

2019-20 Environmental/Earth Sciences Annual Program Plan

I.A. Program Profile: Purpose

Describe the program(s) to be reviewed. What is the purpose of the program and how does it contribute to the mission of Skyline College?

Narrative

The purpose of the Earth and Environmental Science Program at Skyline College is to educate students about the Earth, Earth resources, the environment and the role that they play in changing the environment. We offer 5 GE classes in GEOL, 2 in OCEN, and 2 in ENVS. We have the only GE Area B1/B3 class that is offered fully online, meaning that students can get a Physical Science Lecture and Lab online.

In addition to our GE offerings, we offer several COOP, CTE, and certificate courses ranging from high school engagement to post-secondary training for Climate Protection Professionals.

The goals of the Earth and Environmental Science Program are to:

- 1) Educate students about Earth processes and the environment around them;
- 2) Build an understanding of the interdisciplinary nature of Earth and Environmental sciences, which includes a comprehension of the relationships between Earth processes and the distribution of natural resource;
- 3) Highlight the impact of humans on the environment and the dependency of humans on natural resources; and
- 4) Engage students in environmental stewardship by exposing them to real-world environmental issues and by providing opportunities for them to become engaged on campus and in the community through faculty sustainability efforts.

This contributes to the mission of Skyline College by empowering students to make decisions that will benefit themselves, their communities, and the Earth through educating them on the role that they play in sustaining the Earth and environment. We also offer opportunities for students to become engaged with sustainability related projects on campus and in the community further empowering them to become change agents. A further goal of the program is to expose the students to career opportunities in Earth and Environmental Science.

Since Fall of 2016 we have offered paid internships to students through the Energize Colleges Program, which is funded through a PIF and supervised by Earth and Environmental Science Faculty. This has given paid internship opportunities to forty students and given them opportunities to engage with the community, increase sustainability on campus, gain real-world skills, and educate



themselves and local high school students (through high school engagement) on the Green Workforce and Green Economy.

Associated Objectives

1182-Earth Science Full-time faculty

1181-Institutionalize Sustainability Coordinator

I.B. Program Planning Team

Annual program planning is intended to be a collaborative process which promotes dialogue and reflection. Please identify all individuals who contributed to or shaped the narrative. Include names and the title or role of each person.

Narrative

Carla Grandy, Earth Science Faculty

Carina Anttila-Suarez, Environmental Science Faculty

Associated Objectives

[1182-Earth Science Full-time faculty](#)

[1181-Institutionalize Sustainability Coordinator](#)

II.A. Analysis: Progress on Prior Program Objectives (Goals) and Activities

Describe the progress made on previously established program objectives (goals) including identification of achievements or areas in which further effort is needed. New programs which have not yet established CPR/APP objectives should discuss progress on program implementation or activities.

Narrative

Goal 1: Teach students about Earth processes and the environment around them.

Achievements:

- ENVS 100 explored waste disposal in San Bruno and remediation of issues caused by pollution, mismanagement, and CalTrans at Mountain Lake in San Francisco.
- ENVS 101 was offered for the first time and offerings are being expanded and recommended for Promise Scholars students.
- Offered GEOL/GEOG 106 – Weather and Climate – has been offered fully online three times now -- our first fully online Lecture + Lab course.
- Environmental Leaderships Seminar Series (ENVS 191, 192, 193) was made permanent and is continued to be offered to local high school students as a dual enrollment option in Earth and Environmental Courses.

Further Effort Needed:

- Develop Campus as a Living Lab opportunities for new Environmental Science Building.
- Increased outreach/coordination with counseling faculty to increase enrollment in new courses.

Goal 2: Build an understanding of the interdisciplinary nature of Earth and Environmental sciences, which includes a comprehension of the relationships between Earth processes and the distribution of natural resource.

