



2019-2020
Annual Program Review

Sciences



2019-2020
Annual Program Review

Life Sciences

(Biology, Ecology, Marine Science, and the Health Science Certificate)

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Internal Analysis: Biology

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Biology Enrollment	3,724	3,544	3,829
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Biology Resident FTES	728.07	559.97	602.50
Sections	92	100	111
Fill Rate	83.2%	81.6%	80.7%
WSCH/FTEF 595 Efficiency	583	567	597
FTEF/30	20.8	16.5	16.9
Extended Learning Enrollment	1,284	1,012	602

The percentage change in the number of Biology **enrollments** in 2017-18 showed a moderate increase from 2016-17 and a slight increase from 2015-16.

The percentage change in 2017-18 **resident FTES** in Biology credit courses showed a moderate increase from 2016-17 and a substantial decrease in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Biology courses in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Biology courses showed a slight decrease from 2016-17 and a slight decrease in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Biology courses in 2017-18 showed a moderate increase from 2016-17 and a slight increase from 2015-16.

The percentage change in the **FTEF/30** ratio for Biology courses in 2017-18 showed a slight increase from 2016-17 and a substantial decrease in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial decrease in the number of Biology **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Biology Enrollment	3,724	3,544	3,829

Modality	2015-16	2016-17	2017-18
Traditional	38.0%	38.7%	36.4%
Online	37.2%	42.8%	49.2%
Hybrid	1.6%	1.7%	0.6%
Correspondence (Cable, Telecourse, Other DL)	23.1%	16.7%	13.8%

Gender	2015-16	2016-17	2017-18
Female	55.7%	57.7%	59.0%
Male	43.0%	41.0%	39.4%
Unknown	1.4%	1.4%	1.5%

Ethnicity	2015-16	2016-17	2017-18
African American	7.2%	6.4%	6.2%
American Indian/AK Native	0.3%	0.3%	0.4%
Asian	38.3%	36.2%	34.2%
Hispanic	14.7%	15.0%	14.7%
Pacific Islander/HI Native	0.3%	0.4%	0.3%
White	25.6%	27.0%	28.1%
Multi-Ethnicity	12.5%	13.8%	15.5%
Other/Unknown	1.1%	0.8%	0.7%

Age Group	2015-16	2016-17	2017-18
19 or Less	9.2%	11.3%	10.4%
20 to 24	39.5%	38.8%	38.9%
25 to 29	20.7%	21.0%	21.6%
30 to 34	10.8%	10.4%	10.8%
35 to 39	6.4%	6.9%	6.6%
40 to 49	7.8%	7.0%	7.6%
50 and Older	5.6%	4.7%	4.1%

Biology courses made up 6.2% of all state-funded enrollment for 2017-18. The percentage difference in Biology course **enrollment** in 2017-18 showed a moderate increase from 2016-17 and a slight increase from 2015-16. Enrollment in Biology during 2017-18 showed 36.4% of courses were taught **traditional (face-to-face)**, 49.2% were taught **online**, 0.6% were taught in the **hybrid** modality, and 13.8% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Biology enrollment consisted of 59.0% **female**, 39.4% **male**, and 1.5% students of **unknown** gender. In 2017-18, Biology enrollment consisted of 6.2% **African American** students, 0.4% **American Indian/AK Native** students, 34.2% **Asian** students, 14.7% **Hispanic** students, 0.3% **Pacific Islander/HI Native** students, 28.1% **White** students, 15.5% **multi-ethnic** students, and 0.7% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Biology revealed 10.4% aged **19 or less**, 38.9% aged **20 to 24**, 21.6% aged **25 to 29**, 10.8% aged **30 to 34**, 6.6% aged **35 to 39**, 7.6% aged **40 to 49**, and 4.1% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Biology Degrees	154	147	188
College Awarded Certificates	600	602	628
Biology Certificates	0	0	0

The percentage change in the number of Biology **degrees** awarded in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from the number of degrees awarded in 2015-16.

The percentage change in the number of Biology **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Biology

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Biology Success Rate	75.2%	77.1%	79.5%

Modality	2015-16	2016-17	2017-18
Traditional	85.3%	84.5%	84.2%
Online	75.6%	77.2%	80.6%
Hybrid	85.0%	91.8%	91.7%
Correspondence (Cable, Telecourse, Other DL)	57.4%	58.2%	62.6%

Gender	2015-16	2016-17	2017-18
Female	79.4%	79.9%	82.2%
Male	69.6%	73.1%	75.1%
Unknown	82.4%	77.1%	89.8%

Ethnicity	2015-16	2016-17	2017-18
African American	45.3%	56.4%	57.6%
American Indian/AK Native	58.3%	36.4%	71.4%
Asian	85.4%	85.2%	88.8%
Hispanic	63.6%	65.6%	69.6%
Pacific Islander/HI Native	38.5%	80.0%	90.9%
White	77.9%	80.7%	79.9%
Multi-Ethnicity	70.0%	72.2%	76.6%
Other/Unknown	83.3%	69.0%	72.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	79.0%	86.0%	84.7%
20 to 24	80.4%	79.8%	83.4%
25 to 29	75.5%	74.3%	77.8%
30 to 34	64.8%	75.0%	75.9%
35 to 39	67.6%	68.4%	73.7%
40 to 49	66.2%	72.3%	71.0%
50 and Older	72.4%	69.9%	72.4%

The percentage difference in the **course success rate** in Biology courses in 2017-18 showed a moderate increase from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Biology 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Biology **course success rate** was moderately higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Biology success rate for 2017-18, the success rate was slightly higher for **traditional (face-to-face)** Biology courses, slightly higher for **online** courses, substantially higher for **hybrid courses**, and substantially lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Biology success rate for 2017-18, the success rate was slightly higher for **female** students in Biology courses, slightly lower for **male** students, and substantially higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Biology success rate for 2017-18, the success rate was substantially lower for **African American** students in Biology courses, moderately lower for **American Indian/AK Native** students, moderately higher for **Asian** students, moderately lower for **Hispanic** students, substantially higher for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly lower for **multi-ethnic** students, and moderately lower for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Biology success rate for 2017-18, the success rate was moderately higher for students aged **19 or less** in Biology courses, slightly higher for students aged **20 to 24**, slightly lower for students aged **25 to 29**, slightly lower for students aged **30 to 34**, moderately lower for students aged **35 to 39**, moderately lower for students aged **40 to 49**, and moderately lower for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Biology Retention Rate	87.1%	88.3%	89.5%

Modality	2015-16	2016-17	2017-18
Traditional	88.4%	89.8%	89.9%
Online	86.9%	88.5%	89.6%
Hybrid	90.0%	93.4%	95.8%
Correspondence (Cable, Telecourse, Other DL)	84.9%	84.0%	88.2%

Gender	2015-16	2016-17	2017-18
Female	87.8%	89.1%	90.0%
Male	86.0%	87.1%	88.6%
Unknown	88.2%	91.7%	94.9%

Ethnicity	2015-16	2016-17	2017-18
African American	78.7%	80.6%	84.5%
American Indian/AK Native	83.3%	81.8%	78.6%
Asian	90.5%	91.5%	94.1%
Hispanic	84.4%	83.5%	85.0%
Pacific Islander/HI Native	92.3%	86.7%	90.9%
White	87.1%	90.3%	89.0%
Multi-Ethnicity	84.4%	85.3%	87.2%
Other/Unknown	88.1%	86.2%	84.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	91.0%	92.0%	93.0%
20 to 24	88.8%	88.6%	90.9%
25 to 29	86.8%	88.3%	88.6%
30 to 34	80.5%	88.3%	88.2%
35 to 39	84.0%	84.0%	85.7%
40 to 49	85.2%	90.0%	87.2%
50 and Older	88.1%	81.3%	86.5%

The percentage difference in the **retention rate** in Biology courses in 2017-18 showed a slight increase from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Biology 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Biology **retention rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Biology retention rate for 2017-18, the retention rate was minimally different for **traditional (face-to-face)** Biology courses, minimally different for **online** courses, moderately higher for **hybrid courses**, and slightly lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Biology retention rate for 2017-18, the retention rate was minimally different for **female** students in Biology courses, minimally different for **male** students, and moderately higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Biology retention rate for 2017-18, the retention rate was moderately lower for **African American** students in Biology courses, substantially lower for **American Indian/AK Native** students, slightly higher for **Asian** students, slightly lower for **Hispanic** students, slightly higher for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly lower for **multi-ethnic** students, and moderately lower for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Biology retention rate for 2017-18, the retention rate was slightly higher for students aged **19 or less** in Biology courses, slightly higher for students aged **20 to 24**, minimally different for students aged **25 to 29**, slightly lower for students aged **30 to 34**, slightly lower for students aged **35 to 39**, slightly lower for students aged **40 to 49**, and slightly lower for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Ecology

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Ecology Enrollment	0	0	36
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Ecology Resident FTES	0.00	0.00	3.33
Sections	0	0	1
Fill Rate	0.0%	0.0%	80.0%
WSCH/FTEF 595 Efficiency	0	0	547
FTEF/30	0.0	0.0	0.1
Extended Learning Enrollment	35	11	0

The percentage change in the number of Ecology **enrollments** in 2017-18 showed no comparative data from 2016-17 and no comparative data from 2015-16.

The percentage change in 2017-18 **resident FTES** in Ecology credit courses showed no comparative data from 2016-17 and no comparative data in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Ecology courses in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Ecology courses showed no comparative data from 2016-17 and no comparative data in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Ecology courses in 2017-18 showed no comparative data from 2016-17 and no comparative data from 2015-16.

The percentage change in the **FTEF/30** ratio for Ecology courses in 2017-18 showed no comparative data from 2016-17 and no comparative data in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial decrease in the number of Ecology **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Ecology Enrollment	0	0	36

Modality	2015-16	2016-17	2017-18
Traditional	-	-	0.0%
Online	-	-	100.0%
Hybrid	-	-	0.0%
Correspondence (Cable, Telecourse, Other DL)	-	-	0.0%

Gender	2015-16	2016-17	2017-18
Female	-	-	75.0%
Male	-	-	22.2%
Unknown	-	-	2.8%

Ethnicity	2015-16	2016-17	2017-18
African American	-	-	16.7%
American Indian/AK Native	-	-	0.0%
Asian	-	-	16.7%
Hispanic	-	-	25.0%
Pacific Islander/HI Native	-	-	0.0%
White	-	-	25.0%
Multi-Ethnicity	-	-	16.7%
Other/Unknown	-	-	0.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	-	-	16.7%
20 to 24	-	-	30.6%
25 to 29	-	-	25.0%
30 to 34	-	-	11.1%
35 to 39	-	-	8.3%
40 to 49	-	-	2.8%
50 and Older	-	-	5.6%

Ecology courses made up 0.1% of all state-funded enrollment for 2017-18. The percentage difference in Ecology course **enrollment** in 2017-18 showed no comparative data from 2016-17 and no comparative data from 2015-16. Enrollment in Ecology during 2017-18 showed 0.0% of courses were taught **traditional (face-to-face)**, 100.0% were taught **online**, 0.0% were taught in the **hybrid** modality, and 0.0% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Ecology enrollment consisted of 75.0% **female**, 22.2% **male**, and 2.8% students of **unknown** gender. In 2017-18, Ecology enrollment consisted of 16.7% **African American** students, 0.0% **American Indian/AK Native** students, 16.7% **Asian** students, 25.0% **Hispanic** students, 0.0% **Pacific Islander/HI Native** students, 25.0% **White** students, 16.7% **multi-ethnic** students, and 0.0% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Ecology revealed 16.7% aged **19 or less**, 30.6% aged **20 to 24**, 25.0% aged **25 to 29**, 11.1% aged **30 to 34**, 8.3% aged **35 to 39**, 2.8% aged **40 to 49**, and 5.6% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Ecology Degrees	0	0	0
College Awarded Certificates	600	602	628
Ecology Certificates	0	0	0

The percentage change in the number of Ecology **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Ecology **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Ecology

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Ecology Success Rate	-	-	75.0%

Modality	2015-16	2016-17	2017-18
Traditional	-	-	-
Online	-	-	75.0%
Hybrid	-	-	-
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	-	-	77.8%
Male	-	-	62.5%
Unknown	-	-	100.0%

Ethnicity	2015-16	2016-17	2017-18
African American	-	-	50.0%
American Indian/AK Native	-	-	-
Asian	-	-	66.7%
Hispanic	-	-	88.9%
Pacific Islander/HI Native	-	-	-
White	-	-	66.7%
Multi-Ethnicity	-	-	100.0%
Other/Unknown	-	-	-

Age Group	2015-16	2016-17	2017-18
19 or Less	-	-	66.7%
20 to 24	-	-	81.8%
25 to 29	-	-	88.9%
30 to 34	-	-	50.0%
35 to 39	-	-	66.7%
40 to 49	-	-	0.0%
50 and Older	-	-	100.0%

The percentage difference in the **course success rate** in Ecology courses in 2017-18 showed no comparative data from 2016-17 and no comparative data from 2015-16. When comparing the percentage point difference in the Ecology 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Ecology **course success rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Ecology success rate for 2017-18, the success rate was not applicable for **traditional (face-to-face)** Ecology courses, minimally different for **online** courses, not applicable for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Ecology success rate for 2017-18, the success rate was slightly higher for **female** students in Ecology courses, substantially lower for **male** students, and substantially higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Ecology success rate for 2017-18, the success rate was substantially lower for **African American** students in Ecology courses, not applicable for **American Indian/AK Native** students, moderately lower for **Asian** students, substantially higher for **Hispanic** students, not applicable for **Pacific Islander/HI Native** students, moderately lower for **White** students, substantially higher for **multi-ethnic** students, and not applicable for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Ecology success rate for 2017-18, the success rate was moderately lower for students aged **19 or less** in Ecology courses, moderately higher for students aged **20 to 24**, substantially higher for students aged **25 to 29**, substantially lower for students aged **30 to 34**, moderately lower for students aged **35 to 39**, substantially lower for students aged **40 to 49**, and substantially higher for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Ecology Retention Rate	-	-	83.3%

