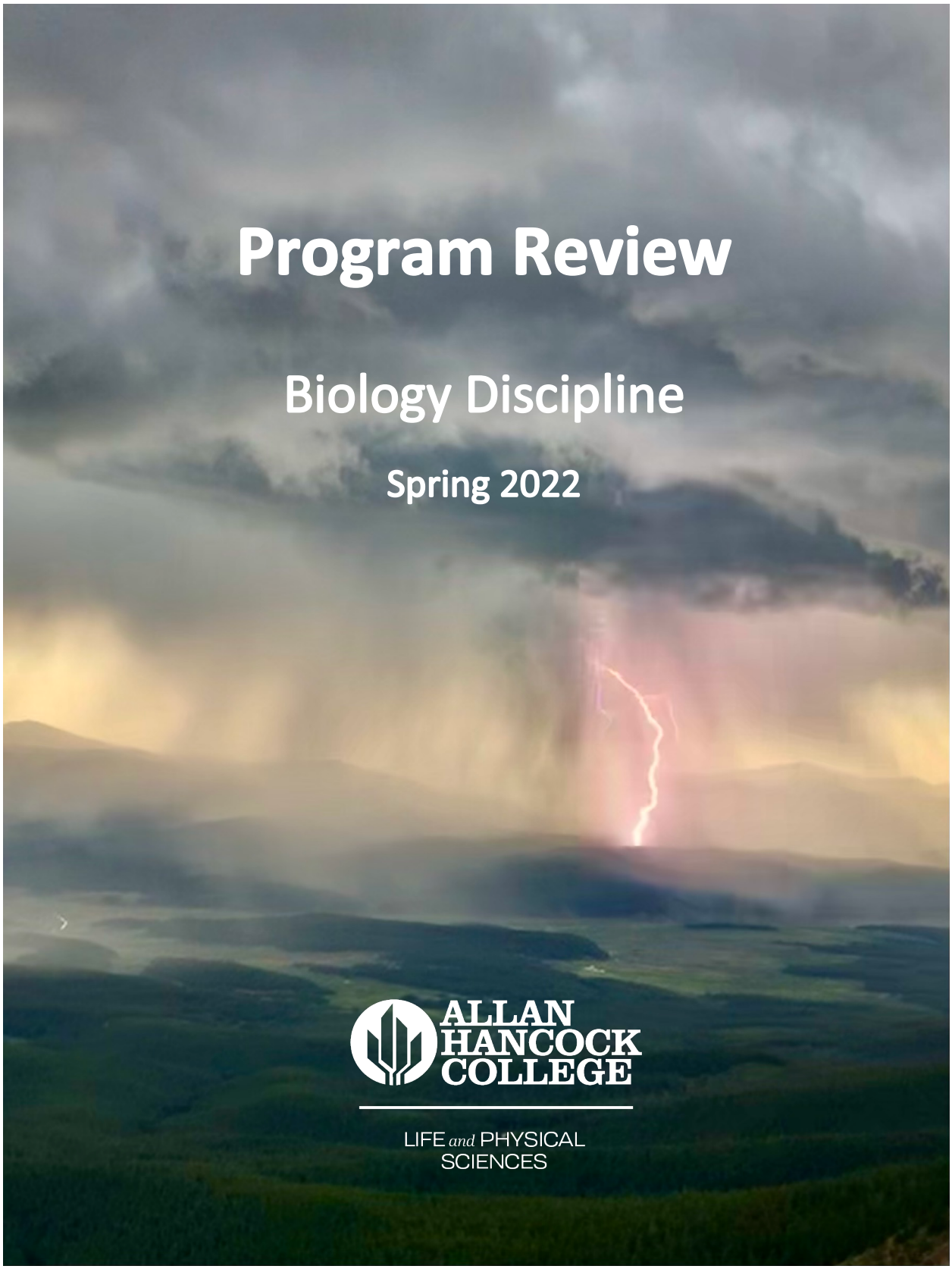


Program Review

Biology Discipline

Spring 2022

ALLAN HANCOCK COLLEGE

LIFE *and* PHYSICAL SCIENCES

Author
Ashley Wise

Contributors
Luke Blacquiere
Alicia Fox
Wendy Hadley
Toby McLaughlin
Leonard Miyahara
Jennifer Morris
Lori Williamson

PROGRAM REVIEW PURPOSE AND GOALS

Program review is the process through which constituencies (not only faculty) on a campus take stock of their successes and shortcomings and seek to identify ways in which they can meet their goals more effectively. It is important to note here that the task of identifying evidence-based successful practices, and sharing these practices college-wide, is far more important than the negative perspective of trying to ferret out ineffective practices. Program review should model a miniature accreditation self-study process within a designated area of the college. This work should guide the larger work of the institution, providing the basis for the educational master plan and the accreditation self-study as well as guiding planning and budgeting decisions. The review should be a candid self-evaluation supported by evidence, including both qualitative and quantitative data. It should honestly document the positive aspects of the program and establish a process to review and improve the less effective aspects of a program. A well-developed program review process will be both descriptive and evaluative, directed toward improving teaching and learning, producing a foundation for action, and based upon well-considered academic values. A major function of program review should be to monitor and pursue the effective alignment between the mission and priorities of the college and the actual practices in the program or service under review.

When it is linked to budgeting, planning, and other processes to carry out its recommendations, program review can contribute to fair and transparent institutional processes. The program review self-study allows for the people with the greatest level of expertise in a particular program to examine and scrutinize the program for effectiveness in serving students and achieving educational excellence.

GOALS

- Recognize excellence in educational and support programs.
- Advance the mission, vision, goals and objectives, and learning outcomes of the institution.
- Integrate program review with the planning, assessment, and budget/resource allocation processes of the college.
- Strengthen programs through self-study and self-improvement.
- Foster cooperation and communication between programs and services.

PROGRAM REVIEW

(*Biology*)

TABLE OF CONTENTS

PROGRAM REVIEW

Status Summary - Plan of Action-Post Validation

During the academic year, 2015-2016, Biology completed program review. The self-study and validation teams developed a final plan of action-post validation based on information in the self study and the recommendations of the validation team. For each plan, indicate the action taken, the result of that action, and the current status of the plan, if it is incomplete.

(If any plan was made and action not taken, please state the rationale for not pursuing that particular item.)

PLAN OF ACTION	ACTION TAKEN ,RESULTAND STATUS
RECOMMENDATIONS TO IMPROVE STUDENT LEARNING OUTCOMES AND ACHIEVEMENT	
1. Continue efforts to increase the transfer of Biology Program students into academic and professional programs at four-year colleges, universities and other institutions. In particular, continue work on the Bridges to Baccalaureate program in conjunction with California Polytechnic State University, San Luis Obispo.	1. Ongoing. The Bridges to Baccalaureate program is no longer active, however, there is continued contact and collaboration with neighboring universities. Cal Poly students are tutors in the Anatomy Open Lab and Zoology students conduct research at Sedgwick Reserve (part of the UC Reserve System) in the Santa Ynez Valley.
2. Continue to promote high academic standards for Biology Program students and success in achieving Student Learning Outcomes, while making every effort to make biology accessible to as many students as possible.	2. Ongoing. All instructors dedicated an enormous amount of time and effort to transition courses into a remote format during COVID and maintain high academic standards. Several courses have pre-requisites to provide the background skills necessary to promote student success once enrolled in our Biology major's courses or when completing courses for the nursing program.
3. Use the NIH Bridges to Baccalaureate program to increase transfer of Biology Program students into academic and professional programs at four-year colleges, universities and other programs.	3. The NIH Bridges to Baccalaureate program ended in 2019.
4. Maintain and increase currency in technology specific to biology, as well as technology directed at education and information literacy.	4. Ongoing. New thermal cyclers were purchased for Biotechnology in Cellular Biology, iWORX software is used in Human Physiology labs, and handheld spectrophotometers are used in General Botany. Several assignments in the Biology major's program include reading recent articles in academic journals.
5. Utilize the STEM Center to increase accessibility to resources and tutoring to support students in biology courses.	5. Ongoing. The new MESA/STEM center is a wonderful companion to our courses. Tutoring is available for Biology majors, introductory biology students, and students taking allied health pre-requisites. There is also a weekly review session for Cellular Biology, the first course in the sequence for Biology majors.
6. Establish a cadaver budget	6. Completed

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN STUDENT CHARACTERISTICS

Enrollment Changes	
1. Greater numbers of students coupled with changes in nursing program requirements have increased enrollment in biology program classes in general. Waiting lists for almost all biology lab classes are increasing. Both non-majors classes such as Introductory Biology and science track classes such as anatomy, physiology, cell biology and microbiology are impacted. It is recommended that the Biology Program continue to offer as many of these sections as possible at different times of day to accommodate a diverse student body, many of whom work and/or have care-giver/family responsibilities.	1. Ongoing. Biology is one of the few disciplines that experienced even greater demand during the pandemic. More sections of Introductory Biology and Human Anatomy than we could accommodate in classrooms were added during our semesters of Emergency Remote Teaching (ERT). Before the pandemic, we doubled our offerings of Biology major classes due to high demand. For the last several years, General Botany has been doubled to meet the needs of both Biology and Agriculture students. Human Physiology will be offered in Lompoc for the first time in Fall 2022. This new addition allows our allied health students to complete all their pre-requisites in Lompoc. With the exception of our majors courses, all other classes have evening sections.
2. Seek ways of increasing lecture/classroom space (M310, M311 space limitations).	2. Ongoing. Scheduling is still limited by lecture space. M310 is adequate for a double lab lecture course, but this room is shared among all Life and Physical Sciences programs. M311 is not well suited for a large lecture class, especially when social distancing is recommended during a pandemic.
3. Incorporate additional instructional assistance for laboratory sections with increased numbers of students/section (lab assistants, graders, student peer mentors, additional faculty etc.).	3. Ongoing. Assistance is not provided during the class session, however, there are tutors available outside of class time. The Anatomy Open Lab provides assistance from Cal Poly students on Friday and Saturday 9am-4pm.
4. The Biology Program should work with the administration in order to maintain and increase the number of full-time instructors at the Santa Maria campus and the Lompoc Valley Campus.	4. Ongoing. All retirements in biology have been replaced. A new full-time biologist will hopefully join the faculty in Fall 2022. The position has just been posted.
5. The Biology Program must also continue to seek high quality, qualified adjunct instructors to assist with large numbers of new and continuing biology students.	5. Ongoing. Hiring a new full-time instructor will help with covering some sections, however, we know several current adjunct instructors are looking for full-time employment and may not be teaching at Hancock long term. A part-time pool is kept open in Human Resources to review as need dictates.
6. Budget augmentation to <u>operational supplies</u>	6. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
7. Budget augmentation to <u>maintenance and repairs</u> for existing equipment	7. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
Demographic Changes	
1. Maintain or increase biology class offerings at both the Santa Maria campus and the Lompoc Valley Center.	1. Ongoing. Sections were increased during remote instruction, however, class space limits these extra sections in person. We have been able to maintain pre-pandemic section offerings at both campuses and are increasing our Lompoc sections by adding Human Physiology.

RECOMMENDATIONS TO IMPROVE THE EDUCATIONAL ENVIRONMENT

Curricular Changes	
1. Continue to reevaluate and update curriculum, maintaining course currency through the AP&P.	1. Ongoing. All course outlines are reviewed during the course review process through Curricunet. Textbooks, assignments, pre-requisites, and Student Learning Outcomes are evaluated during the course review cycle and as need dictates.
Co-Curricular Changes	
1. Continue on-going communications with local high schools to review and discuss articulation agreements between high school and college courses.	1. Ongoing. Our most recent discussion involved Introductory Biology and its suitability for concurrent enrollment. The biology faculty, as well as all voting members of the Life and Physical Science department, decided against offering Introductory Biology as concurrent enrollment.
2. Recommend that all biology courses with writing and math related components modify their outlines and syllabi to include advisories or prerequisites of appropriate English and Math classes.	2. Ongoing. Several courses have Math and English pre-requisites or advisories. Due to AB705, several course outlines need to be modified to remove courses that are no longer offered at AHC after summer 2022.
3. Revisit specific prerequisites for the appropriate biology courses, including Human Anatomy and Microbiology.	3. Ongoing. The drop rate continues to be very high in Human Anatomy and most students are inadequately prepared to succeed in the course. Microbiology is currently reevaluating prerequisites due to AB705 changes in Math offerings at the college.
Neighboring College and University Plans	
1. Promote the transfer of Biology Program students to neighboring Colleges and Universities. Further develop the Bridges to Baccalaureate program, with increased student internships for AHC students at California Polytechnic State University and mentoring by AHC biology faculty.	1. Ongoing. While the Bridges to Baccalaureate program has ended, faculty continue to support and promote transfer to neighboring Colleges and Universities both in and out of the classroom. MESA/STEM workshops and campus tours are shared with students as well as highlighting activities and research taking place on local campuses.
Related Community Plans	
1. Continue to participate in college outreach efforts to promote the Biology Program to local secondary and high school students.	1. Ongoing. Outreach was put on hold during the COVID pandemic, including our popular Friday Night Science annual event in May. Public health and safety will guide our participation in outreach events for the near future.

RECOMMENDATIONS THAT REQUIRE ADDITIONAL RESOURCES

Facilities 1. A major limiting factor for enrollment in several Biology Program courses, such as Introductory Biology and Anatomy, is seating space in the lecture portion of the course. There is only one large lecture room capable of seating more than two sections, M310. M311 cannot quite hold two full sections, and becomes unbearably crowded with more than 45 students in attendance. Furthermore, the M-310/M-311 classrooms are old and dilapidated. New class facilities with greater seating capacity are needed to reasonably maintain or expand existing on-site enrollment. Renovations should include major improvements to the HVAC equipment serving these rooms to provide a more suitable and comfortable environment to promote student learning.	1. Not completed. Still only have one classroom (M310) with sufficient seating for a large lecture accommodating two lab sections.
2. Maintain and increase plantings in the native plant garden on the west side of the M Laboratory building.	2. Ongoing.
3. Improve lighting in laboratories.	3. Ongoing. Shared feedback during facilities master planning.
4. Increase custodial staff to ensure more regular thorough cleaning, particularly of laboratory floors.	4. Ongoing. Janitorial services continue to be lacking in the M building. Soap dispensers can be empty for weeks and the paper towel supply in labs is often low/empty.
Equipment **All biology classes** 1. Increase the maintenance and repair budget for lab equipment	1. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
2. Increase the supply budget for consumables	2. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
3. Develop a long-term budget plan to determine funding needs to cover life cycle of equipment, supplies and consumables.	3. Ongoing. Progress has been made identifying a timeline for replacement equipment used in biology courses, such as Human Anatomy.
4. Increase the office supply (operational supplies) budget	4. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
5. Sensors for wireless labs	5. Ongoing. Need to keep equipment working.
6. Seek budget augmentation for equipment and consumable lab supplies.	6. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.

