YEARLY PLANNING DISCUSSION TEMPLATE
General Questions

Program Name ___Biology_____**Academic Year** 2022-2023____

1. Has your program mission or primary function changed in the last year?

   Our program mission has not changed:
   The Biology Program is committed to providing excellent college-level education in biology at the freshman and sophomore level in support of students seeking academic and professional degrees and certificates. The Biology Program mirrors the Allan Hancock College mission and strategic plan to provide quality educational opportunities that enhance student learning and the creative, intellectual, cultural, and economic vitality of the diverse Santa Maria community. The biology faculty members are committed to incorporating innovative instructional techniques and current technologies to enhance student achievement and instill life-long learning.

2. Were there any noteworthy changes to the program over the past year? (eg, new courses, degrees, certificates, articulation agreements)

   Noteworthy changes include offering all allied health pre-requisite courses in Lompoc with the addition of BIOL 125 Human Physiology starting in Fall 2022 and offering BIOL 124 Human Anatomy at Lompoc in the evening for the first time in Spring 2023. Also, curriculum for Human Cadaver Lab is being updated so this course can return to the schedule in Fall 2023.

Learning Outcomes Assessment

a. Please summarize key results from this year's assessment.

b. Please summarize your reflections, analysis, and interpretation of the learning outcome assessment and data.

Program Learning Outcome (PLO): Apply biological knowledge in environments other than the classroom.

Feedback from the following courses: BIOL 132 Marine Biology, BIOL 100 Introductory Biology, and BIOL 155 General Zoology.

BIOL 132 Marine Biology - Lab report about the intertidal ecosystem

Key Results

- Student performance on the assessment was like previous years.
- The intertidal lab report is an assessment that a larger proportion of the students do not submit when comparing it to other assessments in the course. Based on conversations with students and instructor observations, this is probably because it requires work completed over multiple days—one day on-site in the field observing and photographing and a second day using the

observations and photographs to produce the lab report, and organizational skills. A multiple day project that requires good organizational skills is a difficult task for many students.
- This assessment is a valuable tool for reviewing and using the knowledge gained in previous units especially the organismal focused units (marine algae, plants, invertebrates, birds).
- The assessment supports the course goal: To teach students about local ecosystems and build an appreciation and sense of care for the diversity of organisms that live in the local ecosystems.

Reflections, analysis, and interpretation:

Learning Objective 1: Describe the four zones in the rocky intertidal ecosystem.

- Students show high achievement on this learning objective.
- The field trip site at Ebb Tide Park helps with this learning objective because the park is elevated above the intertidal zone and students have a bird's eye view of the intertidal zone assisting them in seeing and understanding the zonation of the intertidal ecosystem.

Learning Objective 2: Identify and taxonomically classify examples of organisms found in each rocky intertidal zone.

- Students' achievement in the identification of the organisms seems to be correlated with their achievement in the organismal focused units studied previously.
- Many students make mistakes with taxonomic classification. Difficulty with taxonomic classification has been observed for multiple reasons including: use of many Latin language-based terms, misunderstanding the nested hierarchical nature of taxonomy, indifference—copying from the internet without understanding. More opportunities will be added for students to practice taxonomic classification throughout the course to help improve this skill.

Learning Objective 3: Explain the challenges faced by organisms in the intertidal zone and provide examples of adaptations that organisms have evolved to deal with the challenges.

- This learning objective was designed to guide students to think about the intertidal community from an evolutionary perspective.
- The outcomes of students' performance on this objective did not always match their level of understanding. The students that made careful and thoughtful observations in the field showed much greater understanding than students who merely looked up the adaptations of organisms on the internet, but the grading criteria did not differentiate between these groups. Points will be added

on the assessment for field notes. This will more specifically assess students' ability to observe the structures and behaviors of organisms and connect them to their function in relation to biological fitness.

BIOL 100 Introductory Biology – Field trip to local coastal park

Students are given the opportunity to attend a field trip to a local coastal park that introduces them to multiple habitats. They were given two required field trip assignments, and one optional assignment.

