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 **College of Alameda**

2022-23 Program Review – Geology

**Lead Author:**

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| Stephen Self, Geology P/T Instructor, with support from Peter Olds (CHEM/GEOL) and Jayne Smithson (Co-chair, Physical Sciences Cluster) |

**Program Overview**

Provide your program’s mission statement. If your program does not have a mission statement, what is your timeline for creating a mission statement?

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| Geology addresses rocks, volcanoes, glaciers, landslides, earthquakes, etc. all in the context of the relatively new theory of plate tectonics describing how the Earth works. The geology of California is special since we live on the active San Andreas transform plate boundary (hence the earthquakes) which evolved from the previously existing subduction zone plate boundary (responsible for the California Coast Ranges and the Sierra Nevada). Our mission includes:1) Preparing students for transfer and careers in Geology.2) Stimulating student curiosity about how the Earth works (earthquakes, volcanoes, tsunamis, hurricanes etc.) and why California is such an interesting place.3) Providing students with evidence about Earth processes so they can make informed choices about using resources. |

List your program faculty and/or staff

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| Stephen Self (P/T)(please see request to expand funding resources and pool of eligible instructors for GEOL courses at CoA at the end of this full program review) |

Describe your current utilization of facilities, including labs and other space

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| Geology is a relatively new discipline at CoA and has been offered online for the past two years as a result of COVID-19. Geology has been promised a dedicated lecture room (D-114) and lab room (D-113), to be shared with Geography faculty members. The dedicated classrooms and office space are to be functional in time to offer in-person spring 2023 lecture and lab classes in GEOL and GEOG at CoA. |

List your program goals from your most recent Program Review or APU. Then, provide an update on the status of the goal. Has your program achieved the goal? Have any of your goals been revised or any still in progress? Lastly, make sure to discuss which College or District goal your program goal aligns to.

If no program goals exist or if this is your first program review, work to create 2-3 goals and align them with a College or District goal.

**PLEASE NOTE: 2022-2023 is the first full program review for Geology (11/1/2022)**

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| **Old Program Goal** (from APU 2021) | Develop an integrated Earth Science Program (Geology, Geography and Chemistry) to support STEM student success. |
| Status: In-Progress or Complete?  | Complete. New GEOL courses have been activated, along with approvals for GEOL ADT, A.S. and Certificate of Achievement. Interest remains high in taking GEOL courses at CoA, as evidenced by full rosters for GEOL 10 sections offered, and a full roster for GEOL 10 for fall 2022 intersession. Low FTEF allocations continue to restrict additional GEOL course offering opportunities. |
| Which college or district goal is aligned with your program goal? | Advance student access, equity and success. Advance COA teaching and learning. Build programs of distinction.  |

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| **NEW Program Goal** (2022-2025) | Expand Geology course semester offerings at CoA to support an integrated Earth Science Program (Geology, Geography and Chemistry) and STEM student success. |
| Status: In-Progress or Complete?  | In progress (new full-program goal 2022-2025). |
| Which college or district goal is aligned with your program goal? | Advance student access, equity and success. Advance COA teaching and learning. Build programs of distinction.  |

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| **Old Program Goal** (from APU 2021) | Support and enhance student diversity in STEM courses by addressing inequities and achievement gaps in Geology. |
| Status: In-Progress or Complete?  | Ongoing. Significant improvement in student retention and success in Geology courses has been noted over the past 12 months as we use more Open Education Resources (OER) in instruction. |
| Which college or district goal is aligned with your program goal? | CoA Mission Statement: The mission of College of Alameda is to serve the educational needs of its diverse community by providing comprehensive and flexible programs and resources that empower students to achieve their goals. |

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| **New Program Goal** (2022-2025) | Participate in STEM outreach programs to expand student awareness of their potential to succeed in science-based careers.  |
| Status: In-Progress or Complete?  | In progress (new full-program goal 2022-2025). |
| Which college or district goal is aligned with your program goal? | CoA Mission Statement: The mission of College of Alameda is to serve the educational needs of its diverse community by providing comprehensive and flexible programs and resources that empower students to achieve their goals. |

