Physical Sciences

Annual Program Planning Report

Astronomy
Chemistry
Earth and Ocean Sciences
Physics

Academic Year 2020-2021

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2021 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2020-2021 **PROGRAM: ASTRONOMY**
CLUSTER: MATH & SCIENCES **LAST YEAR CPPR COMPLETED: 2018-2019**
NEXT SCHEDULED CPPR: 2023-2024 **CURRENT DATE: 2/7/2021**

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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- 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:
N/A.

GENERAL PROGRAM UPDATE

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

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.

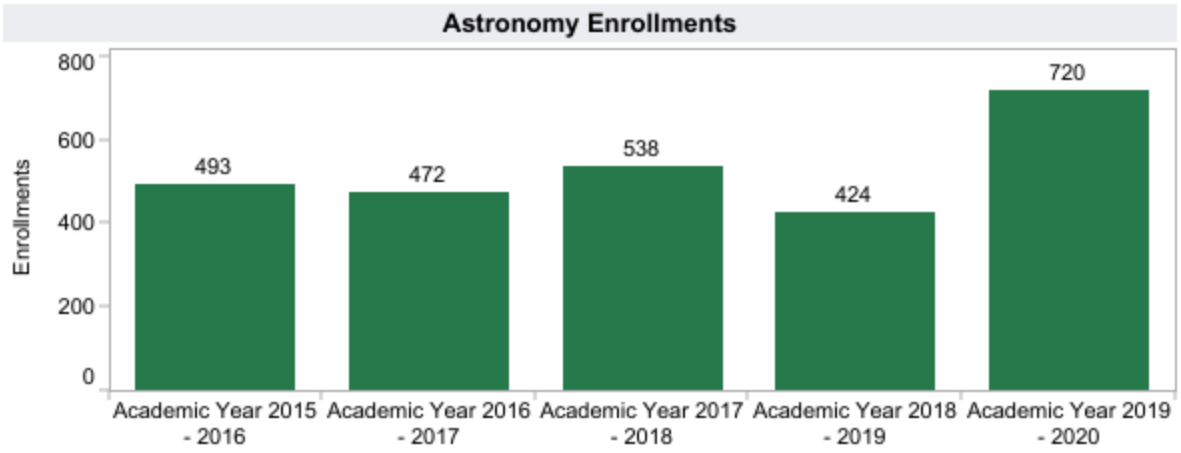
If you selected yes, please complete the Program Sustainability Plan Progress Report below after you complete the Data Analysis section. That data collection and analysis will help you to update, if necessary, your Program Sustainability Plan.

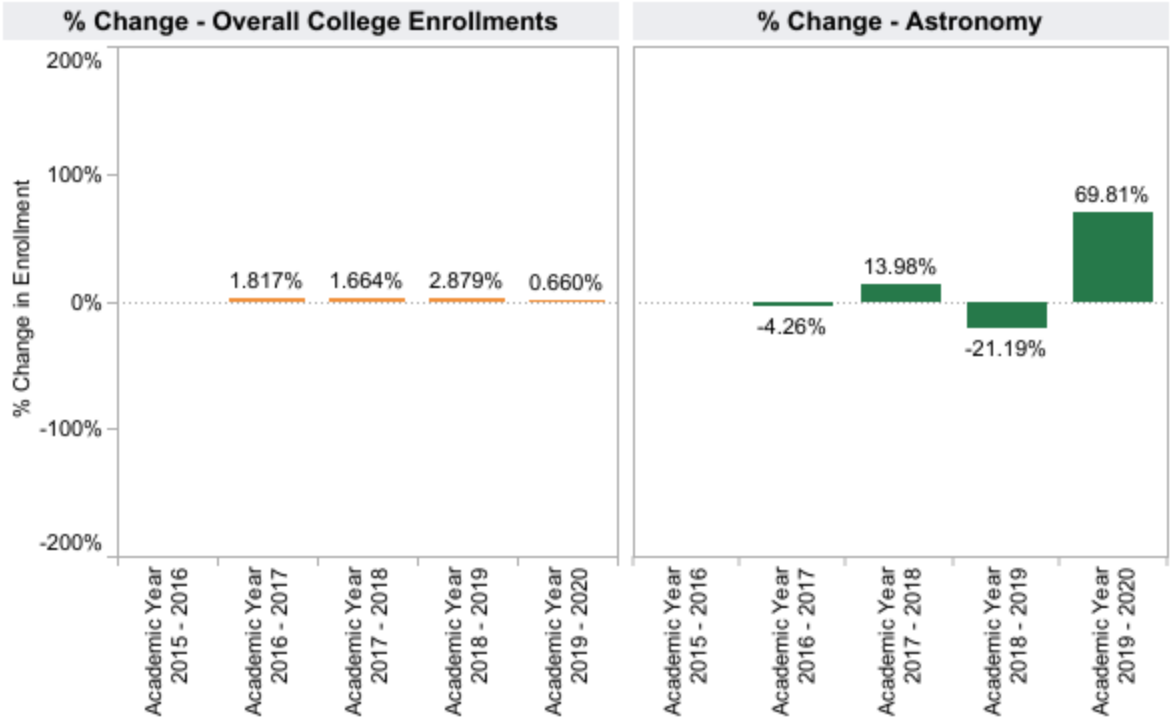
DATA ANALYSIS AND PROGRAM-SPECIFIC MEASUREMENTS

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.
General Enrollment (Insert Aggregated Data Chart)