7. Lab Prep balance to 3 decimal places	7. Not completed. Will seek funding through equipment prioritization process.
8. 2 Computers for data analysis	8. Not completed. Will seek funding through equipment prioritization process.
9. 4 external hard drives	9. Not completed. Will seek funding through equipment prioritization process.
10. Lab carts (Large)	10. No longer needed. Have plenty of lab carts.
11. 24 dissecting microscopes	11. Completed. New set purchased.
12. Prepared slide storage boxes (4)	12. Not completed. Will seek funding through equipment prioritization process.
13. Replacement refrigerators for all biology classes (2)	13. Not completed. Will seek funding through equipment prioritization process.
14. Augment annual instructional supply budgets to minimize reliance on lotto monies	14. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
15. Augment annual instructional supply budget upon addition of any extra sections	15. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
LVC Biology Equipment Resource Needs 1. 2 self-tampering sensidisc dispensers	1. Completed
2. 64 Olympus Life Science microscopes	2. Completed
3. Refrigerator (microbiology)	3. Completed
4. Storage cabinets for models, 36” Wx22”Dx84”H	4. Ongoing. New cabinets may be needed due to adding physiology at LVC and potential of third lab in 3-109.
5. Storage cabinets for models 48”Wx22”Dx84”H	5. Ongoing. New cabinets may be needed due to adding physiology at LVC and potential of third lab in 3-109.
6. SOMSO disarticulated skeleton	6. Completed
7. Case for SOMSO disarticulated skeleton	7. Completed
8. SOMSO male musculature ¾ natural size	8. Ongoing. Will try to obtain funding through equipment prioritization, however, a long lead time is needed once ordered.
9. SOMSO lymphatic system	9. Completed
10. SOMSO head and neck model	10. Completed
11. SOMSO circulatory system model	11. Completed

12. SOMSO nervous system model	12. Completed
13. SOMSO digestive tract model with openable stomach	13. Completed
14. Prepared slide storage boxes	14. Completed
15. Replacement Autoclave	15. Completed
16. SOMSO muscles of the foot model	16. Completed
17. SOMSO ear with pinna	17. Completed
18. SOMSO hinged human skin model	18. Completed
19. Vascular foot model	19. Completed
20. Vascular hand model	20. Ongoing. Made in England and not currently shipping to the US.
21. Dissecting scopes	21. Ongoing. Will try to obtain funding through equipment prioritization.
22. Incubator	22. Completed
LRC at LVC/library Equipment Resource Needs 1. SOMSO heart	1. Completed
2. SOMSO eye with lacrimal glands and eyelids (15 part)	2. Completed
3. SOMSO ear (6 part)	3. Completed
4. SOMSO eye	4. Completed
5. SOMSO muscles of the arm and shoulder model	5. Completed
6. SOMSO muscles of the leg with base of pelvis model	6 Completed.
7. SOMSO articulated skeleton with rolling base	7. Completed
8. SOMSO Full-Figure Muscular Human Anatomy Model	8. Completed
Introductory Biology 1. Replacement microscopes	1. Ongoing. Microscopes are worn and need replacement. Will seek funding through equipment prioritization.
2. Fermentation tubes	2. Completed using instructional supplies budget. Replaced as needed.
Anatomy 1. Human skeletons (real bone)	1. Ongoing. Replacement cycle necessary due to wear from use.
2. Replacement microscopes	2. Ongoing. Dissecting microscopes were recently replaced. Light microscopes starting to show signs of wear.
3. Cadavers	3. Completed. District funding.
4. Replacement models for Santa Maria campus	4. Ongoing. See specific list in Exhibits.

Botany	
1. Plant anatomy models	1. Ongoing. Models get worn and new ones become available.
2. Additional microscope slides	2. Ongoing. When slides break, replacements are needed.
3. Laminated posters	3. Ongoing. New posters become available.
4. Greenhouse heater	4. Ongoing need. Have not found one that is suitable yet.
Cellular Biology	
1. Models of cells, etc.	1. Ongoing. Instructor currently updating and revising labs.
2. Dissecting Microscopes (Stereoscopic) Lab class set of 30	2. No longer needed. Lab schedule has been revised.
3. Micropipetters (0.5 – 100 ul capacity)	3. Completed.
4. Calibrated fermentation tubes	4. Completed using instructional supplies budget. Replaced as needed.
5. Small water baths	5. Completed
6. Gel Electrophoresis chambers and casting trays.	6. Completed
Physiology	
1. 6 midget urine hydrometers	1. Completed using instructional supplies budget. Replaced as needed.
2. Blackout shades/curtains for M-106	2. Ongoing. Would like facilities to install.
Microbiology	
1. Twelve to fifteen glass or stainless steel blenders	1. Ongoing. Only two needed.
2. Twelve to fifteen small mortar and pestles	2. Completed
3. One scanning spectrophotometer	3. No longer needed. Instructor has revised labs.
4. Two shakers for growing microbes	4. No longer needed. Instructor has revised labs.
5. Two ultraviolet lamps	5. No longer needed. Instructor has revised labs.
6. Fermentation lab equipment	6. No longer needed. Instructor has revised labs.
7. Replicator blocks and velveteen	7. Completed
8. Inoculating loops	8. Completed using instructional supplies budget. Replaced as needed.
9. Laminated posters	9. Ongoing. New posters become available.

10. Seek additional funding for consumables	10. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.
11. Calibrated fermentation tubes	11. Completed using instructional supplies budget. Replaced as needed.
12. Replacement autoclave	12. Ongoing. Need a larger one, but have not found a good replacement yet.
13. Replacement refrigerators (3)	13. Ongoing. Need a better refrigerator setup. Will seek funding through equipment prioritization.
14. Winogradsky columns (30)	14. Completed using instructional supplies budget. Replaced as needed.
15. Hot plates (2)	15. Ongoing. Will seek funding through equipment prioritization.
16. Water baths (2)	16. Ongoing. Will seek funding through equipment prioritization.
17. Anaerobic jars (4)	17. Completed
18. Test tube racks (15)	18. Completed
19. Lab glassware (beakers etc.)	19. Completed
20. Carts (2)	20. Completed
21. Replacement fume hood for sterile culturing	21. Ongoing. This is a critical need if the laminar flow hood stops working.
22. Self-tampering sensidisc dispensers (4)	22. Completed
Zoology 1. Models	1. Ongoing. Nothing needed at this time. Future needs will be listed as specific models.
2. Fossils/fossil replicas	2. Ongoing. Nothing needed at this time. Future needs will be listed as specific fossils/fossil replicas.
3. Replacement microscopes	3. Ongoing. Dissecting microscopes were recently replaced. Light microscopes starting to show signs of wear.
4. Microscope slides	4. Ongoing. Nothing needed at this time. Future needs will be listed as specific slides.
5. Models for display	5. Ongoing. Nothing needed at this time. Future needs will be listed individually.
6. Animal skins	6. Ongoing. Nothing needed at this time. Future needs will be listed individually.

7. Taxidermy of collected specimens	7. Ongoing. Nothing needed at this time. Future needs will be listed individually.
8. Zoological posters for display	8. Ongoing. Nothing needed at this time. Future needs will be listed as specific posters.
Marine Biology 1. Models	1. Ongoing. Instructor currently updating and revising labs.
2. Field equipment supply budget	2. Ongoing. Instructor currently updating and revising labs.
Lompoc Valley Center 1. Ice Machine	1. Completed
2. SOMSO Beauchene Skull	2. Completed
3. SOMSO Advanced Muscular Skeleton Rod Mount	3. Completed
4. Budget augmentation for student workers	4. Ongoing. Funding resides in the chemistry program and no augmentation was granted. Minimum wage is $15/hr so it is essential to increase funding for student workers.
Staffing 1. Hire a full-time laboratory specialist at the Santa Maria campus work in biology and chemistry, as needed.	1. Ongoing. There is a full-time lab assistant, however, it is hard to retain good people in this position due to low pay.
2. Hire an additional full time biology instructor for the Lompoc Valley Center or the Santa Maria campus, as need dictates.	2. Ongoing. Full-time faculty recruitment process is in progress with expected additional biology instructor in Fall 2022.
3. Change the part time lab tech position at the LVC to Full time.	3. Completed
4. Budget augmentation for student workers at LVC & SM Campuses	4. Ongoing. Current budget is sufficient, however, needs may change with increased section offerings.
5. Plan for potential retirements of full-time biology faculty prior to the next program review in 2022.	5. Completed. All retired faculty have been replaced since the last program review.
6. Change all full-time laboratory specialist positions to 12 months.	6. Completed
7. Create dedicated travel budget for lab support travel between campuses and to local vendors.	7. Ongoing. Budget augmentation requests sent to Business Services in March 2022 for the 2022-2023 fiscal year.

Allan Hancock College Program Review

2021-2022 Comprehensive Self-Study

I. Program Mission

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.

II. Progress Made Toward Past Program/Departmental Goals

Summarize the progress the discipline has made toward achieving its goals during the past six years. Discuss briefly the quality, effectiveness, strengths and struggles of the program and the impact on student success as reflected in past comprehensive program reviews and Annual Updates.

Since our last comprehensive program review, three new full-time faculty members were hired to replace three faculty retirements. We now have reassigned time for an Introductory Biology team leader to oversee the many sections and part-time instructors teaching that course. One of the new faculty members teaches Human Anatomy at the Lompoc Valley Center (LVC) and has her office there. We continue to have turnover of part-time instructors and challenges finding qualified instructors for certain classes, especially Human Anatomy and Human Physiology.

The Biology Program has just been notified about hiring an additional full-time faculty member to start in Fall 2022. The approval of this position comes from the fact that our enrollments have remained steady or increased during the COVID-19 pandemic. When courses were taught remotely during the 2020-2021 academic year, we added extra sections of Introductory Biology and Human Anatomy to accommodate the demand. Human Physiology maintained a long wait list during this time because we

did not have the faculty or equipment to accommodate more students. Thanks to equipment prioritization, we have now purchased the equipment to offer Human Physiology at LVC and we anticipate this course starting in Fall 2022. This new course offering at LVC will allow students to complete all their nursing pre-requisites in Lompoc.

Now that we have returned to in person instruction, our ability to offer more sections to meet student demand is limited by lecture space availability. Several of our courses are offered as lectures combined with two lab sections with enrollment of approximately 60 students. Only one lecture hall, M-310, can comfortably accommodate this number of students. M-311 has a capacity of 55, however, it is very tight and especially uncomfortable to fill to capacity with students during a pandemic.

In 2019 and 2020 our biology majors program experienced an increase in enrollment. This led to offering an extra section of Cellular Biology in Spring 2019 and Spring 2020, an off-cycle section of Zoology in Spring 2020, and an extra section of Botany in Spring 2020 and Spring 2021. During the pandemic, we have not seen long waitlists in Cellular Biology and Zoology, however, we have continued to offer an additional Botany lab section since it serves both Biology majors and Agriculture students.

Strengths of the biology faculty including maintaining academic rigor and integrity during this time of remote/hybrid instruction. Biology students have access to the MESA/STEM center and the Academic Resource Center (ARC) for tutoring. Human Anatomy students have access to the Anatomy Open Lab staffed by Cal Poly Teaching Assistants on Friday and Saturday 9-4 pm. All biology faculty are available during office hours and via email for student questions.

A struggle for student success has been the inadequate preparation of students entering our college-level science courses. English and math skills are often well-below what is required to succeed in biology courses and our faculty do not have time to train students in these areas as well as the scientific course content. Even courses with a pre-requisite have seen a decline in the student performance during the pandemic. It needs to be a college-wide effort to help students stay focused on their academic goals and devote the appropriate amount of time outside of class to study.

III. Analysis of Resource Use and Program Implementation

Describe the program's current allocation and use of human, physical, technology, and fiscal resources. Are resources sufficient and appropriate to meet program needs? Can program resources be reallocated to better meet student needs?

Staffing:

The Biology Program has six full-time instructors, with one instructor that splits instruction between the Santa Maria and Lompoc campuses. Currently, there are ten part-time instructors, with the majority teaching general education courses. The goal for our new full-time biology position is to hire someone with Human Anatomy and Human Physiology experience.

From 2011 to 2014 there were two full-time lab specialists dedicated to supporting biology courses. When one of them quit, the funds for the position were allocated elsewhere and this position has not been re-hired. There is a lab assistant to help in the afternoon and evening, however, that position is shared with Chemistry. As mentioned earlier, we have increased sections in several of our lab courses. Also, there are courses in Agriculture (AG) and Veterinary Technology (VT) that have been scheduled in the biology labs because they do not have their own dedicated lab space. This additional workload has been placed on our one lab specialist when those disciplines are not in her job description.

Facilities and Technology:

The M science building with our biology labs is now 15 years old. The labs at LVC and lecture halls M310 and M311 are much older. Technology needs to be upgraded on both campuses. It is outdated to use projector screens and not monitors in our classrooms. In general, projector optimization is necessary in our lab classrooms. For example, the projector image in M134 is not in an optimal alignment with the projector screen so images may be cropped from view. At LVC, the podiums in our lab (3-101) and lecture halls routinely used by our classes (2-102, 2-212, and 3-114) need an upgrade. The overhead projector in our LVC biology lab is very old and needs to be replaced. Laptops and iPads for use in the labs also require routine replacement/upgrading to keep up with software requirements for our labs to run smoothly.

In order to offer more sections of lab science courses at LVC, it would be beneficial to convert LVC 3-109 into a science lab. Introductory Biology could be taught in this lab, leaving the current biology lab for our allied health pre-requisites (Human Anatomy, Human Physiology, and Microbiology). Our Microbiology course is currently taught in the chemistry lab at LVC. Moving Microbiology out of the chemistry lab will allow additional chemistry sections to be offered. With an additional science lab, another laptop cart with laptops for 30 students will be needed.

Facilities limitations to scheduling biology courses include other programs, such as Agriculture and Veterinary Technology, using our lab space and a lack of sufficient lecture space for classes with 50-60 student enrollment.

Fiscal Resources:

Biology faculty and staff make every effort to be fiscally responsible. This has posed challenges in the last few years with significantly rising costs of basic supplies we use in labs. The cost of gloves has tripled during the pandemic. Also, adding sections of botany (Santa Maria) and human physiology (LVC) requires more funding for the lab supplies. Budget augmentation requests were sent in March 2022 during the budget development process.

Costs for field experiences, a vital component to several biology courses, has also increased. The annual whale watching trip for marine biology may not happen due to the increased fees. Funding for district travel, field trip transportation, and field experiences is necessary to asses our Program Learning Outcome pertaining to applying biology knowledge in environments other than the classroom. These experiences are also valuable for student engagement.

Replacement of Models:

A significant project recently undertaken by Len Miyahara and Lori Williamson was an assessment of the condition of our anatomical models in M134 and a timeline for replacing models as they wear out. Many models come from SOMSO with a five-year warranty. For most models, due to high frequency use, there is probably a six-year maximum lifespan.