Modality	2015-16	2016-17	2017-18
Traditional	-	-	-
Online	-	-	83.3%
Hybrid	-	-	-
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	-	-	85.2%
Male	-	-	75.0%
Unknown	-	-	100.0%

Ethnicity	2015-16	2016-17	2017-18
African American	-	-	66.7%
American Indian/AK Native	-	-	-
Asian	-	-	83.3%
Hispanic	-	-	88.9%
Pacific Islander/HI Native	-	-	-
White	-	-	77.8%
Multi-Ethnicity	-	-	100.0%
Other/Unknown	-	-	-

Age Group	2015-16	2016-17	2017-18
19 or Less	-	-	83.3%
20 to 24	-	-	81.8%
25 to 29	-	-	100.0%
30 to 34	-	-	75.0%
35 to 39	-	-	66.7%
40 to 49	-	-	0.0%
50 and Older	-	-	100.0%

The percentage difference in the **retention rate** in Ecology courses in 2017-18 showed no comparative data from 2016-17 and no comparative data from 2015-16. When comparing the percentage point difference in the Ecology 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Ecology **retention rate** was slightly lower than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Ecology retention rate for 2017-18, the retention rate was not applicable for **traditional (face-to-face)** Ecology courses, minimally different for **online** courses, not applicable for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Ecology retention rate for 2017-18, the retention rate was slightly higher for **female** students in Ecology courses, moderately lower for **male** students, and substantially higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Ecology retention rate for 2017-18, the retention rate was substantially lower for **African American** students in Ecology courses, not applicable for **American Indian/AK Native** students, minimally different for **Asian** students, moderately higher for **Hispanic** students, not applicable for **Pacific Islander/HI Native** students, moderately lower for **White** students, substantially higher for **multi-ethnic** students, and not applicable for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Ecology retention rate for 2017-18, the retention rate was minimally different for students aged **19 or less** in Ecology courses, slightly lower for students aged **20 to 24**, substantially higher for students aged **25 to 29**, moderately lower for students aged **30 to 34**, substantially lower for students aged **35 to 39**, substantially lower for students aged **40 to 49**, and substantially higher for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Marine Science

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Marine Science Enrollment	528	498	662
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Marine Science Resident FTES	46.78	44.90	61.21
Sections	5	5	7
Fill Rate	76.5%	68.9%	80.0%
WSCH/FTEF 595 Efficiency	847	739	867
FTEF/30	1.8	1.8	1.9
Extended Learning Enrollment	148	112	102

The percentage change in the number of Marine Science **enrollments** in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from 2015-16.

The percentage change in 2017-18 **resident FTES** in Marine Science credit courses showed a substantial increase from 2016-17 and a substantial increase in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Marine Science courses in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Marine Science courses showed a substantial increase from 2016-17 and a slight increase in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Marine Science courses in 2017-18 showed a substantial increase from 2016-17 and a slight increase from 2015-16.

The percentage change in the **FTEF/30** ratio for Marine Science courses in 2017-18 showed a moderate increase from 2016-17 and a slight increase in comparison with the FTEF/30 ratio in 2015-16.

There was a moderate decrease in the number of Marine Science **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Marine Science Enrollment	528	498	662

Modality	2015-16	2016-17	2017-18
Traditional	0.0%	1.8%	1.4%
Online	0.9%	11.0%	22.2%
Hybrid	0.0%	0.0%	0.0%
Correspondence (Cable, Telecourse, Other DL)	99.1%	87.1%	76.4%

Gender	2015-16	2016-17	2017-18
Female	11.7%	12.0%	16.8%
Male	88.1%	86.7%	82.0%
Unknown	0.2%	1.2%	1.2%

Ethnicity	2015-16	2016-17	2017-18
African American	12.5%	13.7%	10.6%
American Indian/AK Native	2.1%	1.2%	1.5%
Asian	5.3%	6.0%	7.9%
Hispanic	24.2%	26.3%	22.7%
Pacific Islander/HI Native	1.1%	0.8%	0.5%
White	42.6%	41.4%	41.5%
Multi-Ethnicity	10.8%	9.2%	14.5%
Other/Unknown	1.3%	1.4%	0.9%

Age Group	2015-16	2016-17	2017-18
19 or Less	1.9%	2.6%	7.1%
20 to 24	14.2%	13.3%	12.4%
25 to 29	18.2%	17.5%	17.1%
30 to 34	15.9%	19.3%	15.9%
35 to 39	16.1%	14.7%	12.1%
40 to 49	23.3%	19.9%	23.3%
50 and Older	10.4%	12.9%	12.2%

Marine Science courses made up 1.1% of all state-funded enrollment for 2017-18. The percentage difference in Marine Science course **enrollment** in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from 2015-16. Enrollment in Marine Science during 2017-18 showed 1.4% of courses were taught **traditional (face-to-face)**, 22.2% were taught **online**, 0.0% were taught in the **hybrid** modality, and 76.4% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Marine Science enrollment consisted of 16.8% **female**, 82.0% **male**, and 1.2% students of **unknown** gender. In 2017-18, Marine Science enrollment consisted of 10.6% **African American** students, 1.5% **American Indian/AK Native** students, 7.9% **Asian** students, 22.7% **Hispanic** students, 0.5% **Pacific Islander/HI Native** students, 41.5% **White** students, 14.5% **multi-ethnic** students, and 0.9% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Marine Science revealed 7.1% aged **19 or less**, 12.4% aged **20 to 24**, 17.1% aged **25 to 29**, 15.9% aged **30 to 34**, 12.1% aged **35 to 39**, 23.3% aged **40 to 49**, and 12.2% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Marine Science Degrees	0	0	0
College Awarded Certificates	600	602	628
Marine Science Certificates	0	0	0

The percentage change in the number of Marine Science **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Marine Science **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Marine Science

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Marine Science Success Rate	63.6%	64.3%	74.3%

Modality	2015-16	2016-17	2017-18
Traditional	-	100.0%	66.7%
Online	100.0%	78.2%	89.1%
Hybrid	-	-	-
Correspondence (Cable, Telecourse, Other DL)	63.3%	61.8%	70.1%

Gender	2015-16	2016-17	2017-18
Female	71.0%	78.3%	86.5%
Male	62.8%	62.0%	72.1%
Unknown	0.0%	83.3%	50.0%

Ethnicity	2015-16	2016-17	2017-18
African American	57.6%	47.1%	61.4%
American Indian/AK Native	72.7%	83.3%	50.0%
Asian	78.6%	86.7%	86.5%
Hispanic	55.5%	59.5%	72.0%
Pacific Islander/HI Native	16.7%	50.0%	33.3%
White	67.6%	71.8%	79.9%
Multi-Ethnicity	68.4%	50.0%	67.7%
Other/Unknown	71.4%	85.7%	83.3%

Age Group	2015-16	2016-17	2017-18
19 or Less	80.0%	61.5%	89.4%
20 to 24	58.7%	75.8%	82.9%
25 to 29	56.3%	57.5%	66.4%
30 to 34	66.7%	60.4%	75.2%
35 to 39	62.4%	61.6%	81.3%
40 to 49	65.0%	66.7%	68.8%
50 and Older	74.5%	67.2%	70.0%

The percentage difference in the **course success rate** in Marine Science courses in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from 2015-16. When comparing the percentage point difference in the Marine Science 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Marine Science **course success rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Marine Science success rate for 2017-18, the success rate was moderately lower for **traditional (face-to-face)** Marine Science courses, substantially higher for **online** courses, not applicable for **hybrid courses**, and slightly lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Marine Science success rate for 2017-18, the success rate was substantially higher for **female** students in Marine Science courses, slightly lower for **male** students, and substantially lower for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Marine Science success rate for 2017-18, the success rate was substantially lower for **African American** students in Marine Science courses, substantially lower for **American Indian/AK Native** students, substantially higher for **Asian** students, slightly lower for **Hispanic** students, substantially lower for **Pacific Islander/HI Native** students, slightly higher for **White** students, moderately lower for **multi-ethnic** students, and moderately higher for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Marine Science success rate for 2017-18, the success rate was substantially higher for students aged **19 or less** in Marine Science courses, moderately higher for students aged **20 to 24**, moderately lower for students aged **25 to 29**, minimally different for students aged **30 to 34**, moderately higher for students aged **35 to 39**, moderately lower for students aged **40 to 49**, and slightly lower for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Marine Science Retention Rate	80.3%	84.9%	89.4%

Modality	2015-16	2016-17	2017-18
Traditional	-	100.0%	88.9%
Online	100.0%	90.9%	98.0%
Hybrid	-	-	-
Correspondence (Cable, Telecourse, Other DL)	80.1%	83.9%	86.9%

Gender	2015-16	2016-17	2017-18
Female	91.9%	90.0%	95.5%
Male	78.9%	84.3%	88.4%
Unknown	0.0%	83.3%	75.0%

Ethnicity	2015-16	2016-17	2017-18
African American	83.3%	83.8%	85.7%
American Indian/AK Native	90.9%	100.0%	80.0%
Asian	82.1%	93.3%	92.3%
Hispanic	77.3%	83.2%	88.0%
Pacific Islander/HI Native	50.0%	75.0%	66.7%
White	81.3%	84.5%	92.0%
Multi-Ethnicity	80.7%	84.8%	86.5%
Other/Unknown	71.4%	100.0%	100.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	90.0%	92.3%	95.7%
20 to 24	80.0%	92.4%	98.8%
25 to 29	76.0%	87.4%	86.7%
30 to 34	79.8%	78.1%	90.5%
35 to 39	78.8%	79.5%	87.5%
40 to 49	82.9%	86.9%	87.0%
50 and Older	83.6%	85.9%	85.0%

The percentage difference in the **retention rate** in Marine Science courses in 2017-18 showed a moderate increase from 2016-17 and a substantial increase from 2015-16. When comparing the percentage point difference in the Marine Science 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Marine Science **retention rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Marine Science retention rate for 2017-18, the retention rate was minimally different for **traditional (face-to-face)** Marine Science courses, moderately higher for **online** courses, not applicable for **hybrid courses**, and slightly lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Marine Science retention rate for 2017-18, the retention rate was moderately higher for **female** students in Marine Science courses, slightly lower for **male** students, and substantially lower for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Marine Science retention rate for 2017-18, the retention rate was slightly lower for **African American** students in Marine Science courses, moderately lower for **American Indian/AK Native** students, slightly higher for **Asian** students, slightly lower for **Hispanic** students, substantially lower for **Pacific Islander/HI Native** students, slightly higher for **White** students, slightly lower for **multi-ethnic** students, and substantially higher for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Marine Science retention rate for 2017-18, the retention rate was moderately higher for students aged **19 or less** in Marine Science courses, moderately higher for students aged **20 to 24**, slightly lower for students aged **25 to 29**, slightly higher for students aged **30 to 34**, slightly lower for students aged **35 to 39**, slightly lower for students aged **40 to 49**, and slightly lower for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

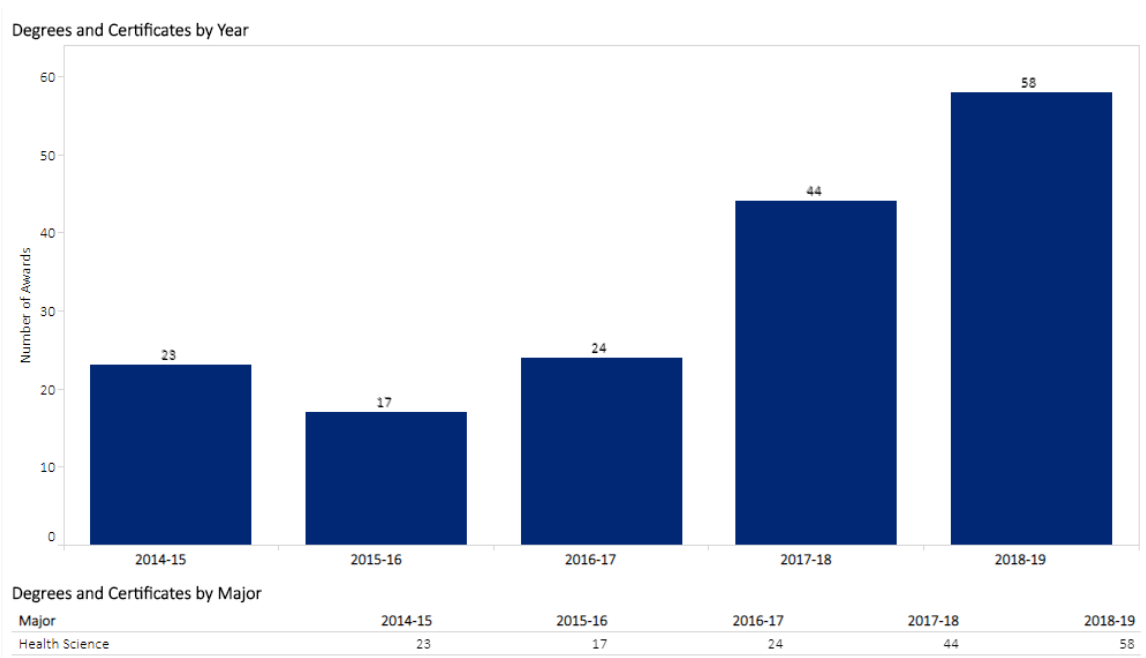
Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Health Science Certificate of Achievement

This program prepares students for entry into health professional programs or jobs in the medical field. Coursework provides many of the science prerequisites for programs in health professions such as nursing, physician assistant, pharmacy, physical therapy, occupational therapy, dental hygiene, radiology technology, dentist, and medical doctor.

We have seen a steady increase in Certificate attainment, with an all-time high of 58 certificates awarded in 2018-2019.

