

Form: "PSR 2021 INSTRUCTIONAL Comprehensive Cohort B"

Participating Area: Earth Science/Geology Cohort-B 1914 I

Show All Possible Responses

*** Response is required**

1. PROGRAM OVERVIEW

* Program Title & Code

Program Title

Earth Science/Geology
(Max chars: 100)

Program Code

1914
(Max chars: 100)

* 1a. Select the Chaffey Goals that directly relate and are MOST relevant to your program.

Goals are numbered for the purpose of making reference points so that PSR writers can identify and locate which Chaffey Goals relate to their program. Goal numbers do not represent priority numbers.

- Goal 1: Equity and Success--Chaffey College will be an equity-driven college that fosters success for all students.
- Goal 2: Learning and Completion--Chaffey College will ensure learning and timely completion of students' educational goals.
- Goal 3: Community Opportunities and Needs--Chaffey College will develop and maintain programs and services that maximize students' opportunities and reflect community needs.
- Goal 4: Technology--Chaffey College will optimize the use of technological tools and infrastructure to advance institutional efficiency and student learning.
- Goal 5: Efficiency--Chaffey College will efficiently and effectively manage systems, processes, and resources to maximize capacity.
- Goal 6: Agility--Chaffey College will responsively adapt to changes in students' academic and career needs.
- Goal 7: Professional Learning--Chaffey College will prioritize and align professional learning for all employees to support the achievement of Chaffey Goals.

* 1b. Describe how your program aligns with the Chaffey Goals. Please provide supporting statements and/or examples.

Refer back to the Chaffey Goals marked above (e.g., Goal 4: supporting statements of how program aligns with this goal).

Goal 1: Equity and Success--Chaffey College will be an equity-driven college that fosters success for all students.

- The department strives to provide equitable staff as a resource for students at all three campuses. We have been fortunate to hire a full-time earth science/geology instructor for the Chino campus, giving us one full-time instructor for each campus.
- The department strives to provide equitable lab and instructional resources for students at all three campuses. Over the last three years, we have supplied the Chino campus with much better rock and mineral sets than was there in previous years. We also were able to supply Chino with full supplies for the very popular earthquake tower lab.
- Achievement gaps and equity are met through courses being taught in an engaging manner. In-person classes have many hands-on activities, and on-line courses include many minds-on activities, which help relate content to students' lives, the community, and the world around them.
- Most earth science courses are offered face-to-face at various times of day on all three campuses, and all have been taught online for a few years, providing equity and accommodation of students and their schedules.
- Oceanography courses (ESC-5 and ESC-5L) have been moved online, rather than only being face-to-face on the Chino campus.
- Geol-1 is now also taught at Chino, making it so this class is now taught at all three campuses.
- The department provides equity and success by providing High School Dual Enrollment courses, working with local high schools involved in the High School Partnership Program.
- The department provides equity and success by participating in the Turning Point Program, offering both lecture and lab classes at the Chino Institute for Women and the Chino Institute for Men.

Goal 2: Learning and Completion--Chaffey College will ensure learning and timely completion of students' educational goals.

- Lecture and lab course options are offered as students either build foundational skills or fulfill their physical science requirements for either a degree or transfer credit.

- Students have the option of taking classes that are paired with a lab (Geol-1 or Geol-2), or they can take them as separate classes, even in different semesters (ESC-1/ESC-1L or ESC-5/ESC-5L), depending on their needs or program requirements.
- None of the earth science and geology courses have prerequisites. This enables students to begin their physical science lecture and lab requirements right away, helping them with a timely completion of their educational goals.
- Students enrolled in earth science and geology courses enter with varying skill sets, preparation levels, and abilities. However, due to the caring and patient faculty in the department, students are met with a growth-mindset, helping them to grow and succeed in these classes.
- The department has participated in Guided Pathways, mapping out how to earn a Geology AS-T degree and meeting the 60 unit requirement, in two years.

Goal 3: Community Opportunities and Needs--Chaffey College will develop and maintain programs and services that maximize students' opportunities and reflect community needs.

- The department has supported students who desire careers in earth science and geology through one of its faculty members being formally trained as a Community Advisor/Faculty Advisor. This provides support and information to students interested in transferring to a university and earning a degree in related fields, finding internships in related fields, or learning about careers in related fields.
- The department has supported the Chaffey STEM Summer Research Opportunity program. Students have participated in summer research through this program working with the University of California, Riverside, the San Bernardino County Museum, and the Natural History Museum.
- Students have attended professional meetings with instructors, such as the Inland Geological Society meetings. This has provided students to get advice from, and meet other geologists and earth scientists in the community.
- Participating in the High School Partnership and Turning Point programs is another example of the department maximizing students' opportunities and reflecting community needs.

Goal 6: Agility--Chaffey College will responsively adapt to changes in students' academic and career needs.

- The department was an early adopter and supporter of online instruction, for both lecture and lab courses.
- The department highly supports the High School Partnership and Turning Point programs.

PRIOR VIP GOALS STATUS/PROGRESS

1c. Please list the program's VIP Goals from the last PSR cycle, and report on the progress (complete, ongoing, etc.).