SLOCCCD Program Review Data - Enrollment

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

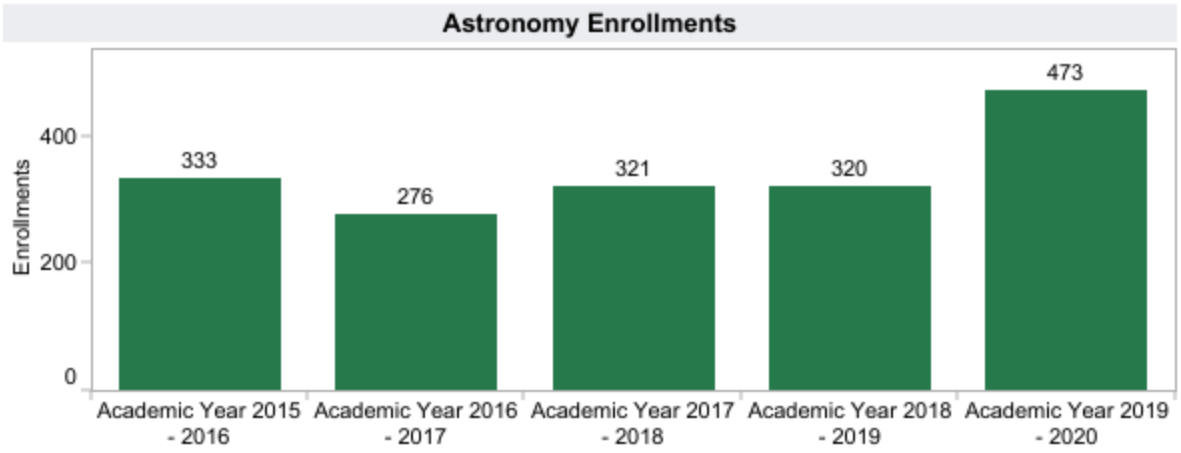


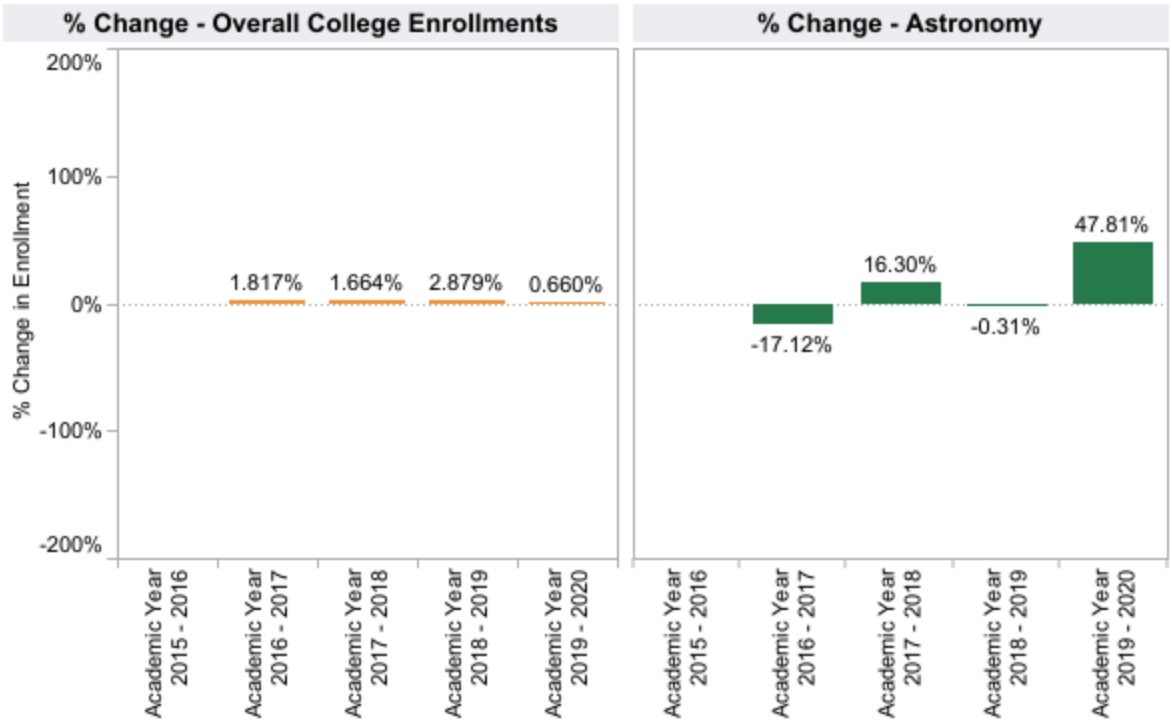


Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

SLOCCCD Program Review Data - Enrollment

Department:	Course:	Dual Enrollment:	Prison:
Astronomy	ASTR 210	All	All

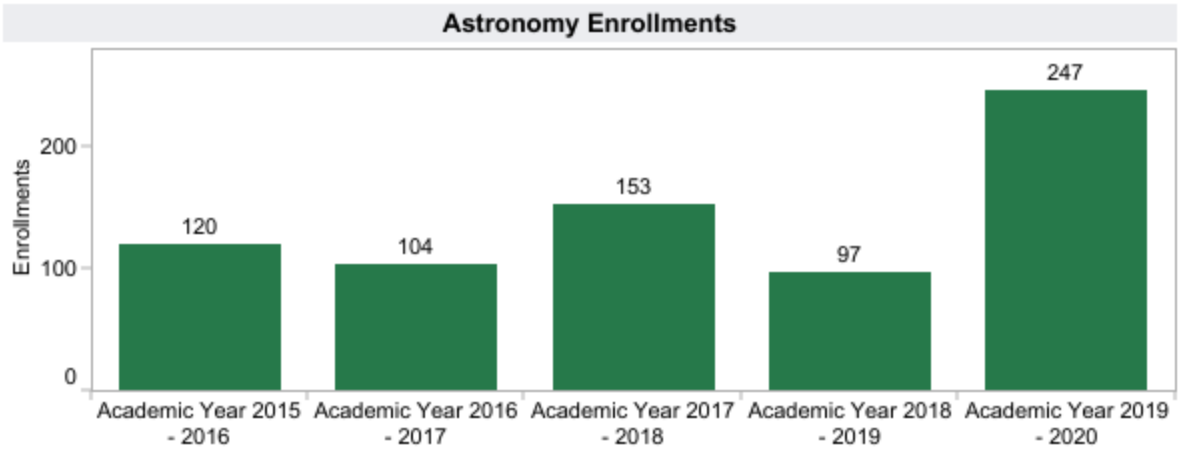


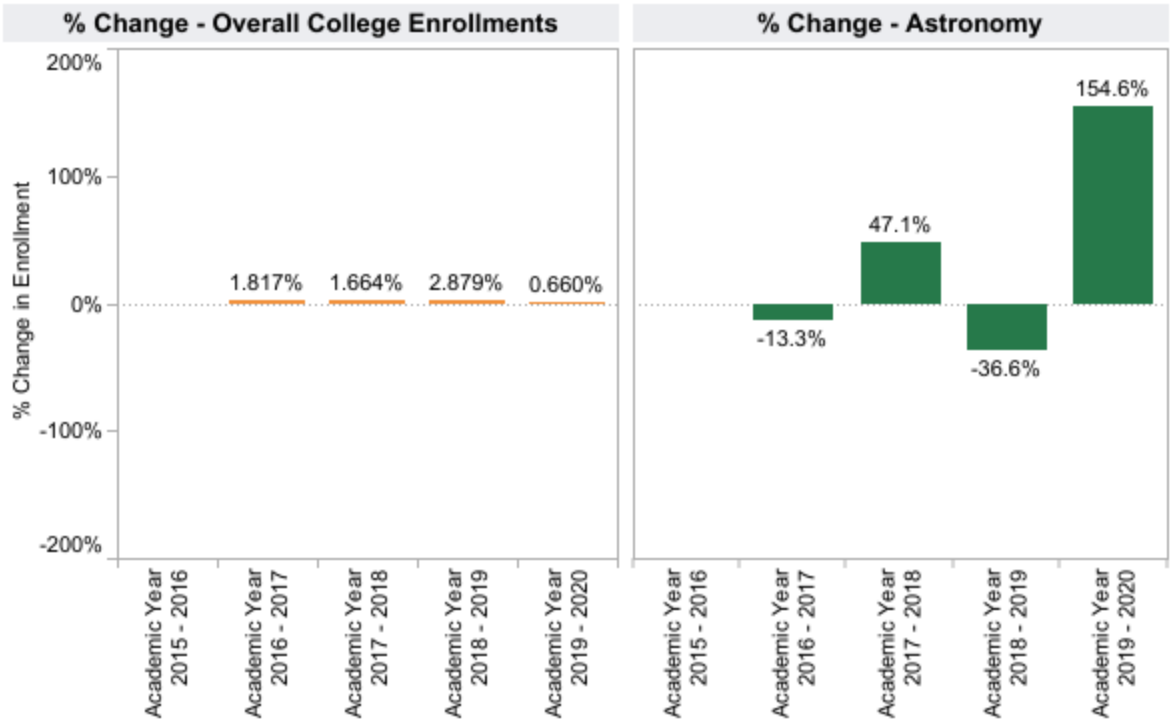


Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

SLOCCCD Program Review Data - Enrollment

Department:	Course:	Dual Enrollment:	Prison:
Astronomy	ASTR 210L	All	All

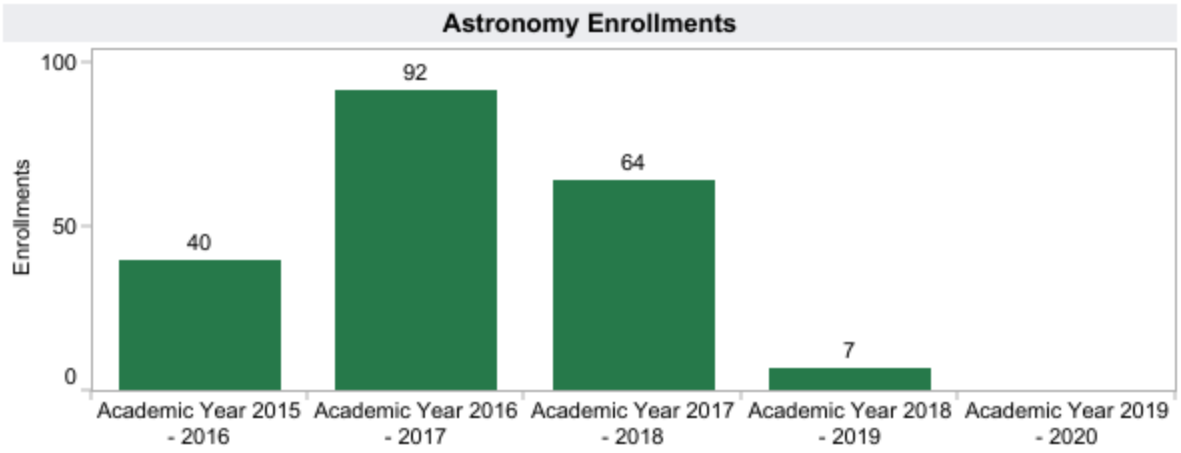


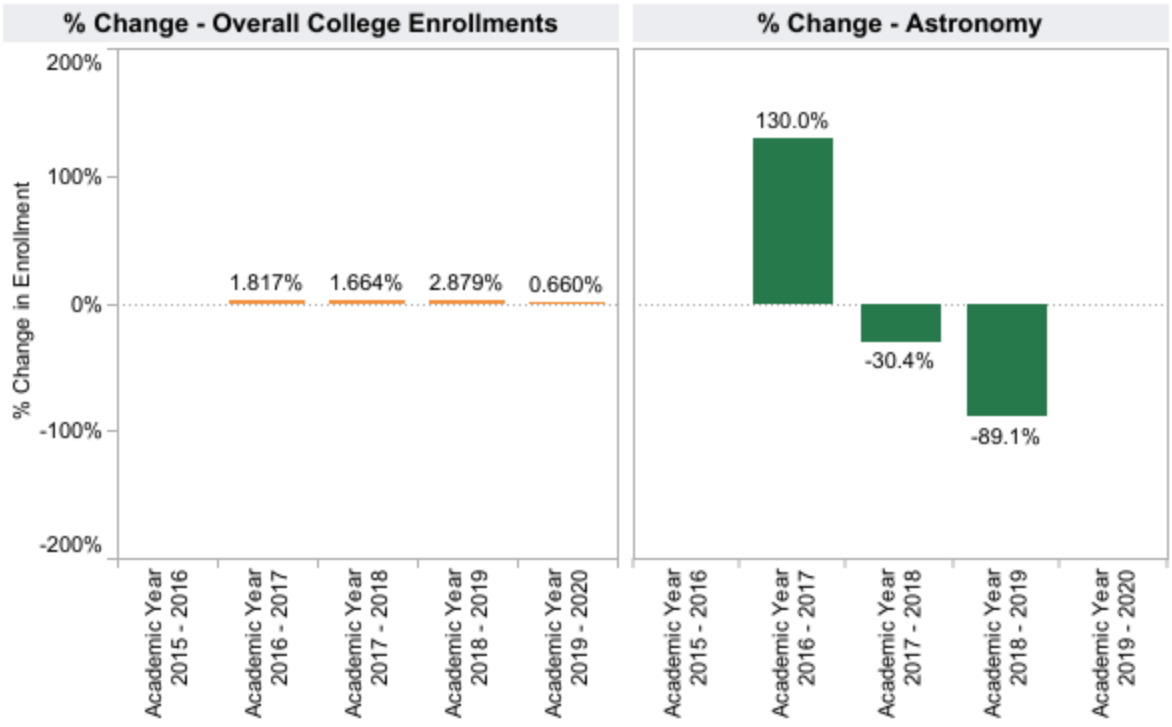


Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

SLOCCCD Program Review Data - Enrollment

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



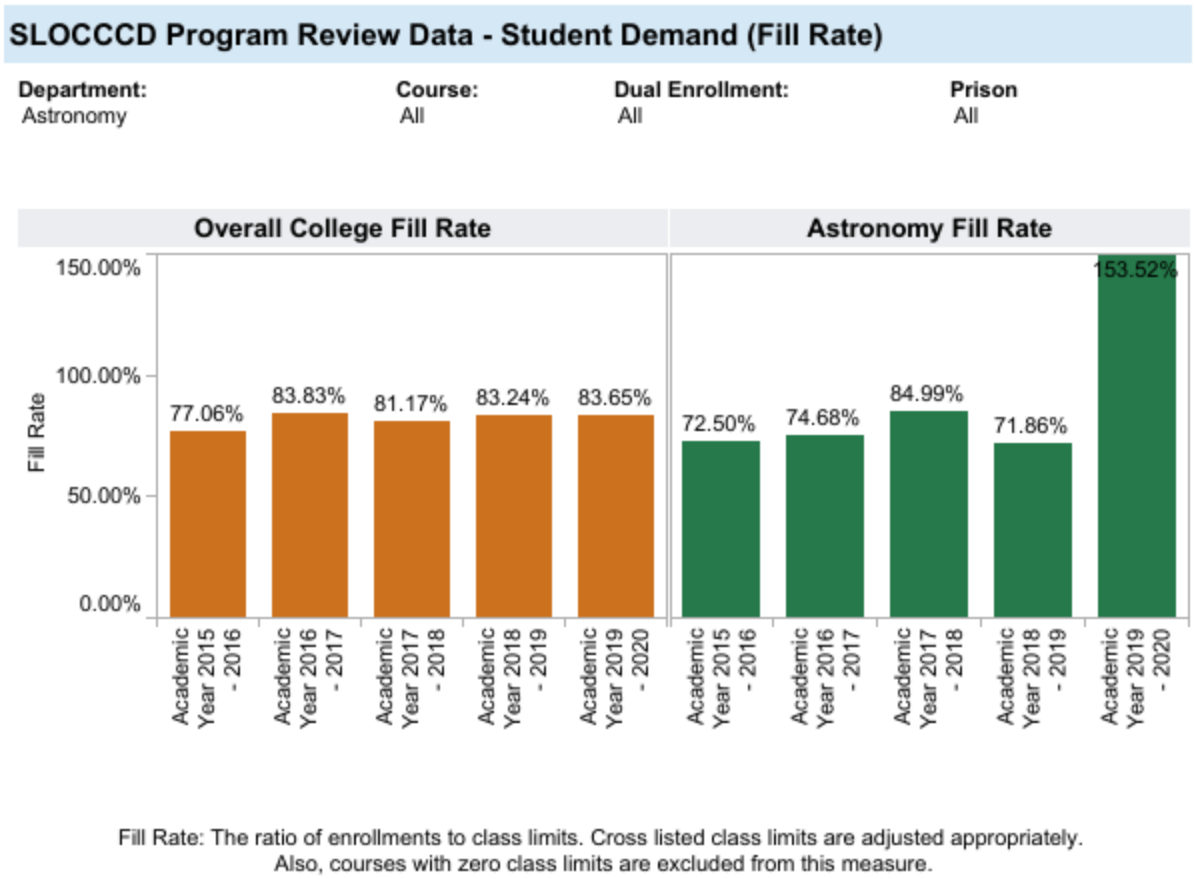


Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

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. In previous years, positive and negative

change fluctuations occurred in ASTR 210L enrollments due to a high degree of variability in NC campus section enrollment (which is only offered once a year, in the fall semester). 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 is due to it no longer being offered from the lack of part-time faculty available to teach that course.

General Student Demand (Fill Rate) (Insert Aggregated Data Chart)



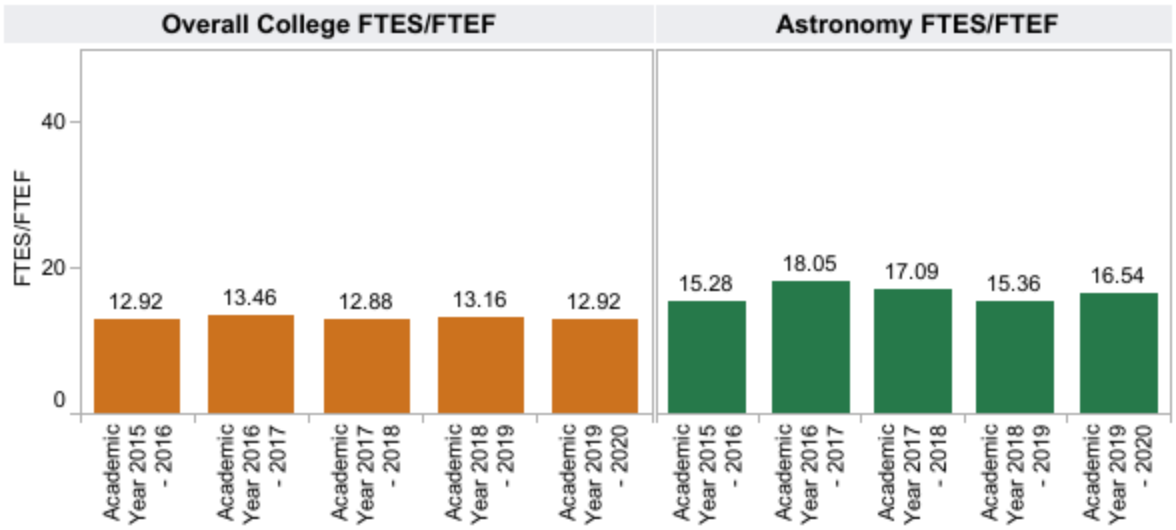
Fill Rate: The ratio of enrollments to class limits. Cross listed class limits are adjusted appropriately. Also, courses with zero class limits are excluded from this measure.

Overall, astronomy fill rates mirror the District's overall fill rate, with a marked increase in fill rate (153.52%) for 2019-2020.

General Efficiency (FTES/FTEF) (Insert Aggregated Data Chart)

SLOCCCD Program Review Data - Efficiency (FTES/FTEF)

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



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

The overall efficiency of astronomy courses is very high compared to the District efficiency over the past five-year history, due to large lectures of 45-60 students in each ASTR 210 lecture section, and many ASTR 210L lab sections being run at/or near capacity (24-28 students). Student Success—Course Completion by Modality (Insert Data Chart)

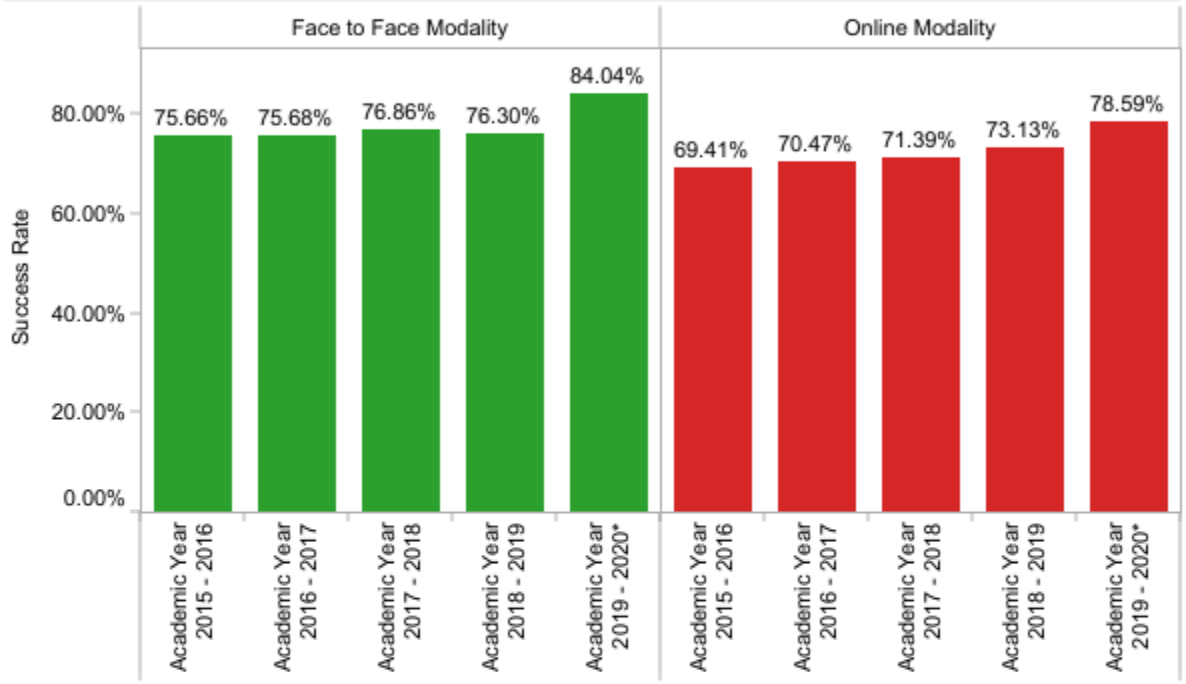
SLOCCCD Program Review Data: Successful Course Completion

Select Department:
All

Course:
All

Legend:
Face to Face Modality
Online Modality

Successful Course Competion by Modality -All



Successful Course Competion by Modality Table - All

		Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	75.66%	75.68%	76.86%	76.30%	84.04%
	Total Department Enrollments	52,399	53,120	53,586	52,830	51,883
Online Modality	Department Success Rate	69.41%	70.47%	71.39%	73.13%	78.59%
	Total Department Enrollments	9,950	10,438	12,311	14,888	16,965

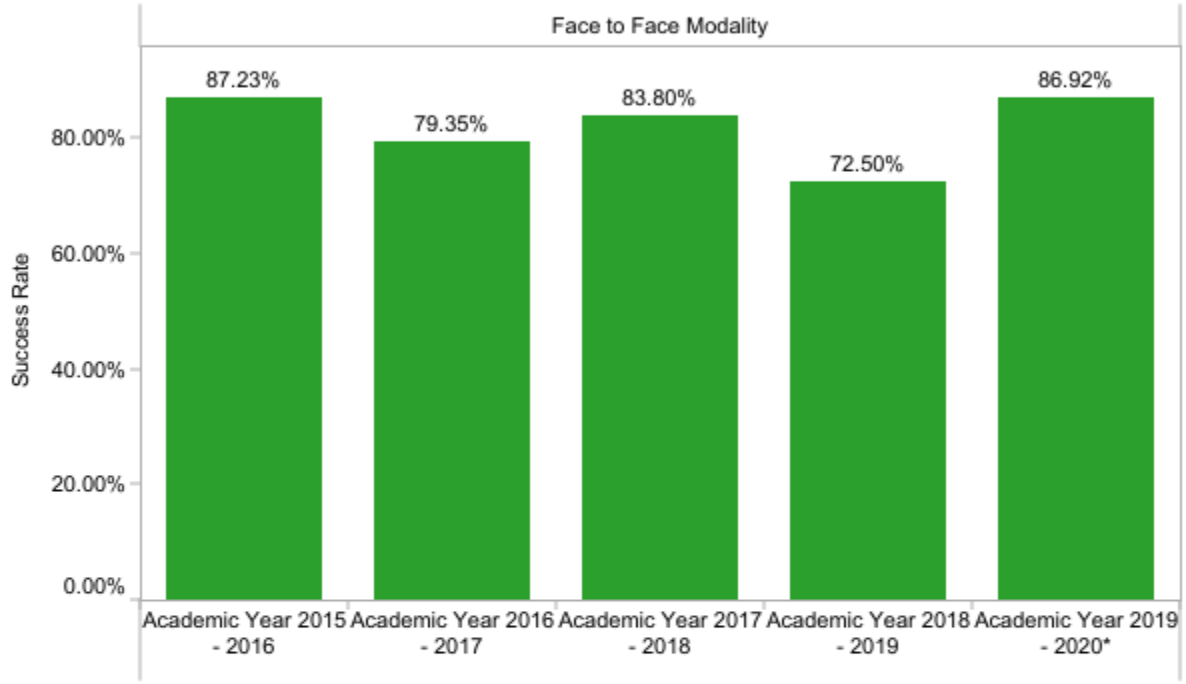
SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
ASTR210

Legend:
Face to Face Modality

Successful Course Competion by Modality -Astronomy



Successful Course Competion by Modality Table - Astronomy

		Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	87.53%	80.00%	86.50%	76.50%	90.20%
	Total Department Enrollments	449.0	380.0	474.0	418.0	725.0
Online Modality	Department Success Rate	82.50%	91.30%	73.44%	71.43%	
	Total Department Enrollments	40.0	92.0	64.0	7.0	

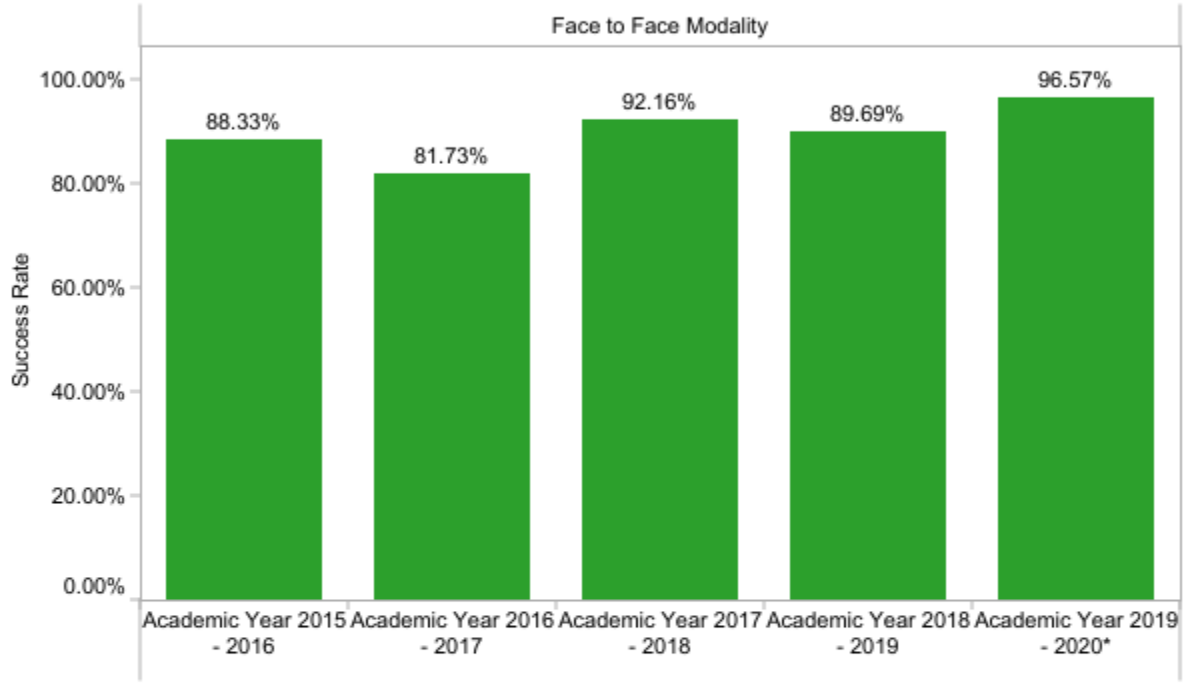
SLOCCCD Program Review Data: Successful Course Completion

Select Department:
Astronomy

Course:
ASTR210L

Legend:
Face to Face Modality

Successful Course Competion by Modality -Astronomy



Successful Course Competion by Modality Table - Astronomy

		Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	87.53%	80.00%	86.50%	76.50%	90.20%
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	Total Department Enrollments	40.0	92.0	64.0	7.0	