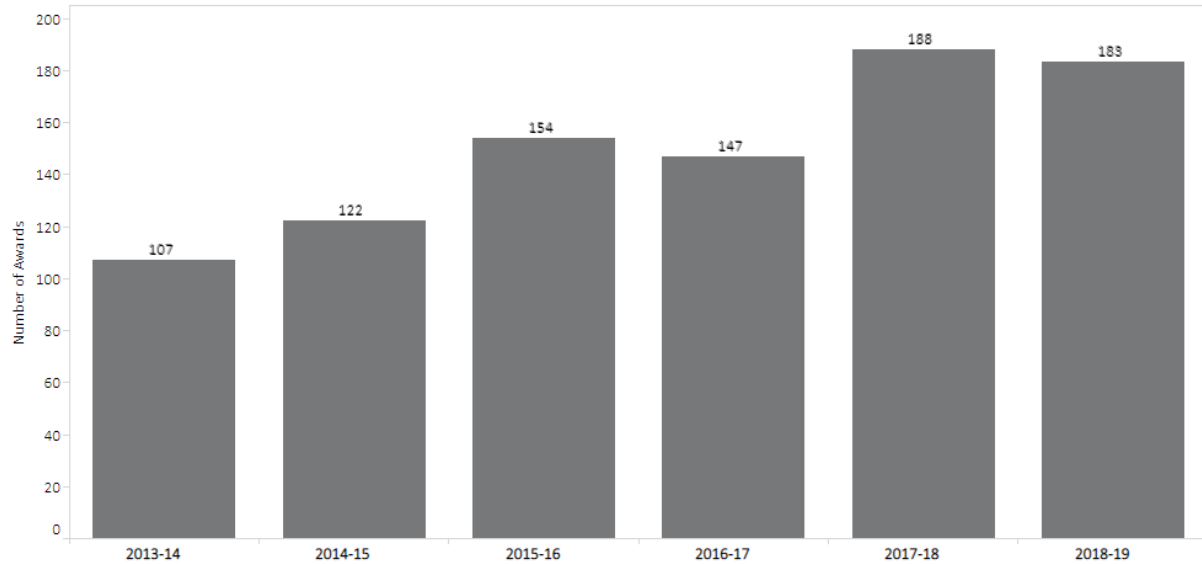


Internal Analysis: Science and Math - Associate of Arts Degree

Courses in the Science and Math area develop an understanding of mathematical and scientific methods and knowledge. Continuing study in science and math will prepare students for a wide range of careers in technology, the health field, education, research, engineering, and business.

Some university majors within Science and Math include: Accounting, Astronomy, Biology, Biotechnology, Botany, Chemistry, Computer Science, Ecology, Education, Engineering, Marketing, Math, Medicine, Microbiology, Nursing, Pharmacy, Physics, and Veterinary Medicine.

Degrees and Certificates by Year



Degrees and Certificates by Major

Major	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Liberal Arts: Science & Math	107	122	154	147	188	183

Student (SLOs) and Program Student Learning Outcome (PSLOs)

Summarize SLOs, PSLO findings, dialog (including participants). Summarize your conversations related to course and programmatic change(s) and include anticipated outcomes. Note: if PSLO data is less than 10 students, identify an alternative method for direct assessment.

1. SLOs data collection is coordinated by the Dean of Institutional Research, Planning, Effectiveness and Grant Development and SLO coordinator(s). Each instructor can use the assessment tool of his/her choice.
2. Between Fall 2018-Spring 2019, 9 courses were scheduled to report SLOs. Of those 9 courses, 5 did not have any data reported to SLO cloud, 3 were reported to the SLO cloud with “not assessed” selected for each student, and 1 course reported full SLO data (but only for 3 of 7 sections taught).

Table 1 *SLO Assessment and Plan*

SLO	Method(s) of Assessment	Participant(s) in the Planning Discussion	Recommended Changes
MRSC C100 SLO 1	N/A – No students assessed over 3 sections	Full-time faculty	To be discussed at first faculty meeting in Fall
MRSC C100 SLO 2	N/A – No students assessed over 3 sections	Full-time faculty	To be discussed at first faculty meeting in Fall
MRSC C100 SLO 3	N/A – No students assessed over 3 sections	Full-time faculty	To be discussed at first faculty meeting in Fall
MRSC C100L	No data in SLO Cloud	N/A	To be discussed at first faculty meeting in Fall
BIOL C103 SLO 1	N/A – All 8 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C103 SLO 2	N/A - All 8 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C103 SLO 3	N/A - All 8 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C103L	No data in SLO Cloud	N/A	To be discussed at first faculty meeting in Fall
BIOL C185	No data in SLO Cloud	N/A	To be discussed at first faculty meeting in Fall
BIOL C220 SLO 1	Comprehensives, Portfolio, Project, Pre/Post Test, Stand. Test, Presentation, Performance	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C220 SLO 2	Comprehensives, Project, Stand. Test, Performance	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C291	No data in SLO Cloud	N/A	To be discussed at first faculty meeting in Fall
BIOL C292 SLO 1	N/A – All 3 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C292 SLO 2	N/A - All 3 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C292 SLO 3	N/A - All 3 students not assessed	Full-time faculty	To be discussed at first faculty meeting in Fall
BIOL C293	No data in SLO Cloud	N/A	To be discussed at first faculty meeting in Fall

Table 2 PSLO Results

PSLO	Method(s) of Assessment	Participant(s) in the Planning Discussion	Recommended Changes
Health Science Certificate	N/A - Health Science Certification of Achievement data currently not be collected	Full-time faculty, Dean of Institutional Research, Planning, Effectiveness and Grant Development and SLO coordinator	Implement outgoing survey for students that obtain the Health Science Certification of Achievement

Curriculum Review

Summarize curriculum activities in the past year, providing dates of revisions, new course adoptions, and/or course deletions. Present a list of current degree(s)/certificate(s) and write a summary on new any degree or certificate discontinued over the past year.

Table 3 Curriculum Review

Course	Title	Term Reviewed	Status
BIOL C100	Introduction to Biology	Spring 2017	Effective Fall 2017
BIOL C100C	Introduction to Biology Lecture/Lab	Fall 2017	Effective Spring 2018
BIOL C100L	Introduction to Biology Lab	Spring 2017	Effective Fall 2017
BIOL C102	Intro. to the Concepts of Anatomy and Physiology	Spring 2018	Effective Fall 2018
BIOL C103	Introduction to Marine Science	Spring 2017	Effective Fall 2017
BIOL C103L	Marine Sciences Lab	Spring 2017	Effective Fall 2017
BIOL C104	Medical Terminology for Health Professionals	Spring 2017	Effective Fall 2017
BIOL C120	Biology of Aging	Spring 2017	Effective Fall 2017
BIOL C122	Bioethics	Spring 2018	Effective Fall 2017
BIOL C180	Cell and Molecular Biology	Spring 2014	Up for Review Fall 2019
BIOL C185	Diversity of Organisms	Spring 2017	Effective Fall 2017
BIOL C200	Pharmacology	Spring 2017	Effective Fall 2017
BIOL C210	General Microbiology	Spring 2018	Effective Fall 2018
BIOL C211	General Microbiology Lecture	Spring 2017	Effective Fall 2017
BIOL C211L	General Microbiology Lab	Spring 2017	Effective Fall 2017
BIOL C220	Human Anatomy	Spring 2018	Effective Fall 2018
BIOL C221	Introduction to Anatomy and Physiology	Spring 2017	Effective Fall 2017
BIOL C225	Human Physiology	Spring 2017	Effective Fall 2017
BIOL C281	Biochemistry	Spring 2017	Effective Fall 2017
BIOL C282	Molecular Biology	Spring 2017	Effective Fall 2017
BIOL C283	Genetics	Fall 2013	Up for Review Fall 2019
BIOL C291	Biology Work Based Learning	Spring 2019	Effective Fall 2019
BIOL C292	Biology Work Based Learning	Spring 2019	Effective Fall 2019
BIOL C293	Work Based Learning	Spring 2019	Effective Fall 2019
BIOL C296	Advanced Anatomical Dissection	Fall 2013	Pending Suspension
ECOL C100/BIOL C106	Human Ecology	Spring 2017	Effective Fall 2017
MRSC C100	Introduction to Marine Science	Spring 2017	Effective Fall 2017
MRSC C100L	Marine Sciences Lab	Spring 2017	Effective Fall 2017
MRSC C105	Marine Biology	Spring 2012	Up for Review Fall 2019

Progress on Initiative(s)

Fill in Table with the following elements.

Initiative: Short description

Status: Specify whether the initiative was Completed, In-Progress, Terminated or Not Started

Progress Status Description: Describe the progress made on the forward strategies.

Outcome(s): Provide a summary of the initiative from inception to completion, indicating associated outcomes.

Table 4 Progress on Forward Strategies

Initiative(s)	Status	Progress Status	Outcome(s)
Create new Lab Space at Garden Grove	Not Started	delayed	Need Feasibility Study
Create a new biotechnology certificate	Not Started	Biotechnology Program Suspended	Biotechnology Courses to be suspended
Increase Biotechnology Equipment to strengthen the program	Not Started	Biotechnology Program Suspended	Biotechnology Courses to be suspended
Maintain lab safety and support sciences courses at the college	Completed	ongoing	Still require an additional Full Time Instructional Lab Associate
Yearly Budget. Ongoing Biological Sciences Consumables/Contracts (included is the Additional Current Needs laundry contract) under the Consumables Assessment: Current Needs	Completed	Awaiting release of the college budget	Awaiting release of the college budget
-70 °C freezer	Completed	Completed	In Use at GGC
Full time Instructional Lab Associate needed to aid in Microbiology, Anatomy, Physiology, Diversity of Organisms, General Biology, Cell and Molecular Biology, and Marine Science Labs that occur over 3 campuses	In-Progress	Awaiting funding	Unknown
Peristaltic pump needed to increase safety and efficiency in microbiology	Completed	Completed	In Use
Incubator needed to run 3rd section of microbiology at NBC	On-hold	Awaiting funding	Required to run third Microbiology section at NBC

Biopacs (4) Biopacs needed for physiology labs to replace broken models and to allow for groups of 4-5 students to use instead of 6-7 around one computer.	In-Progress	Awaiting funding	Still Need (carryover from 2017-2018)
Poison storage cabinet needed at Garden Grove to store toxic chemicals in safe, locked cabinet	In-Progress	Awaiting funding	Still Need (carryover from 2017-2018)
Update microscopes	Completed	Completed	6 Microscopes purchased
Work-based learning materials allow for student research and may increase their transfer rate and acceptance rate to health care programs	In-Progress	Awaiting funding	Not purchased yet
Refrigerator to store microbiological specimens	On-hold	Awaiting funding	Required to run third Microbiology section at NBC
Health Science Academic Triathlon	Completed	completed	Completed
Cadaver lab to increase student knowledge, provide the necessary education for the pre-health care student, and perhaps decrease some dissection costs	In-Progress	Awaiting funding	Hope to fund through NIH SHARE Grant
Nursing Program; PT aid; Pharm aid/tech programs	Delayed	Low Priority	TBD
Hire 2 Full Time Faculty members – 1 for Anatomy/Physiology and 1 for General Biology	In-Progress	Will request during full-time faculty prioritization	TBD

Response to Program/Department Committee Recommendation(s)

Fill in Table with the following elements.

Recommendation #: Short description

Response Status: In-progress, Addressed, Not Addressed

Response Summary: Describe the progress made on the recommendation(s).

Table 5 Progress on Recommendations

Recommendation(s)	Status	Response Summary
Work with the Instructional Wing to identify opportunities for lab expansions for all sciences.	Awaiting administrative approval	No work currently being done on this. Best place for lab expansion and consolidation remains the 3 rd floor of Garden Grove
Secure a National Institute of Health (NIH) grant to support student research projects, building of Cadaver lab, and creation of summer camps.	Waiting to hear	NIH SHARE grant written and submitted
Evaluate the impact of guided pathways on the Sciences Program	ongoing	In biology, we have created various road maps to meet our health care students. We also have ongoing work-study programs to promote the Biology ADT.

Program Planning and Communication Strategies

Describe the communication methods and interaction strategies used by your program to discuss program-level planning, curriculum, SLOs, PSLOs, and institutional performance data.

The Full Time Biology faculty routinely meets once a month, typically on the first or second Friday (depending on the Curriculum Committee meetings).

SLOs are currently being tracked two ways:

1. SLOs are determined through the methodology determined by the Institutional Research, Planning, Effectiveness and Grant Development and SLO coordinator
2. SLOs are determined through a survey designed for students. They are given paraphrases of the SLOs and asked how comfortable they are in performing that SLO. Then they are asked to explain. This was initially piloted with Survey Monkey in a BIOL 220 class. This summer, it was added as a required assignment in Canvas for the BIOL 220 class. Its results will be discussed in our first fall full time faculty meeting.

Coastline Pathways

Describe the program's involvement in Coastline Pathways over the past year.

- Debbie Henry (former department chair) has been a member of the Pathways Onboarding Team.
- There are ongoing discussions to create an Environmental Studies ADT, Health Sciences A.A., and an Allied Health Certificate of Achievement to support more pathway opportunity for our students.
- Biology ADT approved May 2019. Plans to update the Coastline web site with recommended pathways to completion

Implications of Change

Summarize the findings from the program analysis and outline areas of opportunity for change.

The major opportunities of change for the program are tied to the NIH SHARE Grant proposal that was submitted in early July 2019. A summary of the project proposal is provided below:

SHARE Project Specific Aims

The overarching goal of the SHARE Project is to implement and test the effectiveness of learning strategies aligned with NGSS and PCAST recommendations to extend knowledge of best practices for improving recruitment, retention, graduation, and successful employment in the health, biomedical, and biotechnology fields. The goal of the project will be actualized through three specific aims/objectives through provision of: **Aim 1)** advanced courses and degrees for skills development in the allied health and biotechnical fields, **Aim 2)** curriculum that provides student research, work-based learning, and hands-on learning opportunities in allied health, biomedical, biotechnical fields and biological sciences, **Aim 3)** curriculum for primary and secondary education that includes inquiry-based learning using cross-cutting public health topics.

The curriculum component will also incorporate outreach activities that provide student learning opportunities and mentoring for teachers at primary, secondary, and post-secondary schools in the STEM fields at Coastline College during summer programs with an emphasis on health, biomedical, and biotechnology topics in science.