Key Results

- The first assignment is completed prior to and turned in the day of the field trip. Students are given a random plant or animal that they could possibly see during the trip. They provide basic information about the organism and include how that organism may have been used by Native American tribes, such as the Chumash. During the field trip students may be asked to talk briefly about their organism. Of the 27 students that attended the field trip, 20 completed this assignment.
- The second assignment is completed during the field trip. Students learned about the three main habitats at the park, types of organisms common in each habitat, birds that nest at the park, and feeding strategies of birds in the freshwater lake. Students made observations of birds doing bird things (e.g. feeding, sleeping, interacting…). All 27 students completed this assignment.
- The third assignment is focused on communicating their out of the classroom experience to someone. Students write a letter to a friend or family member about their visit, and explain why they would like to take them there the next time they spend time together. Fourteen students turned in the optional assignment.

Reflections, analysis, and interpretation:

Overall, the three assignments are successful at providing students with an opportunity to apply what they learn in the classroom. There was lower completion of the Plant or Animal assignment this semester, which may be partially because the first scheduled field trip was cancelled due to weather. It was another eight weeks until the makeup field trip and many students had forgotten what their organism was. Students were provided an opportunity ask for a reminder via an announcement, but several did not ask. If there is a cancellation and rescheduling of the field trip in the future, all students will be provided with reminders in class the week prior to the new trip. Although there was 100% completion of assignment two, several students were missing some key points in their answers. Instructor information is usually supplemented by the multiple information kiosks available. The park is currently adding and replacing information kiosks so many were not there during our visit. Before the next visit, availability of information will be checked and assignments adjusted as needed to help guide students to the best answers and to help with their observations. Additionally, it would be nice to

continue offering the field trip towards the end of the semester, versus the middle, as students have covered more relevant material by that time.

BIOL 155 General Zoology – Three field trips
One field trip is to a local coastal park, which includes an assignment completed during the trip. The remaining two field trips are to a local reserve where students place trail cameras to observe local wildlife. Following data collection in the classroom, they complete a report on their observations in the field and from the data collected.

Key Results

- Although General Zoology is a survey of the major animal Phyla, the coastal park field trip provides students an opportunity to consider the animals based on the different major plant communities, and microhabitats present. Just as in Bio 100, "students learned about the 3 main habitats at the park, types of organisms common in each habitat, birds that nest at the park, and feeding strategies of birds in the freshwater lake. Students made observations of birds doing bird things (e.g. feeding, sleeping, interacting…)." Additionally, they use the opportunity to practice the taxonomy they learned in the classroom. Twenty-four students completed this assignment.
- The camera trap project allows students to observe animals that they may never see otherwise (e.g. American Black Bear, Mountain Lion, Grey Fox, Golden Eagle…). Students placed 3 cameras at water troughs. Observations were made by students in their Field Notebooks when placing and retrieving cameras to be used with the data they collected from the camera images. Twenty of the 24 students completed the field trips and data collection, while 20 students completed reports on their project.

Reflections, analysis, and interpretation:
All 3 field trips and the associated assignments were successful at providing students opportunities to apply their knowledge from the classroom to their observations in the field and animal activity patterns. Even though all students that completed the project, received passing scores, timing will be reassessed on the field trips and data collection so students that could use additional guidance prior to turning their reports in have more time to ask questions.

c. Please summarize recommendations and/or accolades that were made within the program/department.

This program learning outcome highlights the exceptional learning opportunities for students in Biology, both majors and non-majors. This thorough PLO summary demonstrates the outstanding effort put forth by Biology Program faculty to meet course objectives using a diversity of instructional and assessment methods. Recommendations for future semesters were included in the analysis and interpretation part b.

d. Please review and attach any ***changes*** to planning documentation, including PLO rubrics, associations, and cycles planning.

   There are currently no changes to our planning from the 2021-2022 comprehensive program review document. Biologists will meet to discuss any appropriate updates to our Program Learning Outcomes in Fall 2023.