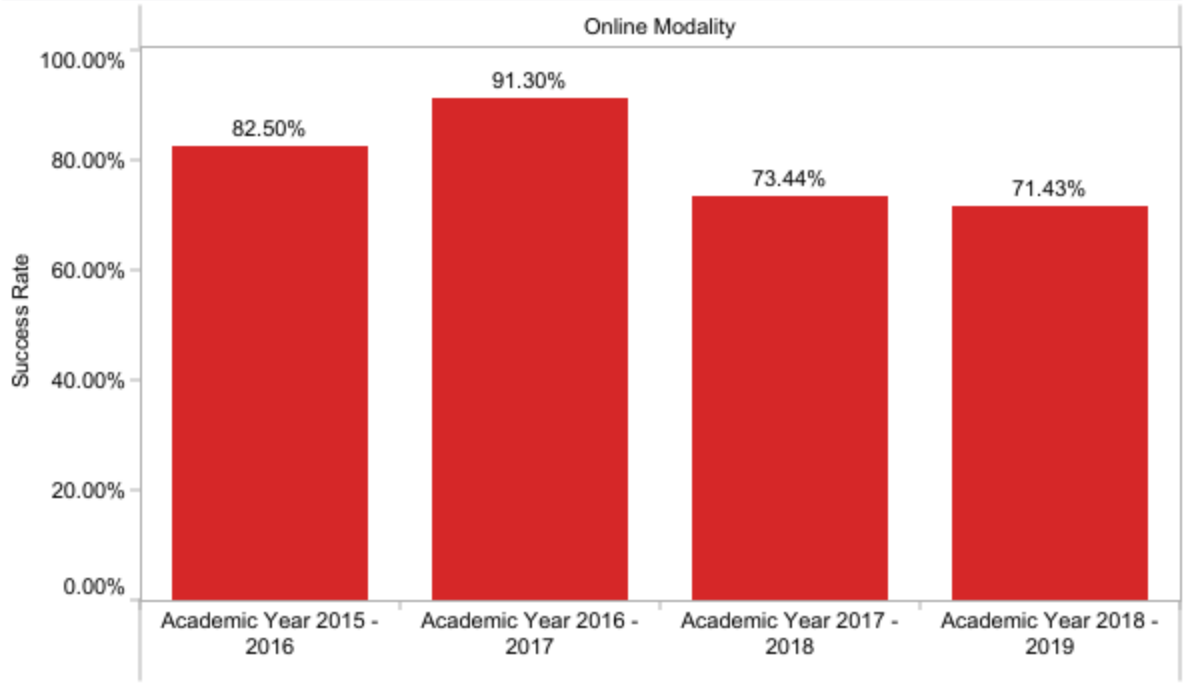
SLOCCCD Program Review Data: Successful Course Completion

Select Department: Astronomy

Course: ASTR299

Legend: Online Modality

Successful Course Competion by Modality -Astronomy



Successful Course Competion by Modality Table - Astronomy

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Online Modality	Department Success Rate	82.50%	91.30%	73.44%	71.43%	
	Total Department Enrollments	40.0	92.0	64.0	7.0	

Compared to the college as a whole, all astronomy courses have comparable successful course completion rates. ASTR 210 and ASTR 210L are only offered in the face-to-face (the only exception being the second half of the spring 2020 semester), while 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 courses.

Degrees and Certificates Awarded (Insert Data Chart)

(Not applicable; Cuesta College has no degree/certificate programs for astronomy.)

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

SLOCCCD Program Review Data: Successful Course Completion

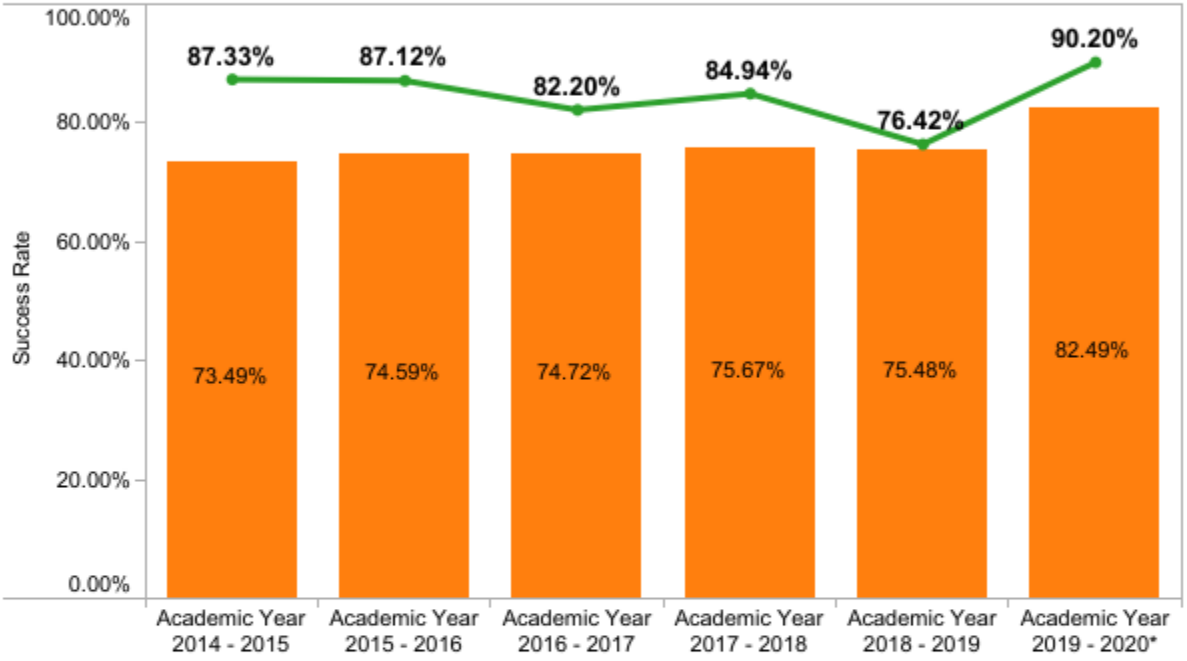
Select Department:
Astronomy

TERM_ID
All

COURSE
All

Measure Names
Department Success Rate
Overall College Success Rate

Successful Course Completion - Astronomy



Astronomy Success Rate Table

	Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Department Success..	87.12%	82.20%	84.94%	76.42%	90.20%
Total Enrollments	489	472	538	425	725

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

The student success rate in astronomy courses is higher than the college-wide rate.
[Disaggregated Student Success]
For both astronomy and all other Physical Sciences Division classes, there is a comparable slightly lower completion rate for DSPS students vs. non-DSPS ASTR students. However, the completion rate of both DSPS and non-DSPS ASTR students is slightly higher than other Physics Sciences Division classes.

Astronomy: 2014-2015 through 2019-2020

DSPS: 110 students (3.46% of overall), success rate = 81.48%

Not DSPS: 3,070 students (96.54% of overall), success rate = 85.40%

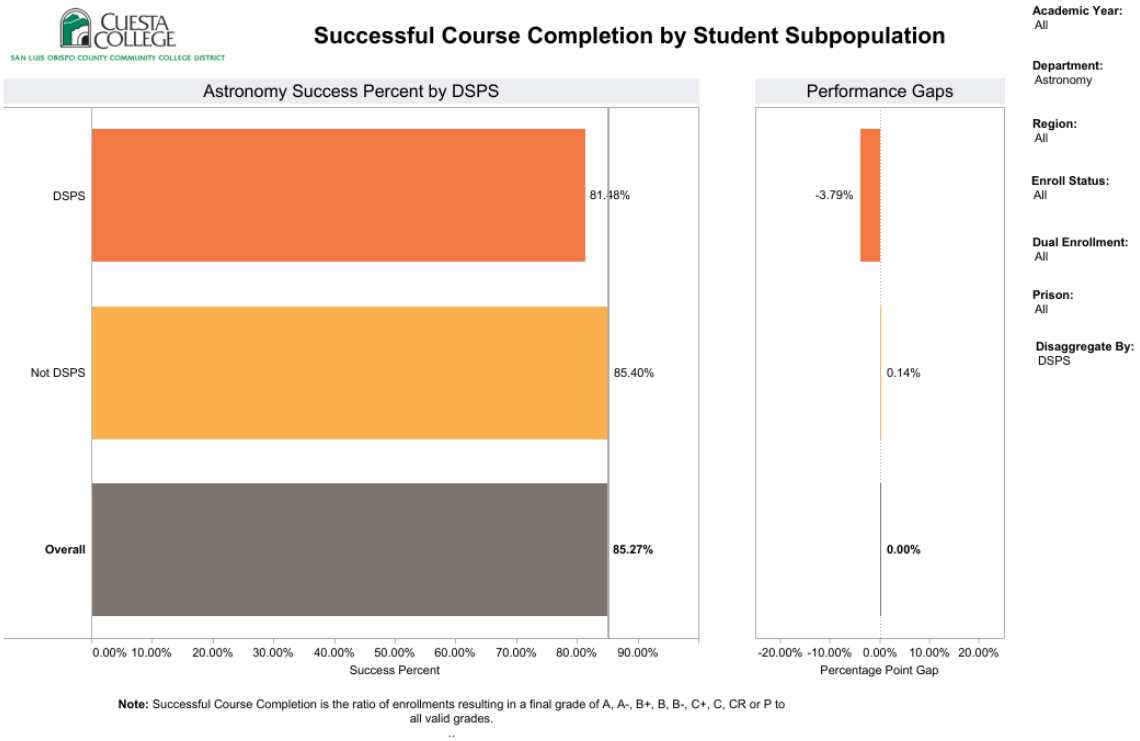
Overall: 3,180 students

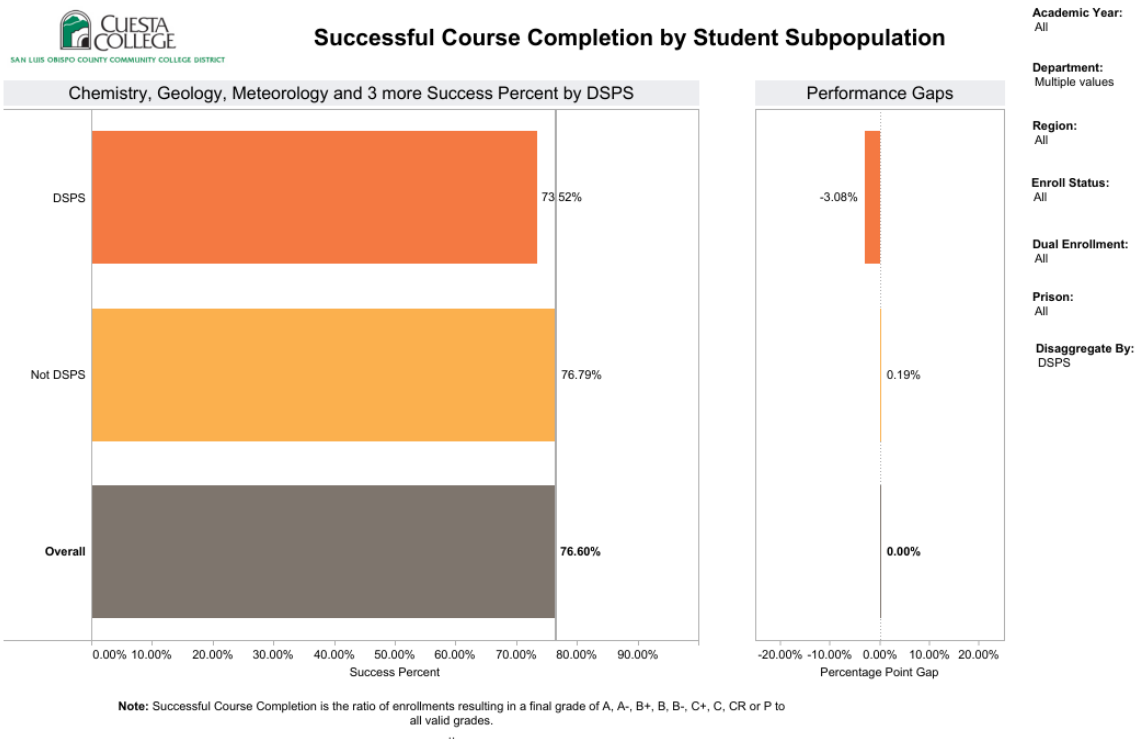
Chemistry, Geology, Meteorology, Oceanography, Physical Sciences, Physics: 2014-2015 through 2019-2020

DSPS: 849 students (5.78% of overall), success rate = 73.52%

Not DSPS: 13,847 students (94.22% of overal), success rate = 76.79%

Overall: 14,696 students





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.
(N/A)

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. Note that Astronomy is not a program; it is currently only two courses: ASTR 210 and ASTR 210L.)

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.*
D. Facilities Changes

During construction of the Student Services Building on the North County Campus, electricity and safe pedestrian access to the telescope shelter at the north side of campus was lost; ongoing efforts should being made to restore power and safe access, if funding is provided. In the meanwhile it is recommended that no public events be held at night at the telescope shelter, due to these safety concerns. If providing hard-wired electrification is not feasible, a portable battery power source and a transfer switch, with additional indoor and outdoor lighting should be installed in order for the telescope shelter to return to full functionality.

The 14" Meade reflector at the Bowen Observatory on top of the 2401/2402 science forum building is now 14 years old, and should be refurbished and realigned. There does not seem to be any local technician available to perform these tasks, so Cuesta faculty and/or volunteer members from the Central Coast Astronomical Society may need to be trained in order to do so. A technical assistant could be used to set up, run, and shut down the telescope during instructional time, such that students can view objects through the telescope during lecture, and to free up the instructor from preparing and running the telescope during lecture. A continuing problem is that the mechanism for opening and closing the slit doors for the dome continue to deteriorate, and this require constant repairs when parts fail.

If funding is provided, the addition of a second digital projector in the N2401 classroom would enable viewing of multiple screens of instruction, as is done in every other classroom where ASTR 210 and 210L has been or is currently offered (2609, 2401, 2402, 2101, 2105, 2108, N2409, N2439).

If funding is provided, the opening of a doorway between the chemistry and physics/astronomy labs in the N2400 building would facilitate direct access to cross-disciplinary equipment during labs.

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.

2021 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2021 **PROGRAM: CHEMISTRY**
CLUSTER: ARTS, HUMANITIES, MATH, & SCIENCES **LAST YEAR CPPR COMPLETED: 2019**
NEXT SCHEDULED CPPR: 2024 **CURRENT DATE: 2/24/2021**

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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:
AS-Chemistry, CA-Premedical Studies

GENERAL PROGRAM UPDATE

Describe significant changes, if any, to program mission, purpose or direction. *If there are not any, indicate: NONE.*
The only significant change is that many courses are being taught virtually due to COVID; this isn't a permanent change to the program. The official name of CHEM 210FL has changed to CHEM 200.

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

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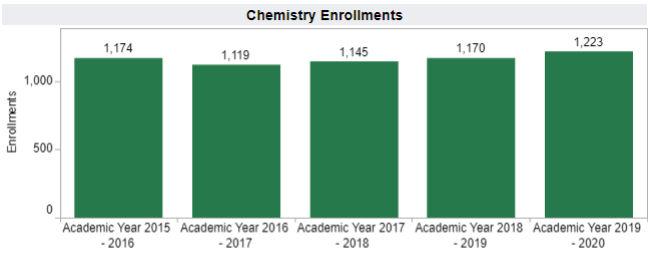
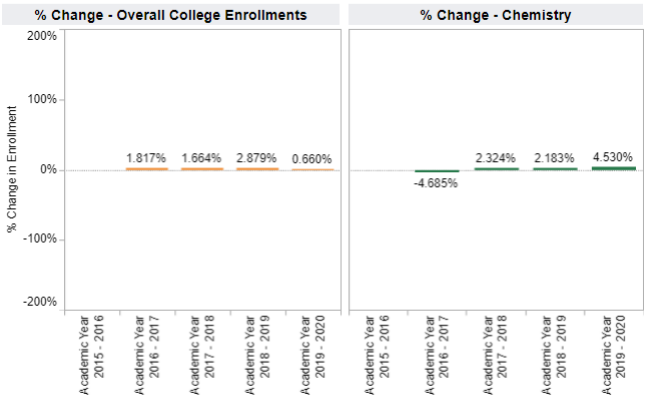
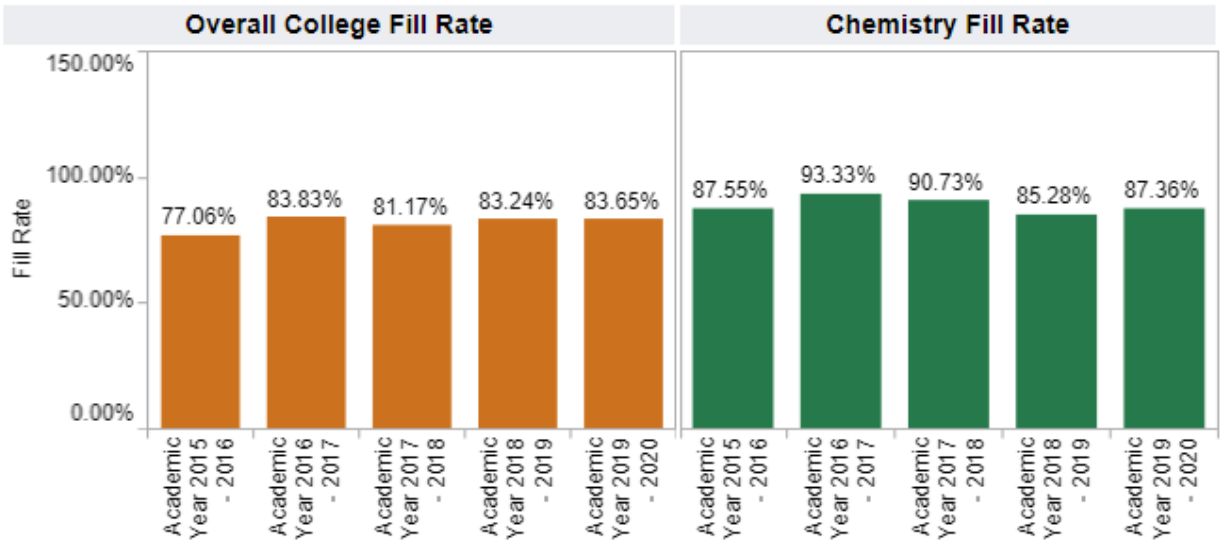




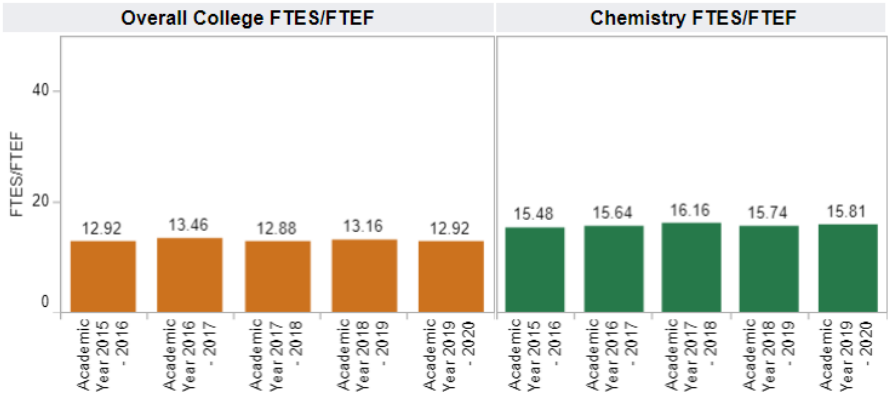
Chemistry enrollment has steadily increased since the low noted in the 2018 APPW document. This steady increase could be attributed to more sections available at a variety of times due to the addition of two new FT faculty and an adjunct faculty member to teach labs. While some faculty in chemistry have significant reassign time, it does not appear it has affected enrollment.