The outcome of the research component of the SHARE Project are to measure the impact of curriculum development, and student and teacher activities on student motivation and success, recruitment, retention, persistence to graduation, and transfer and employment rates.

The SHARE Project at Coastline College will address education, faculty recruiting, and student training and recruitment through courses and degrees for skills development, hands-on inquiry based curriculum, mentoring, and outreach through innovative and experiential learning opportunities.

Section 2: Human Capital Planning

Staffing

For the past three years, the Biology department has requested a second full time Instructional Lab Associate. With a growing department, we plan on requested two full time Instructional Lab Associates.

We will also request an additional two Biology faculty members to help with our growing number of onsite classes, especially with anatomy, physiology, and cell and molecular biology.

Table 6 Staffing Plan

Year	Administrator /Management	F/T Faculty	P/T Faculty	Classified	Hourly
Previous year 2018-19	Dean 1	Biology faculty 5	Biology faculty 21	Full Time Instructional Lab Associate-1	Up to 3 part time temporary Instructional Lab Associates
Current year 2019-20	Dean 1	Biology faculty 5	Biology faculty 22	Full Time Instructional Lab Associate-1	Up to 3 part time temporary Instructional Lab Associates
1 year 2020-21	Dean 1 Assistant Dean 1	Biology faculty 7	Biology faculty 23	Full Time Instructional Lab Associate-3	Up to 3 part time temporary Instructional Lab Associates
2 years 2021-22	Dean 1 Assistant Dean 1	Biology faculty 7	Biology faculty 24	Full Time Instructional Lab Associate-3	Up to 3 part time temporary Instructional Lab Associates
3 years 2022-23	Dean 1 Assistant Dean 1	Biology faculty 7	Biology faculty 25	Full Time Instructional Lab Associate-3	Up to 3 part time temporary Instructional Lab Associates

Professional Development

Provide a description and associated outcomes of the program's professional development participation over the past year. Include evidence that supports program constituents participating in new opportunities to meet the professional development needs of the program.

Table 7 Professional Development

Name (Title)	Professional Development	Outcome
Steve Fauce (Assistant Professor)	SABER West Conference in Irvine, CA – Jan 19-20	Conference Attendee
Steve Fauce (Assistant Professor)	Institute for the Future (IFTF) Training – Jul 22-24	Certification as a Foresight Training Practitioner
David Camerini (Instructor)	Author of “Point-of-Care Detection of Multiple Viral Infections using Acoustic Microstreaming”	Published peer-reviewed paper
David Camerini (Instructor)	NIH Scientific Review Group teleconference meeting on HIV Diagnostics and Cure	Participant
David Camerini (Instructor)	HIV Diagnostics Conference, Atlanta, GA, March 25-29	Conference Attendee
David Camerini (Instructor)	Revised textbook, “Basic Virology”	Submitted to Publisher
Deborah Henry (Professor)	Council of State Neurosurgical Societies	Socioeconomics Medicine
Deborah Henry (Professor)	ASCCC Fall Plenary Session Academic Senate	State issues re: senate and curriculum
Deborah Henry (Professor)	California Association of Neurological Surgeons Annual Meeting	Conference Attendee
Deborah Henry (Professor)	Practitioner Diversion Awareness Conference	Conference Attendee.
Deborah Henry (Professor)	ASCCC Fall Plenary Session Academic Senate	State issues re: senate and curriculum
Deborah Henry (Professor)	Enrollment Management Academy, Claremont	Enrollment Management
Lisa Demchik (Instructor)	Women Hold Up Half the Sky Conference	Conference Attendee
Tanya Murray (Professor)	Women Hold Up Half the Sky Conference	Conference Attendee
Tanya Murray (Professor)	Online Teaching Conference	Serving as a panelist.

Section 3: Facilities Planning

Facility Assessment

Provide a description of the program facilities and specify any changes over the past year. Provide evidence of emerging needs for modifications or additions to the department facilities. In addition, specify how the changes support your initiatives and align to the Facilities Master Plan.

Currently we have four biology labs across three campuses. We have two at Newport Beach Center, one at Le-Jao Center, and one at Garden Grove Center. Because the Garden Grove and Le-Jao Center only have one lab each, this makes it difficult for the science or health science student to take more than one class at one campus. This also increases the work load and cost for travel on faculty and our lone instructional lab associate. This also increases the biohazard at three campuses.

- 1.) **Garden Grove Lab Center:** Ideally, we would have an additional laboratory space at the Garden Grove campus where students could take Anatomy and Physiology classes. Having an up-to-date laboratory, with two doors for safety (as the Le-Jao lab has only one) and a prep area (as the Le-Jao has none), would alleviate some of the additional work and travel time for faculty, staff, and students. If there is enough room, additional faculty offices could be made at Garden Grove as well.

Forward Strategy

GARDEN GROVE LAB CENTER

What college goal does the Garden Grove Center Lab Center support?

- Instructional and Programmatic Excellence- Create two centers for the Health Sciences and Science majors
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Fiscal Stewardship, Scalability, and Sustainability-much easier to manage two centers than three

What Educational Master Plan objective does the Garden Grove Lab Center support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer to Universities and Health Care Programs).
- Explore and enter new fields of study (e.g Health Science Certificate, ADTs in the Sciences).
- Foster and sustain industry connections and expand external funding sources (e.g., STEM grants, Hoag Scholars Program) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

What evidence supports the labs at the Garden Grove Center? Select all that apply

- Internal Research (Student achievement, program performance)

TIMELINE: 3-5 years

- 2.) **CADAVER LAB:** Some students, as part of their application process for transfer to degree programs, require access to a human cadaver. Having a human cadaver program would enhance the Health Science students experience, meet the needs of the transfer student requirements, and may eliminate the need for the dissection of cats (which has become increasingly difficult as there is a shortage). Also, as one student put it, this is a Human Anatomy class, not a Cat Anatomy class. Attached is the proposal for building the cadaver lab. Below is the data from our most recent 5-year Program Review.

Academic Year	2013-2014					
Semester	Summer		Fall		Spring	
CourseID	Sections	Enrollment	Sections	Enrollment	Sections	Enrollment
BIOL 210	0	0	4	103	3	84
BIOL 220	2	50	7	195	6	173
BIOL 225	2	60	5	126	3	81
CHEM 110	1	62	4	137	3	135
CHEM 110L	2	63	5	136	4	135
CHEM 180	1	32	2	78	2	85
CHEM 180L	1	32	3	77	3	84
Total	9	299	30	852	24	777

Academic Year	2014-2015					
Semester	Summer		Fall		Spring	
CourseID	Sections	Enrollment	Sections	Enrollment	Sections	Enrollment
BIOL 210	0	0	3	86	3	85
BIOL 220	2	61	7	202	7	188
BIOL 225	1	33	4	99	4	113
CHEM 110	1	70	5	146	6	157
CHEM 110L	2	71	0	0	0	0
CHEM 180	1	31	2	80	2	80
CHEM 180L	1	32	3	78	3	78
Total	8	298	24	691	25	701

Academic Year	2015-2016					
Semester	Summer		Fall		Spring	
CourseID	Sections	Enrollment	Sections	Enrollment	Sections	Enrollment
BIOL 210	0	0	4	97	4	102
BIOL 220	4	103	8	220	7	191
BIOL 225	3	81	5	126	5	145
CHEM 110	3	116	5	148	6	182
CHEM 110L	0	0	0	0	0	0
CHEM 180	2	60	2	70	2	82
CHEM 180L	2	58	3	67	3	80
Total	14	418	27	728	27	782

Academic Year	2016-2017					
Semester	Summer		Fall		Spring	
CourseID	Sections	Enrollment	Sections	Enrollment	Sections	Enrollment
BIOL 210	0	0	5	135	5	130
BIOL 220	2	67	7	194	8	233
BIOL 225	2	54	5	116	5	137
CHEM 110	3	76	5	105	6	166
CHEM 110L	0	0	0	0	0	0
CHEM 180	2	59	2	59	2	58
CHEM 180L	2	53	2	56	2	52
Total	11	309	26	665	28	776

From Summer 2013 to Spring 2017, we have served **7,296** students in the Health Science Certificate courses. Of these students, **1,867** have taken Bio 220 Human Anatomy.

CADAVER LAB

What college goal does the Cadaver Lab support?

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the Cadaver Lab support?

- Strengthen post-Coastline outcomes (e.g., transfer into Health Care fields/schools).
- Explore and enter new fields of study (e.g., Health Care Fields).

What evidence supports this initiative? Select all that apply

- Internal Research (Student requests as a need for entry into certain Health Care schools, specifically occupational therapy; enhance onsite learning)
- Learning Outcome (SLO/PSLO) assessment

TIMELINE: Less than one year, dependent on funding. Potential to begin during the 2020-2021 school year based on funding from NIH SHARE Grant.

3. **MakerSpace:** Creation of a MakerSpace will be conducted with funds secured from the NIH SHARE grant. STEM students at Coastline College are currently offered research experiences in major's level biology courses (BIOL 180 and BIOL 185), and through student research courses that offer work-based learning opportunities with local allied health professionals such as physicians and physical therapists (BIOL 291, BIOL 292, BIOL 293). In these courses, students have the opportunity to select from the following activities: 1) design and build products that incorporate principles of engineering (mathematics and physics), anatomy and physiology, and biochemistry as educational tools and as service projects for the greater community, 2) collect and analyze field data including water chemistry and population dynamics at local marine science facilities, 3) receive training in patient care, intake, and records maintenance in a local physician's office, and/or 4) receive training as a physical therapy aid with local physical therapists. In these courses' faculty serve as mentors, and students interact with professionals in STEM fields. The biomedical/biotechnology projects currently underway at CCC all have application to our local and national communities. Coastline College offers students opportunities to print 3D prosthetic limbs for pediatric populations identified by a national nonprofit organization, eNABLE. These projects have direct impacts on our local community, building a sense of relevance to the students' coursework, which has been identified as a key component in student retention and success, especially in underrepresented populations. SEPA funding will support the development of a makerspace, within which Coastline College can expand the current experiential learning opportunities provided by adding: 1) computer assisted design training and application to innovate existing prosthetic templates to improve form, fit, function, and service to recipients, 2) CRISPR supplies to expand current training opportunities in genetic engineering; 3) training in basic lab skills through inquiry-based learning activities to support the ADT in Biology.

Forward Strategy

What college goal does the MakerSpace support?

- Instructional and Programmatic Excellence
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change

What Educational Master Plan objective does the MakerSpace support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Strengthen post-Coastline outcomes (e.g., transfer to Universities and Health Care Programs).
- Explore and enter new fields of study (e.g. Health Science Certificate, ADTs in the Sciences).
- Foster and sustain industry connections and expand external funding sources (e.g., STEM grants, Hoag Scholars Program) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, and academic alliances).

What evidence supports MakerSpace? Select all that apply

- Internal Research (Student achievement, program performance)

TIMELINE: 3-5 years

Section 4: Technology Planning

Technology Assessment

Provide a description of the program's utilization of technology and specify any changes over the past year. Provide evidence of emerging needs for modifications or additions to the department technology. In addition, specify how the changes support your initiatives and align to the Technology Plan.

Technology is utilized in our Cell and Molecular Biology, Diversity of Organisms, Microbiology, Physiology and Work-Study Programs. Current needs are

1. Lab laptop for Work Based Learning, and major's biology students and student advisor use. This will house the statistical program and 3D modeling programs (Carryover from last program review).
2. Four Biopac units (two for Le-Jao and two for Newport Beach Center) to replace broken units (Carryover from last program review).
3. Anatomy-based Software Package for 3D printer

EQUIPMENT Needs:

Equipment is heavily needed for our Microbiology program. Current needs:

1. Incubator for BIOL 210-this will allow us to have 3 sections of BIOL 210 (Microbiology) at the Newport Beach Campus.
2. Refrigerator for BIOL 210-this will allow us to have 3 sections of BIOL 210 (Microbiology) at the Newport Beach Campus.
3. Six additional microscopes-to aid our students as our section numbers increase and as the microscopes age and need replaced.
4. Two (2) Small Open Air Platform Shakers – to allow for growth of bacterial cultures and studying of growth curves.
5. Two (2) Slide Warmers for drying slides (under \$1000 total)
6. Poison Storage Cabinet for Garden Grove Center

Additional: Current Needs

1. Laundry service for microbiology lab coats-cost TBD

Consumables Assessment: Current Needs

Microbiology - GGC	\$	16,295.49
Microbiology - NBC	\$	16,960.89
Biology	\$	3,120.33
Anatomy & Physiology	\$	28,930.55
Service Contracts	\$	6,700.00

Biology Total \$ 72,007.26

Forward Strategy

What college goal does Technology Planning/Equipment/Consumables/Service Contracts Planning support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Student Retention and Persistence
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does Technology Planning/Equipment/Consumables/Service Contracts Planning support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).

What evidence supports Technology Planning/Equipment/Consumables/Service Contracts Planning? Select all that apply

- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates-See Attachment on Job Analysis)



2019-2020
Annual Program Review

Physical Sciences
(Astronomy, Chemistry, Geology, Physics)

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Section 1: Program Planning:

Internal Analysis: Astronomy

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Astronomy Enrollment	935	932	987
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Astronomy Resident FTES	83.54	84.72	91.14
Sections	8	10	11
Fill Rate	79.4%	77.2%	80.2%
WSCH/FTEF 595 Efficiency	1,257	1,095	1,087
FTEF/30	1.1	1.3	1.4
Extended Learning Enrollment	460	474	289

The percentage change in the number of Astronomy **enrollments** in 2017-18 showed a moderate increase from 2016-17 and a moderate increase from 2015-16.

The percentage change in 2017-18 **resident FTES** in Astronomy credit courses showed a moderate increase from 2016-17 and a moderate increase in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Astronomy courses in 2017-18 showed a moderate increase from 2016-17 and a substantial increase from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Astronomy courses showed a slight increase from 2016-17 and a slight increase in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Astronomy courses in 2017-18 showed a minimal difference from 2016-17 and a substantial decrease from 2015-16.