IV. Program SLOs/Assessment

What are your program student learning outcomes? Have each of these been assessed since the last comprehensive program review? Describe changes you have made to courses or the program based on these data.

Biology Program Learning Outcomes (PLOs):

1. Apply biological knowledge in environments other than the classroom.
2. Demonstrate current knowledge of evolutionary principles.
3. Demonstrate effective communication using the language, concepts, and models of biology.
4. Demonstrate effective content knowledge of biodiversity.
5. Demonstrate proficient research skills in data gathering analysis.

All of the Biology PLOs have been assessed since the last comprehensive program review, with a range from 84% to 90% of students meeting the standard, as shown in the PLO Performance Table.

PLO Performance Table: Biology- This is a table showing the overal PLO performance over the last 6 academic years, including percent and numbers of students meeting standards.

			Number Met	Number Not Met	Percent Met
Biology	BIOL1	BIOL PSLO - Apply biological knowledge in environments other than the classroom.	1,437	212	87%
	BIOL2	BIOL PSLO - Demonstrate current knowledge of evolutionary principles.	1,887	253	88%
	BIOL3	BIOL PSLO - Demonstrate effective communication using the language, concepts and models of biology.	4,619	901	84%
	BIOL4	BIOL PSLO - Demonstrate effective content knowledge of biodiversity.	786	89	90%
	BIOL5	BIOL PSLO - Demonstrate proficient research skills in data gathering and analysis.	3,399	571	86%

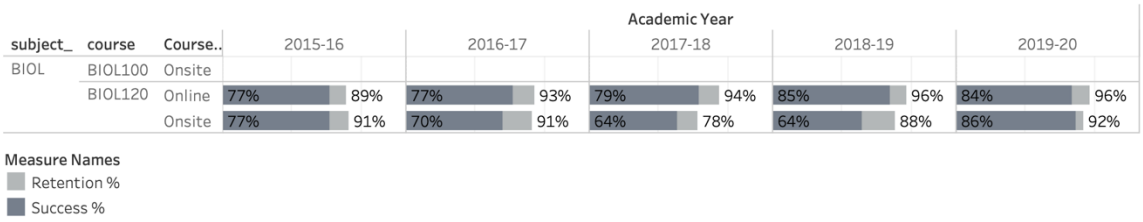
The most significant change planned is a complete revision of our PLOs. With 50% new full-time faculty since our last comprehensive program review, it is an ideal time to revisit these PLOs and work collaboratively to rewrite them. A draft has been discussed and the process to update them through AP&P will begin in Fall 2022. Biology faculty will participate in SPOL (eLumen replacement) training once it is made available.

V. Distance Learning:

Describe the distance education courses offered in your program and any particular successes or challenges with these courses. Include the enrollment as well as percentage of courses offered by modality and the rationale for this ratio.

The only course in the Biology Program offered in a fully remote modality is Humans and the Environment (BIOL 120). This online course is scheduled for both 8 and 16 weeks. The part-time instructor who teaches this course has taught at the college for over 15 years and is well-versed in distance education. These two online sections are full every semester and in the summer session. One section of BIOL 120 is offered each semester in Santa Maria and the enrollment has decreased during the pandemic.

Success and retention rates in the BIOL 120 online and onsite courses have been mostly similar since the last comprehensive program review. Academic years 2015-2016 and 2016-2017 were very close and then 2017-2018 and 2018-2019 showed a significant decline in the onsite course success rate.



The data from 2019-2020 shows a return to almost the same success and retention rates. In 2019-2020, the online course had 96% retention and 84% success while the onsite course had 92% retention and 86% success. Academic year 2020-2021 showed a similar retention rate (94% online vs 92% onsite) while the success rate in the onsite class was lower with 76% vs the online rate of 83%. This success rate in the onsite course is exactly the same as the college overall for the 2020-2021 academic year.

During the pandemic, online courses were an easy transition since they were already offered remotely. Onsite courses dealt with much greater complication due to modality changes from the typical in-person classroom setting. This may be a contributing factor to the lower success rate in the onsite course. Also, the program has had one part-time instructor for the online course and several instructors, both part-time and full-time, teaching the onsite course. Over the last few semesters, it has been a priority to have a full-time instructor teaching the onsite BIOL 120 section.

Program instructors ensure regular substantive instructor-initiated contact in online classes by posting several announcements each week, posting discussions that require participation on at least two days each week, holding regular office hours via Zoom, and sending emails to students to monitor their progress.

VI. Success, Retention, and Equity

Describe how the program works to promote student success. Include teaching innovations, use of academic and student support services (library, counseling, LAP, community partnerships, etc.). Refer to list of Student Services.

All biology instructors completely redesigned the delivery methods of their courses during the COVID pandemic. Keeping academic rigor and student success in mind, instructors worked endless hours to shift lecture and labs to a remote modality. The labs were particularly time consuming. Biology instructors incorporated virtual exercises and take-home kits as well as took photographs of models and made video demonstrations. Now back in person for our labs, this semester saw the return of Anatomy Open Lab on Fridays and Saturdays 9-4 pm staffed by upper division students from Cal Poly. Embedded counseling is also currently used in some of our human anatomy course sections.

Several support services are utilized and promoted by our biology faculty. These include tutoring in the MESA/STEM Center or the Tutorial Center and accommodations through the Learning Assistance Program (LAP). Faculty also use their syllabus and Canvas to share information about support services, such as the Basic Needs Initiative.

Biology faculty have initiated and are participating in several innovative projects. Since fall 2019, our General Zoology course has been using trail cameras to observe wildlife at Sedgwick reserve, a UC reserve run by UCSB. Students take field trips to the reserve, set up cameras at various water trough locations, collect data after retrieving the photos and make observations about the animals (time of day, solitary or in groups, etc…). Biologist Alicia Fox is also collaborating with Agriculture instructor Erin Krier on two additional projects. In spring and summer, they prepared two plots at the community garden to be Monarch Waystations and Certified National Wildlife Federation Habitats. The plan is to register these plots by summer 2022. Alicia and Erin are also working on an NSF grant with two other community colleges (College of the Canyons and Antelope Valley College) providing students at minority-serving institutions the opportunity to do an NSF internship surveying and identifying native bees on campus. Two students at AHC are about to begin work on this project.

Marine Biology classes, with instructor Luke Blacquiere, have been collecting water analysis at the terminus of the Santa Maria river in the fall and spring each year for two years. This activity provided an opportunity to collaborate with Creek Lands Conservation in data collection and education. More field trips in Marine Biology in addition to collaboration with the Central Coast Aquarium in Avila Beach are other innovations that have taken place since Luke was hired in 2019. Our full-time microbiologist hired in 2018, Wendy Hadley, worked at Hardy Diagnostics in Santa Maria and developed chromogenic media used in the identification of microorganisms. According to their website, Hardy was the first company in America with this type of media. Our students benefit from using it in the laboratory and learning about it from the microbiologist who developed this innovative product.

Then, utilizing data from the office of Institutional Research and Planning, report on student success through course completion and retention data. Analyze, by discipline, success by gender, age, ethnicity, and online (may analyze other variables such as disability, English as a second language, day vs. night courses, etc. as appropriate). Suggest possible reasons for these trends and planned actions to address any disproportionate impact.

Since the last comprehensive program review, biology courses have an average 82% retention rate and 68% success rate. Up to age 49, the success and retention rates are comparable with the college overall, with the highest retention in the 35-39 age group. Data from age 50+ is much lower than the college at 60% in 2020-2021, however, we have a very small sample size in this age group (<1% of biology students).

Data from 2020-2021 shows retention rates among Asian, Native American, and Pacific Islander students are much lower than the college overall. Making up less than 5% of biology students, these are also the groups with the smallest representation in the discipline.

Gender analysis reveals a similar retention rate among males and females, 83% and 82%, however, the success rate for females is 5% lower than males. The success rate for males is similar to the college (70% biology vs 72% college) and for females it is much lower (65% biology vs 74% college). Since the data provided is from the 2020-2021 academic year, this discrepancy may highlight the additional challenges that caregivers have faced during the pandemic.

Retention and success by courses in biology shows a similar trend to our last program review. With the exception of BIOL 124 – Human Anatomy, our biology courses have retention rates comparable with the college overall. In Spring 2021, the college had 89% retention, biology courses overall had 83%, and BIOL 124 had 62% (with a 38% success rate). BIOL 124 is often the first science course students take at the college level and it is required as a prerequisite for nursing, physical therapy, and other health programs. In Spring 2021, the retention rate for BIOL 125 – Human Physiology was 86% with 69% success rate. BIOL 124 is a prerequisite for BIOL 125 and this difference in outcomes shows the value of academic preparation when enrolling in a science course. Since the pandemic and several semesters of remote learning, we have seen an increase in students in BIOL 124 who are not academically prepared to succeed. With the return of Anatomy Open Lab this semester, students get two additional days each week to access course materials with the help of Cal Poly tutors.

VII. Trend Analyses/Outlook

Using the information already gathered in the Annual Updates s (e.g., enrollment and achievement data; student learning outcomes assessment and analysis; input by advisory boards; existing articulation agreements; labor market trends) summarize the major trends, challenges, and opportunities that have emerged in the program since the last comprehensive program review. Explain possible causes for any identified gaps or trends and actions taken or needed to address these.

Major trends:
Biology courses remained in high demand during the COVID-19 pandemic. Enrollment increased from 2,063 to 2,261, section count increased from 77 to 82, and FTES increased from 420 to 504 since our last program review. During remote instruction, additional sections of BIOL 100 Introductory Biology and BIOL 124 Human Anatomy were put in the schedule that wouldn't be possible with room limitations during in person instruction. This continued demand shows the urgent need for an additional full-time biology instructor. The recruitment process has begun, with an expected start date of fall 2022.

Major challenges:
Increased the number of lab sections offered put a greater workload demand on our lab specialists. Biology has only one dedicated full-time lab specialist in Santa Maria for four lab classrooms and there is only one full-time lab specialist in Lompoc serving all science courses in two lab rooms. An additional full-time lab specialist in Santa Maria is needed to ensure an adequate and reasonable workload for our lab specialist. There is a full-time lab assistant position in Santa Maria split between biology and chemistry, however, this is a very low paid position and it is challenging to retain employees in this position since they can obtain higher wages and benefits elsewhere. The time investment to train a lab assistant is also significant when there is frequent turnover.

Scheduling our courses is another challenge since lecture space with 60 student capacity is limiting and other programs, such as Agriculture, Viticulture, and Veterinary Technology, often utilize our lab rooms. This usage puts additional work on our laboratory staff who were hired to support biology instruction and not these other programs.

Offering more lab sections requires an increase of supplies and equipment. Budget augmentation requests were sent through the 2022-2023 budget development process. These funds are urgently needed to provide enough materials for students to work in small groups and have supplies available for rapid turnover when lab sections are scheduled close together.

Student preparation, motivation, and focus has also been a challenge in our courses. Remote instruction came with many distractions and several students are struggling to return to in person instruction and the time commitment required to be successful. Biology courses also require college-level reading, writing, and math competencies. Instructors quickly identify students who do not meet these requirements and make support recommendations, however, underprepared students in English and math are usually not successful when attempting biology courses. Communication with academic counselors and close collaboration with the MESA/STEM center are actions taken to address these student challenges.

Major opportunities:
Of the six full-time biology instructors, three were hired since the last comprehensive program review and one was hired in 2015 when program review happened during her first semester teaching General Zoology. The instructor teaching Introductory Biology and Human Anatomy at Lompoc during the last program review is now in Santa Maria teaching Cellular Biology and the Life and Physical Sciences Department Chair. Almost all our courses are being taught by a different full-time instructor than during the last program review.

This transition to new full-time faculty teaching courses has brought new strengths, perspectives, and pedagogy. Introductory Biology has a new lab manual, Marine Biology has new labs and field trips, Cellular Biology has expanded lab techniques in Biotechnology, General Zoology collects trail camera data from a UC preserve, Microbiology utilizes chromogenic agar developed by our instructor, and Human Physiology incorporates iWORX software into several new labs for data collection.

Partnerships with Cal Poly have continued through our Open Anatomy Lab staffed by upper division tutors and other opportunities have emerged recently with NSF, Central Coast Aquarium, and The National Wildlife Federation.

VIII. Long-Term Program Goals and Action Plans (Aligned With the College Educational Master Plan)

Describe the long-term plans for changing or developing new courses and programs, other actions being taken to enhance student success, and the need for professional development activities and other resources to implement program goals. Be sure to show how these plans are related to assessment results. (Plan should cover five- year period and include target dates and resources needed.)

Long term plans revolve around continuing to offer high-quality biology education to students pursuing their transfer, degree, and career goals at AHC. Based on the assessment results, the biology program plans to address the feedback from students regarding availability of our courses. This relates to promoting student success since course availability reduces wait list numbers and provides opportunities for students with time constraints to enroll in biology courses.

Goals
1. Convert LVC 3-109 into a science lab – Target date Fall 2024
With only two science labs in Lompoc to meet the needs of the entire department, a third science lab would allow Introductory Biology to move into a new space, Microbiology to move from the current Chemistry lab into the current Biology lab, and all health science pre-requisite courses could be offered in the current Biology lab. LVC 3-109 would also be able to accommodate new course offerings at LVC, such as GEOL 100 Introduction to Physical Geology and Physics courses.

Repurposing 3-109 from an art lab to a science lab will require:

A. Ceiling completion as there are exposed pipes that give really poor acoustics.
B. Cabinetry for a science lab to properly store equipment and materials.
C. Safety considerations, such as eye wash, safety shower, and fire blanket.
D. Lab benches and seating
E. Stockroom 3-106 will also need safety considerations similar to 3-109.

2. Increase course offerings in Lompoc – Target date Fall 2022 and ongoing
BIOL 125 Human Physiology is on the schedule for instruction at Lompoc in Fall 2022. The conversion of 3-109 will allow more course offerings in Lompoc.

3. Additional lecture space with 60 student capacity – Target date Fall 2024
The Life and Physical Sciences Department only has one large lecture hall, M-310, that can comfortably seat 60 students. For instructor and space efficiency, our 4-unit lab classes are scheduled with lectures accommodating two lab sections so it is crucial to have more lecture classroom availability to meet the student demand for Introductory Biology, Human Anatomy, and Human Physiology. One short-term possibility before new construction is to utilize the classrooms in building E once the fine arts complex is complete and classes have relocated to the new spaces.

4. Additional full-time lab specialist in Santa Maria – Target date Fall 2023
To meet student demand, more lab classes have been added to the schedule. This additional workload does not include a higher salary for our one full-time lab specialist. She has also been assisting with labs in other programs outside of her job description.

5. Continue and expand field and internship experiences for students – Ongoing
Several field courses and field trips have not been offered due to the pandemic and curriculum needs to be revised. Current participation in the NSF grant for native bees may provide student internship opportunities for several more years.

