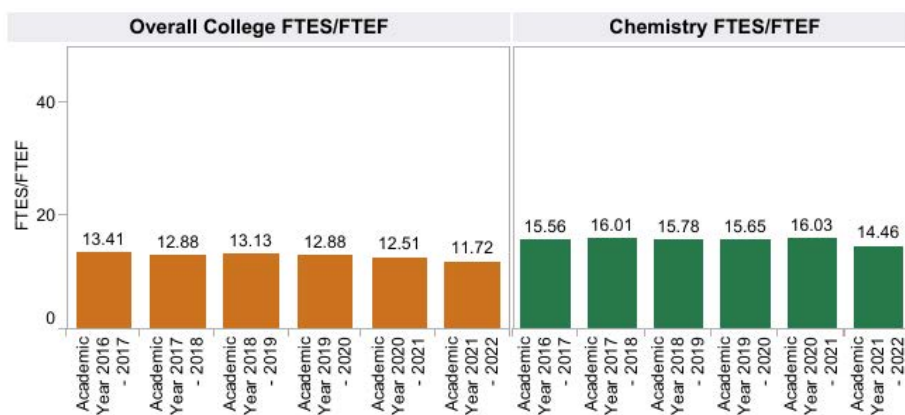


Fill Rate: The ratio of enrollments to class limits. Cross listed class limits are adjusted appropriately. Also, courses with zero class limits are excluded from this measure.

The student demand in chemistry is comparable to the demand across the college (and most years we exceed the demand at the college level). The fill rate has fluctuated somewhat, perhaps due to the hiring of additional PT and FT faculty, chemists taking on college responsibilities with reassign time, and COVID-19. It's interesting to note that the rate at which enrollment is decreasing in chemistry is significantly higher than the rate at which the fill rate is decreasing.

J. [General Efficiency \(FTES/FTEF\) \(Insert Aggregated Data Chart\)](#)

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

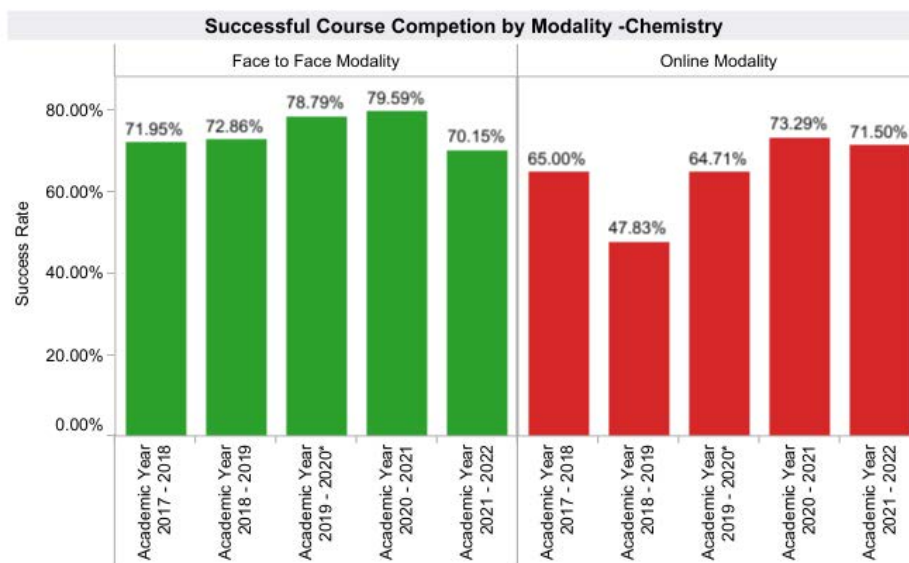


FTES/FTEF: The ratio of total FTES to Full-Time Equivalent Faculty (SXD4 Total-Hours/17.5)/XE03 FACULTY-ASSIGNMENT-FTE)

The college and chemistry have both experienced a drop in efficiency; however, chemistry continues to exceed the efficiency of the college consistently from year to year. The decrease in efficiency in the 21-22 year likely correlates with the decrease observed in enrollment.

K. [Student Success—Course Completion by Modality \(Insert Data Chart\)](#)

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



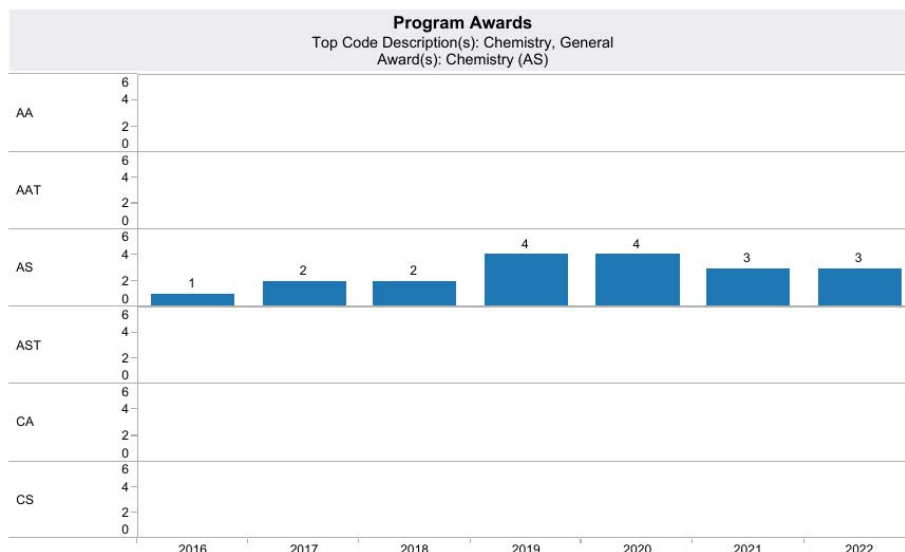
Successful Course Competition by Modality Table - Chemistry

		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Face to Face Modality	Department Success Rate	71.95%	72.86%	78.79%	79.59%	70.15%
	Total Department Enrollments	1,105	1,124	1,189	103	333
Online Modality	Department Success Rate	65.00%	47.83%	64.71%	73.29%	71.50%
	Total Department Enrollments	40	46	34	1,038	622

It is challenging to make any comparison between modalities because the only courses that were offered fully online before Spring 2020 were single sections of CHEM 201A and CHEM201P. Additionally, it is unclear how students are counted in each of the modalities (for example, we cannot account for 103 face-to-face students in the 20-21 academic year). We are encouraged, however, that the course success in the online modality is very close to that of the college. This is likely largely due to the heroic effort chemistry faculty put into developing their online offerings.