The percentage change in the **FTEF/30** ratio for Astronomy courses in 2017-18 showed a moderate increase from 2016-17 and a substantial increase in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial decrease in the number of Astronomy **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Astronomy Enrollment	935	932	987

Modality	2015-16	2016-17	2017-18
Traditional	1.4%	5.5%	3.4%
Online	28.2%	32.8%	32.4%
Hybrid	1.1%	0.0%	0.0%
Correspondence (Cable, Telecourse, Other DL)	69.3%	61.7%	64.1%

Gender	2015-16	2016-17	2017-18
Female	21.4%	23.6%	22.6%
Male	77.4%	74.2%	76.8%
Unknown	1.2%	2.1%	0.6%

Ethnicity	2015-16	2016-17	2017-18
African American	10.8%	12.4%	12.3%
American Indian/AK Native	1.4%	1.5%	1.0%
Asian	10.2%	9.7%	7.5%
Hispanic	21.8%	25.8%	27.8%
Pacific Islander/HI Native	0.4%	0.4%	0.3%
White	36.9%	34.8%	36.5%
Multi-Ethnicity	17.0%	14.5%	13.4%
Other/Unknown	1.5%	1.0%	1.3%

Age Group	2015-16	2016-17	2017-18
19 or Less	6.1%	10.5%	7.2%
20 to 24	19.6%	14.5%	13.7%
25 to 29	16.5%	14.3%	18.3%
30 to 34	17.9%	17.8%	15.0%
35 to 39	12.6%	15.7%	15.5%
40 to 49	17.5%	18.3%	17.8%
50 and Older	9.8%	8.9%	12.5%

Astronomy courses made up 1.6% of all state-funded enrollment for 2017-18. The percentage difference in Astronomy course **enrollment** in 2017-18 showed a moderate increase from 2016-17 and a moderate increase from 2015-16. Enrollment in Astronomy during 2017-18 showed 3.4% of courses were taught **traditional (face-to-face)**, 32.4% were taught **online**, 0.0% were taught in the **hybrid** modality, and 64.1% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Astronomy enrollment consisted of 22.6% **female**, 76.8% **male**, and 0.6% students of **unknown** gender. In 2017-18, Astronomy enrollment consisted of 12.3% **African American** students, 1.0% **American Indian/AK Native** students, 7.5% **Asian** students, 27.8% **Hispanic** students, 0.3% **Pacific Islander/HI Native** students, 36.5% **White** students, 13.4% **multi-ethnic** students, and 1.3% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Astronomy revealed 7.2% aged **19 or less**, 13.7% aged **20 to 24**, 18.3% aged **25 to 29**, 15.0% aged **30 to 34**, 15.5% aged **35 to 39**, 17.8% aged **40 to 49**, and 12.5% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Astronomy Degrees	0	0	0
College Awarded Certificates	600	602	628
Astronomy Certificates	0	0	0

The percentage change in the number of Astronomy **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Astronomy **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Astronomy

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Astronomy Success Rate	66.1%	73.1%	73.7%

Modality	2015-16	2016-17	2017-18
Traditional	69.2%	74.5%	73.5%
Online	55.7%	60.8%	56.9%
Hybrid	70.0%	-	-
Correspondence (Cable, Telecourse, Other DL)	70.2%	79.5%	82.3%

Gender	2015-16	2016-17	2017-18
Female	58.0%	59.5%	61.4%
Male	68.4%	77.5%	77.4%
Unknown	63.6%	70.0%	66.7%

Ethnicity	2015-16	2016-17	2017-18
African American	59.4%	62.1%	57.0%
American Indian/AK Native	46.2%	78.6%	80.0%
Asian	69.5%	76.7%	75.7%
Hispanic	66.7%	74.6%	76.9%
Pacific Islander/HI Native	75.0%	75.0%	100.0%
White	71.3%	79.0%	78.8%
Multi-Ethnicity	56.0%	65.9%	67.4%
Other/Unknown	85.7%	22.2%	61.5%

Age Group	2015-16	2016-17	2017-18
19 or Less	63.2%	74.5%	70.4%
20 to 24	54.6%	61.5%	59.3%
25 to 29	62.3%	66.2%	74.0%
30 to 34	65.9%	76.5%	69.6%
35 to 39	68.6%	78.1%	78.9%
40 to 49	79.3%	82.5%	81.8%
50 and Older	70.7%	66.3%	77.9%

The percentage difference in the **course success rate** in Astronomy courses in 2017-18 showed a substantial increase from 2016-17 and a minimal difference from 2015-16. When comparing the percentage point difference in the Astronomy 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Astronomy **course success rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Astronomy success rate for 2017-18, the success rate was minimally different for **traditional (face-to-face)** Astronomy courses, substantially lower for **online** courses, not applicable for **hybrid courses**, and moderately higher for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Astronomy success rate for 2017-18, the success rate was substantially lower for **female** students in Astronomy courses, slightly higher for **male** students, and moderately lower for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Astronomy success rate for 2017-18, the success rate was substantially lower for **African American** students in Astronomy courses, moderately higher for **American Indian/AK Native** students, slightly higher for **Asian** students, slightly higher for **Hispanic** students, substantially higher for **Pacific Islander/HI Native** students, slightly higher for **White** students, moderately lower for **multi-ethnic** students, and substantially lower for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Astronomy success rate for 2017-18, the success rate was slightly lower for students aged **19 or less** in Astronomy courses, substantially lower for students aged **20 to 24**, minimally different for students aged **25 to 29**, slightly lower for students aged **30 to 34**, moderately higher for students aged **35 to 39**, moderately higher for students aged **40 to 49**, and slightly higher for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Astronomy Retention Rate	79.3%	82.2%	81.9%

Modality	2015-16	2016-17	2017-18
Traditional	69.2%	92.2%	79.4%
Online	73.1%	74.5%	66.3%
Hybrid	90.0%	-	-
Correspondence (Cable, Telecourse, Other DL)	81.8%	85.4%	90.0%

Gender	2015-16	2016-17	2017-18
Female	75.5%	75.5%	69.5%
Male	80.2%	84.4%	85.7%
Unknown	81.8%	80.0%	66.7%

Ethnicity	2015-16	2016-17	2017-18
African American	79.2%	74.1%	70.2%
American Indian/AK Native	84.6%	78.6%	80.0%
Asian	78.9%	83.3%	83.8%
Hispanic	78.4%	83.3%	85.3%
Pacific Islander/HI Native	75.0%	100.0%	100.0%
White	82.3%	86.4%	84.7%
Multi-Ethnicity	72.3%	78.5%	76.5%
Other/Unknown	92.9%	44.4%	84.6%

Age Group	2015-16	2016-17	2017-18
19 or Less	77.2%	91.8%	83.1%
20 to 24	74.9%	73.3%	68.1%
25 to 29	72.1%	78.2%	81.8%
30 to 34	81.4%	85.5%	81.8%
35 to 39	83.1%	84.9%	86.8%
40 to 49	87.2%	84.8%	86.4%
50 and Older	78.3%	74.7%	84.4%

The percentage difference in the **retention rate** in Astronomy courses in 2017-18 showed minimal difference from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Astronomy 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Astronomy **retention rate** was slightly lower than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Astronomy retention rate for 2017-18, the retention rate was slightly lower for **traditional (face-to-face)** Astronomy courses, substantially lower for **online** courses, not applicable for **hybrid courses**, and moderately higher for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Astronomy retention rate for 2017-18, the retention rate was substantially lower for **female** students in Astronomy courses, slightly higher for **male** students, and substantially lower for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Astronomy retention rate for 2017-18, the retention rate was substantially lower for **African American** students in Astronomy courses, slightly lower for **American Indian/AK Native** students, slightly higher for **Asian** students, slightly higher for **Hispanic** students, substantially higher for **Pacific Islander/HI Native** students, slightly higher for **White** students, moderately lower for **multi-ethnic** students, and slightly higher for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Astronomy retention rate for 2017-18, the retention rate was slightly higher for students aged **19 or less** in Astronomy courses, substantially lower for students aged **20 to 24**, minimally different for students aged **25 to 29**, minimally different for students aged **30 to 34**, slightly higher for students aged **35 to 39**, slightly higher for students aged **40 to 49**, and slightly higher for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Chemistry

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Chemistry Enrollment	1,480	1,229	1,250
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Chemistry Resident FTES	239.36	192.81	198.46
Sections	55	51	57
Fill Rate	86.8%	86.8%	79.3%
WSCH/FTEF 595 Efficiency	492	431	390
FTEF/30	8.3	7.7	8.6
Extended Learning Enrollment	71	58	64

The percentage change in the number of Chemistry **enrollments** in 2017-18 showed a slight increase from 2016-17 and a substantial decrease from 2015-16.

The percentage change in 2017-18 **resident FTES** in Chemistry credit courses showed a slight increase from 2016-17 and a substantial decrease in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Chemistry courses in 2017-18 showed a substantial increase from 2016-17 and a slight increase from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Chemistry courses showed a moderate decrease from 2016-17 and a moderate decrease in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Chemistry courses in 2017-18 showed a moderate decrease from 2016-17 and a substantial decrease from 2015-16.

The percentage change in the **FTEF/30** ratio for Chemistry courses in 2017-18 showed a substantial increase from 2016-17 and a slight increase in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial increase in the number of Chemistry **Extended Learning enrollments** in 2017-18 from 2016-17 and a moderate decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Chemistry Enrollment	1,480	1,229	1,250

Modality	2015-16	2016-17	2017-18
Traditional	65.3%	66.2%	66.7%
Online	21.3%	24.5%	23.6%
Hybrid	13.4%	9.4%	9.7%
Correspondence (Cable, Telecourse, Other DL)	0.0%	0.0%	0.0%

Gender	2015-16	2016-17	2017-18
Female	59.1%	59.4%	61.0%
Male	39.7%	39.7%	37.8%
Unknown	1.2%	0.9%	1.2%

Ethnicity	2015-16	2016-17	2017-18
African American	2.0%	1.8%	1.5%
American Indian/AK Native	0.2%	0.0%	0.0%
Asian	48.2%	47.6%	47.6%
Hispanic	9.3%	10.0%	12.2%
Pacific Islander/HI Native	0.1%	0.4%	0.2%
White	27.6%	26.4%	22.7%
Multi-Ethnicity	10.9%	13.0%	14.6%
Other/Unknown	1.7%	0.8%	1.2%

Age Group	2015-16	2016-17	2017-18
19 or Less	13.6%	14.1%	13.1%
20 to 24	42.4%	39.8%	42.5%
25 to 29	23.2%	27.1%	27.8%
30 to 34	10.4%	11.6%	9.2%
35 to 39	5.3%	2.0%	2.7%
40 to 49	3.0%	3.7%	3.8%
50 and Older	2.1%	1.7%	0.9%

Chemistry courses made up 2.0% of all state-funded enrollment for 2017-18. The percentage difference in Chemistry course **enrollment** in 2017-18 showed a slight increase from 2016-17 and a substantial decrease from 2015-16. Enrollment in Chemistry during 2017-18 showed 66.7% of courses were taught **traditional (face-to-face)**, 23.6% were taught **online**, 9.7% were taught in the **hybrid** modality, and 0.0% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Chemistry enrollment consisted of 61.0% **female**, 37.8% **male**, and 1.2% students of **unknown** gender. In 2017-18, Chemistry enrollment consisted of 1.5% **African American** students, 0.0% **American Indian/AK Native** students, 47.6% **Asian** students, 12.2% **Hispanic** students, 0.2% **Pacific Islander/HI Native** students, 22.7% **White** students, 14.6% **multi-ethnic** students, and 1.2% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Chemistry revealed 13.1% aged **19 or less**, 42.5% aged **20 to 24**, 27.8% aged **25 to 29**, 9.2% aged **30 to 34**, 2.7% aged **35 to 39**, 3.8% aged **40 to 49**, and 0.9% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Chemistry Degrees	0	0	0
College Awarded Certificates	600	602	628
Chemistry Certificates	0	0	0

The percentage change in the number of Chemistry **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Chemistry **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Chemistry

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Chemistry Success Rate	78.5%	80.3%	80.6%

Modality	2015-16	2016-17	2017-18
Traditional	79.5%	78.8%	80.8%
Online	75.6%	82.7%	78.0%
Hybrid	78.4%	84.3%	86.0%
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	77.6%	80.7%	80.2%
Male	80.7%	79.7%	81.4%
Unknown	50.0%	81.8%	80.0%

Ethnicity	2015-16	2016-17	2017-18
African American	69.0%	72.7%	84.2%
American Indian/AK Native	66.7%	-	-
Asian	81.0%	83.6%	83.0%
Hispanic	71.0%	73.2%	80.3%
Pacific Islander/HI Native	100.0%	60.0%	66.7%
White	79.5%	80.2%	78.5%
Multi-Ethnicity	72.7%	75.0%	76.4%
Other/Unknown	84.0%	90.0%	80.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	78.1%	82.1%	78.7%
20 to 24	78.8%	76.5%	81.5%
25 to 29	75.2%	86.2%	82.5%
30 to 34	79.9%	78.3%	79.1%
35 to 39	86.1%	60.0%	73.5%
40 to 49	81.8%	84.4%	74.5%
50 and Older	80.6%	90.5%	72.7%

The percentage difference in the **course success rate** in Chemistry courses in 2017-18 showed a slight increase from 2016-17 and a minimal difference from 2015-16. When comparing the percentage point difference in the Chemistry 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Chemistry **course success rate** was substantially higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Chemistry success rate for 2017-18, the success rate was minimally different for **traditional (face-to-face)** Chemistry courses, slightly lower for **online** courses, moderately higher for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Chemistry success rate for 2017-18, the success rate was minimally different for **female** students in Chemistry courses, minimally different for **male** students, and minimally different for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Chemistry success rate for 2017-18, the success rate was slightly higher for **African American** students in Chemistry courses, not applicable for **American Indian/AK Native** students, slightly higher for **Asian** students, minimally different for **Hispanic** students, substantially lower for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly lower for **multi-ethnic** students, and minimally different for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Chemistry success rate for 2017-18, the success rate was slightly lower for students aged **19 or less** in Chemistry courses, minimally different for students aged **20 to 24**, slightly higher for students aged **25 to 29**, slightly lower for students aged **30 to 34**, moderately lower for students aged **35 to 39**, moderately lower for students aged **40 to 49**, and moderately lower for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Chemistry Retention Rate	86.7%	87.7%	87.6%