Achievements:

- Teamed GEOL and ENVS students to tour campus facilities to evaluate energy efficiency measures on campus and conduct a campus energy audit in an effort to help students relate Earth and Environmental Science to the environment around them as well as exposing them to career opportunities and opportunities on campus.
- Through the Comprehensive College Redesign, faculty have begun to participate in a pilot sustainability GE bundle for students to see the connections between sustainability and the various disciplines required for their GE work.

Further Effort Needed:

- Create permanent Sustainability Coordinator position on campus to be able to plan and facilitate student engagement with sustainability and “campus as a living lab” components for classes, not just in Earth and ENVS, but across the campus.

Goal 3: Highlight the impact of humans on the environment and the dependency of humans on natural resources.

Achievements:

- Engagement of students through sustainability related work on campus, including Sustainability Ambassadors Network and the Climate Action Plan, allows students to engage with their environment and exposes them to ways that they can positively impact the environment.
- Study of local climate using fog catcher and weather station engages students with both the science and technologies used in Earth Science.

Further Effort Needed:

- Formalization of service learning within Earth and Environmental classes to engage students with meaningful experience within the community as well as strengthen community relationships.
- Re-establish Student Sustainability Summit to give students the opportunity to identify sustainability projects on campus that they would like to see implemented along with funding to realize them.

Associated Objectives

[1182-Earth Science Full-time faculty](#)

[1181-Institutionalize Sustainability Coordinator](#)

II.B. Analysis: Program Environment

Describe any recent external or internal changes impacting the program or which are expected to impact the program in the next year. Please include when the specified changes occurred or are expected to occur.

Narrative

With the Comprehensive College Redesign that is currently underway at Skyline College, the Earth Science Department will have the opportunity to grow and increase enrollment to be a major component of a GE thematic pathway in Sustainability. We also have several high impact practices (HIPs) such as: internships, capstones, field experiences, and service learning that may also serve as models or be important components of the newly redesigned curricular offerings of the college.

In Fall 2019, we began to offer the ENVS 101 course and the ENVS 100 + 101 series is a common recommendation throughout the Program Maps as an interdisciplinary science course. These courses are also being blocked for Promise Scholars Students beginning in Fall 20 as part of their consolidated course schedules.

In Fall 2016, the introduction of Energize Colleges on the Skyline College Campus has allowed us to engage more students in sustainability related projects through funded internships allowing us to have more of an impact on campus and in the community. We have now provided internships to 40 Skyline College Students through this program and many of those students have gone on to incorporate sustainability or environmental science into their career plans.

Our sustainability related work on campus continues to grow through various initiatives, which provides both a meaningful experience and tool for engagement for students, but also makes it challenging to facilitate all of the activities that are occurring. We continue to incorporate Sustainability themed lessons and activities in classes across disciplines through the Sustainability Blitz, which is supported by our Climate Corps Bay Area Fellows.

With the opening of the new Environmental Science Building in Spring 2020 we are hoping to be able to offer additional courses that will benefit our two degrees (AS-T in Geology, AS-T in Environmental Science). The new classrooms and the center for Earth and Environmental Sciences as well as Sustainability will make that a major focus of the campus community.

Associated Objectives

[1182-Earth Science Full-time faculty](#)

[1181-Institutionalize Sustainability Coordinator](#)

II.C. Analysis: Student Learning Outcomes (SLOs and PSLOs)

- 1) Instructional Programs Only: Describe what was learned from the assessment of course SLOs for the current and past year.
- 2) Student Service Programs Only: If PSLOs are being assessed this year (3-year cycle), describe what was learned. If no assessment was done because this is an off-cycle year, please state that this item is not applicable.