L. [Degrees and Certificates Awarded \(Insert Data Chart\)](#)

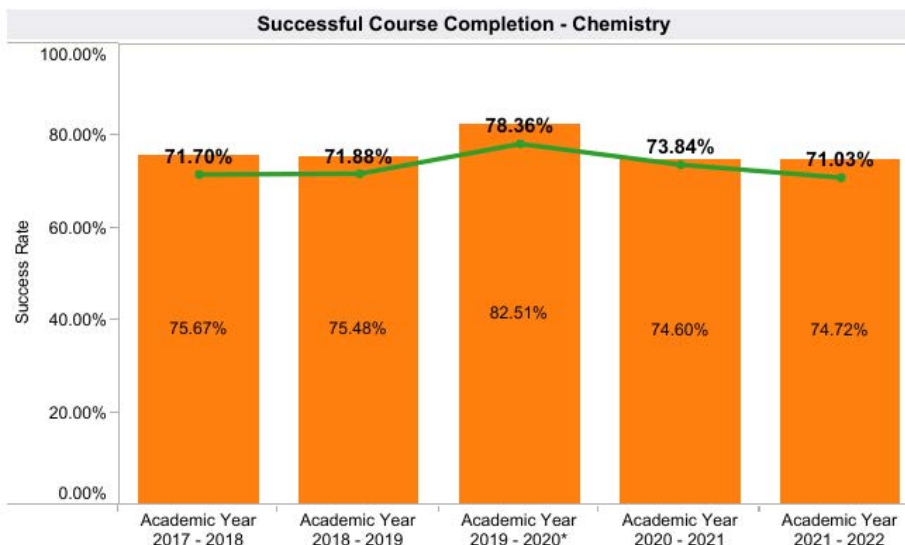
Insert the data chart and explain observed differences between the program and the college.



We primarily offer service courses (most of our students aren't majors) so it makes sense that our awarded degree totals are rather low. While an ADT in chemistry would be beneficial, the current unit totals in courses outside of our department (and division) will not allow for it. There is talk at the state level of increasing transferability to the CSUs from the community colleges which will hopefully lead to changes in unit requirements and allow us to offer some version of an ADT (or what the new iteration would be called). It is unclear if students are getting the Premedical Studies CA as no data is available in the Tableau visualizations. **We would love to have that data. Give it to us now, please.**

M. [General Student Success – Course Completion \(Insert Aggregated Data Chart\)](#)

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

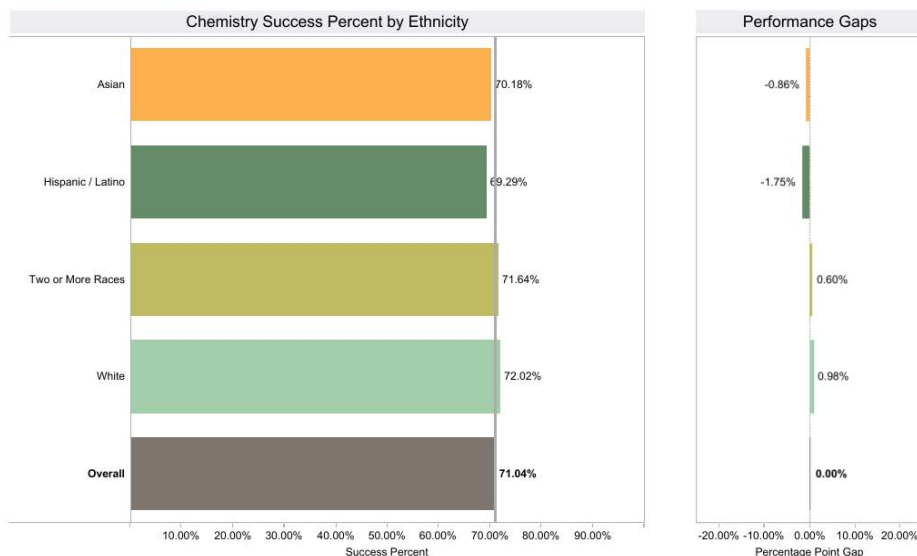


Excluding the anomalous 2019-2020 academic year, successful course completion has remained consistent. The chemistry faculty will continue to work to provide students the services and quality instruction that they need to succeed.

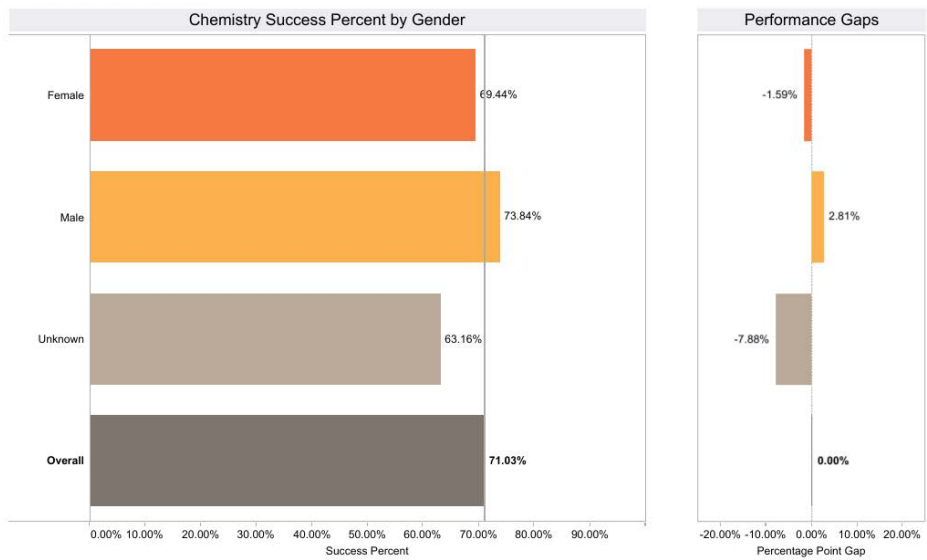
- N. Review the [Disaggregated Student Success](#) charts; include any charts that you will reference. Describe any departmental or pedagogical outcomes that have occurred as a result of programmatic discussion regarding the data presented.