General Student Demand (Fill Rate) (Insert Aggregated Data Chart)



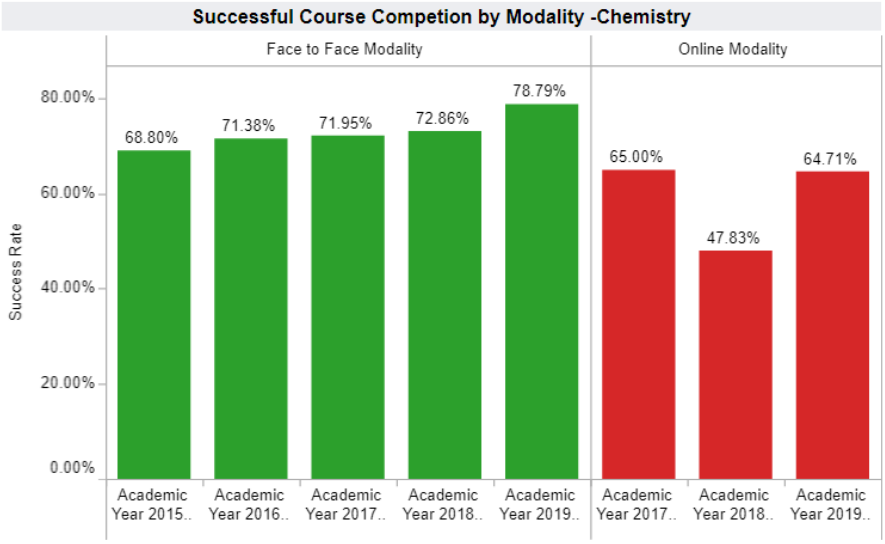
Chemistry's fill rate follows a similar trajectory as the college's course fill rate. However, chemistry's fill rate is higher than the college average, likely due to continued effective management of section offerings.

General Efficiency (FTES/FTEF) (Insert Aggregated Data Chart)



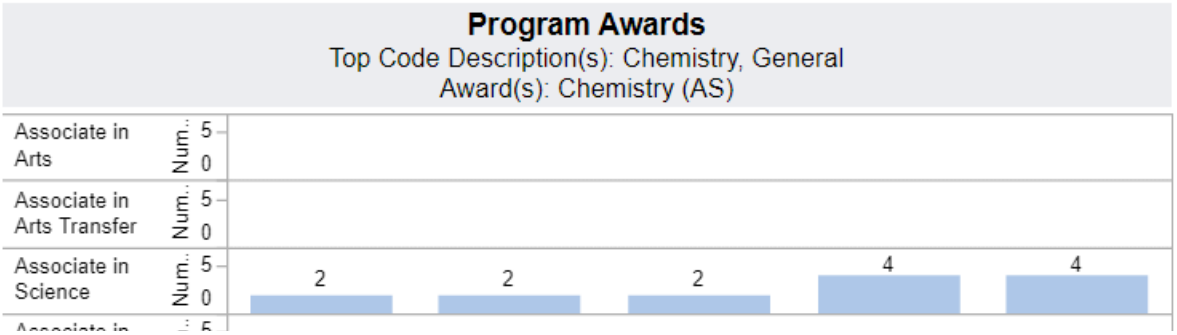
Chemistry's efficiency has remained steady since the last APPW, and still is well above the college efficiency average and target of 15.0. The higher efficiency is due in part to the combination of labs into large lecture sections and the lower loading for lab time.

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



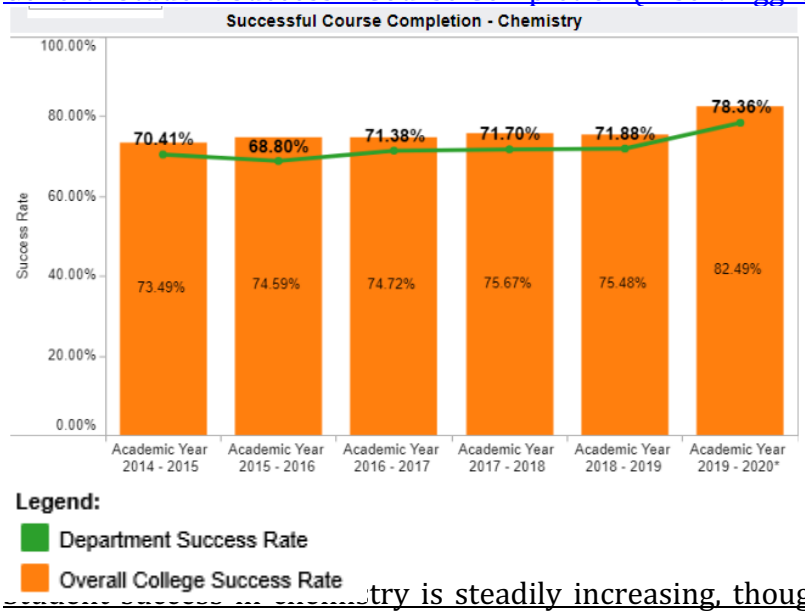
It is challenging to make any comparison between modalities yet because the only courses that were offered fully online before Spring 2020 were single sections of CHEM 201A and CHEM201P. It will be hard to compare data for our next APPW as well since much of our data will be primarily for the online modality.

Degrees and Certificates Awarded (Insert Data Chart)



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 UCs and 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).

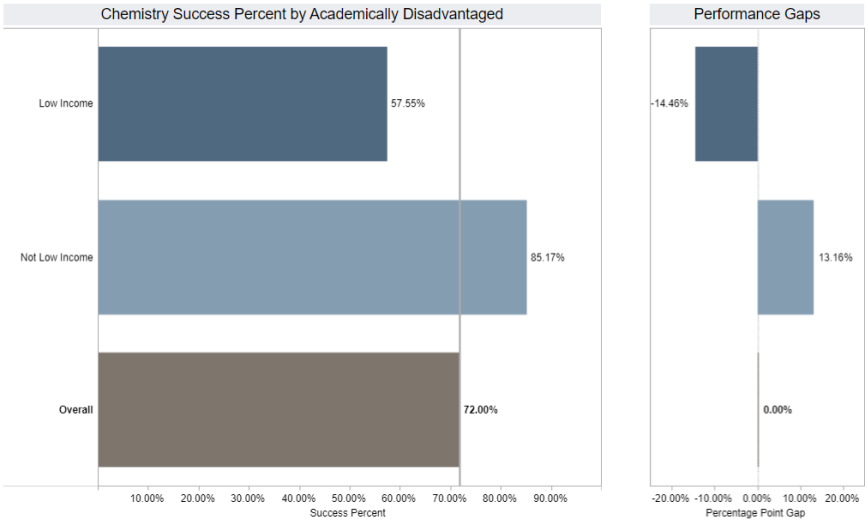
General Student Success – Course Completion (Insert Aggregated Data Chart)



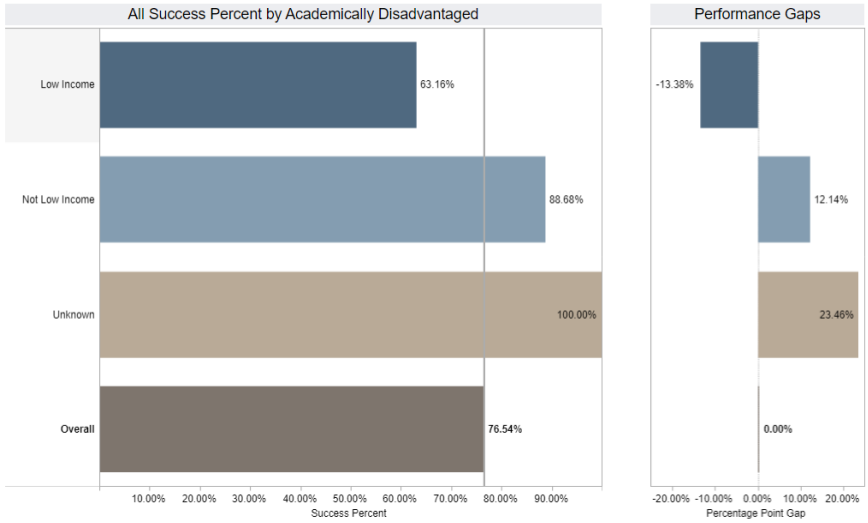
Student success in chemistry is steadily increasing, though is still lower than the overall college values. Chemistry in a challenging course so a lower success rate is not uncommon in institutions statewide. The large % jump from 2018-2019 to 2019-2020 is likely due to the grading policy change for Spring 2020 semester, where grades of F and W after were automatically converted to excused withdraw (EW), which influences our success rate data.

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.

Chemistry Department Success Rates Disaggregated by income status



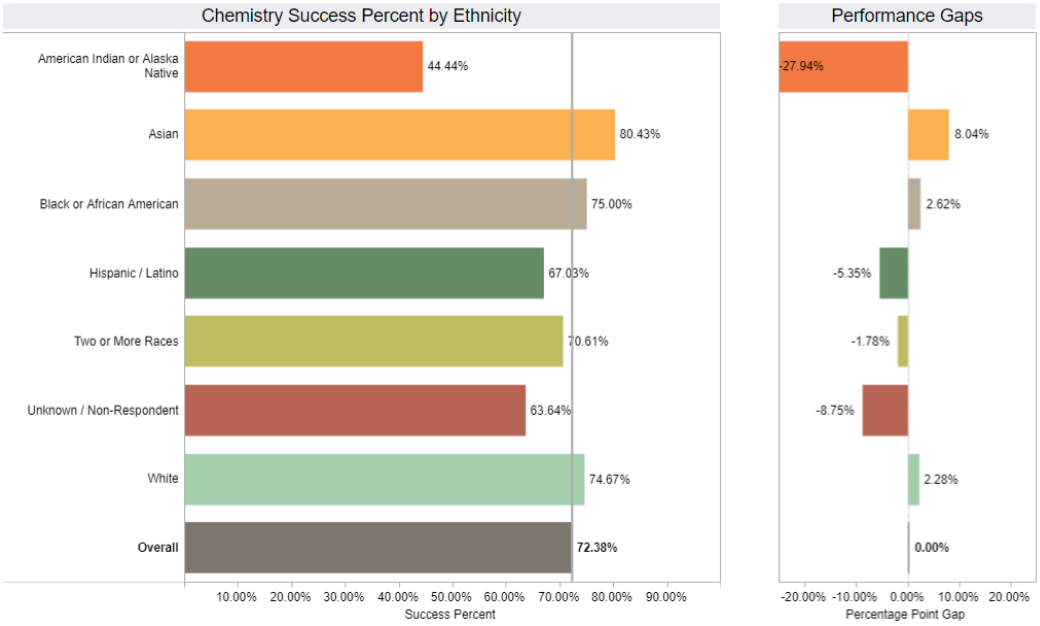
College Success Rates Disaggregated by income status



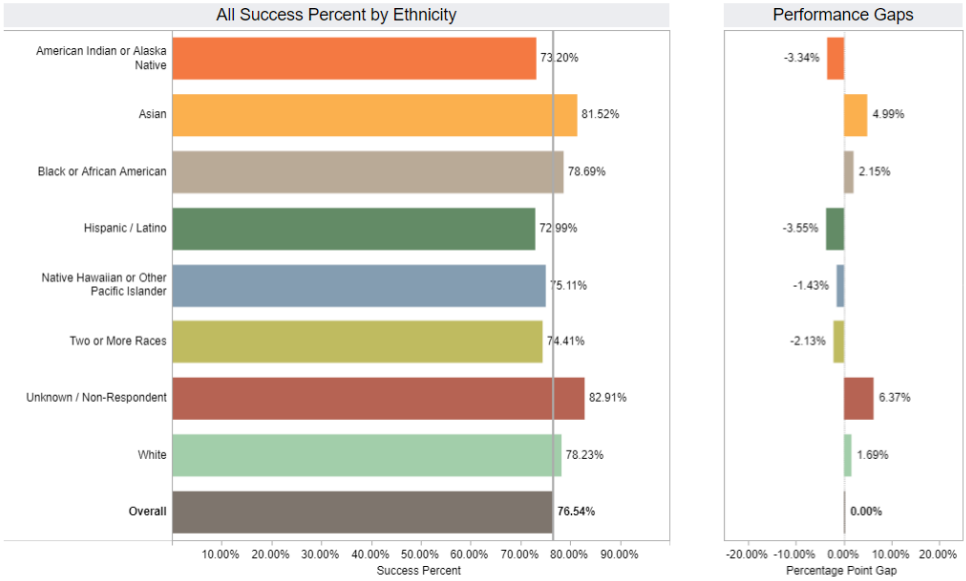
Low income students have a larger equity gap in chemistry than in college-wide totals by a small amount. This could be due to economic barriers of higher cost textbooks and the necessity of chemistry students to attend labs, which take more time than lecture, and may reduce students' abilities to work enough hours at their jobs to support themselves.

Faculty have been exploring low- and no-cost alternatives to textbooks and homework systems. A concern that arises with open-source materials is the effect of non-state vetted resources on the transferability of our high-population courses. We don't want to switch to a low/no cost alternative if it will affect the possibility of 4-year institutions accepting the coursework for transfer. It may be useful to examine culturally responsive teaching so that lower income students can see themselves attaining science degrees. Discussing homework and attendance policies may help reduce the impact of the extended lab times for working students.

Chemistry Department Success Rates Disaggregated by Ethnicity



College Success Rates Disaggregated by Ethnicity

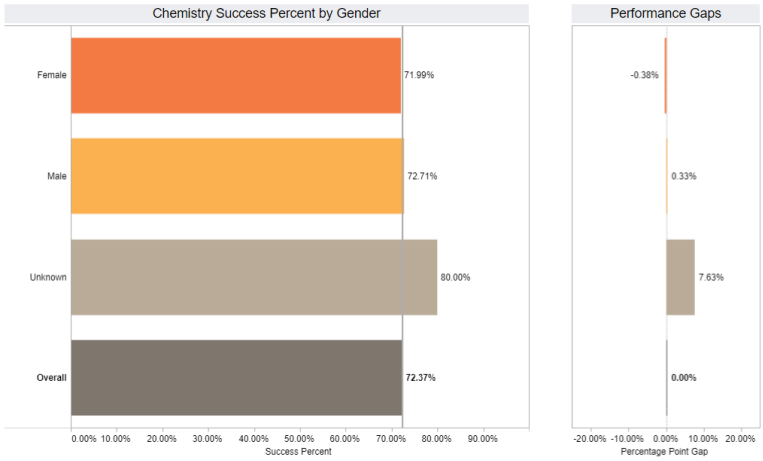


Students who identify as Hispanic/Latino, two or more races, and unknown are negatively disproportionally impacted in the chemistry department compared to other ethnicities. This impact is greater in the chemistry department than college-wide. From what has been discussed college-wide, the populations of students in the other minoritized groups are too small to be able to assess the significance of the gaps (for example, the American Indian/Alaskan native population was a total of 27 students over a 5-year period). To be clear: we are concerned there are success gaps within these populations; it is unclear how representative the data is of the true gap – whether it's larger or smaller.

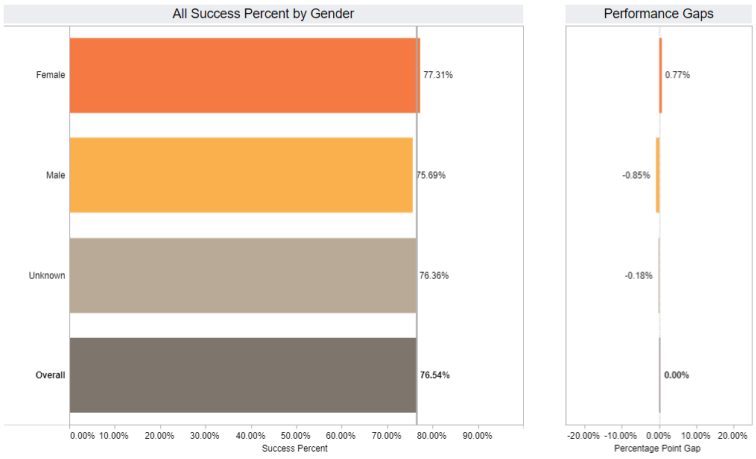
Chemistry has begun to discuss equity in our courses and is dedicated to decreasing these equity gaps. With the advent of the data coaching program and the ease of availability of data, an equity discussion with all of the disaggregated data and a data coach will happen in the next 8 months.

