

2018-19 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 1 in ENV5. 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 thirty 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.

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

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.
- GEOL 105 students explore real-world climate and atmosphere data to understand how Earth's climate is changing as a result of human intervention. GEOL 105 students also complete "Lifestyle Projects" to identify changes that can be implemented in their lives to lessen their environmental impacts.
- Offered GEOL/GEOG 106 – Weather and Climate – was offered fully online in Fall 2017, which is our first fully online Lecture + Lab course.
- Development of new course in Greywater Principles and Practices (GEOL 680SP) gives students an understanding of Earth systems, offers hands-on technical skills in greywater installation and management, and provides a connection to the local community.
- 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 ENVS labs for launch in Fall 2019.
- 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.

Further Effort Needed:

- Create pilot sustainability GE bundle for students to see the connections between sustainability and the various disciplines required for their GE work.
- 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:**

- GEOL 105 students conducted a waste audit on campus in collaboration with the District Facilities Team and the County Office of Sustainability. Students learned that over 50% of waste was compostable but disposed of improperly. Students were able to draw connections between their behaviors and the impacts of their behaviors on the environment as well as develop strategies for reducing waste and encouraging their friends and families to reduce waste.
- Earth and Environmental Science students are participating in the Skyline College Day of Action along with Pacifica Beach Coalition
- Campus speaker to address the Climate Crisis spoke to 100+ GEOL, PHIL, ENGL, and SOCI students on social and environmental impacts of climate change.
- 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.
- Social Justice and Sustainability Community of Practice has offered events and opportunities for students to engage in volunteer and other activities relating to these topics.

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.

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, 2017 we had a 1-unit ENVS 101 lab course approved by curriculum committee and in Spring, 2018 we had a AS-T in Environmental Science approved and submitted to the state. With the upcoming new building, we are hoping to expand our course offerings, majors, and overall enrollment in Earth and Environmental Sciences.

Beginning in Fall 2016, the Climate Corps Bay Area and thus our Climate Protection Professional Certificate program began to include students from the AmeriCorp Program. This addition broadened the student body involved and expanded the number of students able to participate in the certificate and in the program in general.

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 21 Skyline College Students through this program.

In Spring 2017, we offered Greywater Principles and Practices for the first time to give students training and education in a applied aspect of Earth and Environmental Science and expose them to a growing industry in the Bay Area.

Throughout the 2017-18 year, our sustainability related work has grown substantially on campus through these 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. In combination with the Social Justice and Sustainability Community of Practice we have been able to offer several service learning and campus engagement opportunities for Earth and Environmental Science students.

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.

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

OCEN 100 and OCEN 101 were assessed in Fall2018.

Results: Between 80% and 100% of students were able to show mastery of each of the SLOs in each of the courses based on the criteria that we had identified.

What we learned: Overall, students seem to be mastering the SLOs based on the assessment criteria. Moving forward (especially going into Comprehensive Program Review next year) our program needs to have a conversation about: 1) what does it mean to actually master the SLOs; and 2) how can they demonstrate that in class.

Course: OCEN 100		Assessment Date: Fall 2018		
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.
Demonstrate an understanding of the scientific method as it applies to oceanography.	Final exam	Final exam – question 2 (attached)	75% of students will answer question correctly	95% of students answered this question successfully

Demonstrate an understanding of the scale of Earth, ocean, and atmospheric processes.	HW	HW question attached – question 1 (attached)	75% of students will answer question correctly	80% of students answered this question successfully
Evaluate human impacts on as well as societal benefits from oceanographic processes and resources.	final exam	Final exam – question 1 (attached)	75% of students will successfully complete the assignment.	93% of students answered this question successfully
Communicate complex course concepts effectively in writing and diagrams and apply critical thinking and problem solving skills to solve oceanographic problems.	HW	HW question attached – question 2 (attached)	75% of students will answer question correctly	80% of students answered this question successfully
Illustrate the interdisciplinary relationship between ocean processes.	Final Exam	Final Exam – question 23 (attached)	75% of students will answer question correctly	87% of students answered this question successfully

Course: OCEN 100		Assessment Date: Fall 2018		
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	SLO
Example SLO	Final Exam 12/16	With exam questions # 3,	75% of students will answer each of these	86% of students answered

		5, 8 (exam is attached)	questions correctly on the exam.	questions successfully.
Demonstrate ability to interpret features on nautical maps, bathymetric charts, and satellite images.	Lab - 8/24/18	Lab completion – Lab 2	75 % of the students will have successfully completed the lab.	Demonstrate ability to interpret features on nautical maps, bathymetric charts, and satellite images.
Describe the plate tectonic origin of ocean features and identify rocks and sediments located in various marine settings	Lab - 9/7/18	Lab - 9/7/18	75 % of the students will have successfully completed the lab.	100 % of students answered questions successfully.
Demonstrate an ability to graph, analyze, and interpret oceanographic data.	Lab – 9/28/18	Lab completion – Lab 7	75 % of the students will have successfully completed the lab.	90 % of students answered questions successfully.
Collect and measure and interpret various properties of seawater and of the atmosphere.	Lab – 9/14/18	Lab completion – Lab 5	75 % of the students will have successfully completed the lab.	95 % of students answered questions successfully.

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 most thoroughly engaged in the 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 is up overall in the program with headcount increasing from 497 in the 2016-17 to 644 in 2017-18. (This is while enrollments are down overall across the campus and district.)
- Success rates have been increasing overall with a course success rate of 75% in 2013-14 steadily increasing to 87.3 %in 2017-18 with retention also increasing over the same time period from 89% to 93.8%.
- Disaggregated data show racial disparities in our program with Black Students (64%), Hispanic (79%) and Filipino (80%) all succeeding at lower rates than the program-wide average of 87%.
- Additionally students in the 40-49 years of age range are succeeding at a rate of 80% compared to the overall average of 87%.
- 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 ENVS 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.

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.

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 ENV 100 as well as the GEOL/GEOG 106 lecture and lab, both of which are now offered online.

As we prepare for the opening of the new Environmental Science Building in Spring 2020, we will begin to discuss coordinating schedules amongst classes and campus 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.

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