The following are some questions you might want to consider:

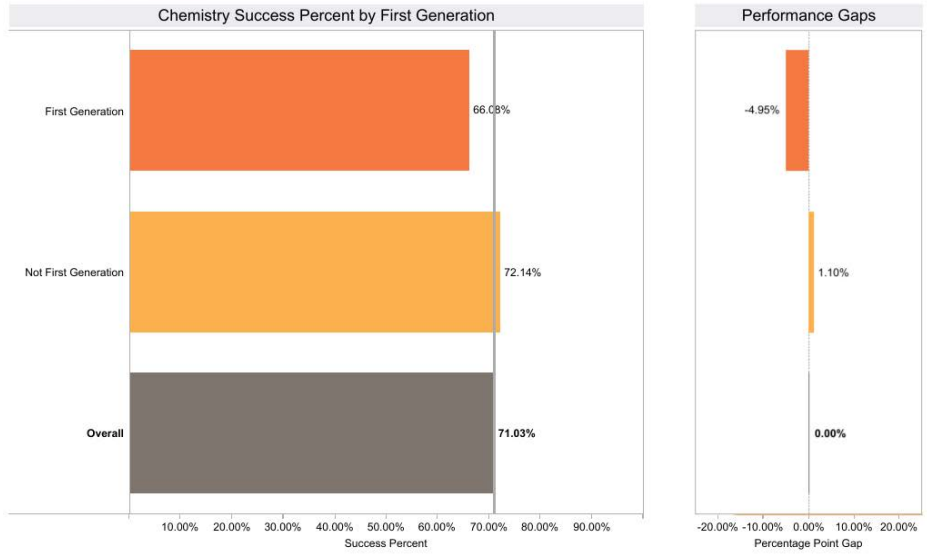
- What specific groups are experiencing inequities? What patterns do you notice in the data? How have the equity gaps changed since the previous academic year?
- What professional opportunities are your program faculty participating in to address closing equity gaps?
- What strategies, policies and/or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



It can be seen in the data that the equity gaps are small for each subpopulation listed. The department faculty will continue to monitor gaps to identify trends. Several faculty in the department have participated in JEDI Academy and have implemented things they've learned in their classes. Additionally, there have been several discussions regarding equity during division meetings. Equity and narrowing equity gaps will continue to be a focus for chemistry faculty.



While a small equity gap is observed by gender, the gap was reversed last year so it is unclear where the equity gap is or if there is an equity gap between binary genders. There is no specific information about nonbinary students so no commentary can be offered about if we are addressing a possible equity gap. **Please ask the chancellor's office to add this to the CCCApply information so we can disaggregate gender data more thoroughly.**



There is an equity gap with first generation students. These students would benefit from additional onboarding and orientation, including demystifying how to succeed in college-level STEM courses, as well as events that introduce them to other students in the department/STEM AOS as well as the faculty and staff in the program.

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. **See Note**
- 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.*

Note: SLO assessment data has been entered into eLumen mostly according to the SLOA calendar. The frequency of data added satisfies the requirements for entering data into eLumen but does not fully adhere to the calendar. Rather than updating the current calendar, the program faculty will wait until the comprehensive review next year to develop a new 5-year assessment calendar.

While changes have been made in courses has a result of student learning outcome data analysis, no program-level changes have been made.

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.*

- G. New or modified plans for achieving program-learning outcomes
- H. Anticipated changes in curriculum, scheduling or delivery modality
- I. Levels, delivery or types of services
- J. Facilities changes
- K. Staffing projections
- L. Other

A

During the comprehensive review next year, program faculty will review student learning and program learning outcomes for all courses and programs, respectively. If any updates occur, the mapping of the SLOs to the PLOs will be updated in eLumen.

C

It is challenging to forecast the level of service that program faculty will be able to provide as we await approval for a full-time temporary faculty member for a sabbatical replacement. An estimated decrease of 35 FTES is anticipated if the full-time temporary faculty member is not approved.

D

Despite numerous roofing repairs completed over the last few years on the 2100 building, most of the rooms on the chemistry side of the building, including several teaching laboratories, the chemical storage room, and the chemistry prep room have been experiencing leaking from the ceilings. It is the hope of program faculty that this leaking is addressed soon (the laboratory techs have been in regular contact with facilities regarding these issues).

E

Program faculty are currently seeking approval for a full-time temporary faculty member to cover a sabbatical replacement in order to support students in general chemistry courses.

F

To promote student belonging in the chemistry program and STEM AOS, the physical science division will be offering periodic mixer events with other STEM students, faculty, and staff. The first mixer in the Spring semester was very well attended. Additionally the STEM club has been reactivated in an effort to regenerate camaraderie between STEM students and student engagement in outreach.

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		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Demand (Fill Rate)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Efficiency (FTES/FTEF)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success – Course Completion		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success — Course Modality		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Degrees and Certificates Awarded		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> 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.

2023 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2023

PROGRAM: EARTH AND OCEAN SCIENCE

CLUSTER: PHYSICAL SCIENCE

LAST YEAR CPPR COMPLETED: 2022

NEXT SCHEDULED CPPR:

CURRENT DATE: 2/20/23 [Click here to enter a date.](#)

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 ([download from this 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 degrees and/or certificates:

Earth and Ocean Sciences (EOS) including:

- Geology AS/ AST (GIS Certificate Program is included within the Geology data)
- Environmental Science AST

GENERAL PROGRAM UPDATE

Describe significant changes, if any, to program mission, purpose or direction. *If there are not any, indicate: NONE.*

With COVID-19 restrictions lifted, the Geology department is looking to increase the field course offerings to at least one field course per semester. Curriculum has been approved for two new field courses (GEOL 229C and GEOL 229D) that will increase the variety of field course offerings. The first field trip since Fall 2019 is set to run in spring 2023 with 13 students enrolled on the trip to Death Valley and the Western Sierras (GEOL 229B).

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.