6. Continue and expand collaborations with the community and neighboring colleges/universities – Ongoing
Recent connections have been made with the Central Coast Aquarium, Santa Maria Natural History Museum, and Creek Lands Conservation. Collaboration with UCSB and Cal Poly is ongoing.

7. Rewrite Program Learning Outcomes – Target date Fall 2022

ALLAN HANCOCK COLLEGE *Assessment Plan*

This part of the program review demonstrates alignment of courses with coverage of program student learning outcomes and lays out the program's plans for conducting assessments over the forthcoming five years.

Mission

The mission of the Biology Program is to provide students with an excellent college-level education in biology at the freshman and sophomore level in the support of students seeking academic and professional degrees and certificates.

Program Outcomes

Program SLO 1: Apply biological knowledge in environments other than the classroom.
Program SLO 2: Demonstrate current knowledge of evolutionary principles.
Program SLO 3: Demonstrate effective communication using the language, concepts, and models of biology.
Program SLO 4: Demonstrate effective content knowledge of biodiversity.
Program SLO 5: Demonstrate proficient research skills in data gathering analysis.

Course/Program Alignment

Key: I= Introduced, D=Developed and practiced with feedback; M=Demonstrated at a specified mastery level)

	Program Outcomes				
	1	2	3	4	5
BIOL 100 – Introductory Biology	I	I	I,D	I,D	I,D
BIOL 120 – Humans and the Environment		I		I,D	
BIOL 124 – Human Anatomy				I,D	
BIOL 125 – Human Physiology			I,D	D	
BIOL 128 - Microbiology		D	D	D, M	D
BIOL 132 – Marine Biology	I,D	I,D	I,D	I,D	I,D
BIOL 150 – Cellular Biology			D	I,D	I,D
BIOL 154 – General Botany	D	D	D, M	D, M	D, M
BIOL 155 – General Zoology	D, M	D, M	D, M	D, M	D, M

Implementation of Assessment

Responsibility for implementing the assessment lies with the entire department. Confident that outcomes are reflected in actual coursework of your major/program, describe the mechanisms for assessment. Think of assessing your outcomes on a 4 or 5 year cycle. (If you have 10 outcomes assessing 2 a year is ideal.)

Program: Biology - 6 Year Assessment Plan

Program Outcome	To be assessed in semester:	Assessment method (s)	Team to review assessment results	Resources needed to conduct assessment	Individual responsible for assessment report	Date we expect to complete review
Apply biological knowledge in environments other than the classroom.	Fall 2022 and Spring 2023	Field trip assignment and/or lab report	Luke Blacquiere Alicia Fox Wendy Hadley	None	Luke Blacquiere	June 2023
Demonstrate current knowledge of evolutionary principles.	Fall 2023 and Spring 2024	Lab assignment and/or essay question	Luke Blacquiere Alicia Fox Ashley Wise	None	Alicia Fox	June 2024
Demonstrate proficient research skills in data gathering and analysis	Fall 2024 and Spring 2025	Research paper and/or lab report	Ashley Wise Wendy Hadley Len Miyahara	None	Ashley Wise	June 2025
Demonstrate effective communication using the language, concepts and models of biology.	Fall 2025 and Spring 2026	Essay questions; presentation rubric; open-ended questions;	Wendy Hadley Jenny Morris Len Miyahara	None	Jenny Morris	June 2026
Demonstrate effective content knowledge of biodiversity	Fall 2026 and Spring 2027	Specimen identification using dichotomous keys; taxonomy exams	Luke Blacquiere Alicia Fox Wendy Hadley	None	Wendy Hadley	June 2027

Dissemination of Information

Results will be shared during our department retreat before the fall semester. In addition, data will be entered in SPOL and shared with the Learning Outcomes and Assessment Committee.

COURSE REVIEW VERIFICATION

REVIEW OF PREREQUISITES, COREQUISITES, AND ADVISORIES

Summary

List all courses in Discipline/Program

Course Prefix No	**CURRENT** Prerequisite/Coreq/Advisory/ Limitation on Enrollement	**LEVEL OF SCRUTINY** (Statistics, Content Review, UC/CSU Comparison, Student Survey – list all)	**RESULT** (i.e., current PCA is established, should be dropped/modified or new PCA is established)	**ACTION TO BE TAKEN** (None, APP- Major or Minor)
BIOL 100	Advisory: Eligibility for ENGL 101 or completion of ENGL 514	N/A	Current PCA is established	None
BIOL 120	N/A	N/A	N/A	None
BIOL 124	Advisory: BIOL 100; CHEM 120 and Advisory: Eligibility for ENGL 101 or completion of ENGL 514	UC/CSU comparison	Current PCA is established	None
BIOL 125	Prerequisite: BIOL 124 and ENGL 101 Advisory: CHEM 120	UC/CSU comparison	Current PCA is established	None
BIOL 128	Prerequisite; BIOL 100 or BIOL 124 or BIOL 125 or BIOL 150 and CHEM 120 or CHEM 150	UC/CSU comparison	Current PCA is established	None
BIOL 132	N/A	N/A	N/A	None
BIOL 150	Prerequisite: CHEM 150	UC/CSU comparison	Current PCA is established	None
BIOL 154	Prerequisite: MATH 331 and either BIOL 100 or BIOL 150	UC/CSU comparison	Due to AB 705, need to modify to remove MATH 331.	APP-Major
BIOL 155	Prerequisite: BIOL 150	UC/CSU comparison	Current PCA is established	None
BIOL 179	N/A	N/A	N/A	None
BIOL 189	N/A	N/A	N/A	None
BIOL 199	N/A	N/A	N/A	None

PLAN OF ACTION – PRE-VALIDATION Six Year

DEPARTMENT: Life and Physical Sciences PROGRAM: Biology

List below as specifically as possible the actions which the department plans to take as a result of this program review. Be sure to address any problem areas which you have discovered in your analysis of the program. Number each element of your plans separately and for each, please include a target date. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan.

RECOMMENDATIONS TO IMPROVE **STUDENT LEARNING OUTCOMES** AND ACHIEVEMENT	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	Target Date
1. Continue efforts to increase the transfer of Biology Program students into academic and professional programs at four-year colleges, universities and other institutions. In particular, continue work on the NSF grant with Antelope Valley College and College of the Canyons as well as Anatomy Open Lab with Cal Poly, Luis Obispo.	1. SLS2, SLS3	1. Ongoing
2. Continue to promote high academic standards for Biology Program students and success in achieving Program Learning Outcomes, while making every effort to make biology accessible to as many students as possible.	2. SLS6, SLS7	2. Ongoing
3. Maintain and increase currency in technology specific to biology, as well as technology directed at education and information literacy.	3. IR3	3. Ongoing
4. Utilize the STEM Center to increase accessibility to resources and tutoring to support students in biology courses.	4. SLS2, SLS3	4. Ongoing

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	Target Date
Enrollment Changes 1. Continue to offer as many sections as possible at different times of day to accommodate a diverse student body, many of whom work and/or have care-giver responsibilities.	1. SLS2, SLS3, SLS5, SLS6, SLS7	1. Ongoing
2. Increase lecture/classroom space to accommodate 60 students.	2. SLS2, IR2	2. Ongoing
3. Incorporate additional instructional assistance for laboratory sections (lab assistants, graders, student peer mentors, additional faculty etc.).	3. SLS2, IR1	3. Ongoing
4. Maintain the number of full-time faculty and increase faculty as needed. Immediately replace vacancies due to retirement, resignation, etc…	4. SLS2, IR1	4. Ongoing
5. Continue to recruit highly qualified adjunct instructors who demonstrate an understanding of, and sensitivity to, our student population.	5. SLS2, IR1	5. Ongoing
Demographic Changes 1. Maintain or increase biology class offerings at both the Santa Maria campus and the Lompoc Valley Center.	1. SLS2, SLS3	1. Ongoing

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	Target Date
Curricular Changes 1. Continue to reevaluate and update curriculum, maintaining course currency through AP&P.	1. SLS1, SLS2, SLS3	1. Ongoing
2. Recommend that all biology courses with writing and math related components modify their outlines and syllabi to include advisories or prerequisites of appropriate English and Math classes.	2. SLS2, SLS3, SLS6	2. Fall 2025
3. Revisit specific prerequisites for the appropriate biology courses, including Human Anatomy and Microbiology.	3. SLS2, SLS3, SLS6	3. Fall 2025

Co-Curricular Changes 1. Continue on-going communications with local high schools to review and discuss articulation agreements between high school and college courses.	1. SLS2, SLS3, SLS6	1. Ongoing
Neighboring College and University Plans 1. Promote the transfer of Biology Program students to neighboring Colleges and Universities.	1. SLS2, SLS3, SLS6	1. Ongoing
Related Community Plans 1. Continue to participate in college outreach efforts to promote the Biology Program to local secondary and high school students.	1. SLS2, SLS3, SLS6	1. Ongoing

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.	1. SLS2, IR1	1. Fall 2023
2. Hire an additional full time biology instructor for the Lompoc Valley Center Santa Maria campus, as need dictates. Replace vacancies immediately.	2. SLS2, IR1	2. Fall 2022 and ongoing
3. Augment budgets for student workers for SM and LVC, as needed.	3. SLS2, IR3	3. Ongoing
4. Create dedicated travel budget for lab support travel between campuses and local vendors.	4. SLS2, IR1	4. Fall 2022

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.	1-7. 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

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 AHC	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)	1. SLS2, IR3	1. Spring 2023
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
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
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
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
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

Exhibits

Student Data

STUDENT DATA SUMMARY

State at least three positive factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

The student feedback is overall very positive. Quality of instruction received a "highly satisfied" from 59% of the 315 responses with an additional 26% responding "somewhat satisfied". Contribution toward intellectual growth received 61% "highly satisfied" with 319 responses while clarity of course goals and learning objectives received 65% "highly satisfied with 322 responses. These two factors also received "somewhat satisfied" values of 26% and 22%, giving satisfied responses a total of 85% for both.

Our student survey was conducted in Spring 2021, a semester of remote instruction due to the ongoing COVID-19 pandemic. Fall 2020 and half of Spring 2020 were also taught remotely. These satisfactory student responses are in alignment with our last program review in 2015-2016, indicating the continuation of high-quality instruction within the biology program during the pandemic and the replacement of three retired faculty members with new full-time faculty.

State at least three negative factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

The availability of courses in the biology program received the highest amount of dissatisfied responses with 8% responding "somewhat dissatisfied" and 4% responding highly dissatisfied" out of 302 students. This same factor received the highest dissatisfied results in our last program review.

The availability of our courses is limited due to the lack of lecture space available to accommodate lectures linked with two lab sections (48-60) students. M310 is the only lecture space that can comfortable fit 60 students and this room is shared with all disciplines in the Life and Physical Sciences. Our lab spaces are also being utilized by other programs (Agriculture, Viticulture, and Veterinary Technology) which limits the availability to offer more sections of biology courses if there is increased demand.

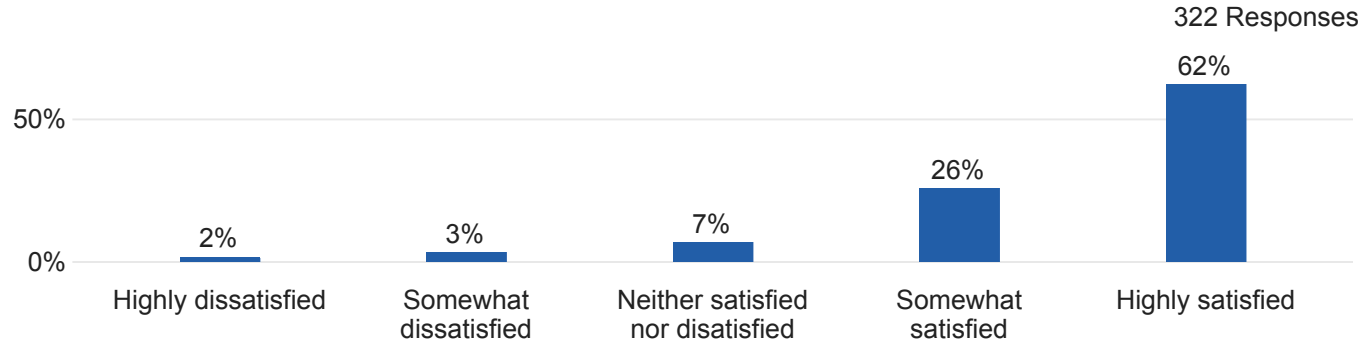
The timing of our courses also depends on other disciplines, such as math and chemistry. Biology students are also enrolled in other math and science courses that cannot conflict with the times we offer our courses.

State any other information (use responsive numbers) that you obtained from student data (e.g. focus groups, questionnaires, or SGIDs) that may be of special interest to the self study team. What planning implications will result from this information?

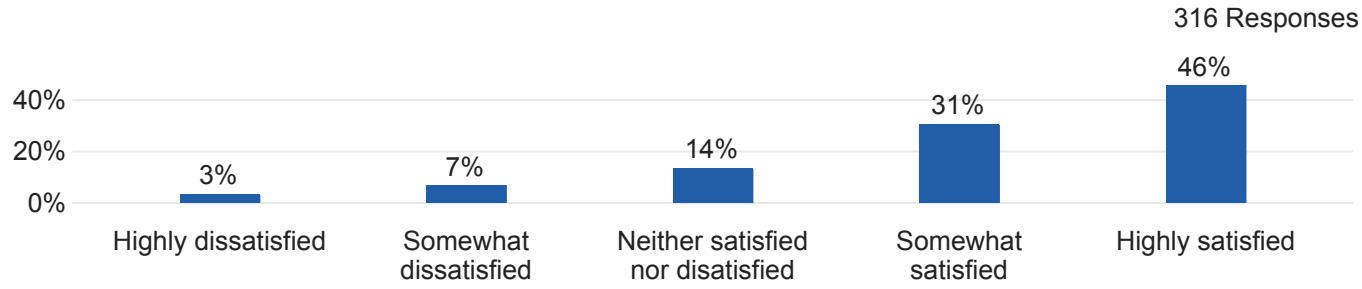
With these responses so similar to the feedback obtained during the last program review, it was not deemed necessary to gather additional data from students. For clarification, BIOL 155 – General Zoology is only offered in the Fall semester and therefore there was a 0% response for students enrolled in that course since the survey took place during the Spring 2021 semester.