Several faculty in the department have undergone extensive equity training and will be sharing what they've learned with the wider department so everyone can make changes to their courses to hopefully narrow each of our gaps and have more equitable classroom environments.

Chemistry Department Success Rates Disaggregated by Gender Identification



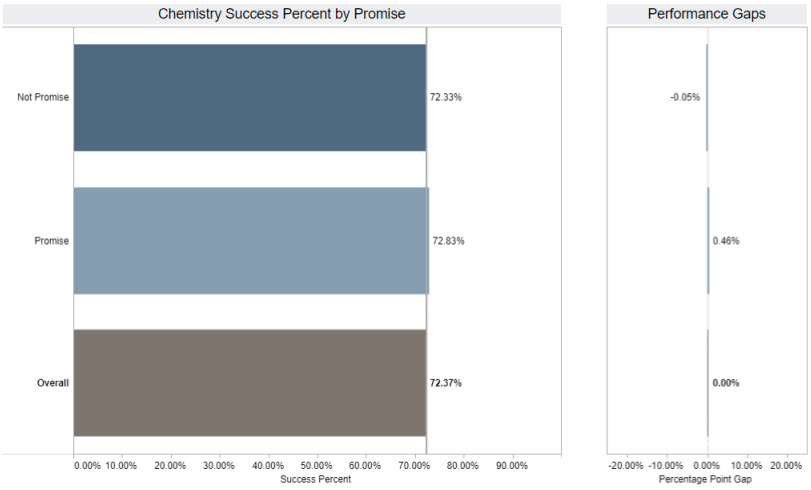
College Success Rates Disaggregated by Gender Identification



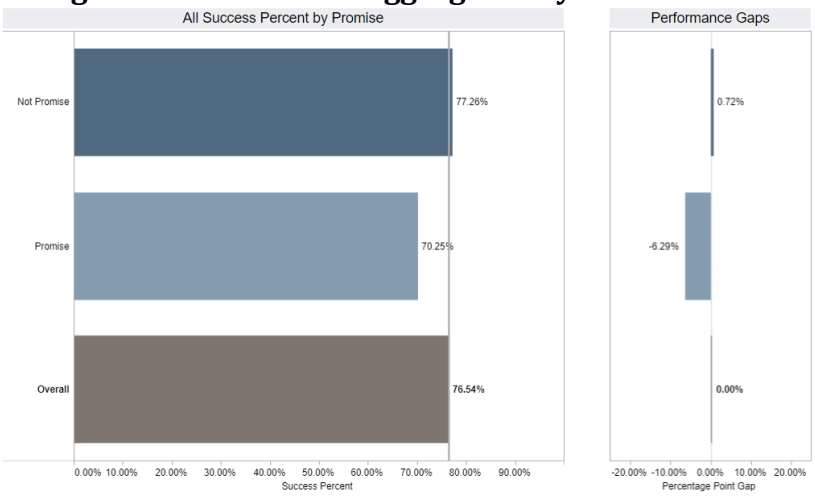
There is a very small gap between those students who identify as female and students who identify as male, as well as an unusually large gap in "unknown", which may mean those students who do not identify with male nor female or those who declined to state. The gap in the department is smaller than the gap at the college-level.

It's interesting to note that there has been a majority female-identifying students in chemistry courses since the Spring 2017 semester. There is also a sign inversion of the success gap in academic year 2016-2017 for female-identifying and male-identifying students that has persisted every academic year since.

Chemistry Department Success Rates Disaggregated by Promise



College Success Rates Disaggregated by Promise



Chemistry has seen similar success between those students that are on The Cuesta Promise and those that aren't. This is significantly different than seen overall at the college, where there is a fairly large success gap for its Promise students.

Our department offers a number of resources for our students, including the FAL program for Introductory Chemistry students (CHEM 200), CHEM 201P, which is a bridge course from introductory or high school chemistry, and CHEM 201AX and BX for those students enrolled in general chemistry. It could be that this cadre of support programs and courses offered by our department helps those Promise students (that may have been underprepared when entering college) to succeed in the early chemistry sequence to the same extent as those not on the Promise scholarship.

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.*

- B/C Course Delivery:
    - Since March in the Spring 2020 semester, delivery of the majority of our courses have been taught as distance education (DE) due to the pandemic. The majority of our courses in the 2020-2021 academic year have been offered 100% DE, with the exception of CHEM 212A and B, which have had some in-person laboratories. The goal for the coming academic year is to try to introduce more in-person work but it will depend on the state of cases in the county and the pandemic country-wide. There has been some discussion that certain lecture aspects of course will remain DE and certain activities from virtual labs could be incorporated into the in-person laboratory.
- B/C Scheduling
    - CHEM 201P was not offered in Spring 2021 and CHEM 201B will not be offered in Summer 2021.
- B/C/D Facilities
    - Facilities have not been an issue for class scheduling due to the primarily online delivery.
    - There have been some changes to door keying and key availability policies on

campus that are making access to certain lab spaces challenging and inconvenient.
    - We have since gotten a new copier/printer/scanner that has been working very well.
    - After a temporary relocation to 6600 for a remodeling project in 2019-2020, faculty have returned to the renovated 2300 office building. A conference room has been restored (and two full-time faculty have FULL SIZE OFFICES!!) and the hope is to make this a student space. One issue is security in that the doors to the offices do not seem to close and latch securely
- E Staffing
    - A new full-time faculty member was hired in Fall 2018.
    - A new adjunct faculty member was added in Fall 2019 with a primary assignment in teaching CHEM 201A laboratories.

A. New or modified plans for achieving program-learning outcomes
B. Anticipated changes in curriculum, scheduling or delivery modality
C. Levels, delivery or types of services
D. Facilities changes
E. Staffing projections
F. Other

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.

2021 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2020-2021 **PROGRAM: EOS**
CLUSTER: ARTS, HUMANITIES, MATH & SCIENCES **LAST YEAR CPPR COMPLETED: 2019**
NEXT SCHEDULED CPPR: 2022-2024 **CURRENT DATE: 2/11/2021**

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
- 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:
Geology AS degree and ADT in geology; GIS Certificate Program.

GENERAL PROGRAM UPDATE

Describe significant changes, if any, to program mission, purpose or direction. *If there are not any, indicate: NONE.*
The GIS Certificate Program started in Fall 2019 and we are in the second year. A part-time EOS faculty member is working with NSF IUSE Grant team and has submitted a proposal for a STEM Seminar to be taught starting Spring 2022. We are planning to provide more research opportunities for students through partnerships with local government agencies, private companies and non-profit organizations.

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.

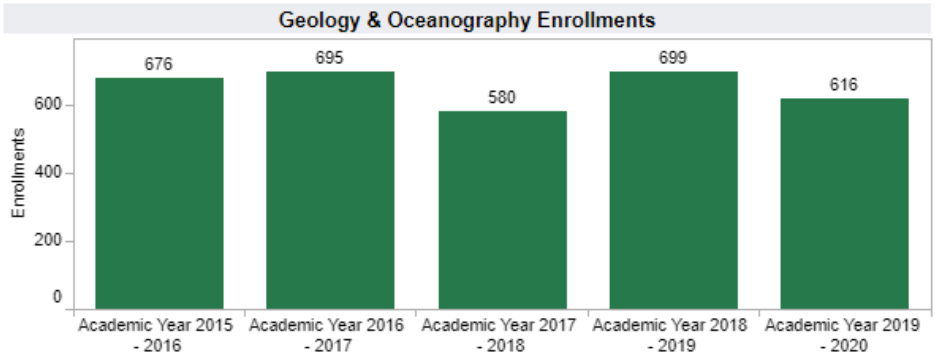
If you selected yes, please complete the Program Sustainability Plan Progress Report below after you complete the Data Analysis section. That data collection and analysis will help you to update, if necessary, your Program Sustainability Plan.

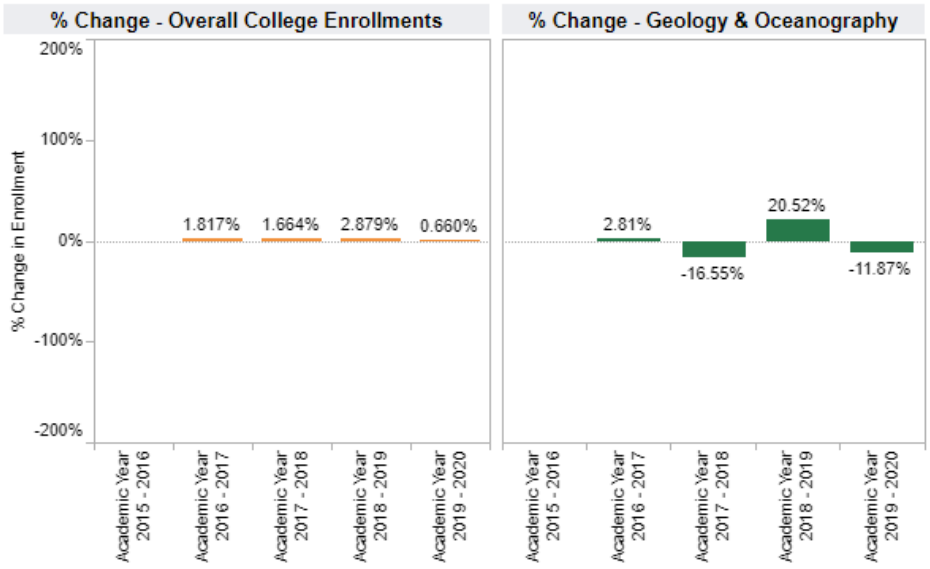
DATA ANALYSIS AND PROGRAM-SPECIFIC MEASUREMENTS

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.

General Enrollment (Insert Aggregated Data Chart)

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



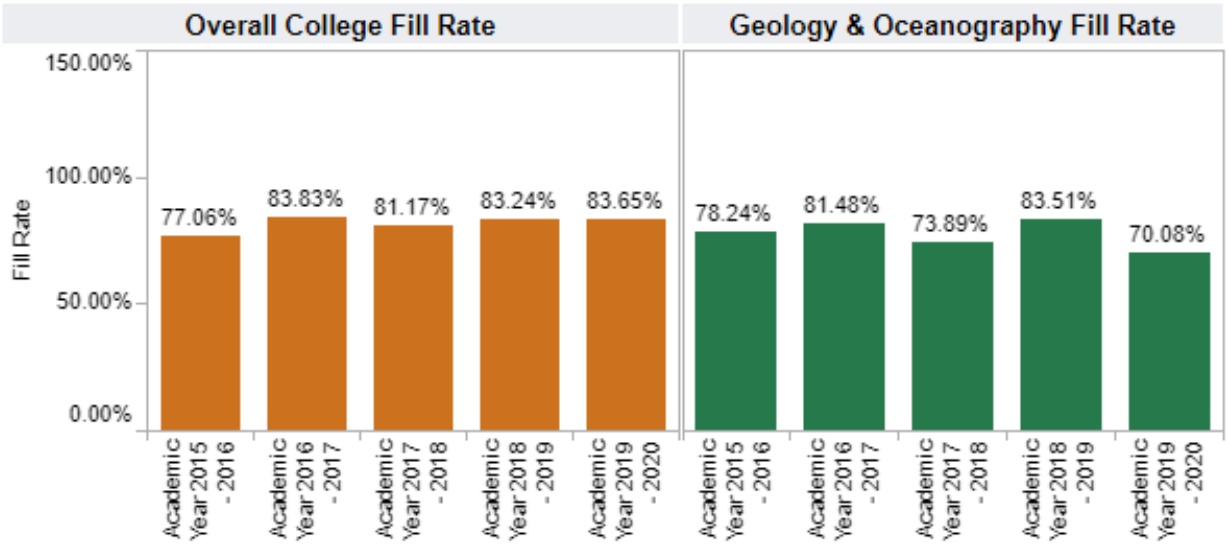


Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

Our enrollments were stable, then increased in 2018-2019 when a new section of an oceanography lab and lecture were added.

General Student Demand (Fill Rate) (Insert Aggregated Data Chart)

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

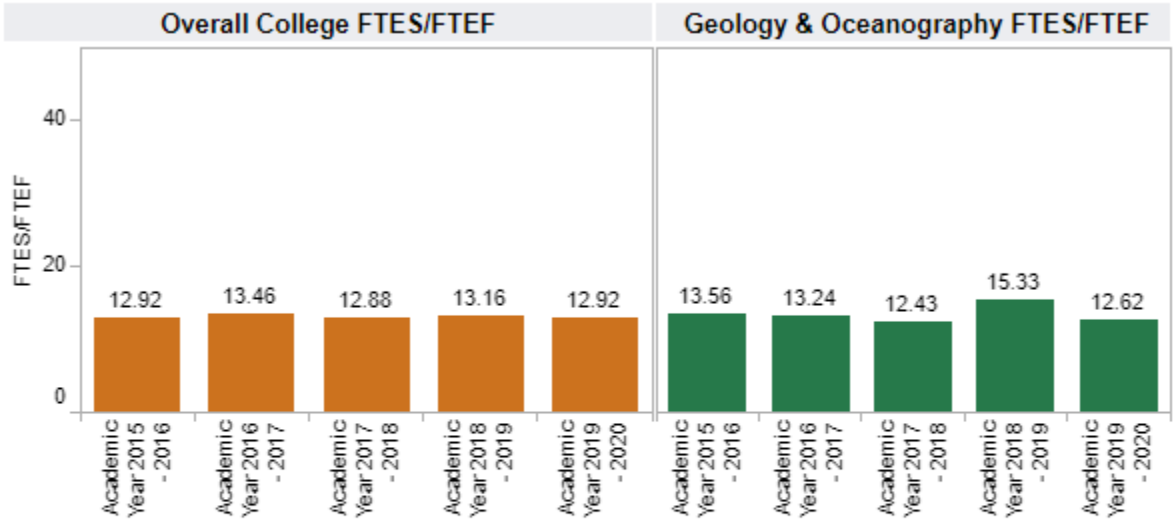


Fill Rate: The ratio of enrollments to class limits. Cross listed class limits are adjusted appropriately. Also, courses with zero class limits are excluded from this measure.

Combined Oceanography and Geology fill rates have mostly been on par with the rest of the college. Part of the decreased fill rates is due to offering classes in larger classrooms with higher capacity.

General Efficiency (FTES/FTEF) (Insert Aggregated Data Chart)

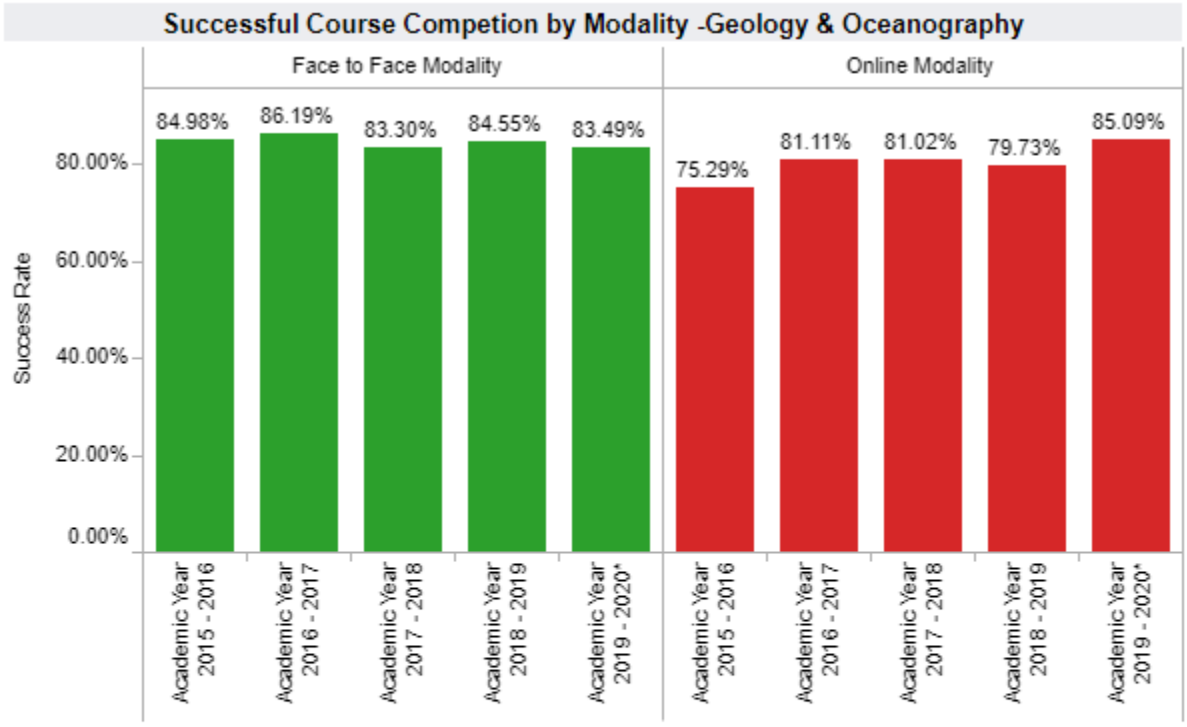
Insert the data chart and explain observed differences between the program and the college.