O. [General Enrollment \(Insert Aggregated Data Chart\)](#)

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

ALL

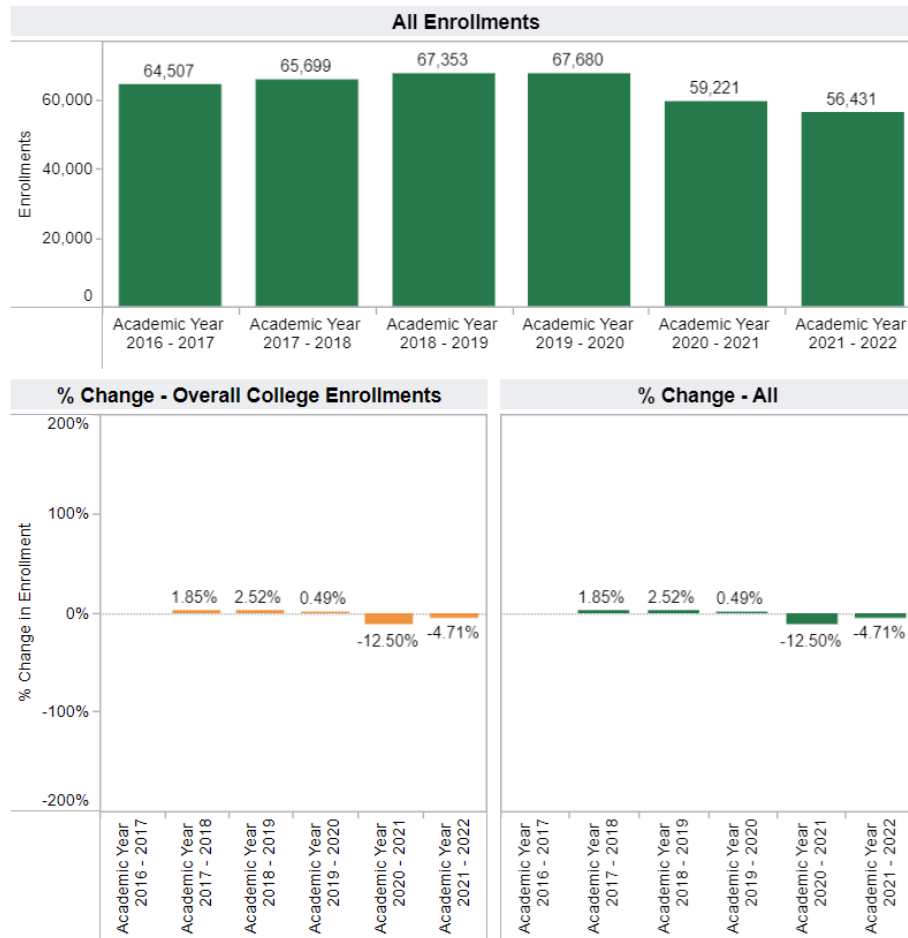


Figure A1: Enrollment numbers for all students at the college (top) and % change in enrollment numbers of all students (bottom).

EOS (Earth and Ocean Sciences), including Geology, Oceanography, and Environmental Science



Figure A2: Enrollment numbers for all students in EOS courses (top) and % change in enrollment numbers of all students in yellow and % change in enrollment numbers of EOS students in green (bottom).

Environmental Science (ENVS)

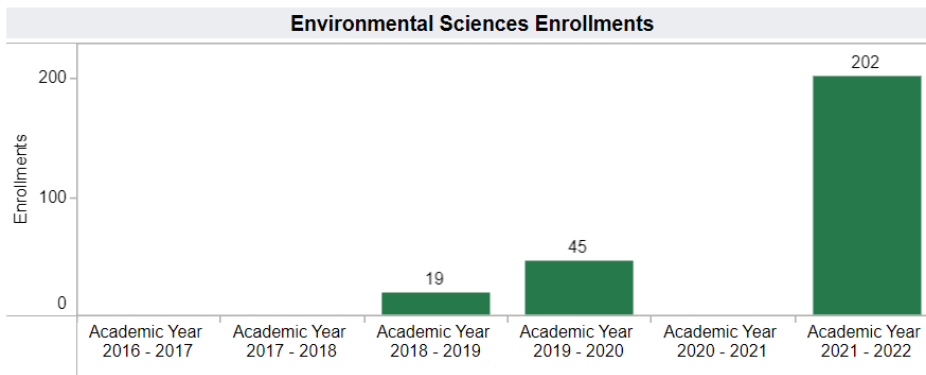


Figure A3: Enrollment numbers for all students in Environmental Science courses.

Geology (GEOL)

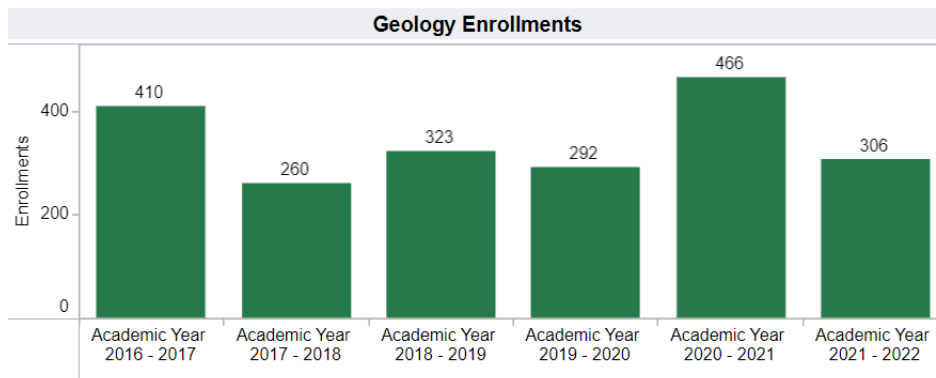


Figure A4: Enrollment numbers for all students in Geology courses.

Oceanography (OCEN)

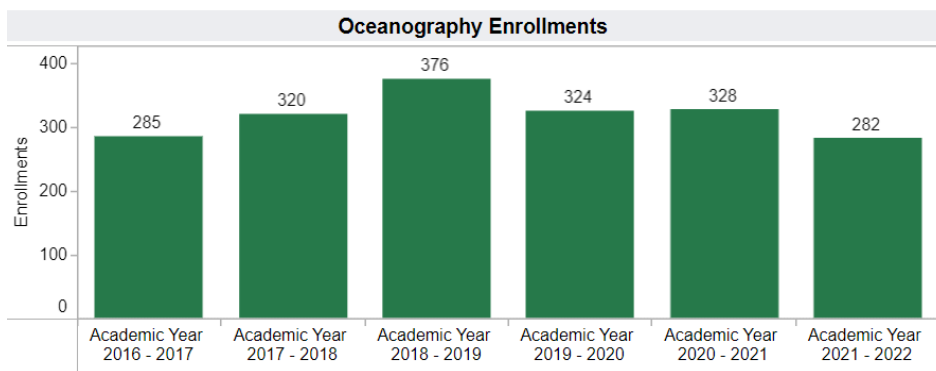


Figure A5: Enrollment numbers for all students in Oceanography courses.

In total, EOS courses are doing well compared to the entire college. There is a slight dip in overall enrollment numbers in the 20-21 and 21-22 years that is consistent with overall decrease in enrollment seen across the college due to the COVID-19 pandemic.

The availability of the ENVS 200 course may have contributed to the drop in Oceanography enrollment in the 21-22 school year. Both of these courses are commonly chosen as a GE course, and may compete with each other for enrollment.

P. [General Student Demand \(Fill Rate\) \(Insert Aggregated Data Chart\)](#)

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

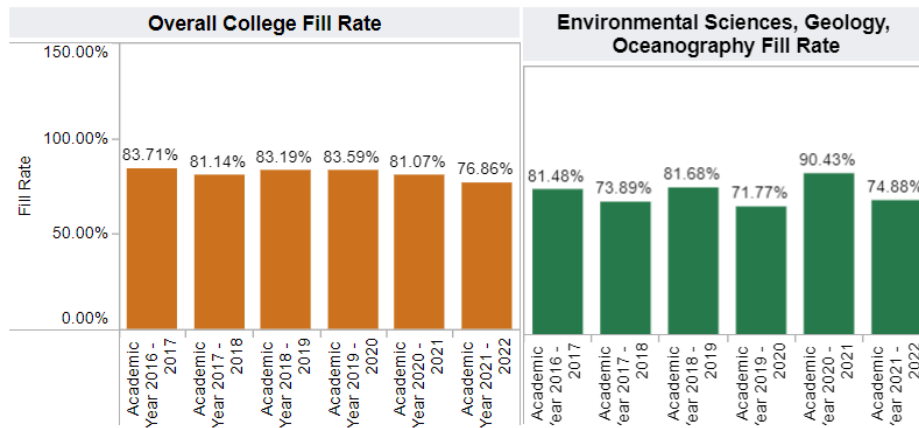


Figure B1: Course fill rate for entire college (orange) and for EOS courses only (green).