3. Is your two-year program map in place and were there any challenges maintaining the planned schedule?

   Two-year program maps are in place for Biology – Associate in Arts and Biology – Associate in Science for Transfer. When scheduling, there are several challenges because conflicts must be avoided with Chemistry, Physics, and Math classes. Also, our program maps are for students taking General Physics while more universities are requiring Engineering Physics. Given these restraints, several programs in the department will be focusing on Innovative Scheduling as our core topic next year for program review.

4. Were there any staffing changes?

   - A new faculty position in Biology was hired with an emphasis in Anatomy and Physiology.
   - New part-time faculty were hired to cover BIOL 100 Introductory Biology courses in Santa Maria and Lompoc.
   - Lab Assistant Resigned. This position needs to be replaced immediately and dedicated only to Biology. The previous position was split between Biology and Chemistry.

5. What were your program successes in the last year?

   As a department, we are increasing our outreach participation with college activities such as Bulldog Bound and STEM Week of Discovery. Also, the Biology Program is partnering with Cal Poly San Luis Obispo and Cuesta College in an application for a Bridges to the Baccalaureate NIH Grant. Student research continues with NSF internships surveying and identifying native bees.

CTE two-year review of labor market data and pre-requisite review

N/A

6. Does the program meet documented labor market demand?
7. How does the program address needs that are not met by similar programs?
8. Does the employment, completion, and success data of students indicate program effectiveness and vitality? Please, explain.
9. Has the program met the Title 5 requirements to review course prerequisites, and advisories within the prescribed cycle of every 2 year for CTE programs and every 5 years for all others?
10. Have recommendations from the previous report been addressed?

PLAN OF ACTION – POST-VALIDATION
(Sixth-Year Evaluation)

DEPARTMENT Life and Physical Sciences PROGRAM Biology

RECOMMENDATIONS THAT REQUIRE **ADDITIONAL RESOURCES**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Staffing 1. Hire a full-time laboratory specialist at the Santa Maria campus to work in biology and chemistry, as needed. 2. Hire an additional full time biology instructor for the Lompoc Valley Center Santa Maria campus, as need dictates. Replace vacancies immediately. 3. Augment budgets for student workers for SM and LVC, as needed. 4. Create dedicated travel budget for lab support travel between campuses and local vendors. 5. Upgrade lab assistant to lab associate position. 6. Shared lab specialist for Agriculture and Veterinary Technology programs. 7. Lab assistant/associate for Lompoc Valley Center as needed due to increased sections being offered.	1. SLS2, IR1 2. SLS2, IR1 3. SLS2, IR3 4. SLS2, IR1 5. SLS2, IR1 6. SLS2, IR1 7. SLS2, IR1	1. Fall 2023 2. Fall 2022 and ongoing 3. Ongoing 4. Fall 2022 5. Spring 2023 6. Fall 2023 7. Fall 2024

Equipment **All Biology Classes** 1. Increase the maintenance and repair budget for lab equipment 2. Increase the supply budget for consumables 3. Develop a long-term budget plan to determine funding needs to cover life of equipment, supplies and consumables. 4. Increase the office supply (operational supplies) budget 5. Sensors for wireless labs 6. Seek budget augmentation for equipment and consumable lab supplies. 7. Lab Prep balance to 3 decimal places 8. 2 Computers for data analysis 9. 4 external hard drives 10. Prepared slide storage boxes (4) 11. Replacement refrigerators for all biology classes (2) 12. Augment annual instructional supply budgets to minimize reliance on lotto monies 13. Augment annual instructional supply budget upon addition of any extra sections	1-6. IR2 7-9. SLS2, IR3 10-11. IR3 12-13. IR2	1-6. Fall 2022 7-9. Fall 2023 10-11. Fall 2023 12-13. Fall 2022 and ongoing
Facilities 1. Additional lecture space in Santa Maria with 60 student capacity. 2. Maintain and increase plantings in the native plant garden on the west side of Laboratory building. 3. Improve lighting and lighting controls in laboratories. 4. Increase custodial staff to ensure more regular thorough cleaning, particularly of laboratory floors. 5. Convert LVC 3-109 to a science lab. 6. Maintain and upgrade technology in classrooms/labs. 7. Maintain and replace instructor and lab station chairs in all labs. 8. Construct lab space for Agriculture, Viticulture, and Vet Tech courses currently scheduled in Biology labs and other M 100-200 lab rooms.	1-8. IR3, IR4	1. Fall 2023 2. Fall 2024 3. Fall 2023 4. Fall 2022 5. Fall 2023 6. Fall 2022 and ongoing 7. Fall 2022 and ongoing 8. Fall 2023