Biology Program
Spring 2021
N = 322

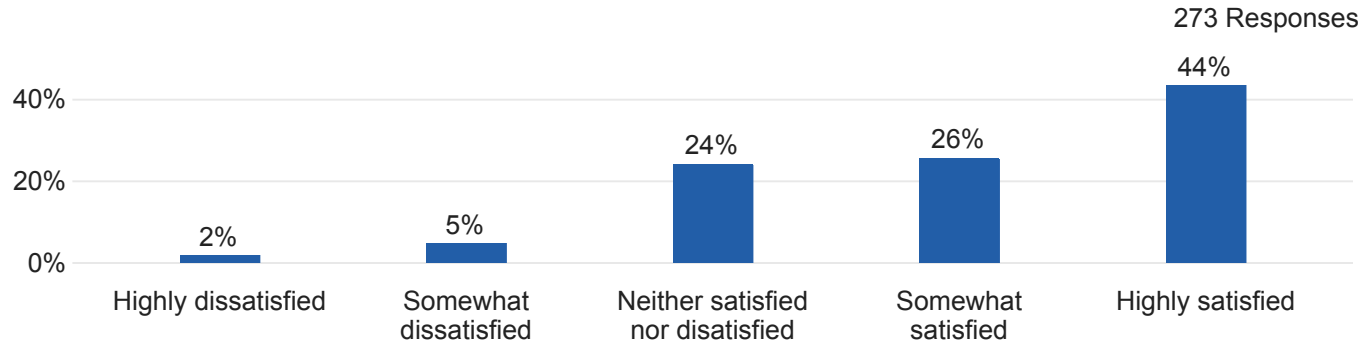
Q2_1 - Quality of instruction within the program



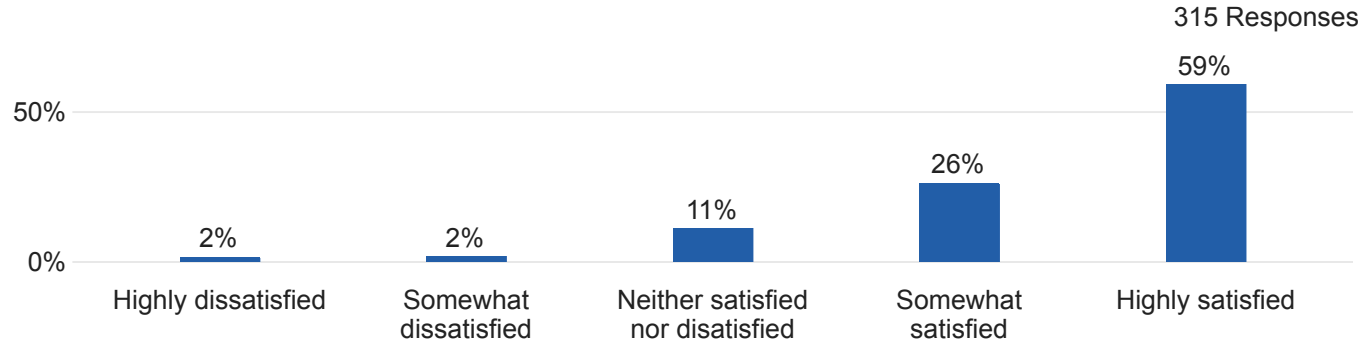
Q2_2 - The way textbooks and other materials used in courses within the program help me learn



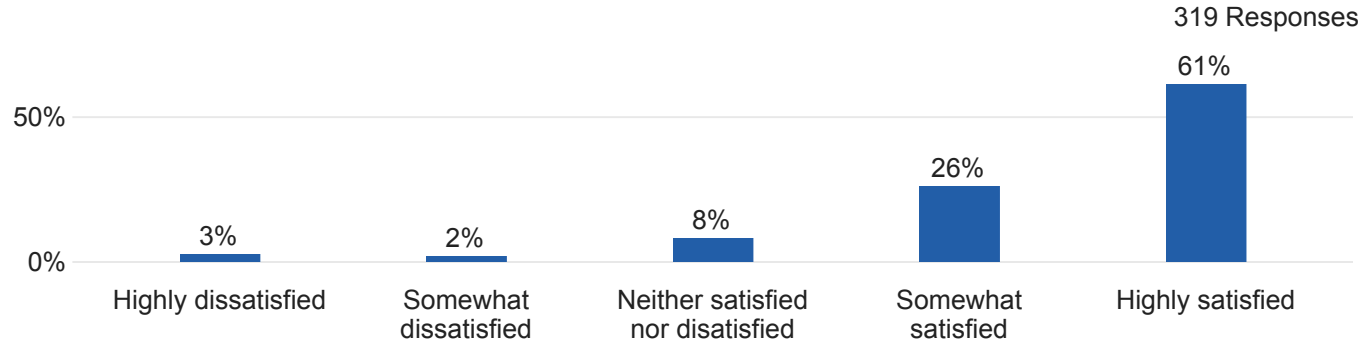
Q2_3 - Advice about the program from counselors



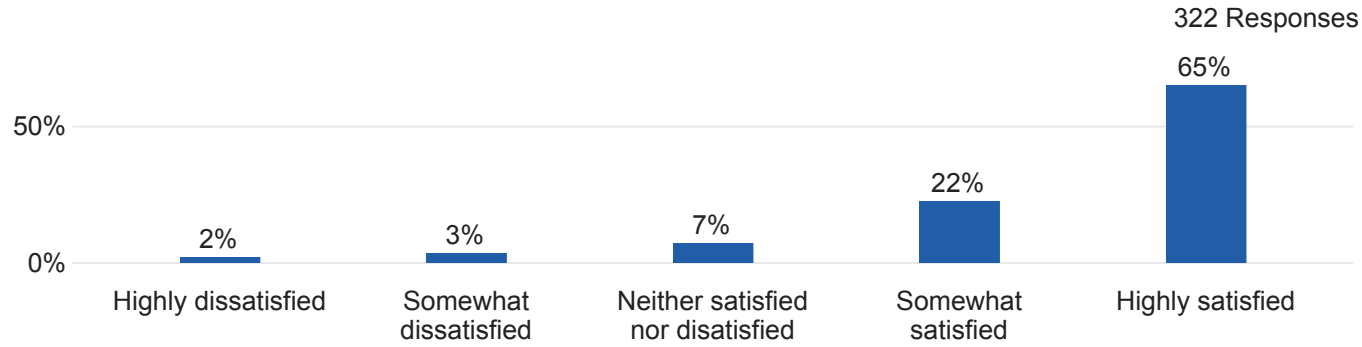
Q2_4 - The way this program meets your educational goals



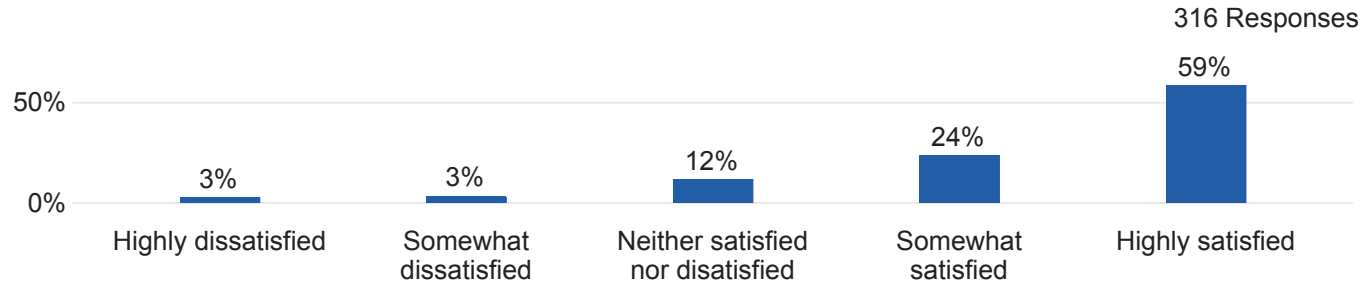
Q2_5 - Contribution towards your intellectual growth



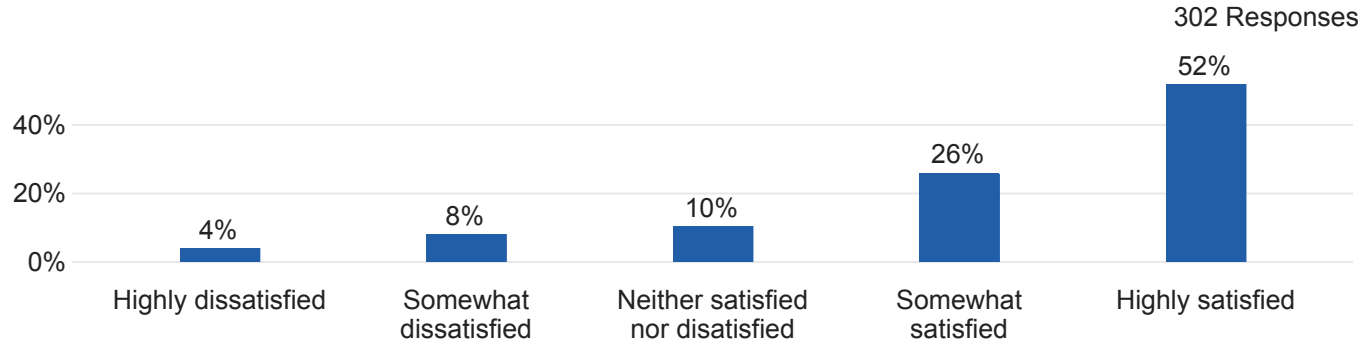
Q2_6 - Clarity of course goals and learning objectives



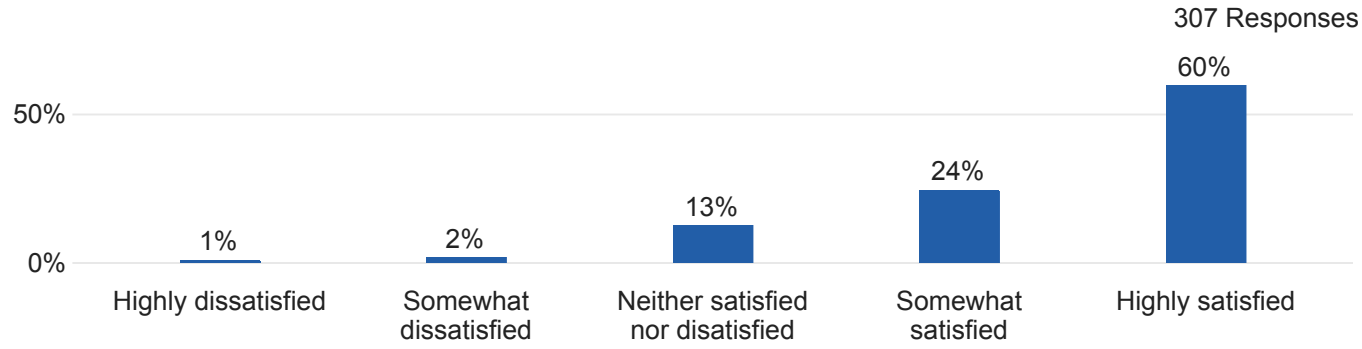
Q2_7 - Feedback and assessment of progress towards learning objectives



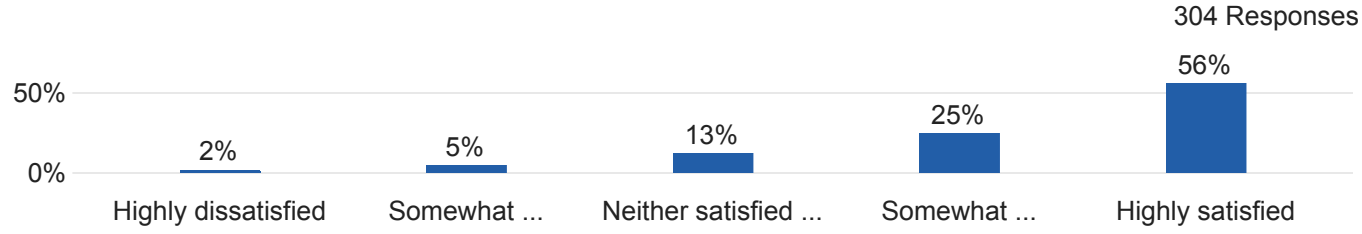
Q2_8 - The availability of courses offered in the Biology Program



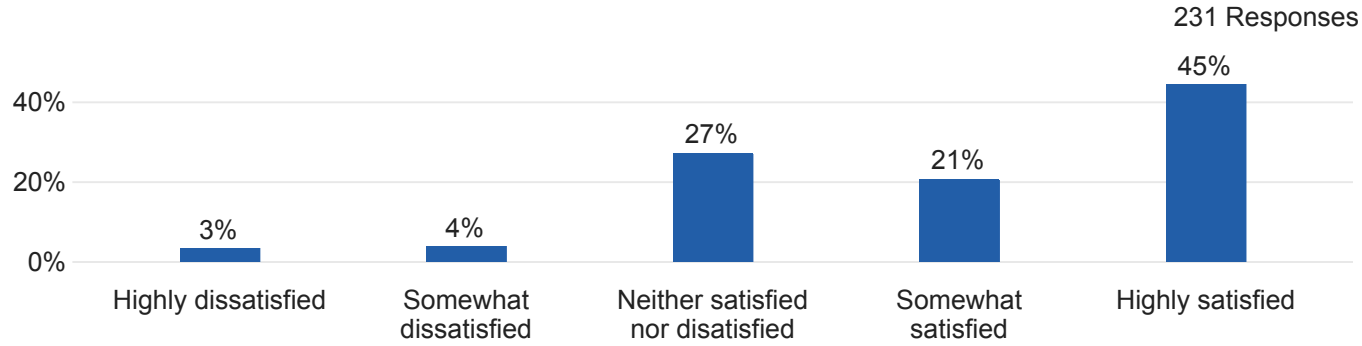
Q2_9 - The content of courses offered in the Biology Program



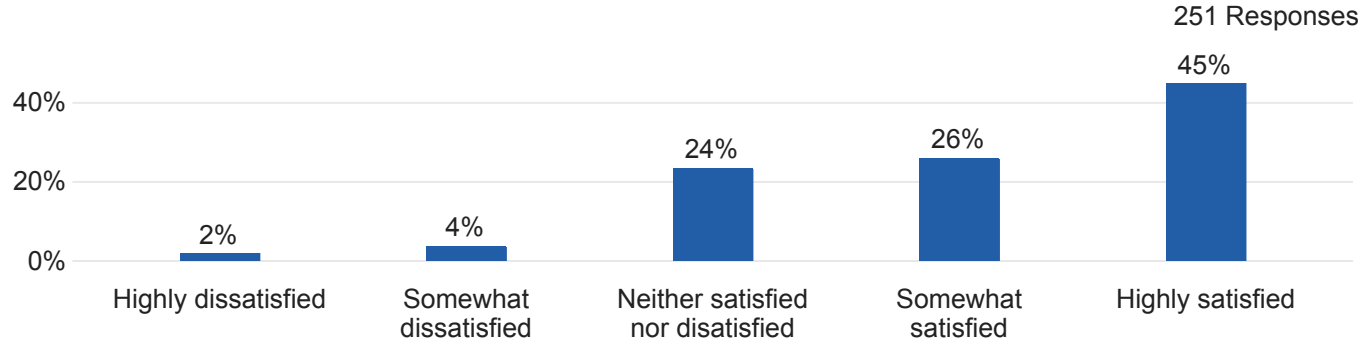
Q2_10 - The coordination of courses offered in the Biology Program and courses offered in other departments that may be required for your major