Fill rates dropped in EOS courses in the 21-22 year. The number of courses offered increased due to the hiring of a new full-time professor and an emphasis put on conserving part-time load. Courses were run with very low enrollment as allowed by the deans in order to conserve load amounts. The drop in fill rates across EOS courses w anticipated to be higher than the campus-wide decrease in fill rates.

Fill rates are anticipated to increase starting in the 22-23 school year as scheduling was completed with fill rates in mind. No courses had to be cut due to low enrollment in Fall of 2022.

Q. [General Efficiency \(FTES/FTEF\) \(Insert Aggregated Data Chart\)](#)

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

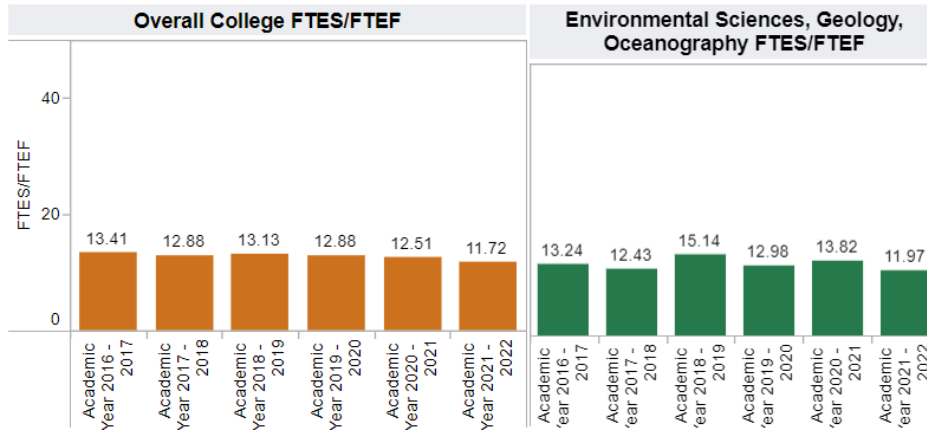


Figure C1: Efficiency of the college (orange) and of EOS courses only (green).

The FTES for EOS courses is only slightly higher than the FTES of the entire college. The trends across the last 6 years are similar between EOS and the entire college.

R. [Student Success—Course Completion by Modality \(Insert Data Chart\)](#)

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

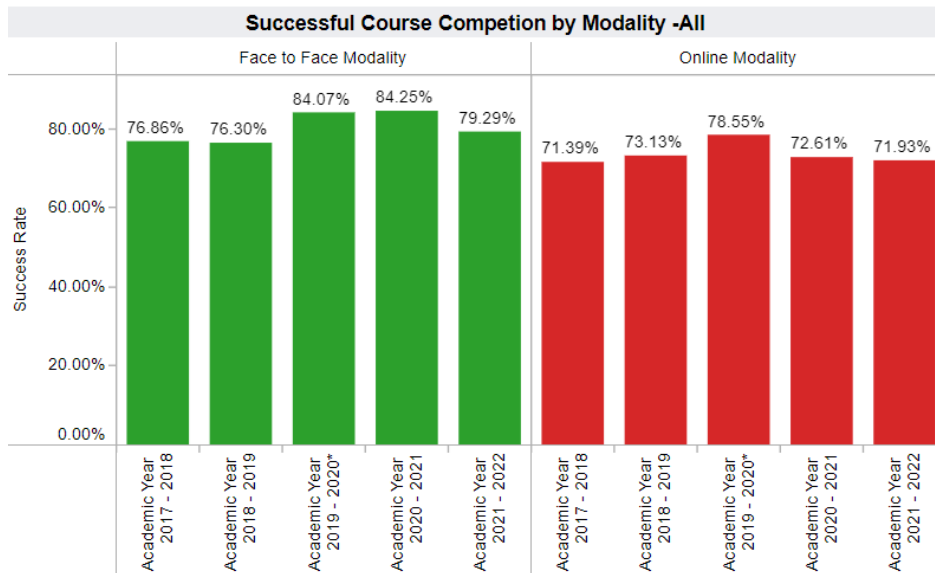
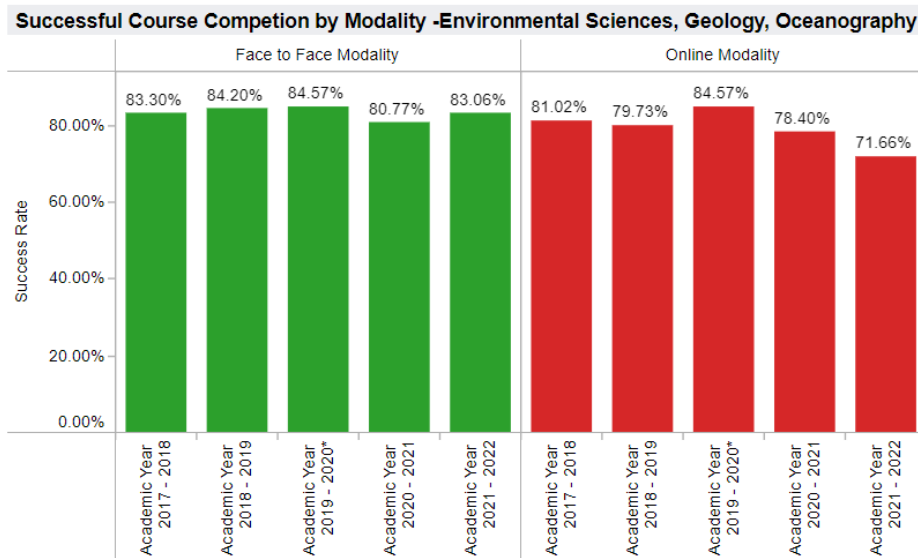


Figure D1: Success rate by modality of the entire college



Successful Course Competition by Modality Table - Environmental Sciences, Geology, Oceanography

		Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Face to Face Modality	Department Success Rate	83.30%	84.20%	84.57%	80.77%	83.06%
	Total Department Enrollments	444.0	596.0	501.0	26.0	242.0
Online Modality	Department Success Rate	81.02%	79.73%	84.57%	78.40%	71.66%
	Total Department Enrollments	137.0	149.0	164.0	768.0	549.0

Figure D2: Success rate by modality of EOS courses only

The number of students enrolled in online courses increased dramatically in the 20-21 and 21-22 due to the COVID-19 pandemic. In person offerings and enrollments were very low compared to past years. This makes the in-person data difficult to conclude on. With a return to more face-to-face course offerings, EOS success rates are anticipated to meet or exceed the overall college rates moving forward.