Earth Science VIP Goal #1: Implement a more dynamic, equitable education experience for Earth Science students on all three campuses in order to increase their understanding of the physical world from both theoretical and hands on learning. - ONGOING

- Collaborate with adjunct faculty on all three campuses to determine hands on learning experiences they are interested in using in their courses to support student learning. -COMPLETE
- Move toward having more "in-house" laboratory assignments that are more dynamic and engaging rather than using more expensive and often less dynamic commercial laboratory manuals. - ONGOING

Earth Science VIP Goal #2: Establish relations between Earth Science students and organizations in the community and in the field of geoscience through attending external events, conferences, meetings, field trips, or other opportunities held at local universities, businesses, societies, professional organizations, etc. -ONGOING

- Identify local universities, businesses, societies, and professional organizations, etc. that are interested in having our students attend their event, meeting, field trip, etc. -ONGOING
- Provide information to students about such events, meetings, field trips, etc. Occasionally faculty members will attend these activities with students. - ONGOING

Geology VIP Goal #1: Implement a more dynamic educational experience for our Geology students in order to increase their awareness of the physical world around them. -ONGOING

- Develop new in-class hands on activities and new labs for both Geol-1 and 2 to increase student learning opportunities at all 3 campuses. -ONGOING
- Reorganize stockroom and classroom storage area to accommodate new lab materials. -ONGOING
- Showcase new labs and in-class activities to adjuncts. -ONGOING
- Continue to develop new in-class hands on activities. -ONGOING
- Assess the effectiveness of Year 1 and 2's efforts and share results with all instructors at 3 campuses. -COMPLETE

Geology VIP Goal #2: Hiring a new full time geology instructor for the Chino campus in order to develop a strong geology program for majors and fulfill the physical science with lab requirement for non-science majors. -COMPLETE

- Offer geology courses at Chino campus. -COMPLETE

Geology VIP Goal #3: Hiring a new full time IA-III instructional assistant in order to aid in the development of a strong geology program for majors and fulfill the physical science with lab requirement for non-science majors. -NOT MET

- Provide full laboratory support for Geology and Earth Sciences for the Rancho, Fontana and Chino campuses. -NOT MET

OTHER RESOURCES REQUESTS

1d.1 At any point during the past PSR cycle (last three years), did you have "other resources requests" that were funded by the Resource Allocation Committee?

If yes, proceed to questions 1d.2. If no, skip to section 2.

If you have items that were funded by Strong Workforce and Perkins, please mark "yes."

Yes

No

1d.2 If yes, did those purchases meet the program's intended purpose. Please explain.

No answer specified

2. EVIDENCE--EQUITY

The evidence section comprises of the following three distinct subsections: equity, program data (includes CTE data), and learning outcomes.

"Equity" represents the first element of the EVIDENCE component of the PSR evaluation. Please reference the Equity Data file to evaluate the following areas.

2a.1 Concerning GENDER/IDENTITY, identify important EQUITY developments and trends.

Review data over the last six years.

Response Legend: 1 = Increase 2 = Decrease 3 = No Change (plus or minus 2%) 4 = No or Insufficient Data Available				
	1	2	3	4
Number of enrollments by males	✓			
Number of enrollments by females	✓			
Success rate by males	✓			
Success rate by females	✓			
Retention rate by males			✓	
Retention rate by females	✓			

2a.2 Concerning RACE/ETHNICITY, identify important EQUITY developments and trends.

Review data over the last six years.

Response Legend: 1 = Increase 2 = Decrease 3 = No Change (plus or minus 2%) 4 = No or Insufficient Data Available				
	1	2	3	4
Number of enrollments by African American	✓			
Number of enrollments by Asian	✓			
Number of enrollments by Caucasian	✓			
Number of enrollments by Hispanic	✓			

Number of enrollments by other race/ethnicity	✓			
Success rate by African American	✓			
Success rate by Asian	✓			
Success rate by Caucasian	✓			
	1	2	3	4
Success rate by Hispanic	✓			
Success rate by other race/ethnicity	✓			
Retention rate by African American			✓	
Retention rate by Caucasian			✓	
Retention rate by Asian			✓	
Retention rate by Hispanic			✓	
Retention rate by other race/ethnicity	✓			

ⓧ **2a.3 Concerning AGE GROUP, identify important EQUITY developments and trends.**

Review data over the last six years.

Response Legend:				
1 = Increase 2 = Decrease 3 = No Change (plus or minus 2%) 4 = No or Insufficient Data Available				
	1	2	3	4
Number of enrollments by age group, 19 or younger	✓			
Number of enrollments by age group, 20-24	✓			
Number of enrollments by age group, 25-29	✓			
Number of enrollments by age group, 30-39	✓			
Number of enrollments by age group, 40-49	✓			
Number of enrollments by age group, 50 or older	✓			
Success rate by age group, 19 or younger	✓			
Success rate by age group, 20-24	✓			
	1	2	3	4
Success rate by age group, 25-29	✓			
Success rate by age group, 30-39			✓	
Success rate by age group, 40-49	✓			
Success rate by age group, 50 or older		✓		
Retention rate by age group, 19 or younger	✓			
Retention rate by age group, 20-24	✓			
Retention rate by age group, 25-29	✓			
Retention rate by age group, 30-39			✓	

Retention rate by age group, 40-49	✓			
Retention rate by age group, 50 or older			✓	

2a.4 Concerning OTHER CHARACTERISTICS, identify important EQUITY developments and trends.

Review data over the last six years.

Response Legend: 1 = Increase 2 = Decrease 3 = No Change (plus or minus 2%) 4 = No or Insufficient Data Available				
	1	2	3	4
Number of enrollments by students with disabilities	✓			
Number of enrollments by first generation	✓			
Number of enrollments by economically disadvantage	✓			
Success rate by students with disabilities	✓			
Success rate by first generation	✓			
Success rate by economically disadvantage	✓			
Retention rate by students with disabilities		✓		
Retention rate by first generation	✓			
Retention rate by economically disadvantage	✓			

2a.5 Over the last three years, has the number of course sections offering zero-cost textbooks increased, decreased, or remained the same?