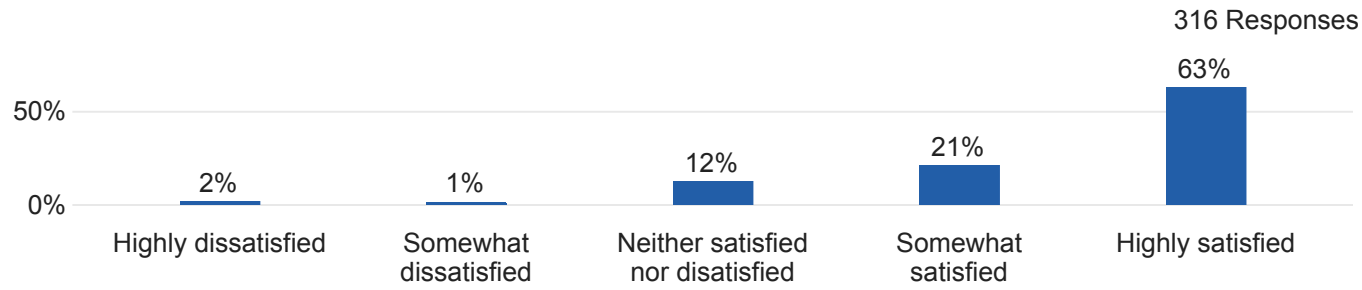
Q2_11 - The physical facilities and space (e.g., classrooms, labs)



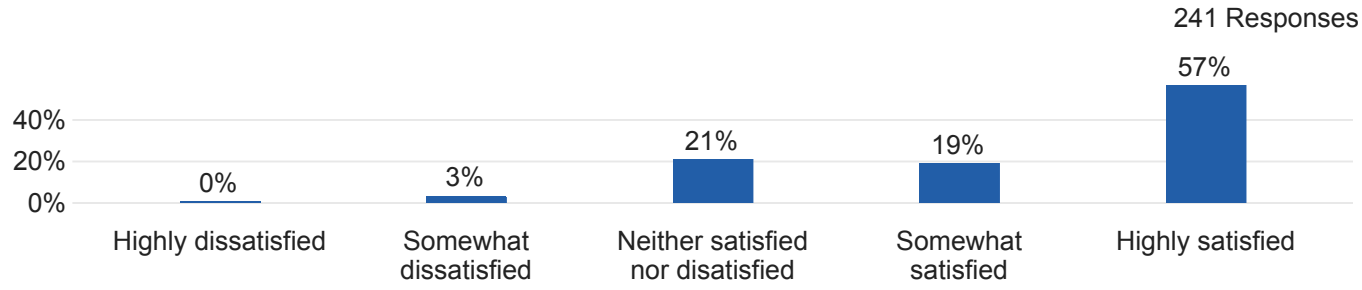
Q2_12 - Instructional equipment (e.g., computers, lab equipment)



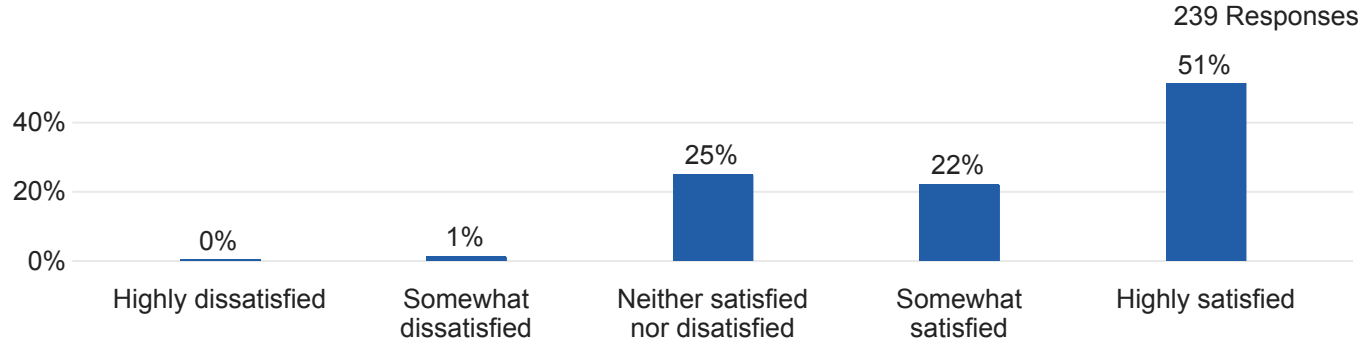
Q2_13 - Presentation of classes via the college's Canvas course management system



Q2_14 - Course assistance through tutorial services (e.g through the Tutorial Center, Math Lab, Writing Center)

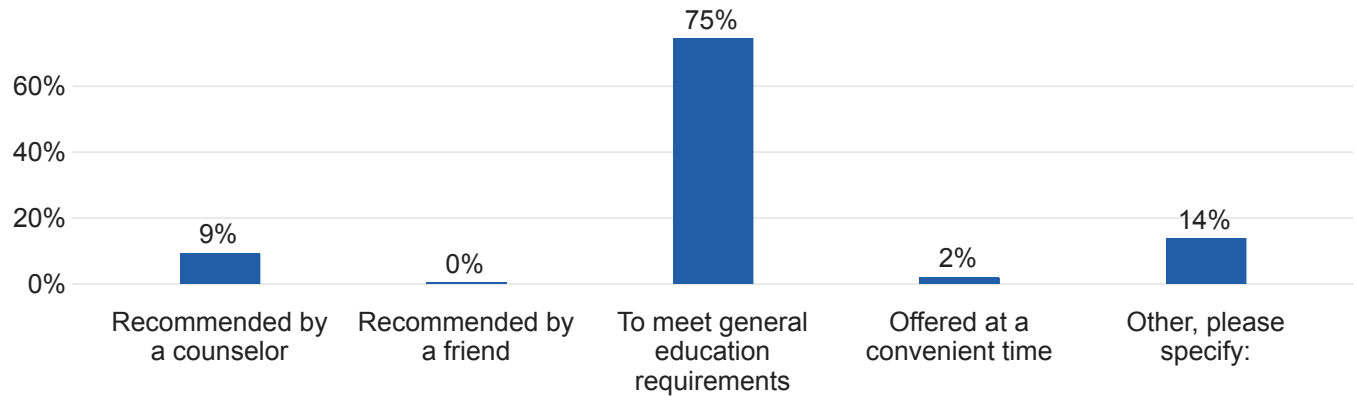


Q2_15 - Availability of appropriate resources in the libraries



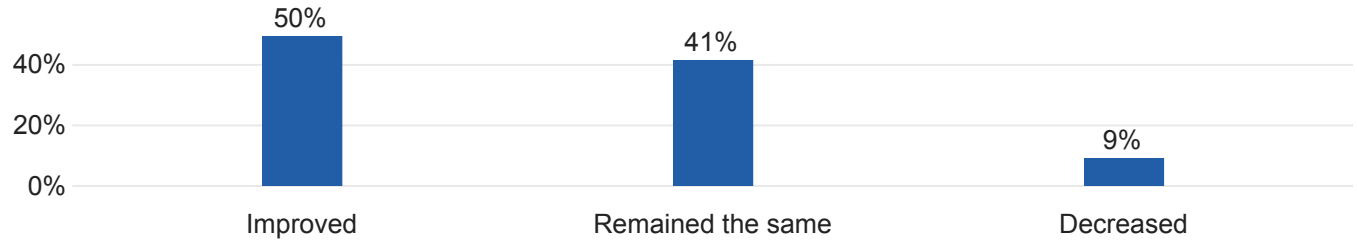
Q4 - Which of the following best describes your reason for taking this and other courses in Biology Program? - Selected Choice

323 Responses



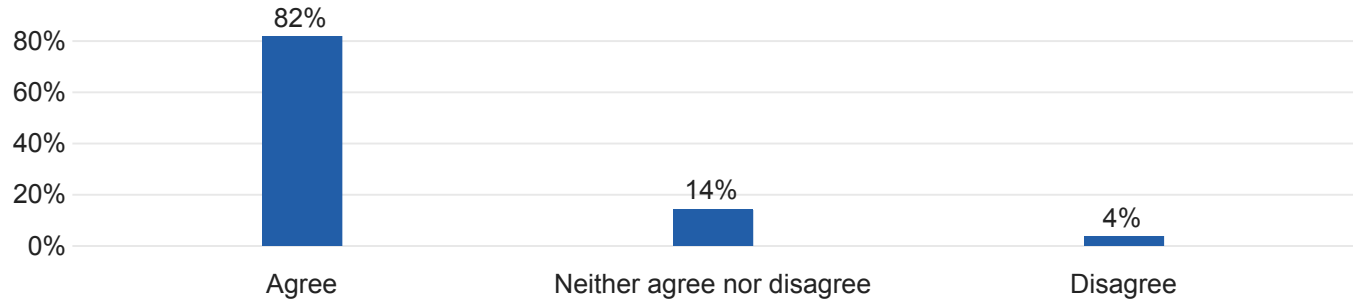
Q5 - Compared to the beginning of the semester, your attitude about Biology Program has

323 Responses



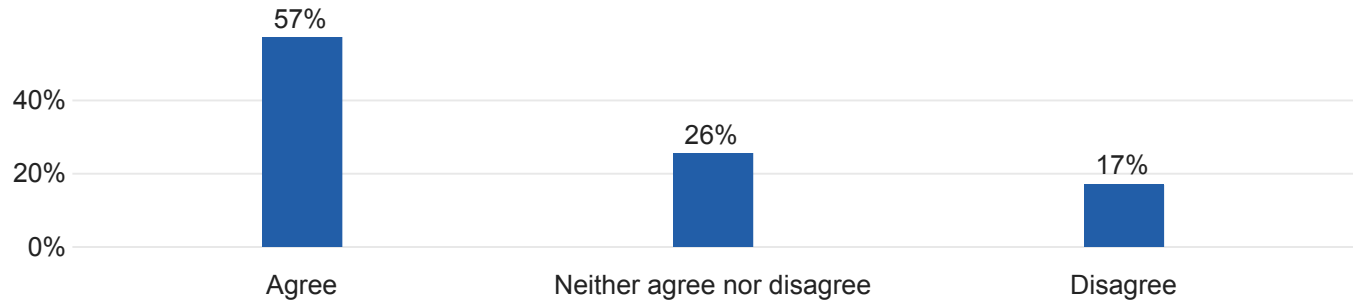
Q6_1 - I would recommend taking courses in the Biology program

322 Responses



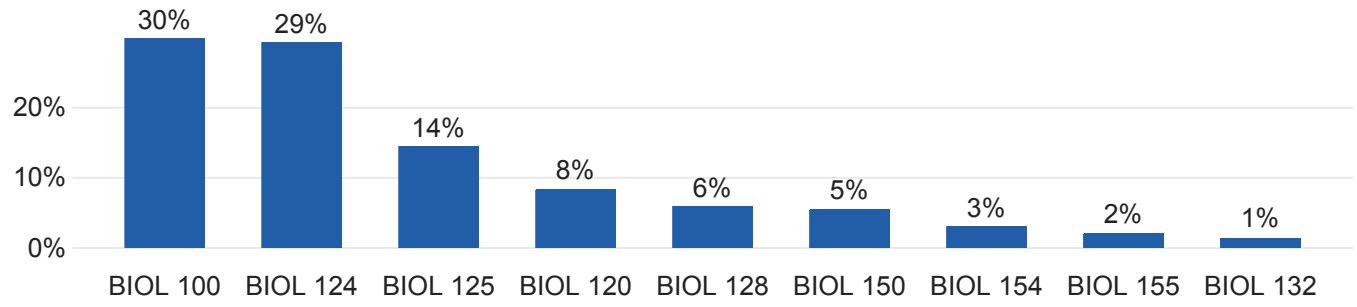
Q6_2 - I plan on taking additional courses in the Biology program

321 Responses



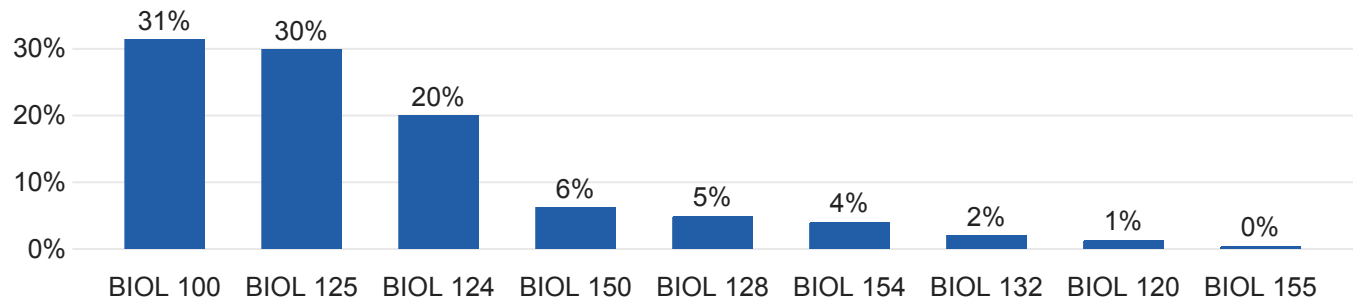
Q7 - Which of the following courses have you taken in Biology Program?

279 Responses



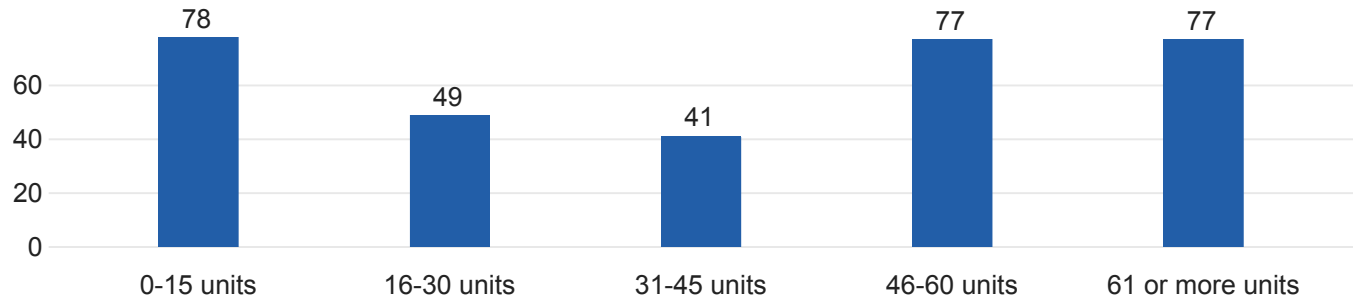
Q8 - Which courses are you taking this semester in Biology Program?