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

The combined efficiency for Geology and Oceanography classes exceeded the overall college FTES in 2018-2019 when an additional lab and lecture section of Oceanography courses were offered, and though FTES declined in 2019-2020, they were on par with the college.

[Student Success—Course Completion by Modality (Insert Data Chart)]
Insert the data chart and explain observed differences between the program and the college.



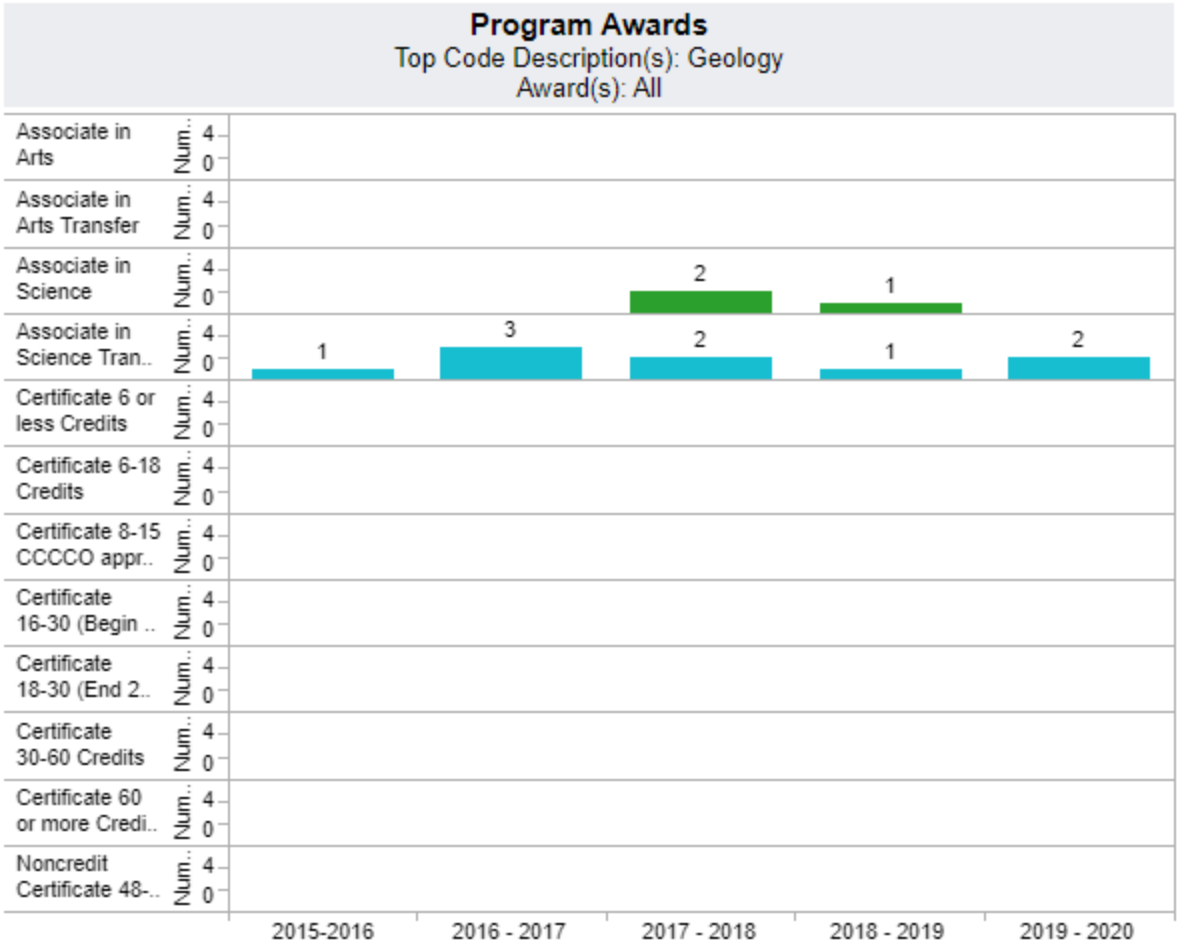
Successful Course Competion by Modality Table - Geology & Oceanography

		Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	84.98%	86.19%	83.30%	84.55%	83.49%
	Total Department Enrollments	586.0	601.0	444.0	577.0	456.0
Online Modality	Department Success Rate	75.29%	81.11%	81.02%	79.73%	85.09%
	Total Department Enrollments	85.0	90.0	137.0	149.0	164.0

There was one online modality course offered in Oceanography and 3 courses offered in the GIS Certificate Program (GEOL coded courses) during this period until the COVID-19 pandemic when all courses switched to emergency online education. Success in the online modality matched or exceeded face-to-face modality. Students enrolled in online courses in Spring 2020 may have had an easier transition during the emergency online education than face-to-face students demonstrated in slightly higher success rates.

[Degrees and Certificates Awarded (Insert Data Chart)]
Insert the data chart and explain observed differences between the program and the college.

Program: Geology **Award Type:** (All)

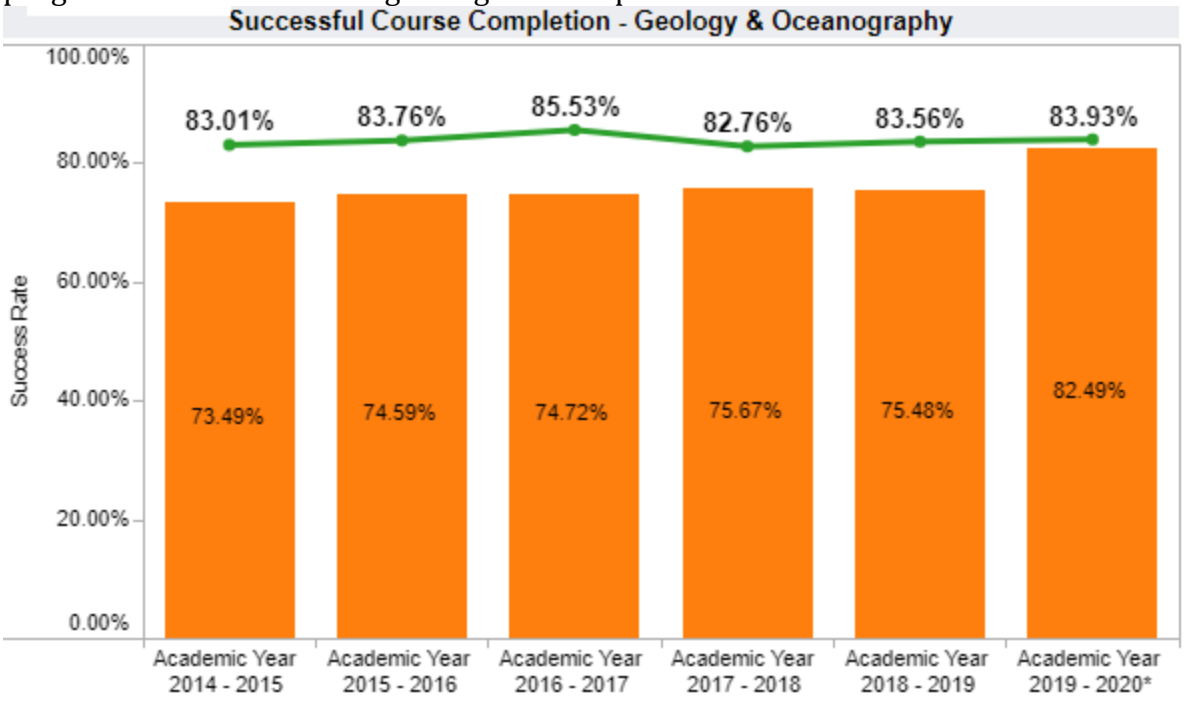


Program Awards Table

Award T..	Award	2015-2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
Associate in Science	Geology (AS)			2	1	
	Total			2	1	
Associate in Scienc..	Geology (AST)	1	3	2	1	2
	Total	1	3	2	1	2
Grand Total		1	3	4	2	2

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

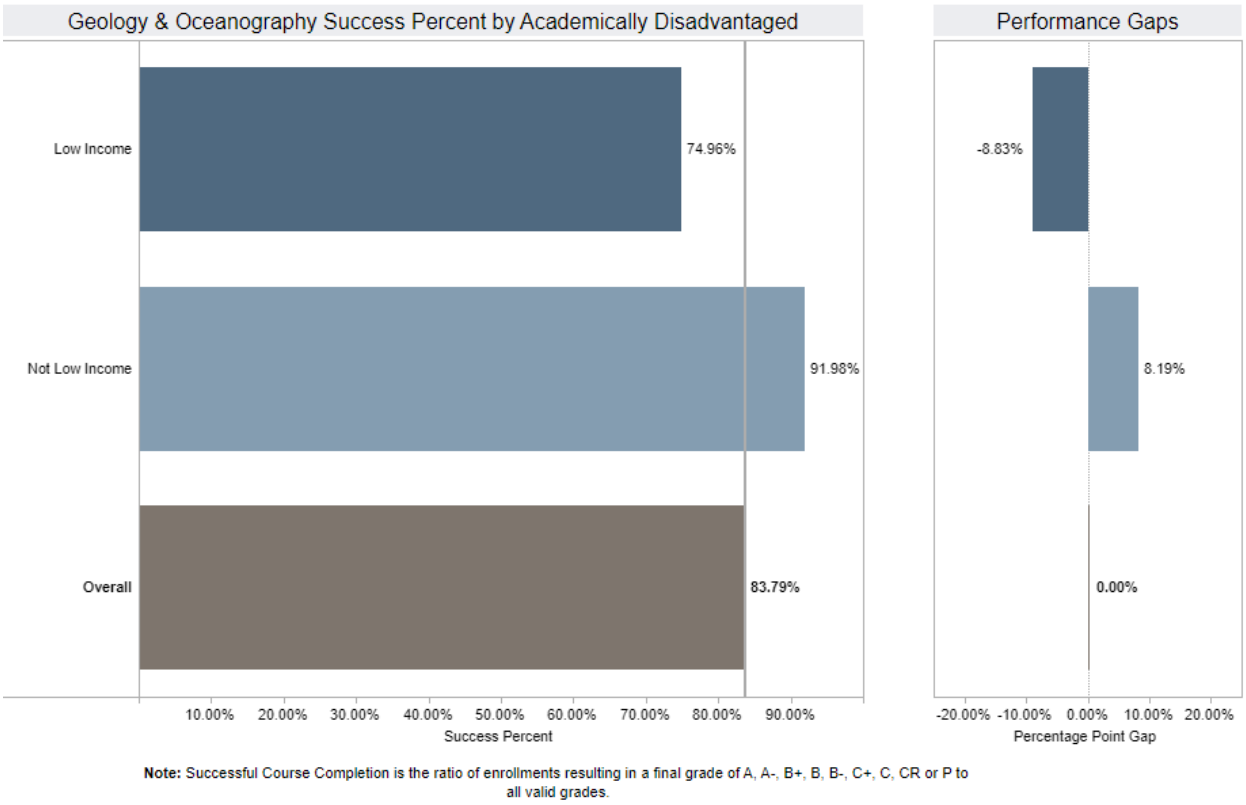
General Student Success – Course Completion (Insert Aggregated Data Chart)
Review the Disaggregated Student Success charts; include any charts that you will reference. Describe any departmental or pedagogical outcomes that have occurred as a result of programmatic discussion regarding the data presented.



Geology & Oceanography Success Rate Table

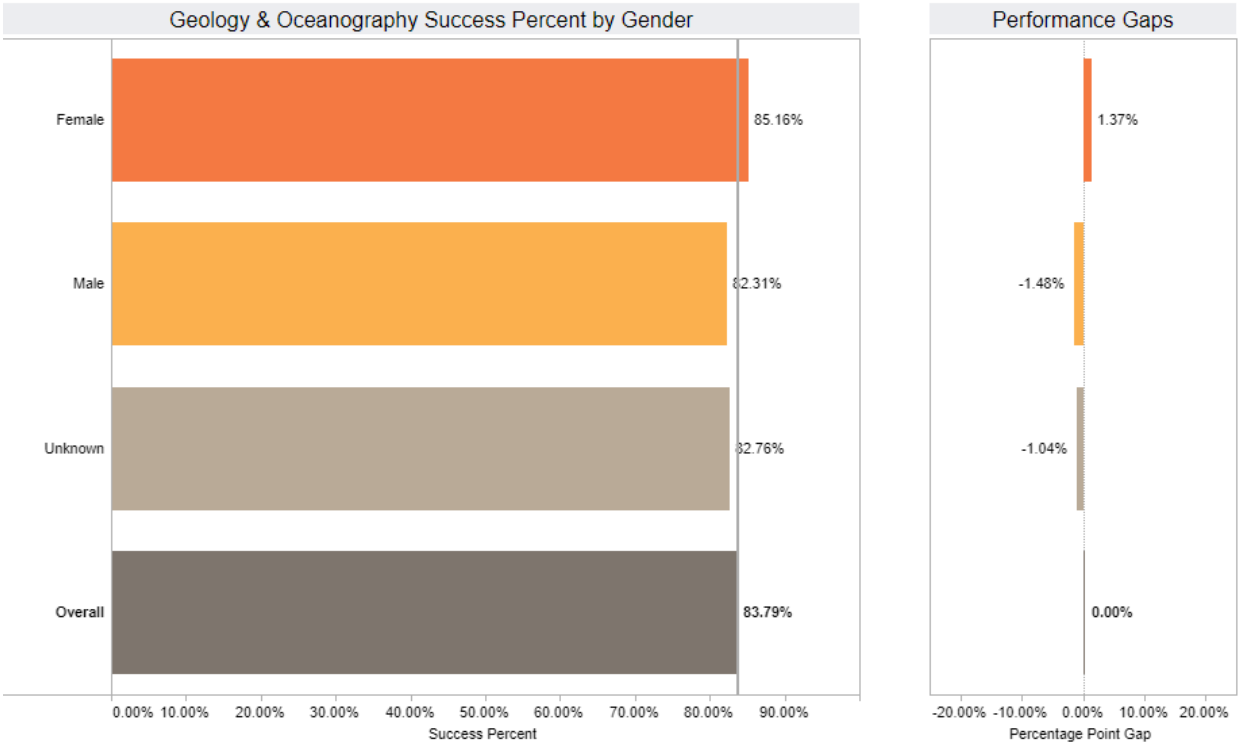
	Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Department Success..	83.76%	85.53%	82.76%	83.56%	83.93%
Total Enrollments	671	691	581	726	620

The success rates in geology and oceanography exceeded the overall college rate for every year.



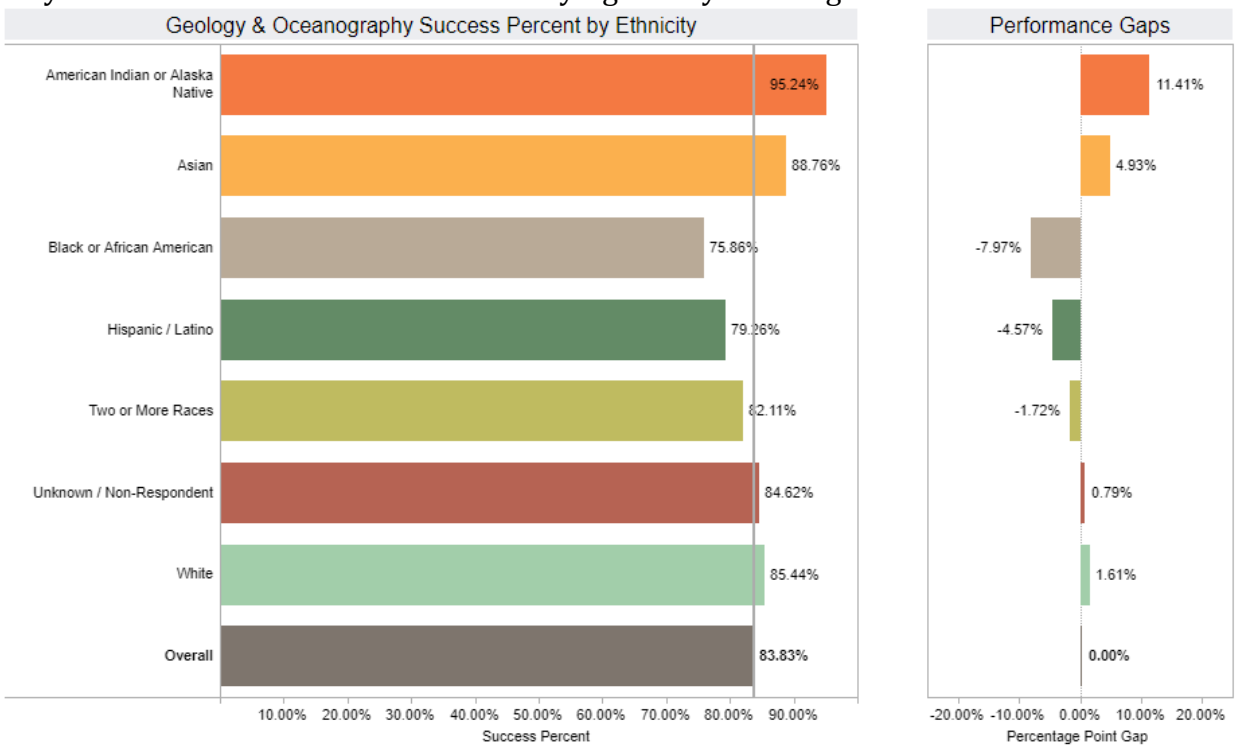
Note: Successful Course Completion is the ratio of enrollments resulting in a final grade of A, A-, B+, B, B-, C+, C, CR or P to all valid grades.