Response Legend: 1 = Increase 2 = Decrease 3 = No Change			
	1	2	3
Number of sections with zero-cost textbooks	✓		

2b. Considering the evidence provided, elaborate on how the program is providing equity in educational opportunities or support to students and/or identify disparities in equity. Provide specific data that supports your answer.

If there is a disparity in equity, do not discuss responsive strategies in this section. This is addressed in the STRATEGIC PLANNING section (item 7d).

The Earth Science/Geology program is providing equity in educational opportunities through course scheduling course and offerings, making courses affordable and accessible, and providing opportunities to connect with the material and others, which shows in enrollment, retention, and success rates.

Enrollment:

The Earth Science/Geology program is providing equity in educational opportunities through scheduling and course offerings, making courses more convenient and available for students to take classes as their schedules and lives permit. Courses are offered on all three campuses in morning, afternoon, and night. The department also offers online sections, with the first course being introduced in spring 2017. Fast Track courses are another way that the department provides equity, helping students with completion in a timely manner. The introduction of Fast Track courses began in fall 2017. Due to these diverse offerings and modalities, enrollment in the Earth Science/Geology program has grown. The total enrollment for Earth Science over the past three years grew by 14.7%, and 96.8% in the last 6 years, which is rather remarkable when compared to the college enrollment data, showing a decline of enrollment in the last 3 years of 2% and an increase of 11.7% in the past 6 years.

Overall, Earth Science/Geology enrollment matches the college's enrollment data for gender. However, there is currently a slightly higher percentage of female students enrolling in the program compared to the college enrollment, and a slightly lower percentage of male students enrolling in the program, compared to the college enrollment, with unknown/decline-to-state students enrolled in the program being relatively equal to the college's enrollment. Comparing enrollment in Earth Science to enrollment in the college by gender, male students enrolled at 37.4% and 40.1%, respectively; female students enrolled at 60.5% and 57.9%, respectively; and unknown/decline to state students enrolled at 2.1% and 2.0%, respectively. This trend shows that the department has supported female and unknown/decline to state students in a way that has encouraged them to enroll in the program's courses.

Earth Science/Geology enrollment for ethnicity also closely matches the college's enrollment for ethnicity. However, the department's enrollment of Hispanic students was slightly higher than the college's enrollment of Hispanic students, and the department's enrollment of Asian students was slightly lower than the college's enrollment of Asian students. Comparing enrollment in Earth Science/Geology to enrollment in the college by ethnicity, African American students enrolled at 7.34% and 7.26%, respectively; Asian students enrolled at 5.03% and 7.66%, respectively; Caucasian students enrolled at 13.11% and 13.28%, respectively; Hispanic students enrolled at 67.85% and 65.37%, respectively; Other ethnicity students enrolled at 3.11% and 3.04%, respectively; and Unknown Ethnicity students enrolled at 3.56% and 3.38%, respectively. This trend shows that the department's course offerings and modalities has especially helped Hispanic students in a way that has encouraged them to enroll in the program's courses.

Earth Science/Geology enrollment by age group also closely matches the college's enrollment by age group. However, the department's enrollment of students in the age group of 20-24 Years Old was slightly higher than the college's enrollment of this age group. Comparing enrollment in Earth Science/Geology to enrollment in the college by Age Group, the 19 or Younger Age Group enrolled at 30.13% and 31.79%, respectively; the 20 to 24 Years Old Age Group enrolled at 40.35% and 38.11%, respectively; the 25 to 29 Years Old Age Group enrolled at 12.37% and 13.24%, respectively; the 30 to 39 Years Old Age Group enrolled at 10.10% and 10.66%, respectively; the 40 to 49 Years Old Age Group enrolled at 5.19% and 4.19%, respectively; and the 50 Years Old or Older Age Group enrolled at 1.86% and 2.01%, respectively.

Enrollment of Students with Disabilities in Earth Science/Geology also closely matches the college's enrollment by age group. Comparing enrollment by students with disabilities in Earth Science/Geology to enrollment in the college is 4.23% and 3.68%, is respectively. The same close margin is seen with economically disadvantaged students in Earth Science/Geology compared with the college, with enrollment at 71.47% and 70.32%, respectively. However, the percentage of First Generation students who enroll in Earth Science/Geology is 41.995, compared to the college's percentage of First Generation students being 25.17%. This shows that the program is attractive to First Generation students and that the program helps them feel welcome in enrolling in courses.

Retention:

The Earth Science/Geology program is providing equity in educational opportunities through making courses affordable and accessible, which has helped with the retention of students. When classes are affordable, students don't have to worry as much about staying in a class or not due to finances. All sections of Earth Science and Geology are zero cost, using zero cost textbooks and having no lab fees. Therefore, having the resources that students need to financially access the curriculum is taken care of, which helps with retention. The Earth Science/Geology department serves many students with disabilities. Our caring and dedicated instructors are mindful of the needs of this population, which shows in the retention of our students. The total retention rate for Earth Science/Geology has increased steadily in recent years, with 1.8% increase over the past 6 years, a 2.6% increase over the past 3 years, and a 3.2% increase over the past year. In the past 6 years, the department's overall retention rate has been between 94.1% and 91.2%, which is very strong and suggests that the department continues to improve at generally retaining students.

The data for the last 6 years for retention in Earth Science/Geology by gender suggests that the department is retaining students well. Male students were retained at a rate that ranged from 90.4% to 93.0%. Female students were retained at a rate that ranged from 91.6% to 94.8%. Unknown/Decline-to-state gender students were retained at a rate of 84.1% to 97.2%.