Narrative

GEOL 105 SLO Results from Spring 2019:

Course: GEOL 105		Assessment Date: Spring 2019		
SLO	Date it will be assessed (generally)	Assessment Method (How are you planning to assess this SLO)	Criteria for evaluating whether the SLO was successfully met (Some metric for determining whether this outcome was met)	Results (To be completed after assessment. These should be submitted by the start of the following semester)
Example SLO	HW & Final Exam	With exam questions # 3, 5, 8 (exam is attached)	75% of students will answer each of these questions correctly on the exam.	86% of students answered questions successfully.
Identify and explain the concepts, principles and interactions of Earth's systems and the interactions between geosphere, hydrosphere, atmosphere and biosphere.	January, 2019	Systems activity	75% of students will complete a grade with a grade of 70% or higher.	87% of students completed assignment with a grade of 70% or higher.
Articulate how human activities affect the	May, 2019	Lifestyle Project	75% of students will complete a grade with a	91% of students completed assignment with

environment as well as how humans are affected			grade of 70% or higher.	a grade of 70% or higher.
Recognize and propose options for mitigating geologic hazards.	February, 2019	Understanding Groundwater Assignment	75% of students will complete a grade with a grade of 70% or higher.	87% of students completed assignment with a grade of 70% or higher.
Communicate complex scientific concepts in writing, verbally and in diagrams.	April, 2019	Climate Change Lab	75% of students will complete a grade with a grade of 70% or higher.	74% of students completed assignment with a grade of 70% or higher.

GEOL 100

GEOLOGY 100 SLO'S: SUMMER, 2016

1.) Employ a conceptual understanding of fundamental concepts, principles, and interactions of Earth's systems through use of the scientific method;

Assessment method: Module Activity (Quiz)

Question: Divergent Boundary

Possible answers: a.) A; b.) B; c.) C; d.) D; e.) E

Success: 70% will answer correctly

Results: 82% of students answered correctly

2.) Relate the internal and external processes that shape and form the Earth to the distribution of Earth resources and to the occurrence of geologic events;

Assessment method: Final Exam

Question: Shallow-focus earthquakes are found along which type of plate boundary?

Possible Answers: a.) All plate boundaries; b.) Transform boundaries; c.) Divergent boundaries; d.) Convergent boundaries

Success: 70% will answer correctly

Results: 71% of students answered correctly

3.) Demonstrate an understanding of the scale of geologic events both temporally and spatially;

Assessment method: Module Activity (Quiz)

Question: At the end of a summer season, which would you expect to see at a typical beach?

Possible Answers: a.) Much more sand piled up on the beach relative to the end of the winter season; b.) Much less sand piled up on the beach relative to the end of the winter season; c.) The same amount of sand should be at the beach no matter what season it is.

Success: 70% will answer correctly

Results: 76% of students answered correctly

4.) Communicate complex course concepts effectively in writing and diagrams and apply critical thinking and problem solving skills to solve geologic problems.

Assessment method: Module Activity (Quiz)

Question: It takes an S-wave approximately 70 seconds to travel 300 km. How long does it take the P-wave to travel this same distance? Choose the best answer below:

Possible answers: a.) 70 seconds; b.) 540 km; c.) 39 km/s; d.) 39 seconds; e.) 520 km

Success: 70% will answer correctly

Results: 81% of students answered correctly

Associated Objectives

[1182-Earth Science Full-time faculty](#)

[1181-Institutionalize Sustainability Coordinator](#)

III.A. Reflection: Considering Key Findings

Consider the previous analysis of progress achieved, program environment, and course-level SLOs or PSLOs (if applicable). What are the key findings and/or conclusions drawn? Discuss how what was learned can be used to improve the program's effectiveness.

Narrative

This program is the process of growth and development. Through early assessment we have learned that students are motivated by coursework that offers a meaningful engagement in their environment and community through campus as a living lab activities, field trips, and opportunities to engage in environmental monitoring.