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| **Old Program Goal** (from APU 2021) | Develop analytical and critical thinking skills required to understand Geology processes in the past and present with respect to future problems and solutions. |
| Status: In-Progress or Complete?  | In progress. This is an ongoing endeavor to prepare students to be responsible citizens and stewards of Earth resources today and tomorrow. |
| Which college or district goal is aligned with your program goal? | Institutional Learning Outcome number 5:Accept personal, civic, social and environmental responsibility in order to become a productive local and global community member. |

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| **New Program Goal** (2022-2025) | Update and expand Geology lab specimens and equipment for analysis |
| Status: In-Progress or Complete?  | In progress (new full-program goal 2022-2025). |
| Which college or district goal is aligned with your program goal? | Institutional Learning Outcome number 5:Accept personal, civic, social and environmental responsibility in order to become a productive local and global community member. |

**Enrollment Trends**



**[Enrollment Trends Dashboard link](https://app.powerbi.com/view?r=eyJrIjoiNWJlOWZmYTEtNTY0MC00MDhkLWE5OTAtYmJjZjIxNzJiNWViIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSection86d6f65e2fb41a73da4d)**

Discuss enrollment trends over the past three years

*For additional analysis, click on the Enrollment Trends Dashboard, set the filters to Alameda and your discipline*

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| Geology enrollment trends show significant and continuous increase 2018-2021. Unfortunately, enrollment data presented above for 2021-2022 is skewed. “Real” students were unable to enroll in GEOL courses because the spaces were occupied by a high number of “fake” students. There is no way to disaggregate the enrollment data presented above to account for the enormous negative impact of the “fake student” infiltration that started in spring 2021 intersession, was heavily damaging in fall 2021, and continued to impact rosters on spring 2022. The “fake student” breeches continue to impact enrollment data in fall 2022.Student interest in Geology courses remains high, as evidenced by the full enrollment (40/40) in the GEOL 10 intersession class being offered in fall 2022. Expanding Geology course offerings is expected to show continuous enrollment growth over the next three years. |

Describe effective and innovative teaching strategies used by faculty to increase student learning and engagement.

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| Geology faculty at CoA use OER course support materials and a variety of teaching strategies to increase student engagement with the course content: power points, in-person lectures with interactive discussions, specimens and models, videos, etc. |

How does the discipline, department, or program maintain the integrity and consistency of academic standards with all methods of delivery, including face to face, hybrid, and Distance Education courses?

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| Geology courses are designed with continuity of rigorous academic standards across all modes of course delivery. Course online shells are available for Distance Education review, and instructor(s) are evaluated regularly for course integrity and teaching excellence. |

**Curriculum**

Have all your course outlines of record in CurriQunet been reviewed within the past three years?



**https://peralta.curricunet.com/**

**X Yes** ☐ No, please explain:

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Please list any planned changes from the current semester forward for curriculum (courses, degrees, and/or certificates) and the rationale for those changes (e.g., labor market data, advisory committee recommendations, transfer institution changes, industry trends, state-wide transfer model curriculum).

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| No new courses are planned for the next three years, although any opportunities to do so will be followed up. Courses for the new programs discussed in last year’s APU (2021-2022) have been implemented (GEOL 3/3A, 18 and 22) and are ready to be scheduled. The complete list of Geology courses now available to be scheduled at CoA include:Geology 1 – Introduction to Physical Geology Geology 2 – Introduction to Mineralogy Geology 3 – Historical Geology Geology 3L – Historical Geology LaboratoryGeology 18 – Geology of California Geology 22 – California Coast Range Studies Geology 49 – Independent Study in Geology |

How is your program meeting the needs of students, and/or articulation with four-year institutions?

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| The new Geology AS-T is ready for students to complete as a science transfer degree option. |

**Student Learning Outcomes Assessment**

List your Student Learning Outcomes

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| 1) Describe the three plate boundary types and their connection with volcanoes and earthquakes, including types of volcanoes and earthquakes. Recognize zones within Earth.  Assessment Method: Essay questions as part of exams/quizzes; forum discussions (group discussions) 2) Summarize the geological and plate-boundary configuration of California and the Bay Area. Assessment Method: Problem solving short answer questions; essay questions as part of exams/quizzes; forum discussions (group discussions) 3) Define and distinguish the three major rock families. Summarize their origin and typical mineral compositions.   Assessment Method: multiple choice exams and quizzes; essay exam questions. |

Please provide a high-level summary and your program’s interpretation of your SLO findings over the past year.