The data for the last 6 years for retention in Earth Science/Geology by Race/Ethnicity also suggests that the department is retaining students well, although improvements can still be made. Students were retained at a rate ranging from 83.5% to 89.5% for African American students, 91.1% to 96.8% for Asian students, 89.2% to 95.6% for Caucasian students, 91.3% to 94.0% Hispanic students, 87.7% to 94.8% for Other Race/Ethnicity students, and 82.1% to 98.1% for Unknown Race/Ethnicity students. Therefore, although all Race/Ethnicity groups maintained excellent retention, there was a significant increase in the retention of Other Race/Ethnicity and Unknown Race/Ethnicity students, both groups having a 8.1% increase.

The data for the last 6 years for retention in Earth Science/Geology by Age Group suggests that the department is retaining students well across age groups. Students in the 19 or Younger Age Group were retained at a rate that ranged from 91.2% to 94.8%. Students in the 20 to 24 Years Old Age Group were retained at a rate that ranged from 90.9% to 93.4%. Students in the 25-29 Years Old Age Group were retained at a rate that ranged from 87.6% to 93.5%. Students in the 30-39 Years Old Age Group were retained at a rate that ranged from 91.1% to 96.1%. Students in the 40-49 Years Old Age Group were retained at a rate that ranged from 88.5% to 97.4%. Students in the 50 or Older Age Group were retained at a rate that ranged from 91.2% to 94.1%. In the past 6 years, most age groups had no significant change in retention rates, which is good, since retention rates are in the 90% range for all age groups. Areas to especially be highlighted are the 25-29 Years Old and the 40-49 Years Old age groups, which had increases in the past 6 years of 6.6% and 8.8%, respectively. This shows that the department is generally supporting all age groups well.

In the past 6 years, retention of students with disabilities in Earth Science/Geology has ranged from 83.7% to 97.2%. Retention of First Generation students has ranged between 90.5% and 93.9%. Retention of Economically Disadvantaged students has ranged between 90.8% and 93.8%. Therefore, even though there is a slight 2.2% decrease in the retention of Students with Disabilities over the past 6 years, a slight 2.7 increase in First Generation students, and a slight 2.0% increase in Economically Disadvantaged students, the retention rates of all of these groups is still very good, being in the 90% range. Much of this retention is from the department's dedication to keeping classes affordable and accessible.

Success:

The Earth Science/Geology program is providing equity in educational opportunities through providing opportunities to connect with the material and others, which leads to high success rates. This is being carried out by equitable staffing, appropriate lab supplies, utilizing Community/Faculty Advisors, encouraging STEM Summer Research Opportunities, and attending meetings with professional organizations. The department has been working towards providing an equitable experience on all three campuses by improving the lab supplies and resources, especially on the Chino campus. Over the past three years, the department has supplied the Chino campus with much needed rock and mineral sets. In fall 2019, the department was able to provide an equitable experience to the students in Chino by hiring a full-time faculty member, which the program now has at all three campuses. The Earth Science/Geology department has utilized Community/Faculty Advisors, with one of the faculty members being formally trained and was serving the department in that capacity. This gave students a specific resource for discussing future career and transfer plans. STEM Summer Research Opportunities were also encouraged by the department, with some students being accepted and participating in the program. The department also utilized the community by attending professional meetings with students, providing opportunities for students to meet other geologists and earth scientists. Such connections with the material and others has enabled students success in the department. The total success rate for Earth Science students over the past six years increased by 4.5%.

Further analysis of the data shows that in all subcategories, Earth Science met or exceeded the college's success rates for students for gender. The data for the last 6 years for success rate in Earth Science/Geology by gender suggests that students are succeeding in the Earth Science/Geology department. Male students have a success rate that ranges from 73.5% to 77.9%. Female students have a success rate that ranges from 79.4% to 83.4%. Unknown/Decline-to-state gender students have a success rate that ranges from 71.7% to 81.2%. Analysis of the data for ethnicity also shows similar results.

Earth Science met or exceeded the college's success rates for students in all subcategories for ethnicity. The data for the last 6 years for success rate in Earth Science/Geology by Race/Ethnicity also suggests that the department is helping students to succeed, although improvements can still be made. Students had success at a rate ranging from 61.3% to 73.0% for African American students, 81.9% to 89.8% for Asian students, 82.0% to 85.8% for Caucasian students, 75.7% to 80.8% Hispanic students, 66.2% to 84.5% for Other Race/Ethnicity students, and 69.6% to 83.0% for Unknown Race/Ethnicity students. In addition, all subgroups had significant increases in success rates in the past 6 years. It is especially noteworthy that in the past 6 years, African American students and Other Race/Ethnicity students respectively had increases in success rates of 12.6% and 27.6%.

The data for the last 6 years for success rate in Earth Science/Geology by Age Group suggests that students are generally successful across age groups. Students in the 19 or Younger Age Group have success rates that range from 70.5% to 77.7%. Students in the 20 to 24 Years Old Age Group have success rates that range from 76.2% to 79.6%. Students in the 25-29 Years Old Age Group have success rates that range from 76.1% to 81.3%. Students in the 30-39 Years Old Age Group have success rates that range from 84.4% to 90.4%. Students in the 40-49 Years Old Age Group have success rates that range from 84.6% to 93.8%. Students in the 50 or Older Age Group have success rates that range from 69.6% to 97.6%. In the past 6 years, the 19 or Younger age group, the 25 to 29 Year Old age group, and the 40 to 49 Year Old age group had significant increases in their success rates, with 10.2%, 8.0%, and 10.9% increases, respectively. However, the 50 or Older age group had a 7.2% decrease in success rate in the past 6 years.