Modality	2015-16	2016-17	2017-18
Traditional	86.9%	85.7%	86.7%
Online	86.3%	92.0%	89.2%
Hybrid	86.4%	90.4%	90.1%
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	85.4%	87.3%	88.5%
Male	89.4%	88.3%	86.3%
Unknown	61.1%	90.9%	86.7%

Ethnicity	2015-16	2016-17	2017-18
African American	89.7%	86.4%	89.5%
American Indian/AK Native	66.7%	-	-
Asian	87.4%	89.6%	88.6%
Hispanic	85.5%	87.8%	90.1%
Pacific Islander/HI Native	100.0%	60.0%	100.0%
White	86.6%	86.1%	86.6%
Multi-Ethnicity	85.1%	84.4%	84.1%
Other/Unknown	84.0%	100.0%	80.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	92.0%	91.9%	86.6%
20 to 24	87.4%	85.9%	89.6%
25 to 29	80.8%	90.4%	88.5%
30 to 34	85.1%	85.3%	81.7%
35 to 39	91.1%	60.0%	82.4%
40 to 49	90.9%	91.1%	80.9%
50 and Older	93.5%	95.2%	81.8%

The percentage difference in the **retention rate** in Chemistry courses in 2017-18 showed minimal difference from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Chemistry 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Chemistry **retention rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Chemistry retention rate for 2017-18, the retention rate was minimally different for **traditional (face-to-face)** Chemistry courses, slightly higher for **online** courses, slightly higher for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Chemistry retention rate for 2017-18, the retention rate was minimally different for **female** students in Chemistry courses, slightly lower for **male** students, and minimally different for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Chemistry retention rate for 2017-18, the retention rate was slightly higher for **African American** students in Chemistry courses, not applicable for **American Indian/AK Native** students, minimally different for **Asian** students, slightly higher for **Hispanic** students, substantially higher for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly lower for **multi-ethnic** students, and moderately lower for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Chemistry retention rate for 2017-18, the retention rate was slightly lower for students aged **19 or less** in Chemistry courses, slightly higher for students aged **20 to 24**, minimally different for students aged **25 to 29**, moderately lower for students aged **30 to 34**, moderately lower for students aged **35 to 39**, moderately lower for students aged **40 to 49**, and moderately lower for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Geology

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Geology Enrollment	1,468	1,469	1,344
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Geology Resident FTES	136.90	135.09	122.74
Sections	32	32	27
Fill Rate	66.5%	69.3%	64.9%
WSCH/FTEF 595 Efficiency	739	718	709
FTEF/30	3.1	3.2	2.9
Extended Learning Enrollment	275	289	186

The percentage change in the number of Geology **enrollments** in 2017-18 showed a moderate decrease from 2016-17 and a moderate decrease from 2015-16.

The percentage change in 2017-18 **resident FTES** in Geology credit courses showed a moderate decrease from 2016-17 and a substantial decrease in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Geology courses in 2017-18 showed a substantial decrease from 2016-17 and a substantial decrease from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Geology courses showed a moderate decrease from 2016-17 and a slight decrease in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Geology courses in 2017-18 showed a slight decrease from 2016-17 and a slight decrease from 2015-16.

The percentage change in the **FTEF/30** ratio for Geology courses in 2017-18 showed a moderate decrease from 2016-17 and a moderate decrease in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial decrease in the number of Geology **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Geology Enrollment	1,468	1,469	1,344

Modality	2015-16	2016-17	2017-18
Traditional	1.1%	1.4%	0.0%
Online	61.6%	62.8%	56.8%
Hybrid	2.7%	4.3%	6.1%
Correspondence (Cable, Telecourse, Other DL)	34.6%	31.6%	37.1%

Gender	2015-16	2016-17	2017-18
Female	43.2%	41.9%	39.2%
Male	55.2%	56.2%	59.1%
Unknown	1.6%	1.9%	1.7%

Ethnicity	2015-16	2016-17	2017-18
African American	10.4%	11.5%	8.9%
American Indian/AK Native	1.2%	0.7%	1.0%
Asian	11.7%	11.6%	12.7%
Hispanic	19.0%	20.0%	18.3%
Pacific Islander/HI Native	0.6%	0.5%	0.3%
White	40.5%	37.6%	42.5%
Multi-Ethnicity	15.1%	16.6%	15.0%
Other/Unknown	1.4%	1.5%	1.3%

Age Group	2015-16	2016-17	2017-18
19 or Less	9.7%	10.8%	8.9%
20 to 24	27.8%	29.9%	28.1%
25 to 29	15.4%	14.2%	16.7%
30 to 34	13.8%	12.9%	12.9%
35 to 39	10.0%	11.0%	9.7%
40 to 49	16.0%	11.8%	13.9%
50 and Older	7.2%	9.4%	9.7%

Geology courses made up 2.2% of all state-funded enrollment for 2017-18. The percentage difference in Geology course **enrollment** in 2017-18 showed a moderate decrease from 2016-17 and a moderate decrease from 2015-16. Enrollment in Geology during 2017-18 showed 0.0% of courses were taught **traditional (face-to-face)**, 56.8% were taught **online**, 6.1% were taught in the **hybrid** modality, and 37.1% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Geology enrollment consisted of 39.2% **female**, 59.1% **male**, and 1.7% students of **unknown** gender. In 2017-18, Geology enrollment consisted of 8.9% **African American** students, 1.0% **American Indian/AK Native** students, 12.7% **Asian** students, 18.3% **Hispanic** students, 0.3% **Pacific Islander/HI Native** students, 42.5% **White** students, 15.0% **multi-ethnic** students, and 1.3% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Geology revealed 8.9% aged **19 or less**, 28.1% aged **20 to 24**, 16.7% aged **25 to 29**, 12.9% aged **30 to 34**, 9.7% aged **35 to 39**, 13.9% aged **40 to 49**, and 9.7% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Geology Degrees	0	0	0
College Awarded Certificates	600	602	628
Geology Certificates	0	0	0

The percentage change in the number of Geology **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Geology **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Geology

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Geology Success Rate	68.6%	73.5%	75.3%

Modality	2015-16	2016-17	2017-18
Traditional	68.8%	75.0%	-
Online	73.3%	79.1%	80.6%
Hybrid	92.5%	74.6%	86.6%
Correspondence (Cable, Telecourse, Other DL)	58.5%	62.3%	65.2%

Gender	2015-16	2016-17	2017-18
Female	74.6%	78.2%	80.1%
Male	63.6%	70.7%	72.2%
Unknown	81.8%	53.6%	73.9%

Ethnicity	2015-16	2016-17	2017-18
African American	52.3%	64.5%	62.7%
American Indian/AK Native	66.7%	70.0%	78.6%
Asian	77.3%	78.9%	84.8%
Hispanic	58.4%	65.0%	64.2%
Pacific Islander/HI Native	66.7%	85.7%	50.0%
White	74.1%	79.7%	78.9%
Multi-Ethnicity	71.9%	73.8%	79.1%
Other/Unknown	65.0%	54.5%	66.7%

Age Group	2015-16	2016-17	2017-18
19 or Less	81.1%	84.3%	84.9%
20 to 24	69.3%	78.4%	80.9%
25 to 29	62.4%	71.8%	71.7%
30 to 34	66.0%	65.3%	68.0%
35 to 39	59.2%	70.2%	72.1%
40 to 49	72.8%	72.3%	68.8%
50 and Older	71.7%	65.2%	78.9%

The percentage difference in the **course success rate** in Geology courses in 2017-18 showed a moderate increase from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Geology 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Geology **course success rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Geology success rate for 2017-18, the success rate was not applicable for **traditional (face-to-face)** Geology courses, moderately higher for **online** courses, substantially higher for **hybrid courses**, and substantially lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Geology success rate for 2017-18, the success rate was slightly higher for **female** students in Geology courses, slightly lower for **male** students, and slightly lower for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Geology success rate for 2017-18, the success rate was substantially lower for **African American** students in Geology courses, slightly higher for **American Indian/AK Native** students, moderately higher for **Asian** students, substantially lower for **Hispanic** students, substantially lower for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly higher for **multi-ethnic** students, and moderately lower for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Geology success rate for 2017-18, the success rate was moderately higher for students aged **19 or less** in Geology courses, moderately higher for students aged **20 to 24**, slightly lower for students aged **25 to 29**, moderately lower for students aged **30 to 34**, slightly lower for students aged **35 to 39**, moderately lower for students aged **40 to 49**, and slightly higher for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Geology Retention Rate	84.2%	86.5%	89.3%

Modality	2015-16	2016-17	2017-18
Traditional	75.0%	90.0%	-
Online	83.2%	88.0%	91.5%
Hybrid	97.5%	81.0%	89.0%
Correspondence (Cable, Telecourse, Other DL)	85.2%	84.3%	86.1%

Gender	2015-16	2016-17	2017-18
Female	84.5%	87.3%	90.3%
Male	83.7%	85.7%	88.5%
Unknown	90.9%	92.9%	95.7%

Ethnicity	2015-16	2016-17	2017-18
African American	85.0%	88.8%	89.0%
American Indian/AK Native	83.3%	100.0%	92.9%
Asian	87.2%	87.1%	91.2%
Hispanic	76.3%	85.4%	86.8%
Pacific Islander/HI Native	100.0%	100.0%	50.0%
White	87.7%	88.2%	89.9%
Multi-Ethnicity	81.0%	82.8%	90.5%
Other/Unknown	85.0%	68.2%	83.3%

Age Group	2015-16	2016-17	2017-18
19 or Less	88.8%	93.7%	91.6%
20 to 24	80.8%	86.3%	93.4%
25 to 29	81.0%	88.0%	90.1%
30 to 34	84.7%	83.2%	82.6%
35 to 39	84.4%	87.6%	89.1%
40 to 49	86.8%	86.7%	86.6%
50 and Older	90.6%	79.7%	87.5%

The percentage difference in the **retention rate** in Geology courses in 2017-18 showed a slight increase from 2016-17 and a moderate increase from 2015-16. When comparing the percentage point difference in the Geology 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Geology **retention rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Geology retention rate for 2017-18, the retention rate was not applicable for **traditional (face-to-face)** Geology courses, slightly higher for **online** courses, minimally different for **hybrid courses**, and slightly lower for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Geology retention rate for 2017-18, the retention rate was minimally different for **female** students in Geology courses, minimally different for **male** students, and moderately higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Geology retention rate for 2017-18, the retention rate was minimally different for **African American** students in Geology courses, slightly higher for **American Indian/AK Native** students, slightly higher for **Asian** students, slightly lower for **Hispanic** students, substantially lower for **Pacific Islander/HI Native** students, minimally different for **White** students, slightly higher for **multi-ethnic** students, and moderately lower for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Geology retention rate for 2017-18, the retention rate was slightly higher for students aged **19 or less** in Geology courses, slightly higher for students aged **20 to 24**, minimally different for students aged **25 to 29**, moderately lower for students aged **30 to 34**, minimally different for students aged **35 to 39**, slightly lower for students aged **40 to 49**, and slightly lower for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Internal Analysis: Physics

Productivity	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Physics Enrollment	376	375	368
College Student Resident FTES	6,343.35	5,928.76	6,189.62
Physics Resident FTES	37.77	37.73	42.57
Sections	8	8	10
Fill Rate	76.4%	76.4%	61.7%
WSCH/FTEF 595 Efficiency	452	448	547
FTEF/30	1.4	1.4	1.3
Extended Learning Enrollment	82	96	57

The percentage change in the number of Physics **enrollments** in 2017-18 showed a slight decrease from 2016-17 and a slight decrease from 2015-16.

The percentage change in 2017-18 **resident FTES** in Physics credit courses showed a substantial increase from 2016-17 and a substantial increase in comparison with resident FTES in 2015-16.

The percentage change in the number of **sections** in Physics courses in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from the number of sections in 2015-16.

The percentage change in the **fill rate** in 2017-18 for Physics courses showed a substantial decrease from 2016-17 and a substantial decrease in comparison with the fill rate in 2015-16.

The percentage change in the **WSCH/FTEF** ratio in Physics courses in 2017-18 showed a substantial increase from 2016-17 and a substantial increase from 2015-16.

The percentage change in the **FTEF/30** ratio for Physics courses in 2017-18 showed a moderate decrease from 2016-17 and a moderate decrease in comparison with the FTEF/30 ratio in 2015-16.

There was a substantial decrease in the number of Physics **Extended Learning enrollments** in 2017-18 from 2016-17 and a substantial decrease from 2015-16.

Comparison of Enrollment Trends	2015-16	2016-17	2017-18
College State-Funded Enrollment	63,485	60,149	61,512
Physics Enrollment	376	375	368

Modality	2015-16	2016-17	2017-18
Traditional	2.7%	2.9%	0.0%
Online	70.5%	71.2%	69.8%
Hybrid	26.9%	25.9%	30.2%
Correspondence (Cable, Telecourse, Other DL)	0.0%	0.0%	0.0%

Gender	2015-16	2016-17	2017-18
Female	55.6%	53.6%	57.3%
Male	42.3%	45.1%	40.2%
Unknown	2.1%	1.3%	2.4%

Ethnicity	2015-16	2016-17	2017-18
African American	2.7%	1.6%	2.4%
American Indian/AK Native	0.3%	0.3%	0.3%
Asian	37.5%	37.6%	37.0%
Hispanic	10.4%	10.9%	11.4%
Pacific Islander/HI Native	1.1%	0.0%	1.1%
White	32.4%	34.1%	29.9%
Multi-Ethnicity	13.6%	15.2%	17.4%
Other/Unknown	2.1%	0.3%	0.5%

Age Group	2015-16	2016-17	2017-18
19 or Less	8.5%	16.8%	12.0%
20 to 24	46.3%	35.5%	39.9%
25 to 29	22.3%	22.7%	24.7%
30 to 34	9.0%	9.6%	10.1%
35 to 39	5.9%	3.7%	5.2%
40 to 49	4.5%	6.1%	4.9%
50 and Older	3.5%	5.6%	3.3%

Physics courses made up 0.6% of all state-funded enrollment for 2017-18. The percentage difference in Physics course **enrollment** in 2017-18 showed a slight decrease from 2016-17 and a slight decrease from 2015-16*. Enrollment in Physics during 2017-18 showed 0.0% of courses were taught **traditional (face-to-face)**, 69.8% were taught **online**, 30.2% were taught in the **hybrid** modality, and 0.0% were taught in the **correspondence (cable, telecourse, and other distance learning)** modality.