Key Findings:

- Enrollment has held steady with headcount of 785 in 2018-2019.
- Success rates have been increasing overall with a course success rate of 84.5% and retention rate of 94% for the 2018-19 year.
- Disaggregated data show racial disparities in our program, though they have are smaller than in previous years and we have seen improvements in several demographic groups. For example success rates for African American Students increased from 59% to 82% from 2017-18 to 2018-19. Success rates for Phillipino (77%), African American (82%), Hispanic/Latino (77%), and Multi Race (83%) are still lower than for White (90%) and Asian (91%) students.
- Additionally students in the 50-59 and 60+ age range are succeeding at lower rates than other age groups.
- Students are most engaged when they are exposed to real-world problems and scenarios through field explorations, accessing data from scientific organizations, and sustainability programs and opportunities on campus;
- OCEN 100 and ENV5 100 continue to have the highest enrollment of all of the courses within the program and through better communication with Counseling faculty and staff, we hope to increase interest in the many other courses offered in Earth and Environmental Science;

Improving Program's Effectiveness:

- Encourage more program faculty to complete the Equity Training Series or engage in other opportunities to develop and implement culturally relevant pedagogy.
- Creating a permanent Sustainability Coordinator position on campus would allow us to create more and implement more fully the engagement pieces that are most meaningful to students;

- Incorporating service learning opportunities in Earth and ENVS would allow students to engage in the community and put their classroom learning to work which would be mutually beneficial to both the students and the community;
- Developing more Campus as a Living Lab opportunities for students to connect with the material in a tangible way.
- Continue to offer internships through Energize Colleges and intentionally recruiting students of color and women into those opportunities.

Associated Objectives

1182-Earth Science Full-time faculty

1181-Institutionalize Sustainability Coordinator

III.B. Reflection: ISLOs

If your program participated in assessment of ISLOs this year:

(1) What are the findings and/or conclusions drawn?

(2) Does the program intend to make any changes or investigate further based on the findings? If so, briefly describe what the program intends to do.

Narrative

Earth and Environmental Science has not participated in ISLO assessment this year.

Associated Objectives

[1182-Earth Science Full-time faculty](#)

[1181-Institutionalize Sustainability Coordinator](#)

IV.A. Strategy for Program Enhancement: Continuation/Modification

Indicate whether the program is continuing implementation of the last CPR strategy or revising the strategy. Please describe the modifications if revisions are intended.

Note: Any new strategies should be linked to Institutional Goals through creation of objectives in the next section. If the program has not yet participated in comprehensive program review, an annual or multi-year strategy can be defined in this item.

Narrative

The program continues to implement the most recent CPR strategy through regular assessment of SLO and ISLO data to better understand student mastery and from that improve the courses and the way that we offer the material.

Additionally, we are revising the strategy to expand the engagement of our students with the campus and community through regular projects and opportunities in sustainability related efforts. To be able to achieve this we are requesting that a Sustainability Coordinator position be institutionalized so that these opportunities can be expanded thereby impacting more students and further enhancing community engagement.

An additional strategy is to engage a wider range of students through expanding our distance education offerings to include ENV5 100 as well as the GEOL/GEOG 106 lecture and lab, both of which are now offered online.

With the opening of the new Environmental Science building we have dedicated spaces for our Earth and Environmental Classes as well as opportunities for Sustainability events. This will also be an ongoing discussion with the introduction of a GE thematic bundle in Sustainability that will incorporate both the course work in our program but also across campus, along with High Impact Practices such as internships, ePortfolio, and service learning.

Associated Objectives

[1182-Earth Science Full-time faculty](#)

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IV.B. Strategy for Program Enhancement: Action Plan and Resource Requests

Based on the most recent CPR and any desired modifications, develop an annual action plan with related resource requests. No narrative response will be entered in this section, but the objectives you create will be printed automatically in the APP report under this item.

(1) To begin, click on PLANNING at the top of the page, then CREATE A NEW OBJECTIVE. To view previously created objectives, click PLANNING at the top of the page, then VIEW MY OBJECTIVE.

(2) IMPORTANT! Make sure to associate each objective to this standard in the APP. Need help? Contact the PRIE Office for further instructions. Institutional Goals. Need help? Contact the PRIE Office for further instructions.

Narrative

See action plan and resource request.

Associated Objectives

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Enhanced Budget with Objectives and Task Detail

[Environmental/Earth Sciences Enhanced Budget with Objectives and Task Detail](#)