305 Responses



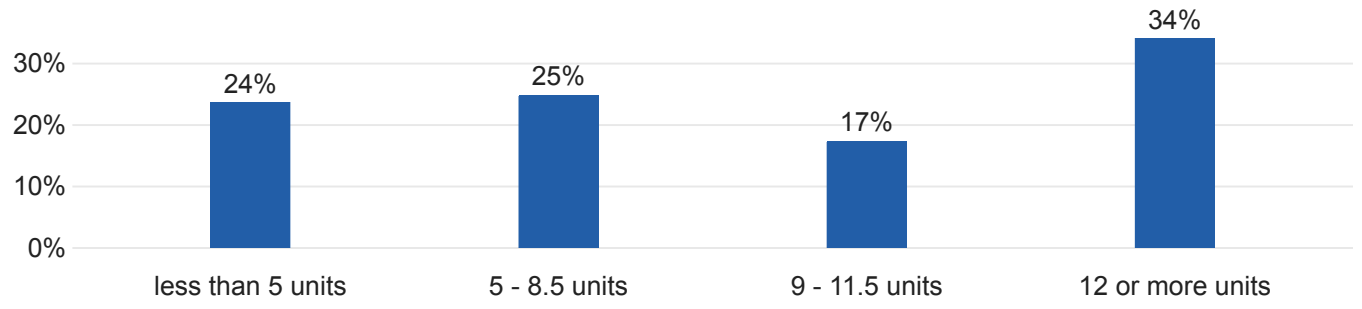
Q10 - How many units have you completed prior to this semester?

322 Responses



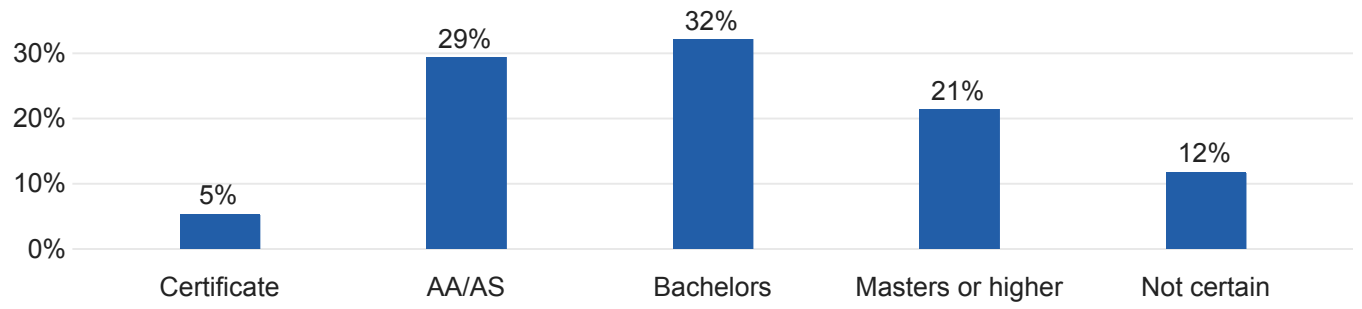
Q11 - In how many units are you currently enrolled?

322 Responses



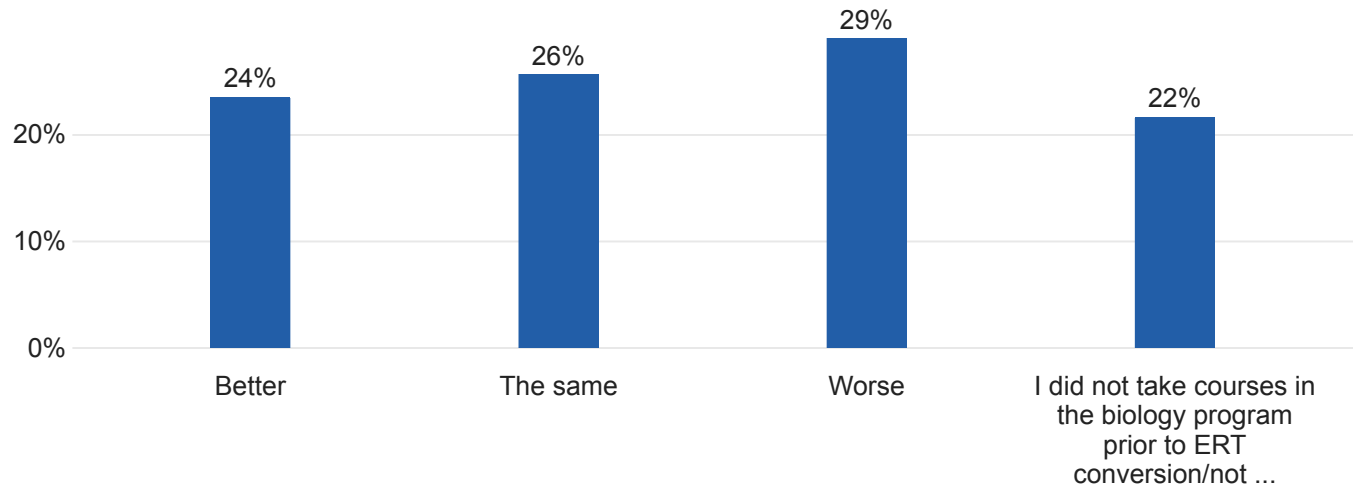
Q12 - What is your final academic goal?

323 Responses



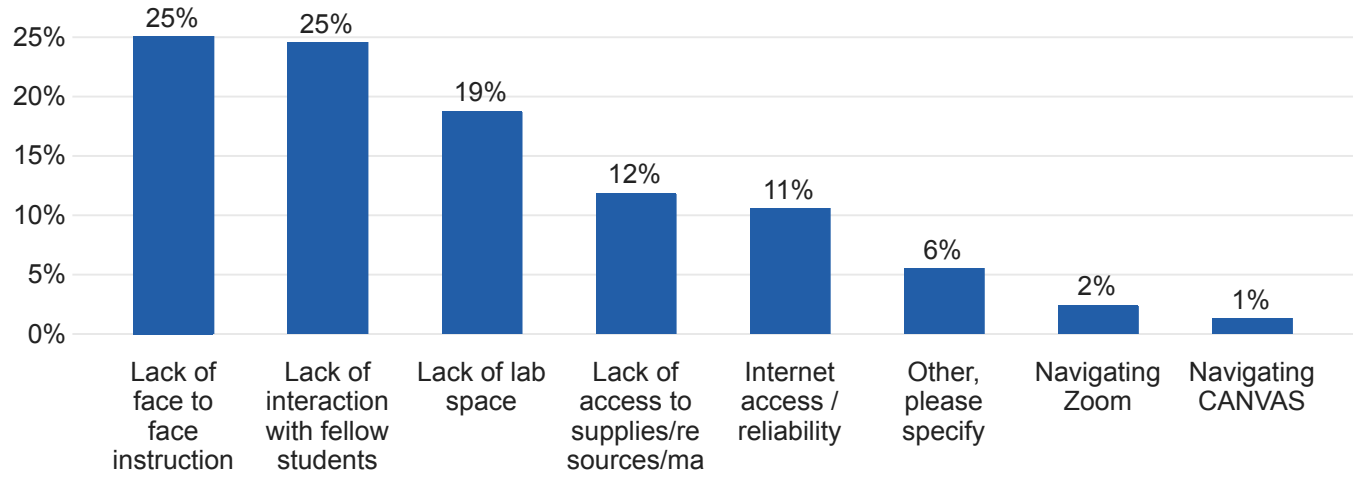
Q13 - Has the change to online ERT (Emergency Remote Teaching) courses made your experience of biology courses:

323 Responses



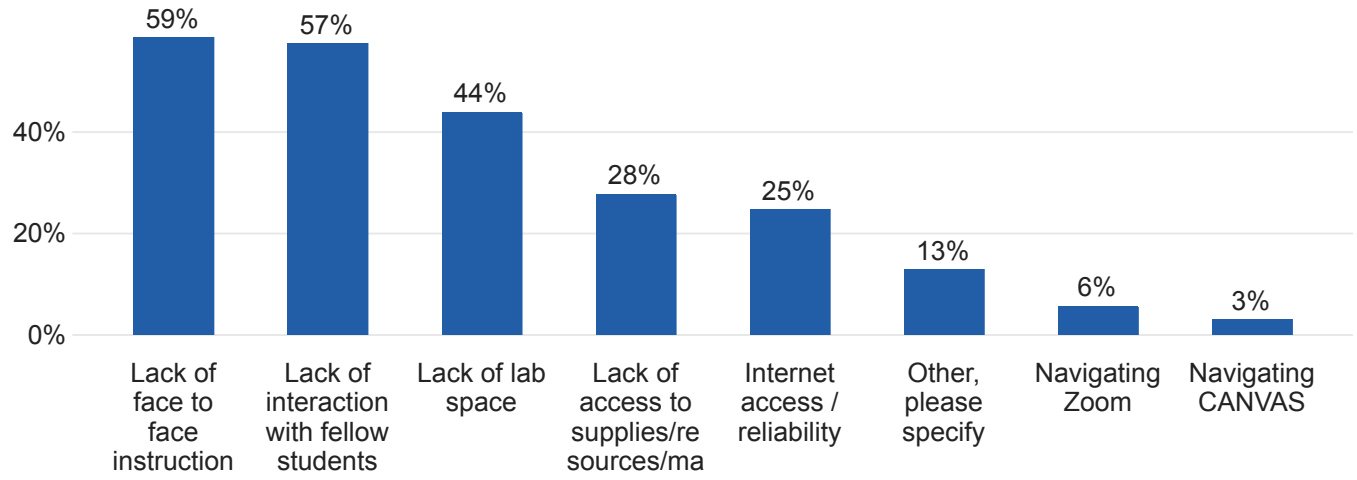
Q14 - Please indicate which of the following are barriers or challenges to your success inbiology courses in the remote teaching mode as opposed to face to face instruction: Percentage of Choices

303 Responses



Q14 - Please indicate which of the following are barriers or challenges to your success inbiology courses in the remote teaching mode as opposed to face to face instruction: - Percentage of Responses

303 Responses



Q14_8_TEXT - Other, please specify - Text

Other, please specify - Text
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A

N/A

N/A

N/A

N/A

N/A

N/A

None

N/A

As a LAP student, ERT just created complications for me. In person learning is best for me especially in courses such a biology.

N/A

Its a lot harder to learn and focus learning this way.

N/A

N/A

N/A

Not as good hands-on. Which I expected.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
Lab tool experience
N/A
N/A
N/A
N/A
N/A

I loved it. I excel on independent and remote learning. I will not be going back to hancock for the next portions of the bio program. I took Human Anatomy online at Santa Barbara City College prior to covid. The only reason why I took this class now was because it was online. Working full time, having kids, owing a home I have to go back to school on my terms an online gives me that flexibility. In the Fall, there is not a time that works with my schedule for microbiology, I will have to find a class else where.

N/A

N/A

N/A

N/A

N/A

N/A

distractions at home(kids)

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

I didn’t really have any challenges during ERT because I quite liked learning remotely even if I didn’t get the chance to go to lab in person.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

I'm satisfied with the way the class it taught but I'm a person who engages more when it's in person instead of zoom since there is a lot distractions at home that take time away from the class.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

I like the ERT better, I felt none of the above was a challenge for me.

N/A

N/A

N/A

N/A

N/A

N/A

It is difficult to see things for lab due to lighting or camera quality.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Biology classes should be taught in person.

Online learning especially with science courses for me was very challenging. I prefer and learn better in an actual classroom.

N/A

N/A

N/A

N/A

N/A

Lack of motivation

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Family being a distraction during class

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Distractions to teacher in their home setting during key topics, key sequences.

Not having the physical lab models to study from

N/A

N/A

N/A

N/A

N/A

N/A

N/A

None

N/A

Personally, it is hard to concentrate at home with 3 kids. I find that being in a classroom setting allows me to retain more information because my focus is only on the lecture.

N/A

N/A

N/A

N/A
“Office hours”individual one on one time, no quite areas here at home. No extra time “after class” , parents are still home and back to doing things around the house rather than staying in class asking questions or heading to the library to study a little more.
N/A
N/A
N/A
N/A
N/A
N/A
Ability to focus .let’s face it I focus a lot better in the classroom vs at home with the distractions that come with being at home (my children interrupting me, etc)
Lack of concentration
N/A
N/A
None, very convenient
N/A
None, i enjoyed
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A

N/A
Lack of actual hands on laboratory experience.
N/A
N/A
N/A
N/A
N/A
N/A
N/A
Protorio was very stressful to deal with when taking an exam. It had many glitches.
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
For me it was hard to complete the labs through zoom. I would have liked to be in-person for the lab selection for my biology course.
N/A
N/A
N/A
N/A

zoom is so laggy during this class. other class is okay. teacher tried his best.

N/A

N/A

N/A

N/A

N/A

My challenges are not related to the style of teaching; whether remote or not.