The gap between low income and high income has narrowed but is still conspicuous. Part of this is a result of low-income students being unwilling or unable to purchase textbooks and Access cards required to use the web-based software. Multiple instructors have changed course materials to be part of the First-Day Access program to reduce the cost to students and have incorporated more OER.

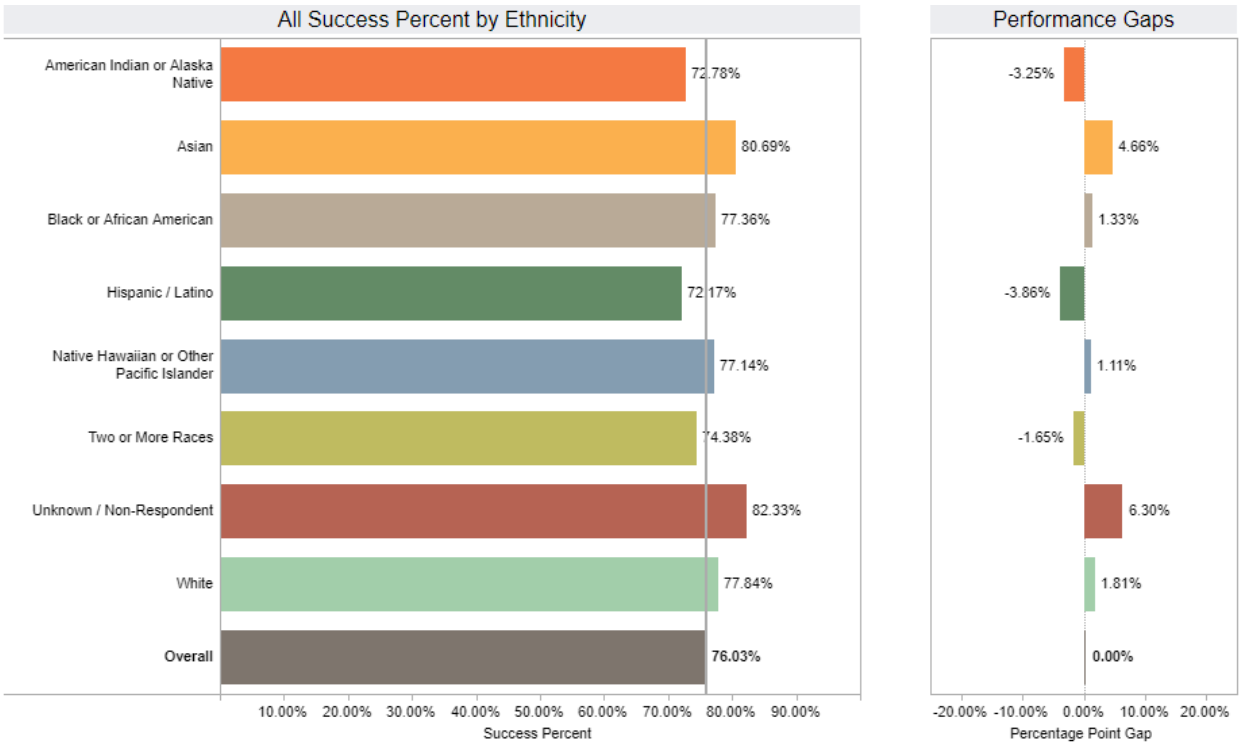


Note: Successful Course Completion is the ratio of enrollments resulting in a final grade of A, A-, B+, B, B-, C+, C, CR or P to all valid grades.

The data indicates little disparity between student-identified genders with a slightly higher rate of success for female-identifying students. This increase in female-identifying students may be attributed to more female-identifying faculty teaching these STEM courses.



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.



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.

Student success disaggregated by ethnicity reveals there is an equity-gap between Black or African American and Hispanic/Latinx students, with a greater gap between Black or African American students and a smaller gap between Hispanic/Latinx students when compared to all student success by ethnicity. At least one faculty member is attending the J.E.D.I. workshop in Spring 2021 to improve their pedagogy to more equitable practices.

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.
N/A

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.*

G. New or modified plans for achieving program-learning outcomes
H. Anticipated changes in curriculum, scheduling or delivery modality. We anticipate Geology 212 will remain in the Distance Education modality post-COVID emergency online education. We will also continue to offer ive fully DE GIS courses to support an online certificate program. Geology 211 is scheduled to run at least once per academic year for students in the ADT program.
I. Levels, delivery or types of services. Geology 210 should be expanded to two sections with a double-lecture and two lab sections or two single-lectures and two lab sections to accommodate student demand.
J. Facilities changes
K. Staffing projections. A full-time hire is anticipated to join EOS in Fall 2021 to maintain this program since the retirement of both FT faculty, one in Spring 2018 and the second in Fall 2020. We also expect one of our PT faculty to retire from their FT position, so they may not be available to teach courses in the six months following their retirement.
L. Other. The Geology and Oceanography programs 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.

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.

2021 INSTRUCTIONAL ANNUAL PROGRAM PLANNING WORKSHEET

CURRENT YEAR: 2021 **PROGRAM: PHYSICS**
CLUSTER: ARTS, HUMANITIES, MATH, AND SCIENCES **LAST YEAR CPPR COMPLETED: 2020**
NEXT SCHEDULED CPPR: 2025 **CURRENT DATE: 2/19/2021**

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
- 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:
A.S. Physics, AS-T Physics

GENERAL PROGRAM UPDATE

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

PROGRAM SUSTAINABILITY PLAN UPDATE

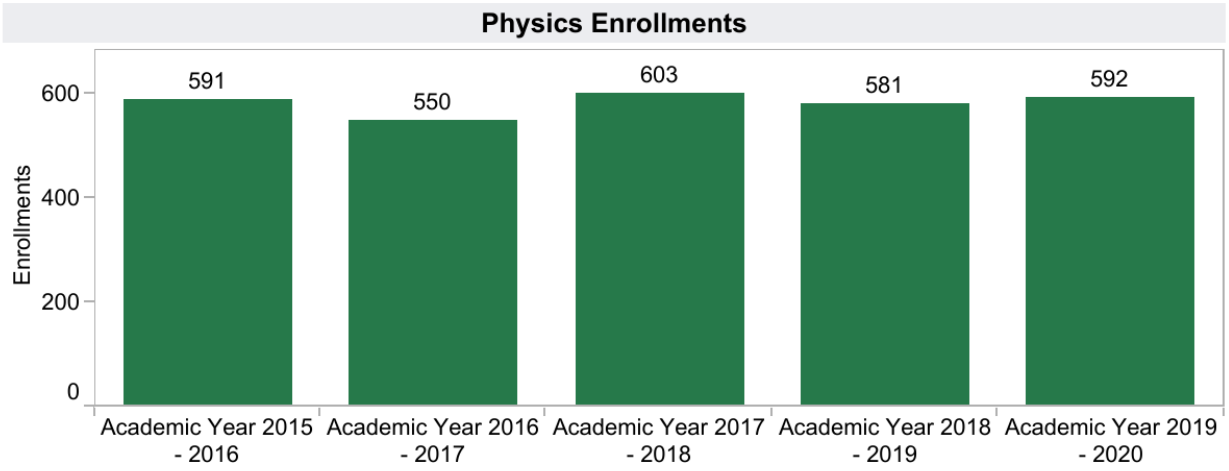
Was a Program Sustainability Plan established in your program's most recent Comprehensive Program Plan and Review?

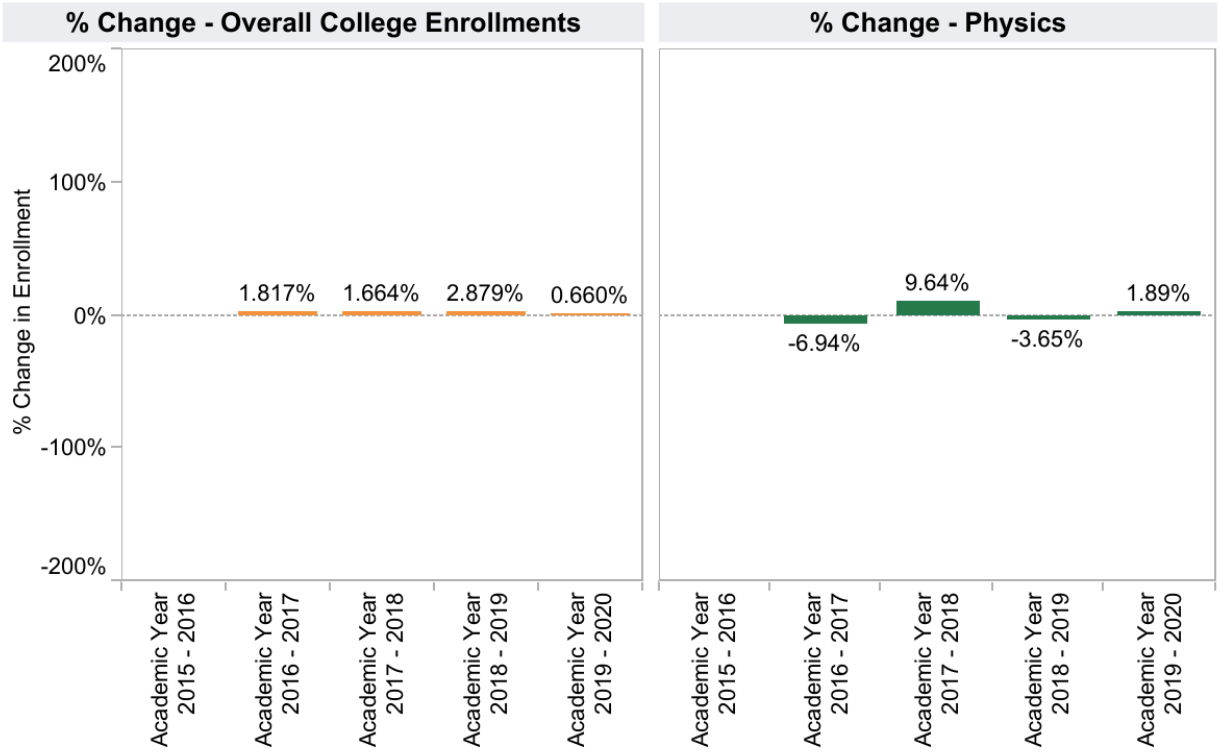
Yes ☐ If yes, please complete the Program Sustainability Plan Progress Report below.
No ☒ If no, you do not need to complete a Progress Report.

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.
General Enrollment (Insert Aggregated Data Chart)



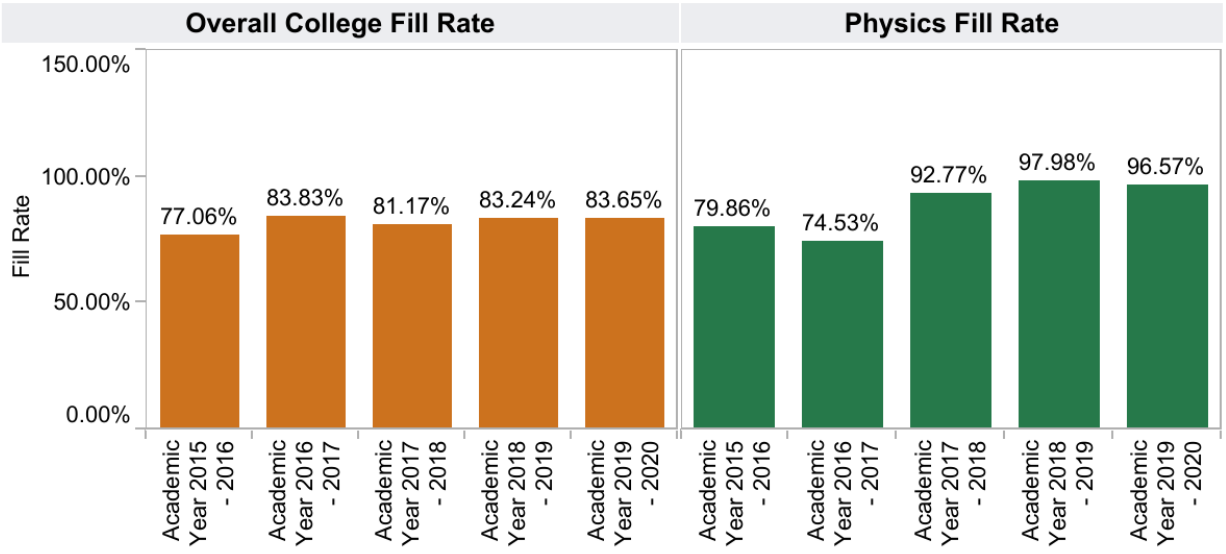


Physics enrollments have been rather steady during the past five years. Demand for physics courses has decreased slightly on the San Luis Obispo Campus, but has been offset by dual enrollment offerings at local high schools. These dual enrollment sections are taught by Cuesta faculty. Dual enrollment accounts for 51 students on average per year.

General Student Demand (Fill Rate) (Insert Aggregated Data Chart)

SLOCCCD Program Review Data - Student Demand (Fill Rate)

Department:	Course:	Dual Enrollment:	Prison
Physics	All	All	All



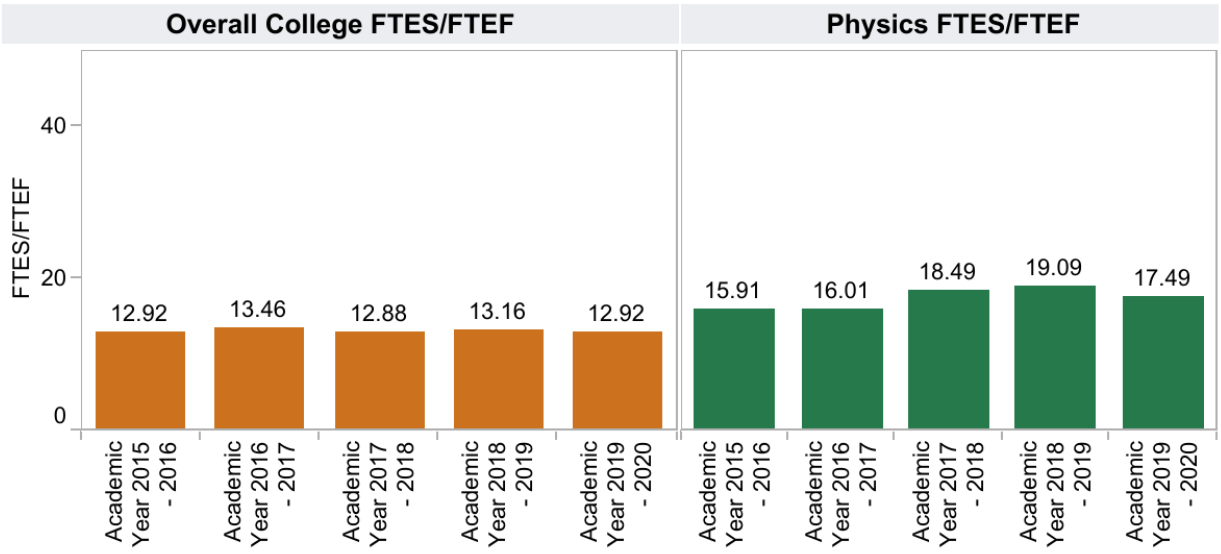
Fill Rate: The ratio of enrollments to class limits. Cross listed class limits are adjusted appropriately. Also, courses with zero class limits are excluded from this measure.

Demand for Physics courses has increased dramatically during the past three years. This coincides with the addition of dual enrollment offerings at local high schools and a shift in sections. It should be noted that the headcount did not change dramatically while the fill rate rose.

General Efficiency (FTES/FTEF) (Insert Aggregated Data Chart)

SLOCCCD Program Review Data - Efficiency (FTES/FTEF)

Department:	Course:	Dual Enrollment:	Prison:
Physics	All	All	All



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

The efficiency in Physics is much higher than the college. This is largely due to the fact that multiple labs are paired with single lectures. It should be noted that the efficiency is high despite running PHYS 208C which is a traditionally low-efficiency course.