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| Geology students at CoA have met or surpassed SLO assessment goals consistently over the past 12 months. |

What were the most important things your department learned from assessment? Did implementation of your action plans result in better student learning?

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| The past two years of online course delivery have demonstrated that Geology students learn well in an online environment, but improvements were noted in student success with the adoption of OER materials.Geology is a hands-on learning discipline. We anticipate that the return to in-person instruction over the next three years will enhance student learning of course content. |

Have you assessed your program learning outcomes (PLOs) within the past few years? How have your assessments informed improvements/changes to your program. If you have not assessed your PLOs, explain the plan to assess and the expected timeline.

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| PLOs have not yet been assessed for the new Geology programs, as these programs were implemented at the beginning of fall 2022. PLOs will be assessed in the next GEOL APU and thoroughly examined in the next Geology full program review in 2025. |

College of Alameda Institutional Learning Outcomes (ILOs) were created to guide educational programs and services. They include:

* **Problem Solving:** Solve problems and make decisions in life and work using critical thinking, quantitative reasoning, community resources, and civil engagement.
* **Communication and Technology:** Use technology and written and oral communication to discover, develop, and relate critical ideas in multiple environments.
* **Creativity:** Exhibit aesthetic reflection to promote, participate and contribute to human development, expression, creativity, and curiosity.
* **Diversity:** Engage in respectful interpersonal communications, acknowledging ideas and values of diverse individuals that represent different ethnic, racial, cultural, and gender expressions.
* **Civic Responsibility:** Accept personal, civic, social and environmental responsibility in order to become a productive local and global community member.

How does your program participate in assessing the Institutional Learning Outcomes (ILOs)? If your program has not participated, how will you plan to incorporate these outcomes within your program?

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| All Geology PLOs are linked to CoA ILOs in the Peralta CurriQunet curriculum management system. As discussed above, Geology PLOs will be assessed for the first time next year. |

**Course Completion**

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| College | Academic Year | Subject  | Total Graded | Course Completion | Course Completion Rate |
| Alameda | 2022 | GEOL | 61 | 39 | 64% |
| Alameda | 2021 | GEOL | 34 | 22 | 65% |
| Alameda | 2020 | GEOL | 50 | 36 | 72% |
| Alameda | 2019 | GEOL | 46 | 37 | 80% |
| Alameda | 2018 | GEOL | 45 | 31 | 69% |

Consider your course completion rates over the past three to five years (% of student who earned a grade of "C" or better).

[**Course Completion Dashboard link**](https://app.powerbi.com/view?r=eyJrIjoiNjc2MDhiNTEtNTJhZi00MDM0LTk5NDItNTRiY2EzMGI1NTZiIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSection86d6f65e2fb41a73da4d)

How does the course completion rate for your program or discipline compared to your college's Institution-Set Standard for course completion of **67%**?

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| As discussed above, the “fake” student enrollment crisis of 2021-2022 skewed the course completion rates. “Fake” students were dropped at various times after Census Rosters were submitted in fall 2021 and spring 2022 , which makes the data reported above unreliable. The “real” students who were enrolled in Geology courses completed these courses at rates that are comparable to or exceed CoA averages, as evidenced by the rosters kept by Geology faculty. |

Are there substantial differences in course completion rates between face to face and Distance Education/hybrid courses? If so, how does the discipline, department, or program address this?

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| No. |

If your program offers dual enrollment courses, examine the data, and discuss the course completion rates compared to the overall program rate.