Specific needs by course and/or location:

Introductory Biology 1. Replacement microscopes 2. Equipment for a forensic investigation 3. Compensation for enology instructor that gives a tour of wine-making at A	 1. SLS2, IR3 2. SLS2, IR3 3. SLS6, IR1, IR2	 1. Fall 2023 2. Fall 2023 3. Fall 2023
Human Anatomy 1. Human skeletons (real bone) 2. Replacement microscopes 3. Replacement models for Santa Maria campus – see specific list in Exhibits	 1. SLS2, IR3 2. SLS2, IR3 3. SLS2, IR3	 1. Ongoing, as needed. 2. Fall 2023 3. Ongoing as needed. Specific list in Exhibits.
Human Physiology 1. Blackout shades/curtains for M-106	 1. SLS2, IR3	 1. Spring 2023
Microbiology 1. Two glass or stainless-steel blenders 2. Replacement autoclave 3. Replacement refrigerators (3) 4. Hot plates (2) 5. Water baths (2) 6. Replacement fume hood for sterile culturing 7. Bunsen burners need to be replaced	 1. SLS2, IR3 2. SLS2, IR3 3. IR3 4. SLS2, IR3 5. SLS2, IR3 6. SLS2, IR3 7. SLS2, IR3	 1. Fall 2023 2. Fall 2024. Urgent need if broken. 3. Fall 2023 4. Spring 2023 5. Fall 2022 6. Fall 2023. Urgent need if broken. 7. Fall 2022
Cellular Biology 1. Power supplies (2) – Thermo Scientific Compact Power Supply ($1305.19 each for $2610.38 total)	 1. SLS2, IR3	 1. Spring 2023 URGENT NEED
General Zoology 1. Formlabs 3D Printer ($5000) 2. Trail cameras - RECONYX HyperFire 2 Covert IR Camera, OD Green, HF2X (6 cameras at $400 each = $2400)	 1. SLS2, IR3 2. SLS2, IR3	 1. Fall 2023 2. Fall 2023
General Botany 1. Plant anatomy models 2. Greenhouse heater	 1. SLS2, IR3 2. SLS2, IR3	 1. Ongoing, as needed. 2. Spring 2023
Marine Biology 1. Cold water marine aquarium touch tank 2. Water testing equipment to be used in the field	 1. SLS2, IR3 2. SLS2, IR3	 1. Fall 2023 2. Spring 2023

3. Whale watching field trip assistance	3. SLS6, IR1, IR2	3. Fall 2024
M-135 1. Counter and cabinet reconfiguration on the south wall of M135 to accommodate cold water marine aquarium and BIOL 100 labs	1. IR3	1. Fall 2023
2. Garbage disposals for sink drains in M135	2. IR3	2. Spring 2023
3. Instructor computer and computer work station for M135	3. IR3	3. Fall 2023
4. Laptop computers and storage unit for M135	4. IR3	4. Fall 2023