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

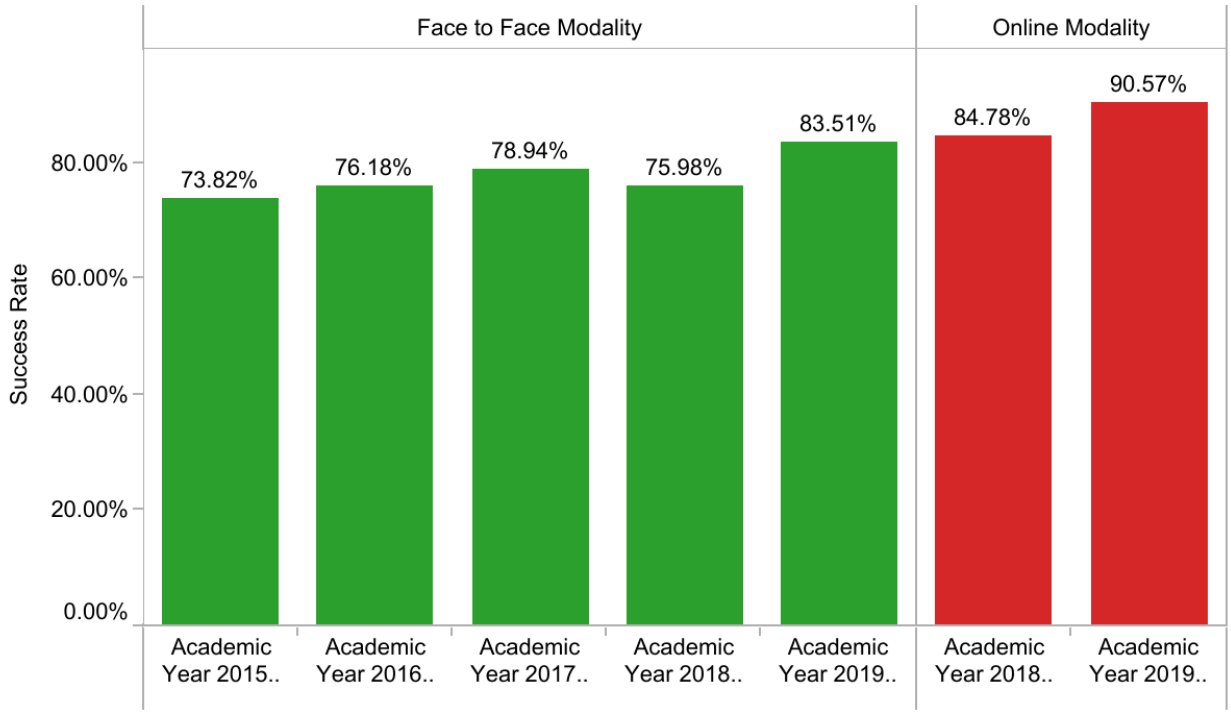
SLOCCCD Program Review Data: Successful Course Completion

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 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	73.82%	76.18%	78.94%	75.98%	83.51%
	Total Department Enrollments	592.0	550.0	603.0	535.0	539.0
Online Modality	Department Success Rate				84.78%	90.57%
	Total Department Enrollments				46.0	53.0

The course success rate for physics courses taught face-to-face is near the college average. The success rate for physics courses taught online is considerably higher than the college average. Prior to the COVID-19 pandemic (starting during the spring 2020 term), the only physics courses offered online were dual enrolled courses. Students in these courses receive more resources and have more time to complete the course. This, coupled with a high percentage of students who are more prepared academically, results in a success rate that is over 10% higher than the college success rate.

Degrees and Certificates Awarded (Insert Data Chart)

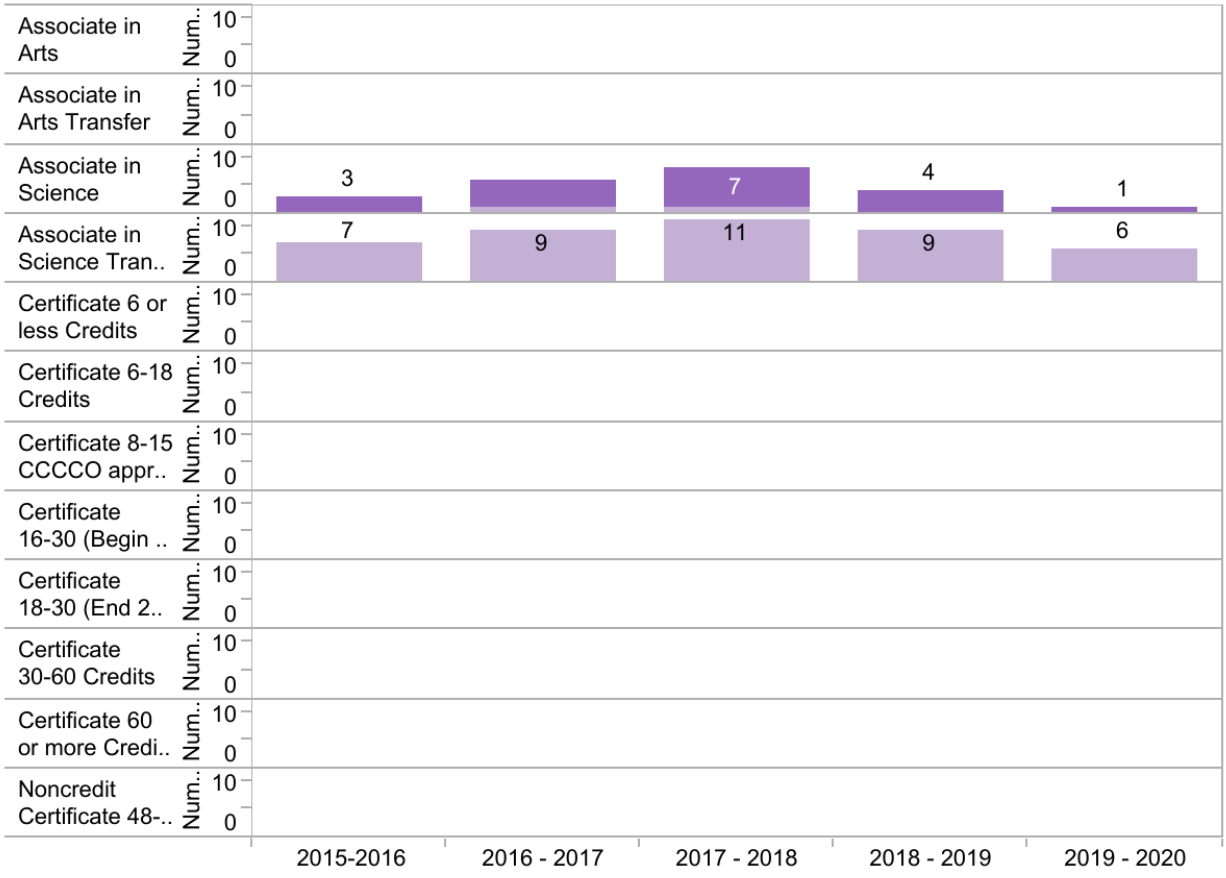
SLOCCCD Program Review Data: Degrees and Certificates Awarded

Program: Physics, General

Award Type: All

Program Awards

Top Code Description(s): Physics, General
Award(s): All



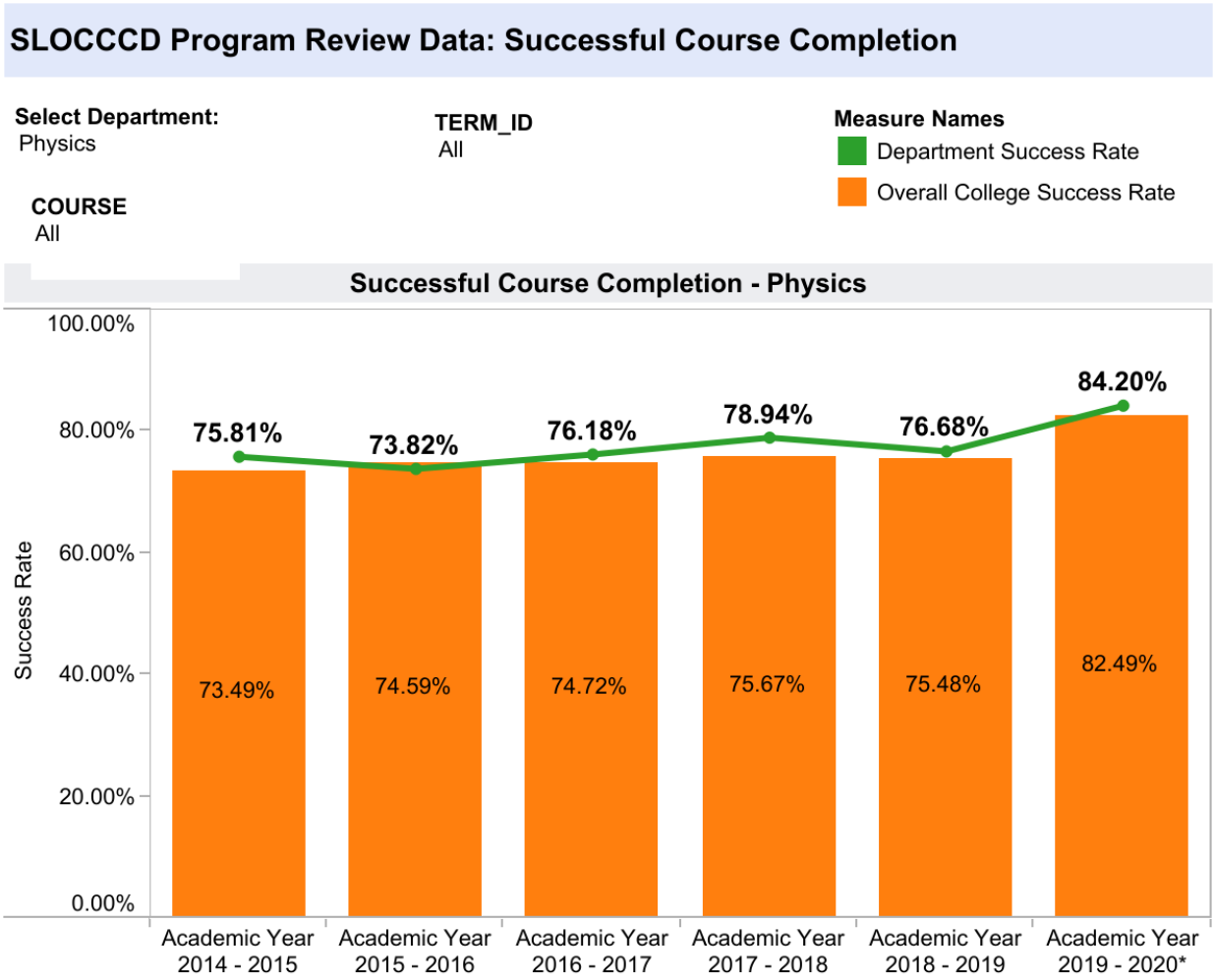
Program Awards Table

Award T..	Award	2015-2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
Associate in Science	Physics (AS)	3	5	7	4	1
	Physics (AST)		1	1		
	Total	3	6	8	4	1
Associate in Scienc..	Physics (AST)	7	9	11	9	6
	Total	7	9	11	9	6

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

There are relatively few degrees awarded in physics. This is largely due to the fact that students who take physics are doing so to fulfill pre-requisite or general education requirements.

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

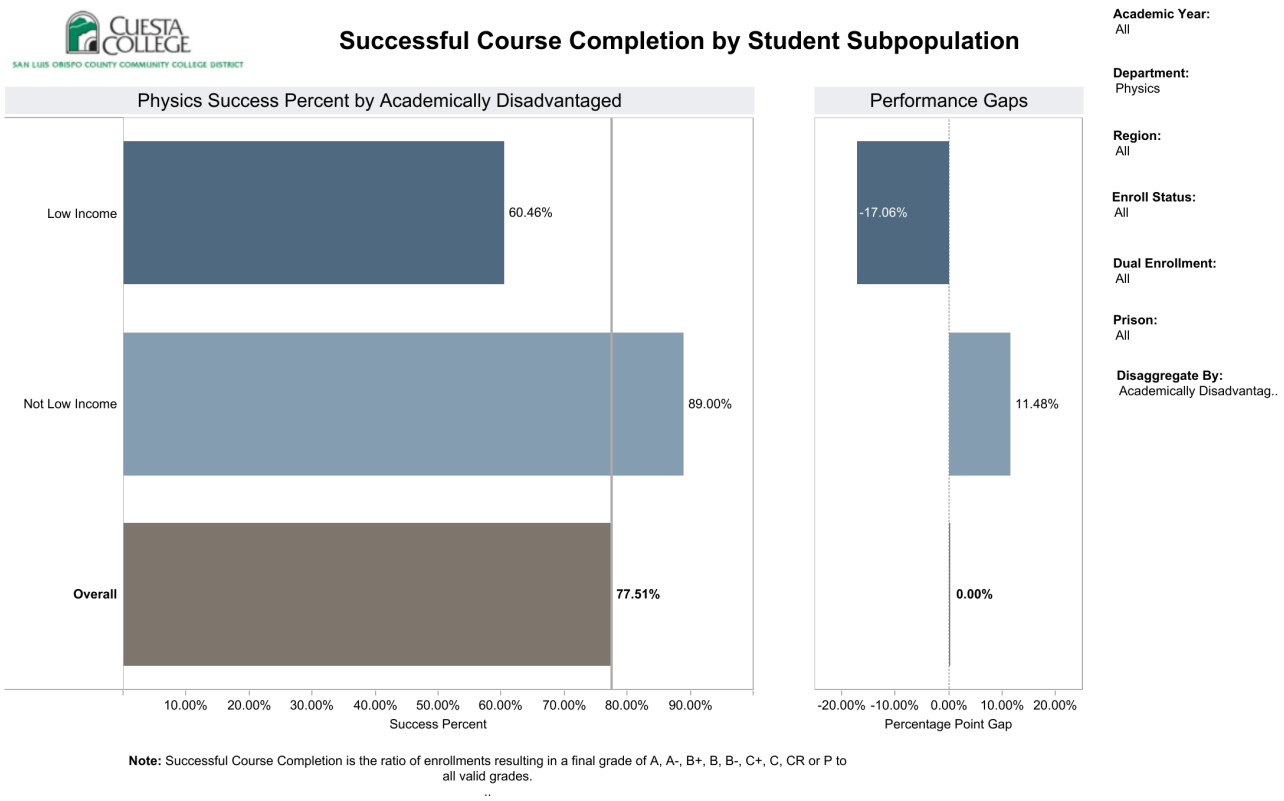


Physics Success Rate Table

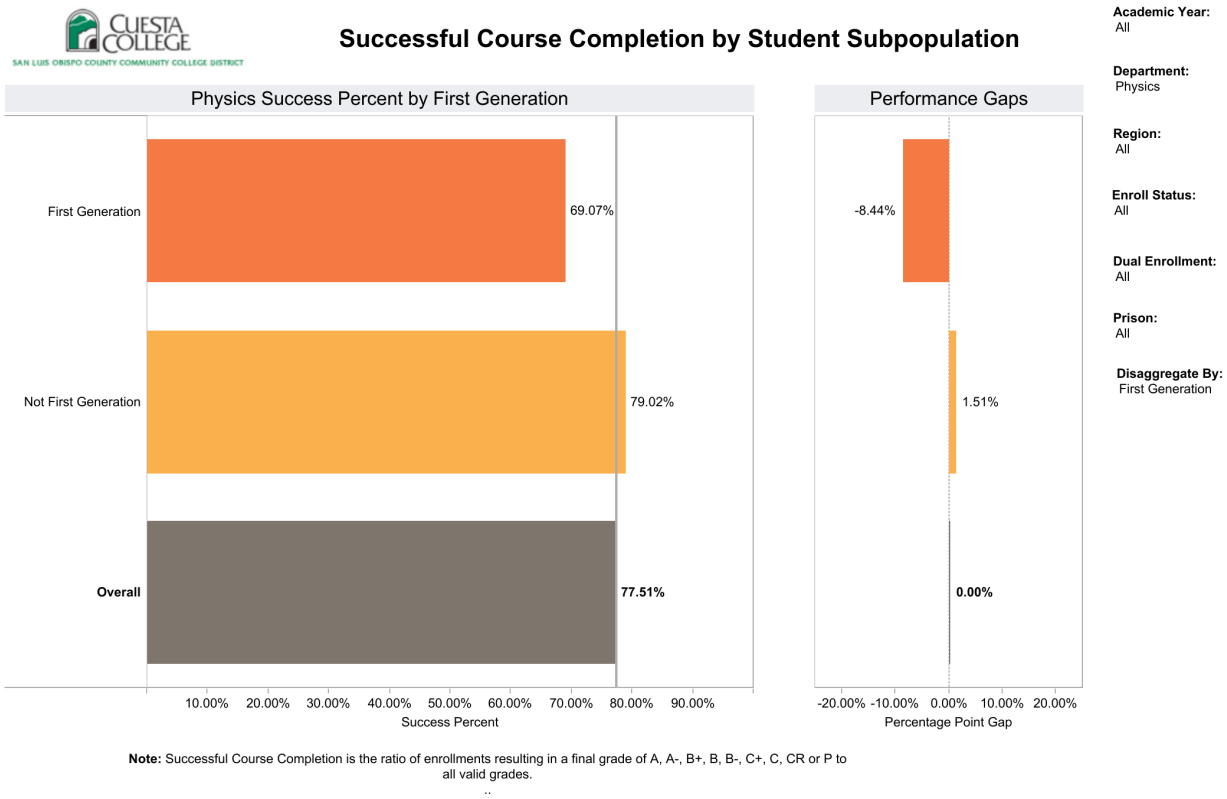
	Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Department Success..	73.82%	76.18%	78.94%	76.68%	84.20%
Total Enrollments	592	550	603	581	592

Success in physics courses increased slightly during the past five years including a large increase up during the 2019-20 academic year. During the spring 2020 term, there was a 94.9% success rate. This increase is likely due to students applying for and receiving EW's due to relaxed criteria brought about by the COVID-19 pandemic.

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.



There is a clear gap in low income student completion rates. Some possible barriers to student success are the high cost of textbooks and calculators that are required for the course. Additionally, many students take physics courses while taking other high unit, challenging courses. The course schedules that students typically have require a great deal of out-of-class time, which often is at odds with outside commitments such as work or caregiving.



There is also a notable gap in the completion rates for first generation students. We will increase our efforts to close this gap by taking advantage of coaching opportunities.

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.*

Anticipated changes in curriculum, scheduling or delivery modality

The full extent of the ramifications of the COVID-19 pandemic have yet to be realized. It is clear that student expectations and faculty expectations for curriculum delivery and course management will change. We anticipate a shift away from full face-to-face to hybrid or blended modalities for future sections.

Staffing projections

Fall 2021 requests for dual enrollment physics courses taught by Cuesta faculty far exceeds the staffing. We will be able to accommodate less than 50% of the requested sections for fall 2021. This means that 6 sections will not be offered. In order to meet projected demand for these courses, a full-time faculty member will need to be hired.

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.