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| Not applicable |

**Course Retention**

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| College | Academic Year | Subject | Total Graded | Total Retained | Course Retention Rate |
| Alameda | 2021-2022 | GEOL | 61 | 49 | 80% |
| Alameda | 2020-2021 | GEOL | 34 | 26 | 77% |
| Alameda | 2019-2020 | GEOL | 50 | 44 | 88% |
| Alameda | 2018-2019 | GEOL | 46 | 38 | 83% |
| Alameda | 2017-2018 | GEOL | 45 | 36 | 78% |

On average the course retention rate (number of students are retained in the course) for College of Alameda has been **85%** for the past three years. Examine the course retention rates for your program over the last three years. How does your program or discipline course retention rates compare to the college?

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| Again, as discussed above, the “fake” student enrollment crisis of 2021-2022 skewed the student retention rates. “Fake” students were dropped at various times after Census Rosters were submitted in fall 2021 and spring 2022, which makes the data reported above unreliable. The “real” students who were enrolled in Geology 10 sections were retained at rates that are comparable to or exceed CoA averages and completed the courses, as evidenced by the rosters kept by Geology faculty. |

College of Alameda continues to focus on access, equity, and success. The goal is to create an inclusive environment where all students can thrive and meet their education and career goals.

To address equity gaps and work towards achieving equity in educational outcomes, examine your program data for evidence of disproportionate impact (DI). Using the percentage point gap method to identify DI, subgroups whose course completion rate falls more than -3 percentage points below the All Students success rate are highlighted red. The Margin of Error value (MOE) is used to determine the presence of DI using the Point Gap Method. Values lower than the corresponding MOE are reflective of disproportionate impact (i.e., pink highlighted cells). Groups with 10 students or less are excluded from the analysis.

Note: The table reflected use 2021-22 course data to calculate DI.

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| **College** | **Subject** | **Target Population** | **Census Enrollment** | **Success Rate** | **PPG Index** | **MOE**  | **DI Identified** |
| Alameda | GEOL | All Students | 61 | 63.9 |   |   |   |
| Alameda | GEOL | Asian | 14 | 92.9 | 28.9 | -25.2 | FALSE |
| Alameda | GEOL | Black / African American | 10 | 60.0 | -3.9 | -29.8 | FALSE |
| Alameda | GEOL | Decline to State / Unknown | 6 | 50.0 | -13.9 | -38.4 | FALSE |
| Alameda | GEOL | DSPS/SAS | 6 | 66.7 | 2.7 | -38.4 | FALSE |
| Alameda | GEOL | Female | 31 | 67.7 | 3.8 | -16.9 | FALSE |
| Alameda | GEOL | First Generation | 31 | 71.0 | 7.0 | -16.9 | FALSE |
| Alameda | GEOL | Hispanic / Latino | 18 | 55.6 | -8.4 | -22.2 | FALSE |
| Alameda | GEOL | Male | 24 | 62.5 | -1.4 | -19.2 | FALSE |
| Alameda | GEOL | Two or More | 7 | 57.1 | -6.8 | -35.6 | FALSE |
| Alameda | GEOL | White | 10 | 50.0 | -13.9 | -29.8 | FALSE |

What can your discipline, department, or program do to improve course completion for disproportionate impacted groups?

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| As soon as reliable numbers can be determined (or disaggregated from the data that includes “fake” student infiltration), assessment of noted achievement gaps, if any, will be assessed, analyzed, discussed and reported. Assessing Disproportional Impact (DI) by self-reported ethnicity would be useful information only if the information itself is not suspect. |

**Degrees & Certificates Conferred**

Does your program offer any degree/certificate programs? If your program does not, skip this section and continue to **Engagement**

Since the last program review, what has the discipline, department, or program done to improve the number of degrees and certificates awarded?

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| Geology ADT, AS and Certificate od Achievement are new programs that were implemented in fall 2022. |

For more information on awards: [**Degrees & Certificates Dashboard link**](https://app.powerbi.com/view?r=eyJrIjoiZjU2M2M5MzItOTcwZi00Y2U1LWJmODUtYTc0YjlhZGI2ZDhjIiwidCI6ImVlYTE2YTE2LTQ4YWYtNDc3Yi05MTEzLTA1YjFjMDExMjNmZiIsImMiOjZ9&pageName=ReportSectionde32556e136b0a8caccd)

Increasing the number of students who complete a certificate or degree is a shared goal across CoA’s Ed Master Plan Goals, PCCD Goals, the Chancellor’s Office Vision for Success, the Student-Centered Funding Formula, and Guided Pathways. What is planned for the next 3 years to increase the number of certificates and degrees awarded?