In 2017-18, Physics enrollment consisted of 57.3% **female**, 40.2% **male**, and 2.4% students of **unknown** gender. In 2017-18, Physics enrollment consisted of 2.4% **African American** students, 0.3% **American Indian/AK Native** students, 37.0% **Asian** students, 11.4% **Hispanic** students, 1.1% **Pacific Islander/HI Native** students, 29.9% **White** students, 17.4% **multi-ethnic** students, and 0.5% students of **other** or **unknown** ethnicity. The age breakdown for 2017-18 enrollments in Physics revealed 12.0% aged **19 or less**, 39.9% aged **20 to 24**, 24.7% aged **25 to 29**, 10.1% aged **30 to 34**, 5.2% aged **35 to 39**, 4.9% aged **40 to 49**, and 3.3% aged **50 and older**.

Awards	2015-16	2016-17	2017-18
College Awarded Degrees	2,047	2,221	2,213
Physics Degrees	0	0	0
College Awarded Certificates	600	602	628
Physics Certificates	0	0	0

The percentage change in the number of Physics **degrees** awarded in 2017-18 showed no comparative data from 2016-17 and no comparative data from the number of degrees awarded in 2015-16.

The percentage change in the number of Physics **certificates** awarded in 2017-18 showed no comparative data from 2016-17 and showed no comparative data in comparison with the number of certificates awarded in 2015-16.

Success and Retention: Physics

Comparison of Success Rates	2015-16	2016-17	2017-18
College State-Funded Success Rate	66.7%	68.6%	70.4%
College Institution Set Standard Success Rate	55.6%	56.7%	58.3%
Physics Success Rate	81.4%	78.9%	82.1%

Modality	2015-16	2016-17	2017-18
Traditional	70.0%	81.8%	-
Online	81.1%	76.4%	79.0%
Hybrid	83.2%	85.6%	89.2%
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	81.3%	81.6%	86.3%
Male	81.1%	75.7%	75.7%
Unknown	87.5%	80.0%	88.9%

Ethnicity	2015-16	2016-17	2017-18
African American	50.0%	50.0%	77.8%
American Indian/AK Native	100.0%	100.0%	0.0%
Asian	85.8%	83.7%	92.6%
Hispanic	69.2%	70.7%	71.4%
Pacific Islander/HI Native	50.0%	-	75.0%
White	83.6%	81.3%	75.5%
Multi-Ethnicity	78.4%	70.2%	81.3%
Other/Unknown	100.0%	100.0%	50.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	84.4%	74.6%	75.0%
20 to 24	83.3%	83.5%	86.4%
25 to 29	81.0%	84.7%	85.7%
30 to 34	79.4%	80.6%	78.4%
35 to 39	81.8%	78.6%	89.5%
40 to 49	64.7%	73.9%	50.0%
50 and Older	76.9%	42.9%	75.0%

The percentage difference in the **course success rate** in Physics courses in 2017-18 showed a minimal difference from 2016-17 and a slight increase from 2015-16. When comparing the percentage point difference in the Physics 2017-18 course success rate to the College's overall success average* (70.4%) and the institution-set standard* (58.3%) for credit course success, the Physics **course success rate** was substantially higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Physics success rate for 2017-18, the success rate was not applicable for **traditional (face-to-face)** Physics courses, slightly lower for **online** courses, moderately higher for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Physics success rate for 2017-18, the success rate was slightly higher for **female** students in Physics courses, moderately lower for **male** students, and moderately higher for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Physics success rate for 2017-18, the success rate was slightly lower for **African American** students in Physics courses, substantially lower for **American Indian/AK Native** students, substantially higher for **Asian** students, substantially lower for **Hispanic** students, moderately lower for **Pacific Islander/HI Native** students, moderately lower for **White** students, minimally different for **multi-ethnic** students, and substantially lower for students of **other** or **unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Physics success rate for 2017-18, the success rate was moderately lower for students aged **19 or less** in Physics courses, slightly higher for students aged **20 to 24**, slightly higher for students aged **25 to 29**, slightly lower for students aged **30 to 34**, moderately higher for students aged **35 to 39**, substantially lower for students aged **40 to 49**, and moderately lower for students aged **50 and older**.

Comparison of Retention Rates	2015-16	2016-17	2017-18
College State-Funded Retention Rate	83.4%	83.7%	85.1%
College Institution Set Standard Retention Rate	69.9%	70.9%	71.1%
Physics Retention Rate	89.6%	88.0%	89.7%

Modality	2015-16	2016-17	2017-18
Traditional	70.0%	100.0%	-
Online	90.9%	87.3%	89.1%
Hybrid	88.1%	88.7%	91.0%
Correspondence (Cable, Telecourse, Other DL)	-	-	-

Gender	2015-16	2016-17	2017-18
Female	88.0%	87.6%	91.9%
Male	91.8%	88.8%	86.5%
Unknown	87.5%	80.0%	88.9%

Ethnicity	2015-16	2016-17	2017-18
African American	80.0%	100.0%	100.0%
American Indian/AK Native	100.0%	100.0%	100.0%
Asian	90.8%	89.4%	94.9%
Hispanic	84.6%	92.7%	85.7%
Pacific Islander/HI Native	75.0%	-	100.0%
White	90.2%	89.1%	84.5%
Multi-Ethnicity	90.2%	77.2%	89.1%
Other/Unknown	100.0%	100.0%	50.0%

Age Group	2015-16	2016-17	2017-18
19 or Less	90.6%	87.3%	88.6%
20 to 24	90.2%	90.2%	92.5%
25 to 29	91.7%	88.2%	89.0%
30 to 34	82.4%	88.9%	86.5%
35 to 39	90.9%	85.7%	94.7%
40 to 49	82.4%	91.3%	77.8%
50 and Older	92.3%	71.4%	83.3%

The percentage difference in the **retention rate** in Physics courses in 2017-18 showed a slight increase from 2016-17 and minimal difference from 2015-16. When comparing the percentage point difference in the Physics 2017-18 retention rate to the College's overall retention average* (85.1%) and the institution-set standard* (71.1%) for credit course success, the Physics **retention rate** was slightly higher than the **college average** and substantially higher than the **institution-set standard** for credit course success.

When comparing the percentage point difference between instructional modalities to the overall Physics retention rate for 2017-18, the retention rate was not applicable for **traditional (face-to-face)** Physics courses, minimally different for **online** courses, slightly higher for **hybrid courses**, and not applicable for **correspondence (cable, telecourse, and other distance learning)** courses.

When comparing the percentage point difference between genders to the overall Physics retention rate for 2017-18, the retention rate was slightly higher for **female** students in Physics courses, slightly lower for **male** students, and minimally different for students of **unknown** gender.

When comparing the percentage point difference between ethnicity groups to the overall Physics retention rate for 2017-18, the retention rate was substantially higher for **African American** students in Physics courses, substantially higher for **American Indian/AK Native** students, moderately higher for **Asian** students, slightly lower for **Hispanic** students, substantially higher for **Pacific Islander/HI Native** students, moderately lower for **White** students, minimally different for **multi-ethnic** students, and substantially lower for students of **other or unknown** ethnicity.

When comparing the percentage point difference between age groups to the overall Physics retention rate for 2017-18, the retention rate was slightly lower for students aged **19 or less** in Physics courses, slightly higher for students aged **20 to 24**, minimally different for students aged **25 to 29**, slightly lower for students aged **30 to 34**, moderately higher for students aged **35 to 39**, substantially lower for students aged **40 to 49**, and moderately lower for students aged **50 and older**.

*Note: College term success and retention averages and institution-set standards are computed annually and recorded in the college Key Performance Indicators (KPI) Scorecard.

Data Source: Banner Student Information System

Calculation Categories

Language	Range
Minimal to No Difference	< 1.0%
Slight Increase/Decrease	Between 1.0% and 5.0%
Moderate Increase/Decrease	Between 5.1% and 10.0%
Substantial Increase/Decrease	> 10.0%

Student (SLOs) and Program Student Learning Outcome (PSLOs)

Means of assessing SLOs for the Physical Sciences are being reviewed and will be implemented beginning FA 19 with the assistance of the associated faculty for the following courses:

ASTR 100, CHEM/PHYS 140, CHEM 110, CHEM 180/180L, GEOL 105/105L, GEOL 185/185L, PHYS 120, PHYS 125

Table X *SLO Assessment and Plan*

SLO	Method(s) of Assessment	Participant(s) in the Planning Discussion	Recommended Changes

Curriculum Review

Table Curriculum Review

Course	Title	Term Reviewed	Status
ASTR C100	Introduction to Astronomy		
ASTR C100L	Astronomy Laboratory		
ASTR C102	Stellar Astronomy		
ASTR C103	Cosmology		
ASTR C100	Introduction to Astronomy		
ASTR C100L	Astronomy Laboratory		
ASTR C101	Planetary Astronomy		
ASTR C102	Stellar Astronomy		
ASTR C103	Cosmology		
ASTR C104	Tools of Astronomy		
CHEM C100	Principles of Chemistry		
CHEM C105	Chemistry Explorations for Teachers		
CHEM C110	Introduction to Chemistry		
CHEM C130	Preparation for General Chemistry		
CHEM C140	Survey of Chemistry and Physics		
CHEM C180	General Chemistry A		
CHEM C180L	General Chemistry A Lab		
CHEM C185	General Chemistry B		
CHEM C185L	General Chemistry B Lab		
CHEM C220	Organic Chemistry A		
CHEM C220L	Organic Chemistry A Lab		
CHEM C225	Organic Chemistry B		
CHEM C225L	Organic Chemistry B Lab		
ECOL C100	Human Ecology		
GEOL C105	General Geology		
GEOL C105L	Geology Lab		
GEOL C106	Earth Sciences for Teachers		
GEOL C115	California Geology		

GEOL C121	Environmental Geology		
GEOL C185	Historical Geology		
GEOL C185L	Historical Geology Lab		
PHYS C110	Conceptual Physics		
PHYS C110L	Conceptual Physics Lab		
PHYS C120	Algebra Based Physics: Mechanics		
PHYS C125	Algebra Based Physics: Electricity and Magnetism		
PHYS C185	Calculus Based Physics: Mechanics		
PHYS C280	Calculus Based Physics: Electricity and Magnetism		
PHYS C285	Calculus Based Physics: Modern		
PHYS C110	Conceptual Physics	SP 19	FA 19
PHYS C110L	Conceptual Physics Lab	SP 19	FA 19
PHYS C120	Algebra Based Physics: Mechanics		
PHYS C125	Algebra Based Physics: Elec/Mag		
PHYS C140	Survey of Chemistry and Physics		
PHYS C185	Calculus Based Physics: Mechanics		
PHYS C280	Calculus Based Physics: Electricity and Magnetism		
PHYS C285	Calculus Based Physics: Modern		

Progress on Initiative(s)

Table Progress on Forward Strategies

Initiative(s)	Status	Progress Status	Outcome(s)
Provide more physics offerings to meet student demand.	Ongoing	Hired two new adjuncts.	Evening section of Phys 120 added in SP 19.
Continue to provide an effective and safe learning environment by maintaining new equipment, supplies, and labs in physical sciences.	Completed/ Ongoing	In 2017-18, physical science was purchased and hired lab associates	Overall lab quality has improved
Develop and scale an Applied Physics/ Engineering program	On Hold	Waiting for clear initiative from administration	
Develop and scale a Geology Program.	On Hold	New Hire (Kelly Ruppert) in FA 2019.	
Increase course quality and student access to course materials in physical sciences	Ongoing	Early stages of PT Evals to check for rigor and accessibility.	
Full Time Faculty	Ongoing	Still need 1 FT Physics.	1 new FT GEOL (Kelly Ruppert) hired FA 19.

Response to Program/Department Committee Recommendation(s)

Table X Progress on Recommendations

Recommendation(s)	Status	Response Summary
Work with the Instructional Wing to identify opportunities for lab expansions for all sciences.	Awaiting administrative approval	No work currently being done on this. Best place for lab expansion and consolidation remains the 3 rd floor of Garden Grove
Secure a National Science Foundation (NSF) grant to support student research projects.	Ongoing	STEM Grant was declined in 2018 (Tanya Murray PI, Devine was a Co-I)
Evaluate the impact of guided pathways on the Sciences Program	ongoing	Chemistry is working to develop an ADT and update any C-ID required by other programs.

Program Planning and Communication Strategies

The FT faculty (Devine, Dupon, Marcus) meet to discuss scheduling, hiring, curriculum, and related issues. Chair Devine regularly discusses role of Physical Sciences and best strategies for progress with Dean Neal.

Coastline Pathways

Primary involvement is related to the development of ADT for Chemistry and any related C-ID requirements for other programs.

Implications of Change

Given the current budget constraints, the primary changes over the next 1-2 years will be in improving the quality and efficiency of course offerings in the Physical Sciences.

Section 2: Human Capital Planning

Staffing

Table X Staffing Plan

Year	Administrator /Management	F/T Faculty	P/T Faculty	Classified	Hourly
Previous year	Dean	3	Astronomy: 1 Chemistry: 8 Geology: 5 Physics: 3		
Current year*	Dean	4	Astronomy: 1 Chemistry: 8 Geology: 3 Physics: 3		
1 year	Dean	4	Astronomy: 1 Chemistry: 8 Geology: 3 Physics: 3		
2 years**	Dean	5	Astronomy: 1 Chemistry: 8 Geology: 3 Physics: 1		
3 years	Dean	5	Astronomy: 1 Chemistry: 8 Geology: 3 Physics: 1		

*FT GEOL (Kelly Ruppert) hired in FA 2019

**FT PHYS is still needed, although budget constraints make it unlikely to be filled for at least 2-3 years.

Professional Development

Table X Professional Development

Name (Title)	Professional Development	Outcome
David Devine FT Astronomy/Physics	Assisting in RSI evaluations related to accreditation.	Completed FA 18. Awaiting notification of any results.