In the past 6 years, success rates of students with disabilities in Earth Science/Geology has ranged from 71.2% to 85.5%. Success rates for First Generation students has ranged between 75.8% and 80.6%. Success rates for Economically Disadvantaged students has ranged between 76.2% and 80.9%. In addition, over the past 6 years, each of these groups of students has had a significant increase in their success rates. The success rate of Students with Disabilities, First Generation students, and Economically Disadvantaged students has increased by 6.6%, 6.3% and 6.0%, respectively.

3. EVIDENCE--PROGRAM DATA

"Program Data" represents the second element of the EVIDENCE component of the PSR evaluation. Please reference the Program Data file to evaluate the following areas.

3a. Identify important PROGRAM developments and trends.

Review data over the last six years.

Response Legend:					
1 = Increase 2 = Decrease 3 = No Change (plus or minus 2%) 4 = N/A 5 = No or Insufficient Data Available					
	1	2	3	4	5
Overall Enrollment	✓				
Overall Retention	✓				
Overall Course Success	✓				
FTES	✓				
All ADT degrees awarded	✓				
All AA degrees awarded	✓				
All AS degrees awarded				✓	
All degrees awarded	✓				
	1	2	3	4	5
All Certificate Completion				✓	
Average units earned, ADT degree	✓				
Average units earned, AA degree	✓				
Average units earned, AS degree				✓	
Average units earned, all degrees	✓				
Average units earned by certificate(s)				✓	
Overall average # of semesters to award degree(s)					✓

Overall average # of semesters to award certificate(s)



3b. Considering the evidence provided, explicitly identify specific program strengths and provide data/evidence that supports your answer.

This is an assessment of your program's health. Be sure to address any items marked "increase" and/or "no change," if "no change" is a positive reflection of the program (e.g., provide data for stable or increased enrollment, retention, success patterns, or data for increase number of certificates/degrees).

Programs may provide additional information or data that has not been included in their IR files.

Enrollment, retention, and success rates show that the Earth Science/Geology program is a highly successful program that supports and serves students well.

Strengths of the Earth Science/Geology program:

Enrollment in the Earth Science/Geology program has increased 14.7% in the past 3 years, and 96.8% in the past 6 years. This enrollment demand has increased the number of sections that the department offered, which is reflected in the 12.9% increase of FTES in the last 3 years, and 20.5% in the past 6 years. This increase in FTES and course offerings has been seen on all three campuses, as we have offered day and evening courses, as well as courses online. The department began to support courses for the High School Partnership and Turning Point programs in the past 3 years, which is also reflected in enrollment and FTES increases.

The Earth Science/Geology program exhibits remarkable retention rates. The retention rate for the past 6 years has ranged from 91.2% to 94.1%. To have retention rates in the 90% range every year is quite noteworthy. This shows that courses and faculty in the Earth Science/Geology department are engaging students and motivating them to continue their education. Another promising aspect of the data is that the retention rate continues to rise, with a 2.6% increase in the past 3 years, and a 3.2% increase in the past year.

The Earth Science/Geology program has strong success rates, which continue to increase. The success rate for the past 6 years has ranged from 77.1% to 81.2%. Success rates in the department continue to rise. The success rate in the past 6 years has increased 1.8%, with a 2.6% increase in the past 3 years, and a 3.2% in the past year. The Earth Science/Geology department strives to deeply engage students utilizing a variety of methods, such as hands-on activities and labs, field trips, guest speakers, online resources, professional meetings, etc. The department is highly supportive of students, and encourages them to participate fully in their education by encouraging them to apply for Chaffey's STEM Summer Research Opportunities or other internships or programs that arise.

The Earth Science/Geology program is dedicated to equity, which is seen in the offering of sections that use zero cost textbooks and are zero cost courses. All earth science and geology courses have become zero cost, even the lab courses. This makes it possible for students to take Earth Science and Geology courses as they need them, rather than as they can afford them.

The Earth Science/Geology program has had a few students complete AS-T degrees in the last few years. Often times, earth science and geology majors transfer to 4-year institutions before they attain these degrees. The Earth Science/Geology program is a support to both majors and non-majors, and is instrumental in supporting all students by helping them to fulfill general education or career requirements.

3c. Considering the evidence provided, explicitly identify specific areas in which the program can improve over the next three years. Provide specific data/evidence that supports your answer.

Be sure to address any items marked "decrease" and/or "no change," if "no change" reflects an area needing improvement (e.g., provide data for decreased enrollment patterns or the number of certificates/degrees earned). You are only be asked to identify areas of improvements. You will be asked to address the strategies that the program plans to implement in the STRATEGIC PLANNING section (item 7d).

Programs may provide additional information or data that has not been included in their IR files.

Areas for improvement for the Earth Science/Geology program:

The Earth Science/Geology program has strong success rates. However, it would be more appropriate if the success rates would better match the retention rates. The department not only wants to retain students, but wants them to be successful in the program. The success rate for the past 6 years has ranged from 77.1% to 81.2%, while the retention rate has ranged from 91.2% to 94.1%. The success rate in the past 6 years has increased 1.8%, with a 2.6% increase in the past 3 years, and a 3.2% in the past year. The department feels that this improvement needs to continue.

The Earth Science/Geology program would also like to improve in the area of degrees awarded. Not many students declare geology or earth science as their major. Most of the students in the Earth Science/Geology program transfer to 4-year institutions before earning a degree. We would like to see more of them stay at Chaffey to finish much of their math and science lower-division requirements at Chaffey, which is typically what many of them need for earning the AS-T degree before they transfer. This advice is not often realized by students, so the department needs to improve in having these conversations with students earlier in their college experience.