Online success in EOS courses reflects the success of all online courses at the college well. Faculty in this department transitioned to the online modality with interactive and engaging curriculum, especially with lab courses, for the 20-21 and 21-22 school years. Lab courses in EOS are back to being offered only in-person this year (22-23) and we are offering only 3 online lecture courses. One DE geology course, one DE oceanography course, and one DE late start 9-week course. These courses are seeing high enrollment numbers.

S. [Degrees and Certificates Awarded \(Insert Data Chart\)](#)

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

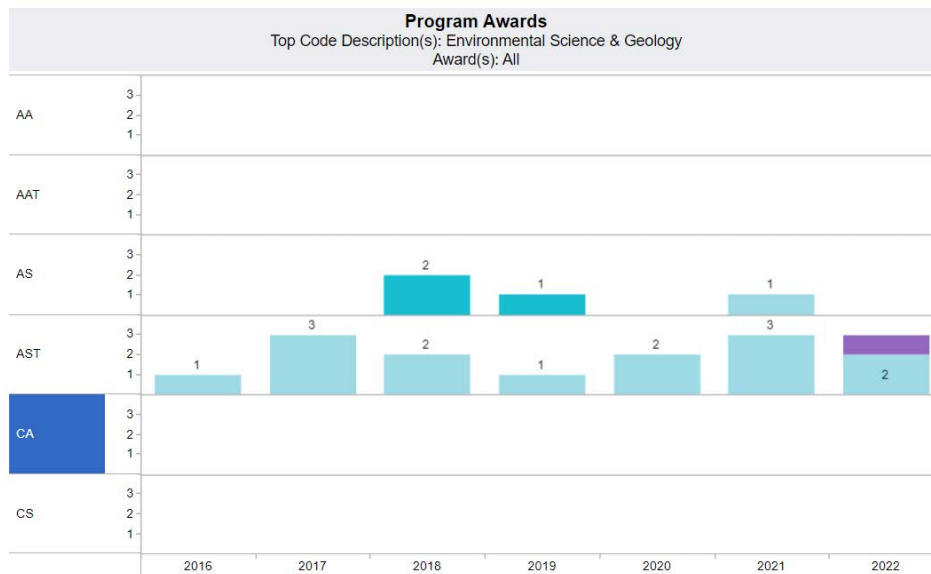


Figure E1: Degrees awarded in Geology (blue) and Environmental Science (purple)

This data shows that only one student completed an AST in Environmental Science in 2022 and 2 students completed an AST in Geology. The number of students in the Geology AST or AS degree is comparable to the very low numbers completing these degrees in past years.

Spring 2023 is the first year that a field course (GEOL 229) will be offered since fall 2019. Completion of this field course is required for the AS degree in Geology.

As more data on the Environmental Science program of study is collected and added into this database, we expect to have more to conclude on in future annual reviews.

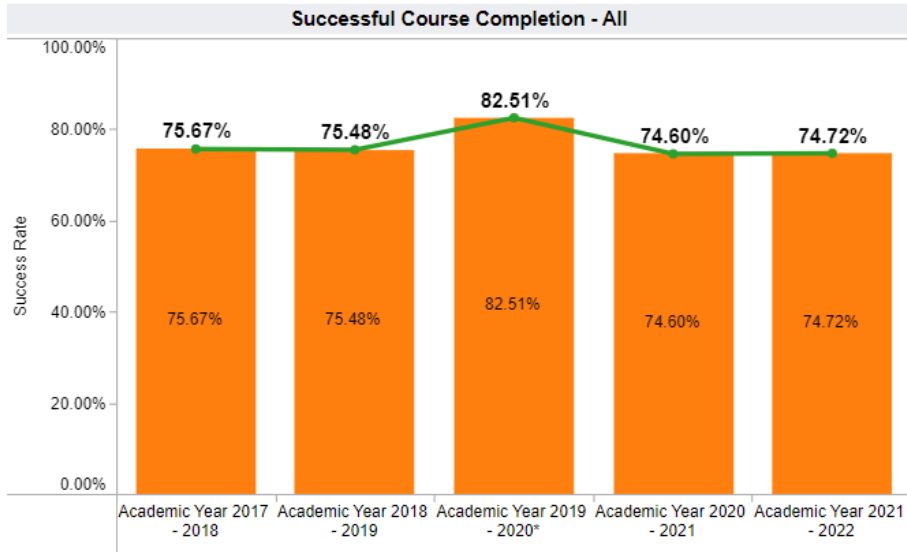
T. [General Student Success – Course Completion \(Insert Aggregated Data Chart\)](#)

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

SLOCCCD Program Review Data: Successful Course Completion

Select Department: (All) TERM: (All) Measure Names: Department Success Rate, Overall College Success ...

COURSE: (All)



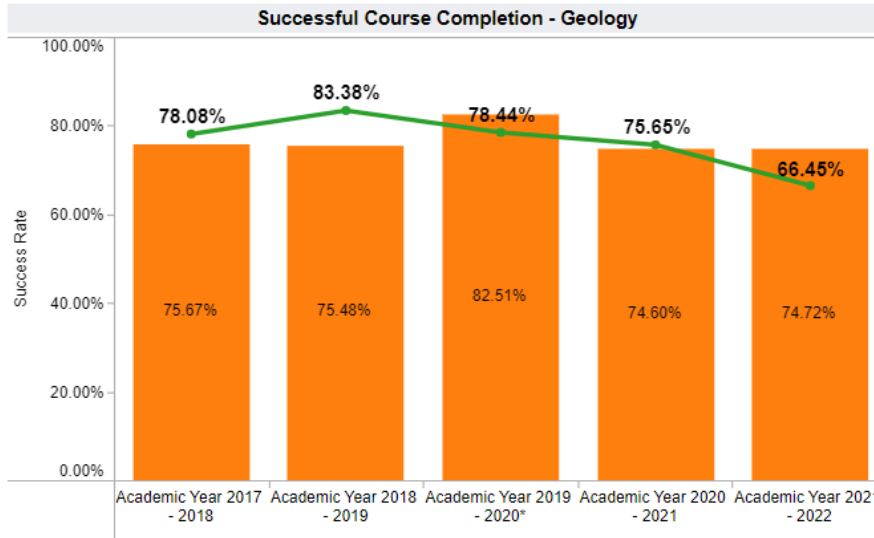
	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Department Success..	75.67%	75.48%	82.51%	74.60%	74.72%
Total Enrollments	65,897	67,718	68,852	60,205	57,057

Figure F1: Course completion across entire college

SLOCCCD Program Review Data: Successful Course Completion

Select Department: TERM: Measure Names: Department Success Rate, Overall College Success ...