Needs for LVC

Equipment 1. Storage cabinets for models, 36" Wx22"Dx84"H	1. IR3	1. Spring 2023
2. Storage cabinets for models 48"Wx22"Dx84"H	2. IR3	2. Spring 2023
3. SOMSO male musculature ¾ natural size	3. SLS2, IR3	3. Fall 2023
4. Vascular hand model	4. SLS2, IR3	4. Fall 2023
5. Dissecting scopes	5. SLS2, IR3	5. Fall 2023
~~6. Drying oven/incubator for stockroom. Existing one in stockroom from when the center opened. Temperature range up to 200 degrees Celsius when glassware needs quick drying rather than air drying and the ability to use as a backup incubator. (high priority)~~	6. IR3	6. Spring 2023 COMPLETED
7. Incubator for 3-109 lab. (low priority until used as lab room)	7. IR3	7. Fall 2024
8. Biological cabinet Class II (laminar flow hood) to grow bacteria. Class II protects the environment, user, and sample. Cost is $13,500. (low priority)	8. IR3	8. Fall 2024
9. Slide boxes for BIOL 100 move to 3-109 as some shared slides will now need to be provided for 3-109/3-101. Cost is $850 for 1, two are needed for a total cost of $1,700. (low/medium priority)	9. IR3	9. Fall 2024
~~10. 1/4 sized Somso musculature figure a quantity of 4 and $1,200 ea., total $4,800. (high priority)~~	10. SLS2, IR3	10. Spring 2023 COMPLETED
11. 1/2 sized Somso male musculature with internal organs a quantity of 1 at $5,250. (high priority)	11. SLS2, IR3	11. Spring 2023 PENDING
~~12. Life sized Male musculature figure 3B with internal organs a quantity of 1 at $8,955. (high priority)~~	12. SLS2, IR3	12. Spring 2023 COMPLETED
13. Cabinetry to store additional items for growth of biology program. (low priority until 3-109 lab conversion)	13. IR3	13. Fall 2024

14. Laptops to keep up with technology changes should be looked at replacing/upgrading at least every 5 years. 15. Anatomical or other biological models' replacement cycle. Somso models come with a five-year warranty. Six years max depending on care of the models. 16. Laptop cart of 30 laptops when 3-109 used as a lab. (medium priority)	14. SLS2, IR3 15. SLS2, IR3 16. SLS2, IR3	14. Fall 2023 and ongoing 15. Ongoing, as needed 16. Fall 2024
Facilities 1. 3-109 repurposing into a science lab from an art lab 2. 3-106 stockroom fix to support scientific items that cannot all be stored in 3-109 3. Creation of a modular building for student life and food service, like MESA/STEM or Student Health buildings 4. Lab seating for 3-101 when science lab conversion for 3-109 occurs. Needed for Bunsen burner usage in Microbiology. Cost $6000. (medium priority) 5. Lab seating for 3-109. Cost is $6000 for 32 seats. (medium priority will shift to high priority when lab conversion occurs) 6. 3-109 science lab cabinetry. Cost is $85,000. (medium priority will shift to high priority when lab conversion occurs) 7. 3-109 science lab benches for students. Cost is $21,500. (medium priority will shift to high priority when lab conversion occurs) 8. 3-109 safety measures eye wash/safety shower, fire extinguisher, fire blanket. (medium priority will shift to high priority when lab conversion occurs) 9. 3-109 complete ceiling for acoustics to be better, no tiles to dampen noise from pipes. (high priority) 10. 3-106 stockroom safety shower/eye wash, fire blanket. (medium priority will shift to high priority when lab conversion occurs) 11. The podium and document projector in the LVC Biology lab (LVC 3-101) as well as the podium in the three large lecture halls (LVC 2-212, 2-102, 3-114) are starting to wear out. (high priority)	1. IR4 2. IR4 3. SLS2, SLS6, SLS7 4. IR4 5. IR4 6. IR4 7. IR4 8. IR4 9. IR4 10. IR4 11. IR3, IR4	1. Fall 2024 2. Fall 2024 3. Fall 2024 4. Fall 2024 5. Fall 2024 6. Fall 2024 7. Fall 2024 8. Fall 2024 9. Spring 2023 10. Fall 2024 11. Spring 2023

Staffing 1. Once 3-109 is a science lab, an additional laboratory specialist (11 or 12 months) needed to cover chem, bio, and potentially physics/geology. Cost $74,500 with benefits. Low priority until lab conversion. High priority with 3-109 science lab.	1. SLS2, IR1	1. Fall 2024
Budget 1. Increase of instructional supply budget to $8,535. Needed for additional lab preps and cost increases/inflation. (high priority)	1. IR2	1. Fall 2022