Section 3: Facilities Planning

Facility Assessment

A dedicated Physics laboratory room will be needed within the next 5-10 years. The “Dance Studio” will suffice, but only as a temporary solution.

Section 4: Technology Planning

Technology Assessment

It depends on the hire of a FT Physics faculty. The new hire would be expected to explore applied physics/engineering program such as robotics

Section 5: New Initiatives

Initiative #1: Develop a makerspace, allowing the College to expand the current experiential learning opportunities.

Describe how the initiative supports the college mission: Providing computer assisted design training and application to innovate existing prosthetic templates to improve form, fit, function, and service to recipients, CRISPR supplies to expand current training opportunities in genetic engineering; and training in basic lab skills through inquiry-based learning activities to support the ADT in Biology.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

Recruitment of a new student population from local high schools based on summer MakerSpace camps.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative. These projects have direct impacts on our local community, building a sense of relevance to the students' coursework, which has been identified as a key component in student retention and success, especially in underrepresented populations (Hurtado 2010, Graham et al. 2013).

Recommended resource(s) needed for initiative achievement: NIH SHARE Grant

What is the anticipated outcome of completing the initiative?

The MakerSpace will lead to increased enrollment student retention in work-based study courses. It will also allow for the creation of summer camps for local high school students.

Provide a timeline and timeframe from initiative inception to completion.

3-5 years.

Initiative #2: Mentoring Activities: Faculty training and development Program

Describe how the initiative supports the college mission: The goal is for the department to set up regular training and mentorship sessions for faculty to encourage an increase in hands-on critical thinking exercises becoming a regular part of the curriculum in the biological sciences courses..

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

A more highly trained faculty group will lead to increased student recruitment and retention.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative. Research has shown this types mentorship program would encourage regular meetings and/or training sessions to promote professional development of the adjunct faculty and develop concrete strategies onhow to encourage inclusion of critical thinking and experimentation within the introductory level science courses (University of Kentucky Leadership Council 2011).

Recommended resource(s) needed for initiative achievement: NIH SHARE Grant

What is the anticipated outcome of completing the initiative?

This training would utilize the makerspace, human cadaver lab, and other facilities that will be funded by the grant. This type of hands-on training has been shown to be highly effective at increasing engagement and participation, particularly among adjunct faculty.

Provide a timeline and timeframe from initiative inception to completion.

1-2 years.

Initiative #3: K-12 Teacher Mentorship and Training Program

Describe how the initiative supports the college mission: Engagement of primary and secondary teachers in partnerships Coastline faculty through teacher training workshops on curriculum development that embraces the practices of science and engineering that the NGSS Framework identifies as essential for all students.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

A more highly trained faculty group will lead to increased student recruitment.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative. Students taught by science teachers who are more highly qualified, tended to have higher achievement, as well as better educational pathways and outcomes in STEM (Lee and Mamerow 2019), and teachers who engage in training and mentoring programs tend to experience increases in content knowledge, views of science inquiry, beliefs about reform-based teaching, and teaching self-efficacy more than control group teachers (Granger et al 2018).

Recommended resource(s) needed for initiative achievement: NIH SHARE Grant

What is the anticipated outcome of completing the initiative? With assistance from the proposed makerspace and human cadaver lab, the department will install a professional development program for K-12 educators at the elementary, middle school and high school levels. The training would be formatted as a Summer Camp for teachers which would require development of course manual with innovative and informative teaching material and techniques. Participating teachers would earn a certificate at completion of the Summer Camp.

Provide a timeline and timeframe from initiative inception to completion.

1-2 years.

Initiative #4: Development of an Associates of Arts (AA) Degree for Health Sciences

Describe how the initiative supports the college mission: Offering a newly created AA Degrees for our students will lead to an increase in degrees obtained from the department. This major is appropriate for students who plan to enter training in one of the health professions, including nursing, physical therapy, occupational therapy, dental hygiene, physician assisting, and health sciences.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

Another potential pathway for attainment of an AA degree.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative. Research of offerings from local colleges (namely Irvine Valley College and Saddleback College) offer this degree.

Recommended resource(s) needed for initiative achievement: Additional faculty to expand our course offerings

What is the anticipated outcome of completing the initiative? Completion of this curriculum qualifies students to receive AA in Health Sciences.

Provide a timeline and timeframe from initiative inception to completion.

3-5 years.

Initiative #5: Development of an Associate's Degree for Transfer (ADT) for Environmental Studies

Describe how the initiative supports the college mission: Offering a newly created ADT for our students will lead to an increase in degrees obtained from the department.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

Another potential pathway for attainment of an ADT degree.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative. This degree could be offered by Coastline with the introduction of a single course that is not being offered (Intro to Environmental Science).

Recommended resource(s) needed for initiative achievement: Additional faculty to expand our course offerings

What is the anticipated outcome of completing the initiative? Completion of this curriculum qualifies students to receive ADT in Environmental Studies.

Provide a timeline and timeframe from initiative inception to completion.

3-5 years.

Initiative 6: Continue to provide an effective and safe learning environment by maintaining new equipment, supplies, and labs in physical sciences.

- Jean Dupon has created new lab manuals for Chemistry.
- David Devine is working on updating the Physics lab content.

Describe how the initiative supports the college mission:

- This initiative is directly related to student success and the creation of innovative, student-centered labs and courses.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

How does this initiative play a part in Coastline Pathways?

Improving the quality of Physical Science courses that are required by the sciences and other programs.

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative.

- Discussions with the NBC Dean, FT and PT faculty, Lab Associates and a comparison with curriculum at local community colleges has revealed a need to improve the quality and quantity of the physical sciences labs.

Recommended resource(s) needed for initiative achievement:

- No immediate resources are required, although the identification of necessary lab equipment and supplies, especially in Chemistry, will most likely arise during the next 1-2 years.

What is the anticipated outcome of completing the initiative?

- Improvements to the quality and quantity of Physical Sciences Labs and the development of Field Trips associated with Geology.

Provide a timeline and timeframe from initiative inception to completion.

- All updates and upgrades should be completed by the 2020-2021 school year.

Initiative 7: Develop and scale an Applied Physics/Engineering program

Describe how the initiative supports the college mission:

- This initiative is directly related to student success and the creation of innovative, student-centered labs and courses. It will also enhance career opportunities and successful transfer to four-year colleges and universities.

What college goal does the initiative support? Select one

X Student Success, Completion, and Achievement

X Instructional and Programmatic Excellence

Access and Student Support

Student Retention and Persistence

X Culture of Evidence, Planning, Innovation, and Change

X Partnerships and Community Engagement

Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

X Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.

Provide universal access to student service and support programs.

X Strengthen post-Coastline outcomes (e.g., transfer, job placement).

X Explore and enter new fields of study (e.g., new programs, bachelor's degrees).

Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.

Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).

Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

What evidence supports this initiative? Select all that apply

Learning Outcome (SLO/PSLO) assessment

Internal Research (Student achievement, program performance)

X External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative.

- STEM education is a long standing point of national emphasis. One of the primary goals for the Newport Beach Center was to serve as a STEAM center. The addition of curriculum that focuses on projects related to Applied Physics/Engineering is crucial towards achieving this goal.

Recommended resource(s) needed for initiative achievement:

FT Faculty and equipment

What is the anticipated outcome of completing the initiative?

- The establishment of NBC as a bona fide STEAM center. This will grow and enhance all STEM fields at Coastline.

Provide a timeline and timeframe from initiative inception to completion.

- 4-6 years after a new FT Physics faculty is hired.

Initiative 8: Develop and scale a Geology Program.

Describe how the initiative supports the college mission:

This initiative is directly related to student success and the creation of innovative, student-centered labs and courses. It will also enhance career opportunities and successful transfer to four-year colleges and universities.

What college goal does the initiative support? Select one

X Student Success, Completion, and Achievement

X Instructional and Programmatic Excellence

Access and Student Support

Student Retention and Persistence

X Culture of Evidence, Planning, Innovation, and Change

X Partnerships and Community Engagement

Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

X Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.

Provide universal access to student service and support programs.

X Strengthen post-Coastline outcomes (e.g., transfer, job placement).

X Explore and enter new fields of study (e.g., new programs, bachelor's degrees).

Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.

Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).

Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

What evidence supports this initiative? Select all that apply

Learning Outcome (SLO/PSLO) assessment

Internal Research (Student achievement, program performance)

X External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative.

According to the United States Labor Department, employment of geoscientists is projected to grow 14 percent from 2016 to 2026, faster than the average for all occupations. The need for energy, environmental protection, and responsible land and resource management is projected to spur demand for geoscientists.

Recommended resource(s) needed for initiative achievement:

FT Faculty (hired in FA 19)

What is the anticipated outcome of completing the initiative?

- Update and improve the rigor and quality of the existing Geology courses.
- Create new Geology courses, especially online GEOL 106 for future K-12 teachers.
- Organize and offer Geology related Field Trips

Provide a timeline and timeframe from initiative inception to completion.

- New FT GEOL hired beginning FA 19. Expected completion by FA 24.

Initiative 9: Increase course quality and student access to course materials in physical sciences

Describe how the initiative supports the college mission:

This initiative is directly related to student success and the creation of innovative, student-centered labs and courses. It will also enhance career opportunities and successful transfer to four-year colleges and universities.

What college goal does the initiative support? Select one

- Student Success, Completion, and Achievement
- Instructional and Programmatic Excellence
- Access and Student Support
- Student Retention and Persistence
- Culture of Evidence, Planning, Innovation, and Change
- Partnerships and Community Engagement
- Fiscal Stewardship, Scalability, and Sustainability

What Educational Master Plan objective does the initiative support? Select all that apply

- Increase student success, retention, and persistence across all instructional delivery modalities with emphasis in distance education.
- Provide universal access to student service and support programs.
- Strengthen post-Coastline outcomes (e.g., transfer, job placement).
- Explore and enter new fields of study (e.g., new programs, bachelor's degrees).
- Foster and sustain industry connections and expand external funding sources (e.g., grants, contracts, and business development opportunities) to facilitate programmatic advancement.
- Strengthen community engagement (e.g., student life, alumni relations, industry and academic alliances).
- Maintain the College's Asian American and Native American Pacific Islander Serving Institution (AANAPISI) designation and pursue becoming a designated Hispanic Serving Institution (HSI).

What evidence supports this initiative? Select all that apply

- Learning Outcome (SLO/PSLO) assessment
- Internal Research (Student achievement, program performance)
- External Research (Academic literature, market assessment, audit findings, compliance mandates)

Describe how the evidence supports this initiative.

- Courses in the physical sciences are taken to satisfy GE requirements or as part of STEM majors.

Recommended resource(s) needed for initiative achievement:

- OER, Master courses

What is the anticipated outcome of completing the initiative?

- A consistent, high quality suite of courses that ensure an appropriate level of rigor while maintaining RSI standards.

Provide a timeline and timeframe from initiative inception to completion.

- By the end of the 2020-2021 school year.

Section 6: Prioritization

Initiative	Resource(s)	Est. Cost	Funding Type	Health, Safety Compliance	Evidence	College Goal	To be Completed by	Priority
Support student learning and success through the provision of hands on activities in science	Annual Biological Science Budget	75,000	General funds	No	Cannot run labs without supplies	Student Success, Completion, and Achievement	2019-20	1
Two Full Time Instructional Lab Associates	Two Full Time Instructional Lab Associates	75,000/each	General Funds	No	Cannot run labs without help and safety	Student Success, Completion, and Achievement	2019-20	2
Support student learning and success through the provision of hands on activities in science	Biopacs (4)	16,000	General or Equipment funds	No	Cannot run labs without	Student Success, Completion, and Achievement	2019-20	3
Ensure a safe learning environment	Poison Storage Cabinet	1800	General or Equipment funds	yes	Safely store toxic chemicals in locked cabinet	Student Success, Completion, and Achievement	2019-20	4
Support student learning and success through the provision of hands on activities in science	Microscopes (6)	7500	General or Equipment funds	No	Microscopes at GGC are old and outdated	Student Success, Completion, and Achievement	2019-20	5
Host Work Based Learning	Work Based Learning Materials: laptop	\$1,000	General or Equipment Funds	No	Cannot analyze data collected by students or support student projects in BIOL290s without	Student Success, Completion, and Achievement	2019-20	6
Continue to host the Health Science Academic Triathlon	Event funding	1,000	VP funds	No	Promotes certificates	Promotes certificates	2019-20	7
Support student learning and success through the provision of hands on activities in science	Small Open Air Platform Shaker	4,000	Equipment funds	No	Required for Growth Curve Cultures in Microbiology	Transferrable research and practical skills for students	2019-20	8

Support student learning and success through the provision of hands on activities in science	Cadaver Lab	250,000	Measure M?	No	See last program review 2017-2018	Student Success, Completion, and Achievement	2021	9
Support student learning and success through the provision of hands on activities in science	Incubator	3,000	Equipment funds	Yes	Cannot run labs without	Student Success, Completion, and Achievement	2019-20	10
Support student learning and success through the provision of hands on activities in science	Refrigerator	1500	Equipment funds	Yes	Cannot run labs without	Cannot run labs without	2019-20	11
Two Full Time Faculty	Two Full Time Faculty	100,000/each	General Funds	No	FTES growing each semester	Increase degrees and certificates	2019-20	12
Conversion of 3 rd floor Garden Grove Rooms to labs	Needs feasibility study	Needs feasibility study	?	No	See last program review 2017-2018	Increase certificates Improve Guided pathways for students	2019-20	13
Nursing Program; PT aid; Pharm aid/tech programs	General funds- feasibility studies	\$10,000	General funds	No	See under initiatives	Increased degrees and certificates	2025	14