COURSE:



	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*	Academic Year 2020 - 2021	Academic Year 2021 - 2022
Department Success..	78.08%	83.38%	78.44%	75.65%	66.45%
Total Enrollments	261	350	296	466	307

Figure F2: Course completion in Geology

SLOCCCD Program Review Data: Successful Course Completion

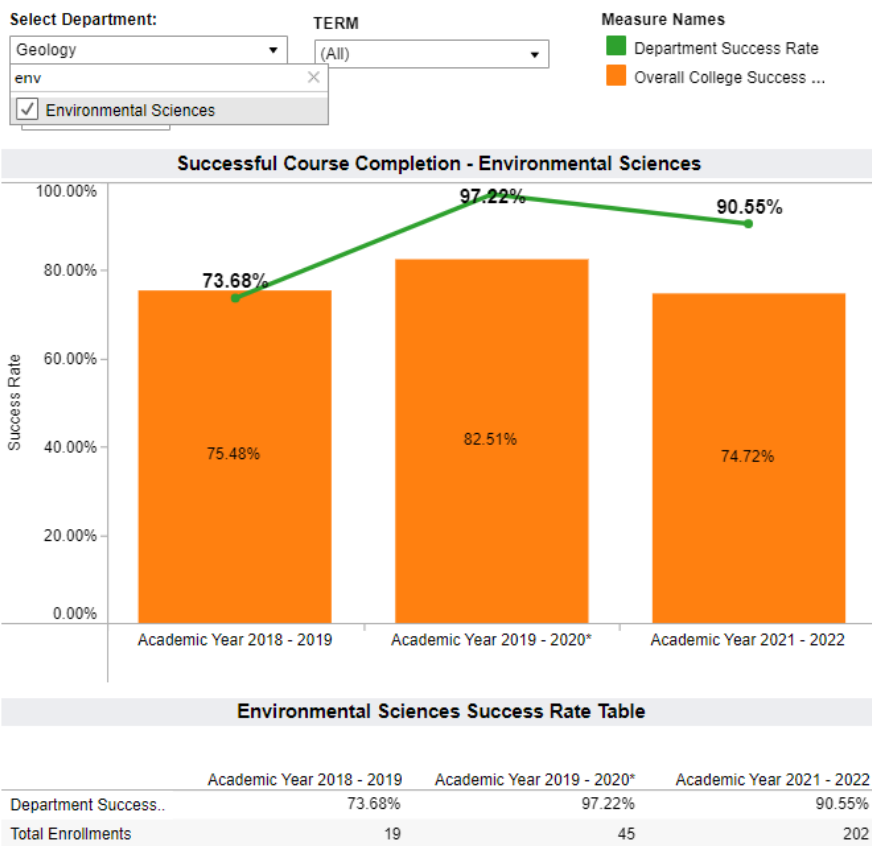


Figure F3: Course completion in Environmental Science

Course completion rates are very high for Environmental Science courses – there is only one class included in this program, ENVS200.

Course completion rates have dropped for Geology courses, since previous years to a rate that is below the average for the college. It is anticipated the success rates will increase closer to college-wide rates as courses have shifted back to pre-Covid modalities.

- U. 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?

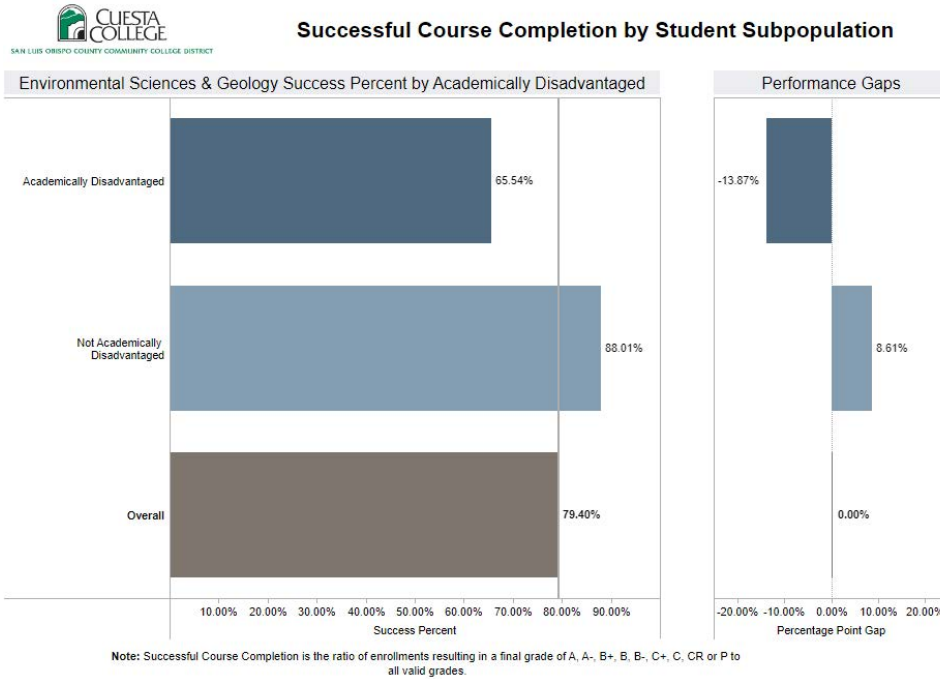


Figure G1: Course completion by academically disadvantaged vs not academically disadvantaged.

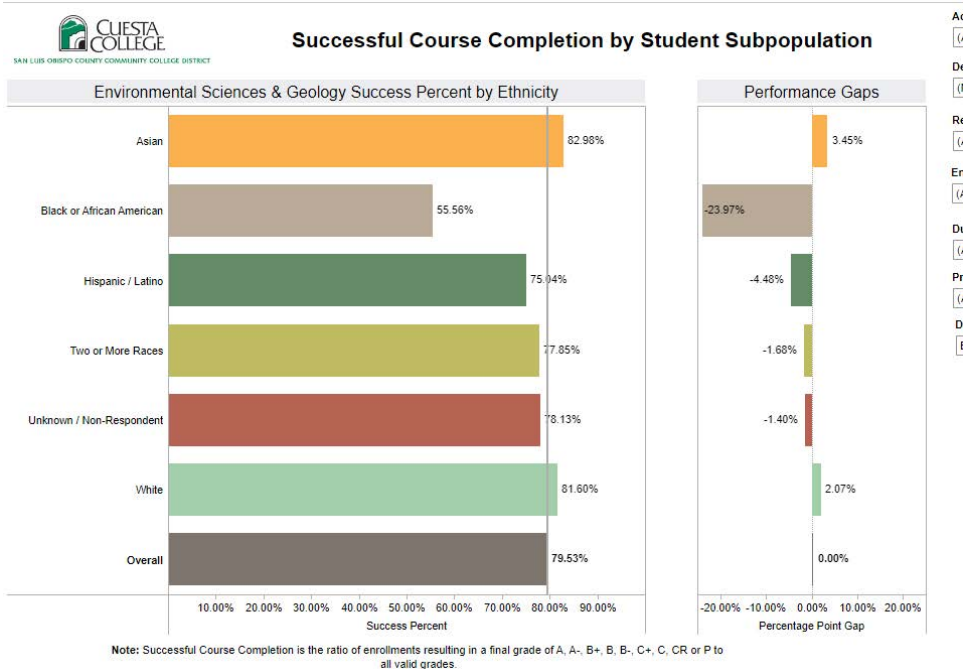


Figure G2: Course completion by ethnicity.