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| With the cooperation of CoA Administrators who allocate FTEFs, Geology faculty plan to expand the number of program-satisfying Geology courses offered every semester at CoA. It is anticipated that expanding course offerings in support of the new Geology programs will lead to increase in the number of Geology degrees and certificates awarded over the next three years. |

**Engagement**

Discuss how faculty and staff have engaged in institutional efforts such as committees, presentations, and departmental activities. Please list the committees that full-time faculty participate in.

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| The sole Geology instructor at the moment is a part-time faculty member who has limited opportunities to participate on committees and presentations. The Geology P/T faculty member is active in department meetings (Physical Sciences Cluster) and curriculum. |

Discuss how faculty and staff have engaged in community activities, partnerships and/or collaborations.

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| The sole Geology instructor at CoA is retired from a 40-year career as a Professor ofGeology and a federal scientist. They continue to be involved in research and other community activities that are appropriate for this discipline. |

Discuss how adjunct faculty members are included in departmental training, discussions, and decision-making.

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| As noted above, the sole Geology instructor is a part-time faculty member who is included in all Physical Sciences cluster (departmental) activities and decision making. |

**Prioritized Resource Requests Summary**

In the boxes below, please add resource requests for your program. If there are no resource requested, leave the boxes blank.

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| **Resource Category** | **Description/Justification** | **Total Estimated Cost** |
| Personnel: Classified Staff |  |  |
| Personnel: Student Worker: | Three geology student workers and/or instructional assistants are requested to tutor students, help students in labs, help with lab set-up and clean-up, and to help faculty with field trip logistics. |  |
| Personnel: Part Time Faculty | A second part-time Geology instructor is needed immediately to teach the planned expansion of Geology courses, starting in spring 2023 intersession. Courses to be offered in the near future include Geology 1, 2, 3/3L, 10, 18, and 22, as well as GEOL 49 independent study and field trip(s).We highly recommend interviewing potential instructors NOW, rather than waiting. Having a ready pool of instructors is preferable to cancelling classes because last-minute instructors are not available. | Unknown personnel costs |
| Personnel: Full Time Faculty  | A full-time Geology instructor hire is requested for fall 2023 or spring 2024 as the Geology program expands. | Unknown personnel costs |

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| **Resource Category** | **Description/Justification** | **Total Estimated Cost** |
| Professional Development: Department wide PD needed | Meetings and conferences: Faculty need to stay current in their fields of expertise and research. Travel and registration fees for these meetings need to be covered by COA. | $5,000 |
| Professional Development: Personal/Individual PD needed |  |  |
| Supplies: Software | ESRI Arc-GIS license shared with Geography. | varies |
| Supplies: Books, Magazines, and/or Periodicals |  |  |
| Supplies: Instructional Supplies | Rock sample collections, mineral sample collections, thin section sets, bathymetric map of the world, faulting models etc. | $1,000 per funding cycle (Lottery funds) |
| Supplies: Non-Instructional Supplies |  |  |
| Supplies: Library Collections |  |  |
| Technology & Equipment | Petrographic microscopes for student use, scanning electron microscope to be shared with Chemistry and Geography. | To be advised |
| Library: Library materials/collections | Journal subscriptions to Geology, Geochemistry, Earth and Planetary Science Letters, Journal of Geophysical Research, etc. | $500 |
| Facilities: Classrooms/Labs | Dedicated smart-room classrooms for lecture (D-114) and laboratory (D-113) classes, to be shared with Geography programs until the new Science Building is built. These facilities have been promised for active use at the beginning of spring 2023 semester. |  |
| Facilities: Offices | Office space to be provided for GEOL instructor (or shared with Geography faculty) to hold in-person office hours and meet with students outside of the classroom. |  |
| Facilities Other | Dedicated, locking storage space for Geology specimens, maps and teaching supplies. Can be shared with Geography program in D-113. |  |
| Other | Use of CoA 15-passenger vans for field trips | Gas and insurance costs |