Although the success rates for all race/ethnicity groups increased over the last 6 years, the Earth Science/Geology program would like to improve the success rates specifically for the African American and Hispanic groups. The success rates for African American students over the last 3 years ranged from 63.4% to 71.7%, and the success rates for Hispanic students over the last 3 years ranged from 75.7% to 80.8%. All other race/ethnicity groups consistently had success in the 80% range over these last 3 years. Therefore, the department would like to focus on increasing the success of our African American and Hispanic students in order to match the success of the other groups.

Although there was no change for many of the retention rates for race/ethnicity, this is a positive result. All subgroups in the past 6 years consistently had retention rates higher than 80%.

Retention by gender is another area where there was little to no change in the rates. However, all subgroups are being retained rather consistently in the 90% range. Therefore, this is a positive result that we would like to continue to see.

Success rate by age group is an area that at first glance seems to be concerning due to a decrease or no change in rates. For example, students 50 years or older showed a decrease in success rates, and students in the 30-39 years old age group showed no change. However, when given a closer look at the data, these groups are actually doing quite well, with success rates that are generally in the 80-90% range. On the other hand, students who are 19 or younger have the lowest success rates of all the categories, ranging from 70.5% to 77.7% in the past six years. Therefore, it is where the concern is for success by age group, although we are moving in the right direction.

Another area that the Earth Science/Geology program has some data that shows no change is in the retention of students who are in the 30-39 Years Old and the 50 or Older age groups. Having no change in retention rates is good for these groups, as they are ranging in retention from 91.1%-96.1% for 30-39 year-old students and 82.6% to 100.0% for 50 or older students over the past 6 years.

Even though retention of students in the Students with Disabilities is high, ranging from 83.7% to 97.2% in the past 6 years, this is a decrease in retention for this subgroup. It has decreased more in the last year by 4.1%, compared to 0.0% and 2.2% in the past 3 years and 6 years, respectively.

4. EVIDENCE--Career & Technical Education (CTE)

4a. Is this a CTE program?

If yes, proceed to questions 4b-4e. If no, skip to section 5.

Yes No

Labor Market Information (LMI): Regional Job Outlook (If Applicable)

4b. Identify important CTE PROGRAM developments and trends.

Response Legend: 1 = Middle Skill 2 = Above Middle Skill		
	1	2
CTE: Projected Occupational Growth		

4c. Please reflect on projected occupational growth. Are entry-level and median hourly earnings 10% below or 10% above regional living wages? Please explain and provide specific data that supports your answer.

This is an opportunity to discuss middle and above middle occupations and whether these occupations are projected to grow or decline.

Programs may provide additional information or data that has not been included in their IR files.

No answer specified

External Oversight: Advisory Committee Information (If applicable)

Programs that have an active advisory committee must complete this section.

4d. Does your program have an active Advisory Committee (whether on campus or external) that informs the direction and/or operations of the department? If "Yes" Advisory Committee meeting minutes within the LAST 6 MONTHS must be included as an attachment to this form.

Yes No

4e.1 Has the Advisory Committee recommended changes to your program that align with a current or emerging industry?

Yes No

4e.2 If yes, what are the recommendations?

No answer specified

5. External Oversight: External Regulations (If applicable)

External regulations apply to areas with outside accrediting agencies. If you DO NOT have external regulations, answer "no" on question 5a and skip 5b.

5a. External Agency

Does the program have external regulations?

Yes No

5b. External Agency Information

If yes, please provide the following information:

- a) Name of Agency
- b) Date of last review
- c) Recommendations made
- d) Any budgetary or institutional impacts from the recommendations
- e) Progress on recommendations
- f) Date of next review

*Note: more than one external agency can be added in the same field if needed.

No answer specified

6. EVIDENCE--LEARNING OUTCOMES

"Learning Outcomes" represents the third element of the EVIDENCE component of the PSR evaluation.

6a. Please identify which of the following MANDATORY components have been completed by checking the appropriate boxes.

The Outcomes and Assessment Committee will verify if mandatory components have been fulfilled.

If you have any questions about learning outcomes, please refer to Chaffey College's Outcomes and Assessment website or email Jo Alvarez at jo.alvarez@chaffey.edu

- Current COURSE LOs for every course have been entered into Taskstream's "Course Learning Outcomes (CLOs) Workspace" for each course.
- Current COURSE LOs have been mapped to Institutional Learning Outcomes into Taskstream's "Course Learning Outcomes (CLOs) Workspace."
- Current PROGRAM LOs have been entered into Taskstream's "Program Learning Outcomes (PLOs) Workspace."
- Current PROGRAM LOs have been mapped to Institutional Learning Outcomes in the "Program Learning Outcomes (PLOs) Workspace."
- Current PROGRAM LOs have been mapped to align courses to Program LOs (Curriculum Map) in Taskstream's "Program Learning Outcomes Workspace."

6b. Have you uploaded a current Chronological Assessment Plan (CAP) into the "Program Learning Outcomes (PLOs) Workspace?"

A CAP is a learning outcomes assessment schedule.

"Current" is defined as two assessment cycles. This means CAPs should project out at least SIX YEARS.

Yes

- No
 Comment:

6c. Three-year cycle

Do you evaluate all courses within the three-year period?

- Yes
 No
 Other:

6d. Are all COURSE LO assessment results from fall 2017 through fall 2020 entered into Taskstream?

- Yes
 No
 Other:

ASSESSMENT REFLECTION

Look over your learning outcomes assessment results for the various COURSES in your program(s).

6e. Based on learning outcomes assessment results, explicitly identify program strengths. Provide specific data that supports your answer.

Pay special attention to learning outcomes that HAVE been met.