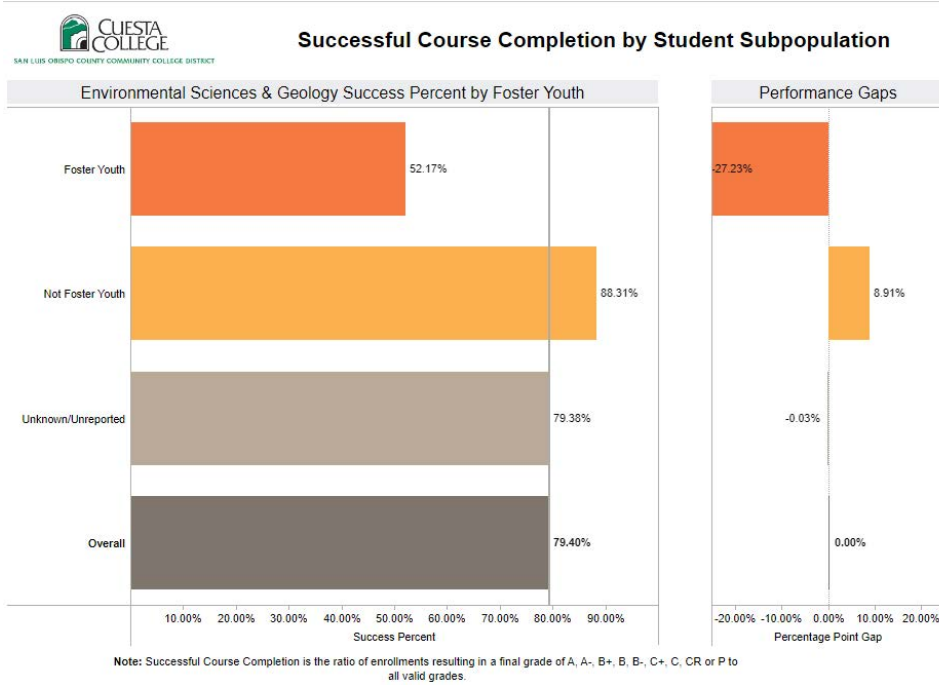


Figure G3: Course completion by Foster Youth

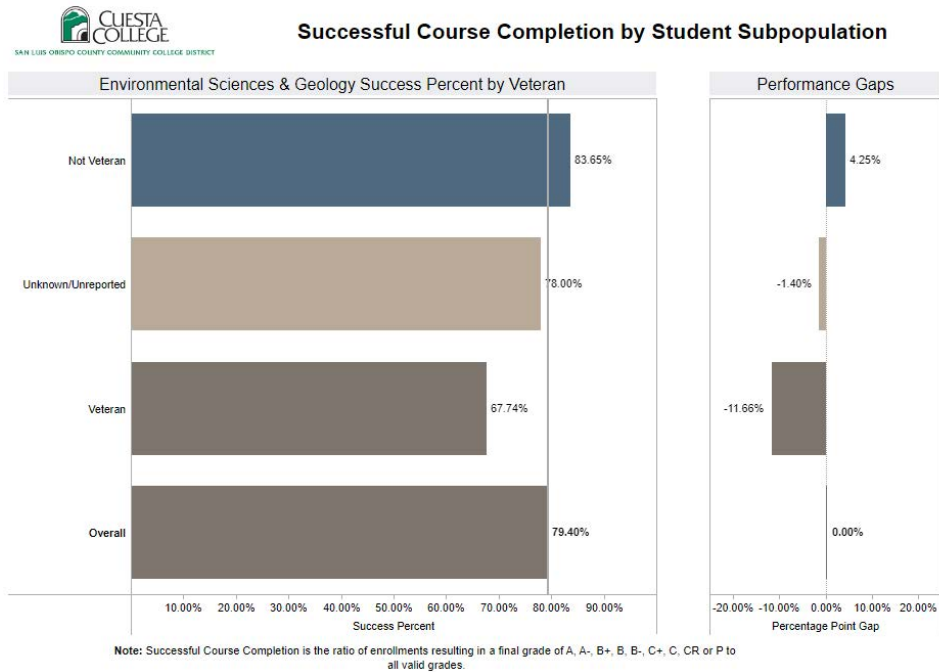


Figure G4: Course completion by veteran status.

The 4 graphs above show the largest inequalities by sub population.

Both full-time faculty member Emily Kane and part-time faculty member Jennifer Shellhorn completed the JEDI Academy offered by the college in Summer 2022. We are pleased that the faculty teaching the most of EOS available load have chosen to complete this equity-focused professional development academy.

The equity gaps in academically disadvantaged students vs not academically disadvantaged students have been larger for the 20-21 and 21-22 school years. This is not unexpected given the switch to fully remote courses for most offerings due to the COVID-19 pandemic.

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.*

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.*

- M. New or modified plans for achieving program-learning outcomes - NONE
- N. Anticipated changes in curriculum, scheduling or delivery modality - The newer faculty within the EOS department are working their way through the curriculum of each class that is offered and editing where necessary to ensure the COR reflects how the courses will be taught. This update of outdated COR documents will continue through the next few semesters.
- O. Levels, delivery or types of services - New opportunities for Environmental Science Dual Enrollment courses are in discussion that could add to faculty load availability within the EOS department. EOS is running its first field course this Spring 2023 semester to Death Valley. The goal for the next year

is to offer at least one field trip opportunity each semester. EOS faculty will work on the planning of the two new Field Courses (GEOL 229C and 229D) over summer of 2023 with the goal of offering one of these new field trips in the coming two years.

- P. Facilities changes – Room 2108 was transitioned into a lab-only space due to the fact it is not designed as a lecture classroom. This allows ease of lab scheduling in 2108 and the ability to offer student success hours in the lab room.
- Q. Staffing projections
- R. Other – The EOS courses would benefit from more interactive equipment for student engagement and hands-on experiences. Faculty are aiming to budget for a stream table and a wave table to accompany the augmented reality sand table. EOS courses is in the process of acquiring a 36” plotter printer. EOS is also looking into refining field equipment for lower costs to students in the field courses.

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		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Demand (Fill Rate)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Efficiency (FTES/FTEF)		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success – Course Completion		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Student Success — Course Modality		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> Implemented	Select one
Degrees and Certificates Awarded		<input type="checkbox"/> Identified <input type="checkbox"/> Resources Allocated <input type="checkbox"/> 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.