The assessment of SLOs for the Earth Science/Geology department has greatly improved over the last three years. In fall 2018, we moved from assessing every SLO each semester in a few classes, to assessing one SLO every fall in all classes. This has shown to be a much better system for collecting SLO data, as instructors are not overwhelmed with the amount of data collection, and instead can reflect on the data and provide insight about student experiences with the SLO. As instructors analyze the SLO data, they are asked to reflect on the data, using the following questions:

1. What do you think helped the students who met or exceeded this SLO?
2. Did you try any new strategies that helped students meet this SLO? If yes, what?
3. Have you noticed any challenges, sticking points, or misconceptions with students in meeting the SLO? If yes, what were they?
4. In the future, what are some new, old, or current strategies that you plan to use to either improve student achievement of this SLO? Or, what is your plan to help maintain a high achievement level for this SLO?

These questions have helped instructors to reflect on their own teaching of the SLO content and to determine what is working, what isn't, and what changes they plan on making, if necessary, to help students meet the SLO in the future. By giving some time between the next assessment of that specific SLO, it also gives instructors time to research or make the changes they desire before the next assessment of that SLO happens again.

The method of having every instructor assess the SLOs, as opposed to mostly just the full-time faculty with a couple of adjuncts assess them, is another aspect of SLOs that the program has changed in the past three years, which is going well. Assessing every section has helped to ensure equity, since we are no longer mainly assessing groups of students who have registered in courses with the full-time faculty. Assessment is now conducted for classes independent of the instructor, day or time of the class, class modality (in-person vs. online), or length of the course (18-week, 14-week, or 8 week), etc. The assessment now captures the learning outcomes of all students, which is a strength of the program's SLO assessment process.

The assessment of SLOs over the past three years shows that students are meeting the SLOs. ESC-1 has had success rates of 79%, 90%, and 89%, for SLO#1, SLO#2, and SLO#3, respectively. ESC-1L has had success rates of 83%, 79%, and 89%, for SLO#1, SLO#2, and SLO#3, respectively. ESC-5 has had success rates of 96%, 89%, and 91%, for SLO#1, SLO#2, and SLO#3, respectively. ESC-5L has had success rates of 90%, 90%, and 91%, for SLO#1, SLO#2, and SLO#3, respectively. GEOL-1 has had success rates of 87%, 85%, 89%, and 88% for SLO#1, SLO#2, SLO#3, and SLO#4, respectively. GEOL-2 has had success rates of 100%, 90%, 80%, and 90% for SLO#1, SLO#2, SLO#3, and SLO#4, respectively. These success rates show that the methods of instruction that faculty are using are beneficial to students in meeting the SLOs, and that these types of methods should be encouraged and continued.

6f. Based on learning outcomes assessment results, explicitly identify areas in which the program(s) can improve. Provide specific data that supports your answer.

Pay special attention to learning outcomes that HAVE NOT been met.

The move to assessing SLOs by all faculty has its challenges. Adding the reflection piece as part of SLO reporting has helped individual faculty members in assessing their own practices and implementation of content related to SLOs. However, having meaningful discussions about "closing the loop" as a department is often difficult, since most faculty members are part-time adjuncts, who have busy schedules and work at many locations. This is compounded by the fact that SLO data is not collected by instructors at the same time, so finding a time to close the loop as a department, after all data has been collected and processed, is also a challenge.

The SLOs that students are struggling the most with are SLO#1 for ESC-1 and SLO#2 for ESC-1L. Both of these had 79% of students meet the SLO. Although this is considered being met for success, it is still below the success rate of the other SLOs assessed by the Earth Science/Geology program. These two SLOs involve scientific methods and identification of rocks, both which are important in the understanding and application of earth science.

7. STRATEGIC PLANNING

7a. Do you have any plans to modify a degree or certificate in your program?

- Yes
 No

7b. Are you planning to initiate a new program?

- Yes
 No

OVERALL IMPROVEMENT

To help answer 7c and 7d, review the following subsections:

Subsection 2: EVIDENCE--Equity

Subsection 3: EVIDENCE--Program Data

Subsection 4: EVIDENCE--Learning Outcomes

7c. Identify specific reasons for "why" improvement is needed. Use an evidence-based approach to support your answer.

To help guide your thinking, consider framing improvement in more tangible ways: orientations for new faculty, inefficiencies in office processes, communication gaps (with adjuncts or other departments), tracking errors, budgeting processes that are not as timely or efficient, coordination with other related areas in other educational units, resource management of supply budgets.

Improvement is needed because there are students who continue to need help and support in order to be successful. Although the overall enrollment, retention, and success rates are high, and SLOs are being met, there are still groups in need of extra support and encouragement from the Earth Science/Geology program. Specifically, these groups include African American and Hispanic students, with success rates in the 61.3%-73.0% range and 75.7%-80.3% range, respectively, while the other groups are generally in the 80%-90% range. In addition, students in the 19 or Younger and 20 to 24 Years Old age group, have success rates in the 70.5%-77.7% and 77.3%-79.6% range, respectively, while other age groups are generally in the 80-90% range. Students with Disabilities, First Generation, and Economically Disadvantaged students are additional groups that have success rates that are in the 70% to low 80% range. Reasons in the department for why improvement is needed likely include communication gaps in discussing SLO results and findings, as well as needing additional lab activities that are innovative and engaging to students.

7d. What is your program's plan to make improvements? An effective plan is descriptive and has well-defined steps. Explain your answer in order of priority; rank highest priority first, followed by second highest priority, and so on.

If there is a disparity in equity, the strategies for implementation should be included in the plan.

1. The Earth Science/Geology faculty will work to connect at-risk students with Chaffey's student support programs.

2. The Earth Science/Geology faculty will identify earth science/geology majors early and provide advice to them regarding their major, transfer plans, internships/STEM Summer Research opportunities.
3. The Earth Science/Geology faculty will look for/purchase innovative tools and resources (including hands-on labs/activities/equipment/supplies) to provide a more equitable educational experience for students.
4. The Earth Science/Geology department will look for/participate in experiential learning opportunities for students to provide a more equitable educational experience for students.
5. The Earth Science/Geology department will share and discuss SLO results and findings with all faculty teaching the course.
6. The Earth Science/Geology department will develop and implement practices for sharing ideas and resources among faculty.
7. The Earth Science/Geology department will improve student learning and success by improving the full-time/part-time faculty ratio through hiring another full-time faculty member.

CURRICULUM IMPROVEMENT

As we move toward Guided Pathways, curriculum serves as a central catalyst for the movement. Reflect and provide information on questions 7e and 7f.

Information will be forwarded to the Curriculum Office. There is NO SCORING on curriculum improvement questions, 7e and 7f.

7e. How does (or will) your program incorporate experiential learning components into your curriculum?

- Field trip opportunities
- Hands-on activities and labs

(Max chars: 5,000)

7f. How does (or will) your program incorporate career exploration into early courses in your degrees and/or certificates?

- We will continue to invite students to attend professional meetings/talks with other geoscientists.
- Encourage students to apply and participate in the STEM Summer Research Opportunities.
- Encourage students to discuss career options with faculty members.

(Max chars: 5,000)

7g. Do you have any recommendations for a professional development workshop(s) that will help you or your program execute future plans?

Type N/A in the response field if you are not making any recommendations for professional development.

Information will be forwarded to the Faculty Success Center for future professional development planning. NO SCORE is assigned.

Equity professional development workshops would help our program, specifically targeting African American, Hispanic, the 19 or Younger and 20 to 24 Years Old age group, Students with Disabilities, First Generation students, and Economically Disadvantaged students.

8. VIP GOALS

8a. What are your Three-Year Visionary Improvement Plan Goals (1-3 goals recommended)?

Perhaps the most important piece in the PSR process is the creation of the Visionary Improvement Plan (VIP). The VIP is an opportunity for all program members (not just primary writers) to get together to analyze data, discuss the overall self-study, and identify program improvement goals for the next three years.

VIP Goals should align with the Chaffey Goals, and should be clear, specific, measurable, action-oriented, realistic, and time bound.

VIP Goal #1: Provide greater opportunities for innovative, experiential, and hands-on learning to provide a more equitable educational experience for students, measured by a 5% increase in SLO results for in-person lab courses over 3 years.

VIP Goal #2: Develop and implement an effective, efficient mechanism for the sharing of ideas, resources, and of SLO results and findings among all faculty members.

8b. Select the Chaffey Goals that directly relate and are MOST relevant to your VIP GOALS (please select all that apply):

VIP goals should relate to Chaffey Goals.

- Goal 1: Equity and Success--Chaffey College will be an equity-driven college that fosters success for all students.
- Goal 2: Learning and Completion--Chaffey College will ensure learning and timely completion of students' educational goals.
- Goal 3: Community Opportunities and Needs--Chaffey College will develop and maintain programs and services that maximize students' opportunities and reflect community needs.
- Goal 4: Technology--Chaffey College will optimize the use of technological tools and infrastructure to advance institutional efficiency and student learning.
- Goal 5: Efficiency--Chaffey College will efficiently and effectively manage systems, processes, and resources to maximize capacity.
- Goal 6: Agility--Chaffey College will responsively adapt to changes in students' academic and career needs.
- Goal 7: Professional Learning--Chaffey College will prioritize and align professional learning for all employees to support the achievement of Chaffey Goals.

*** 8c. Explain the rationale that led your program to develop each VIP Goal. How does each VIP Goal align with the Chaffey Goals?**

VIP Goal 1--Rationale and how it aligns with the Chaffey Goals

VIP Goal 2--Rationale and how it aligns with the Chaffey Goals

VIP Goal 3--Rationale and how it aligns with the Chaffey Goals

VIP Goal #1: Provide greater opportunities for innovative, experiential, and hands-on learning to provide a more equitable educational experience for students.

The rationale for this goal is the desire for equity. We know from our enrollment, retention, and success rates, that the use of hands-on activities is effective. However, what we have done thus far is not enough to see the success rates of many underrepresented groups to match the success rates of students in other groups. This goal aligns with the Chaffey Goals of Equity and Success (Goal 1), Learning and Completion (Goal 2), and Technology (Goal 4). It aligns with the Chaffey Goal of Equity and Success because it is the desire for equity that is driving this goal. The program not only wants students to be successful overall, but for there to be equity in the success rates for all subgroups. This goal aligns with both the Chaffey Goal of Learning and Completion and the goal of Technology by the program being dedicated to search for and use tools and resources that would foster innovative, experiential, and hands-on learning for all students.

VIP Goal #2: Develop and implement an effective, efficient mechanism for the sharing of ideas, resources, and of SLO results and findings among all faculty members.

The rationale for this goal is that more efficient and timely communication needs to occur between faculty in order to help our students be more successful. Many adjunct instructors are utilized, who work at a variety of locations and have very different schedules from each other, which poses challenges when sharing information and collaborating. Each instructor has ideas and resources they have been using to help students have success in the program. Developing and implementing a mechanism for sharing such ideas and resources would help the program move forward in meeting and supporting the Chaffey Goal of Efficiency (Goal 5) as well as the goal of Equity and Success (Goal 1). This goal aligns with the Chaffey Goal of Equity and Success as the sharing of ideas, resources, and SLO results and findings would help facilitate discussion among faculty and improve student instruction, thus improving student success. This goal aligns with the Chaffey Goal of Efficiency by helping the program to figure out an effective way for all instructors to take part in "closing the loop."