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

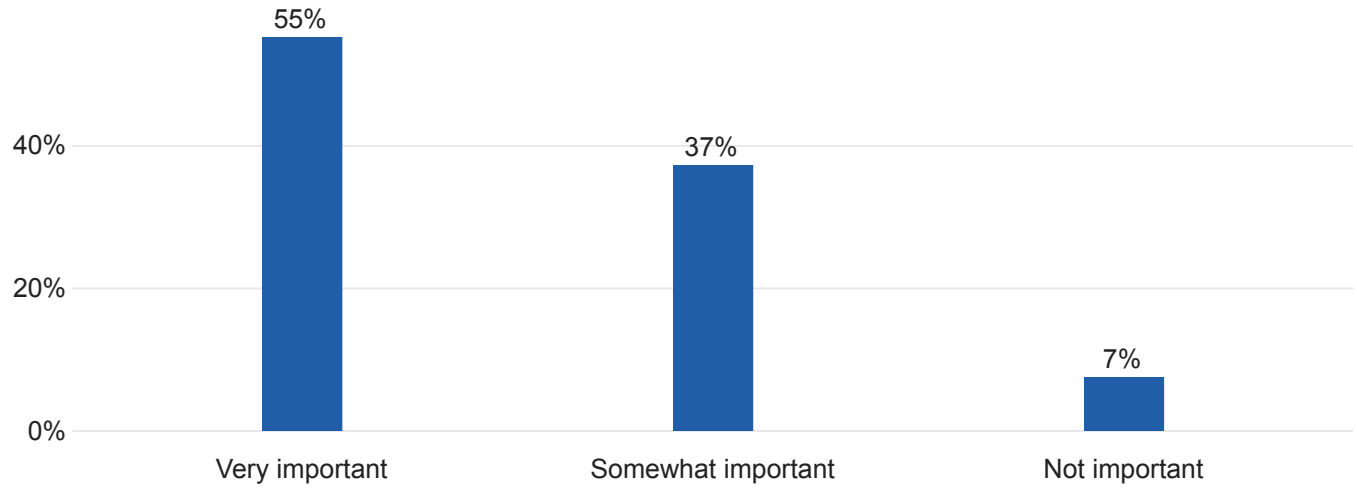
N/A

N/A

N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
Lacking time management since there is not in person schedule

Q15 - If you are currently taking a laboratory course in ERT mode, rate the importance of the materials and resources that the biology program has provided you with to your success in the courses:

322 Responses



Statistics

Program Data

STEP 1 | Choose subjects: BIOL

Subjects: BIOL

STEP 2 | Choose awards: Biology

Awards: Biology

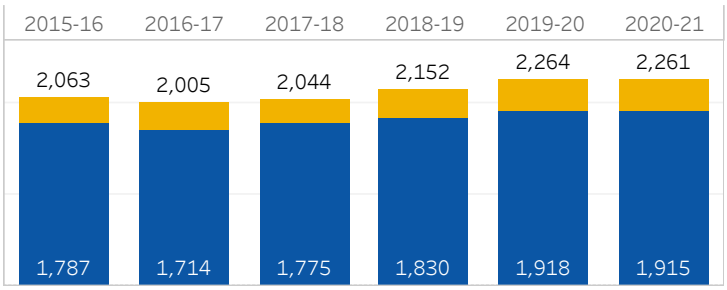
STEP 3 | Choose majors: Biology

Student Majors: Biology

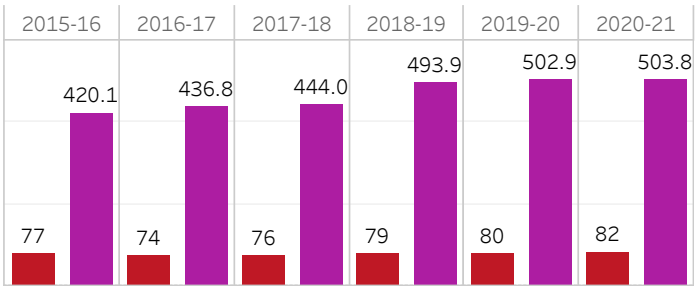
Contents

Quick Program Facts

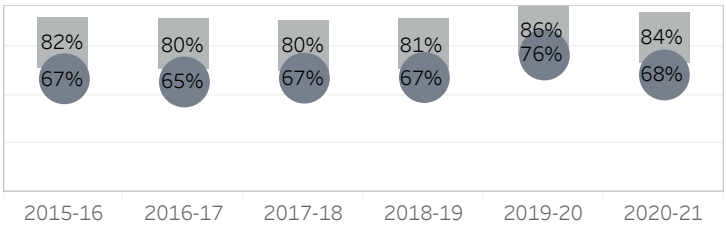
Headcount (undup)=Blue | Enrollment (dup)=Gold



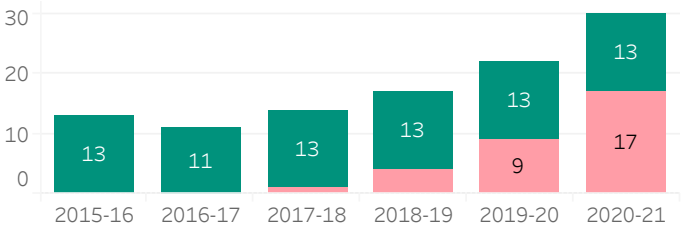
Sections=Red | FTES=Purple



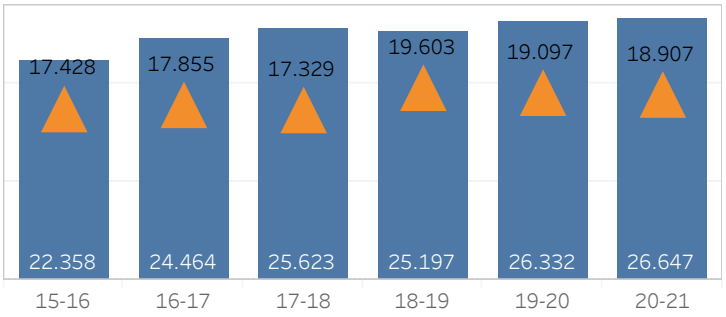
Retention=square | Success=circle



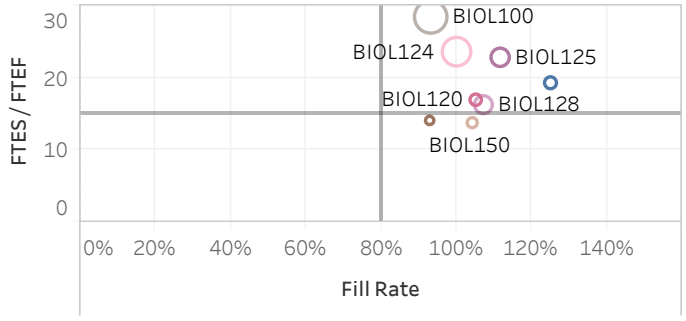
Credit Awards - Gold=Cert | Green=AA/AS / Pink=ADT



FTEF=Bar | FTES/FTEF=Triangle



Program Efficiency Fall 2020



Data Source: Student-MIS; Award, Major & Faculty-Banner | Headcount-unduplicated students; Enrollment-duplicated students; Retention-students who receive a grade in the course; Success-students who receive a passing grade in the course; FTES/FTEF target is 15+; Fill Rate target is 80%+

1 Outcomes BIOL

course_
All

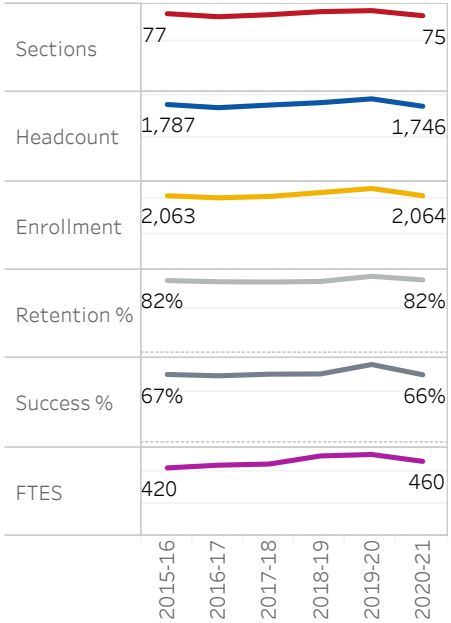
EW Grade
Exclude EW

	Sum 2014	Sum 2015	Fall 2015	Spring 2016	Sum 2016	Fall 2016	Spring 2017	Sum 2017	Fall 2017	Spring 2018	Sum 2018	Fall 2018	Spring 2019	Sum 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
Sections	8	7	36	34	7	34	33	7	34	35	7	35	37	6	37	37	36	39
Headcount	170	183	916	922	171	884	889	187	896	927	194	942	970	213	1,000	1,015	1,000	1,013
Enrollment	172	183	940	940	192	906	907	187	910	947	194	956	1,002	214	1,014	1,036	1,022	1,042
retained	159	170	742	772	167	721	722	162	709	764	169	728	837	198	814	817	826	864
Retention %	92%	93%	79%	82%	87%	80%	80%	87%	78%	81%	87%	76%	84%	93%	80%	92%	81%	83%
success	134	153	610	612	148	584	578	139	598	631	151	595	699	172	662	783	665	696
Success %	78%	84%	65%	65%	77%	64%	64%	74%	66%	67%	78%	62%	70%	80%	65%	88%	66%	67%
FTES	29	34	192	194	35	204	198	33	201	210	31	223	240	34	231	237	232	228

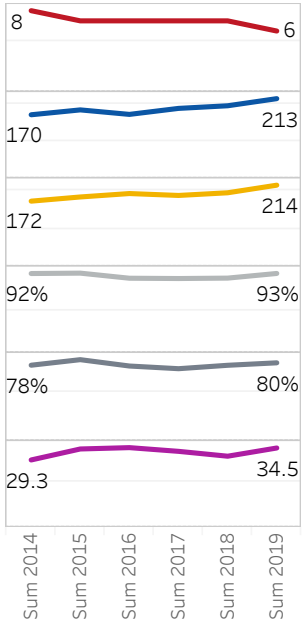
Outcomes Allan Hancock College Credit

	Sum 2015	Fall 2015	Winter 2016	Spring 2016	Sum 2016	Fall 2016	Winter 2017	Spring 2017	Sum 2017	Fall 2017	Winter 2018	Spring 2018	Sum 2018	Fall 2018	Winter 2019	Spring 2019	Sum 2019	Fall 2019	Spring 2020	Sum 2020	Fall 2020	Spring 2021
Sections	355	1,177	41	1,220	357	1,184	41	1,214	333	1,168	45	1,186	270	1,145	47	1,159	299	1,208	1,212	272	1,119	1,107
Headco..	5,593	10,982	1,051	11,341	4,354	12,111	1,023	11,636	5,306	11,889	1,118	11,320	4,596	11,380	1,171	10,580	4,940	12,091	11,342	4,633	10,462	10,076
Enrollm..	8,789	28,471	1,270	28,153	8,305	29,268	1,314	28,161	8,052	28,754	1,480	26,960	6,868	28,650	1,535	26,193	7,252	30,166	26,977	7,364	25,401	23,090
Retention %	90%	86%	84%	89%	90%	88%	87%	88%	90%	87%	87%	88%	90%	87%	88%	88%	92%	88%	92%	90%	88%	89%
Success %	77%	70%	71%	73%	80%	71%	77%	74%	80%	71%	79%	74%	80%	71%	79%	74%	81%	72%	85%	80%	72%	75%
FTES	1,009	3,807	111	3,715	967	4,197	115	4,020	900	4,126	139	3,869	835	4,061	169	3,827	846	4,136	3,763	827	3,531	3,231

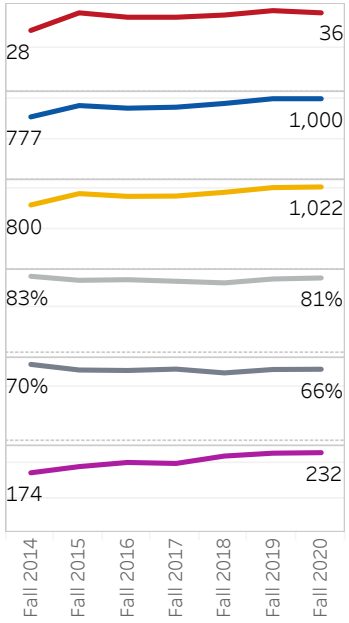
BIOL Academic Year



Summer Terms

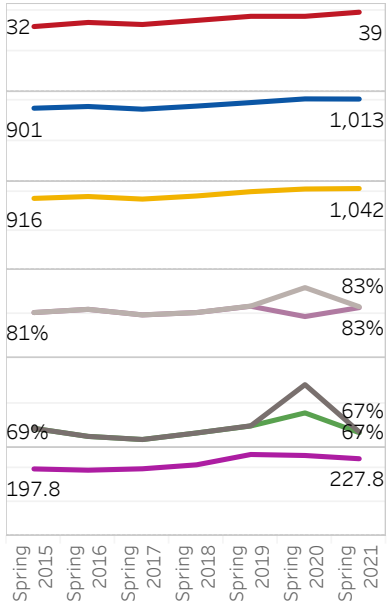


Fall Terms

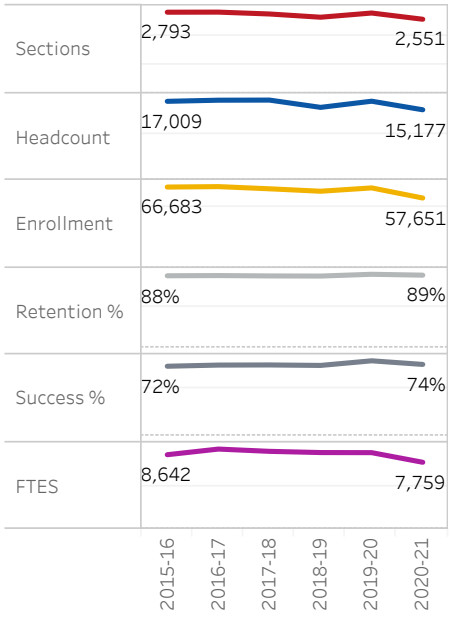


Winter Terms

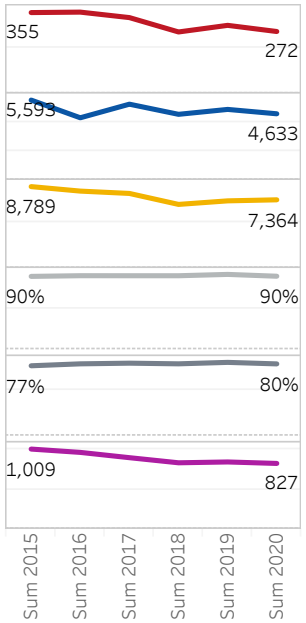
Spring Terms



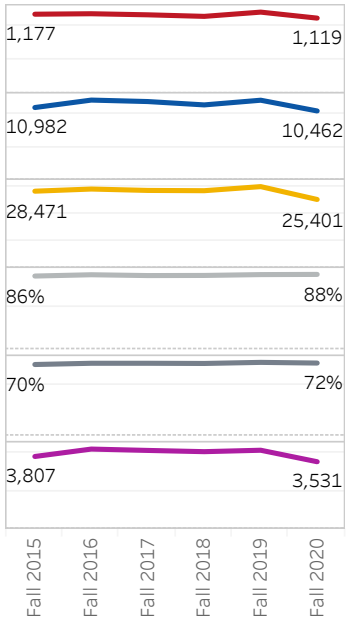
AHC Credit Academic Year



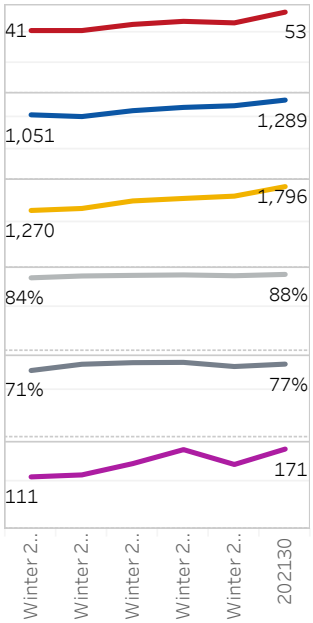
Summer Terms



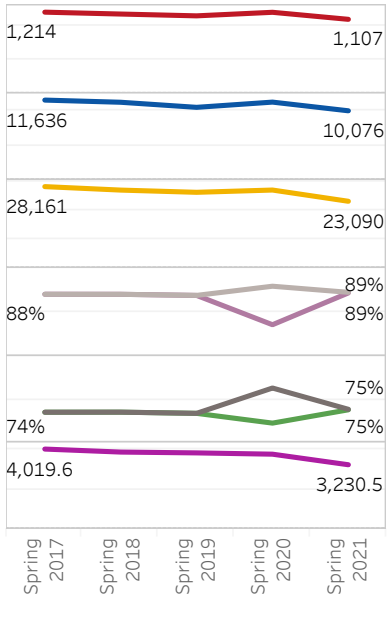
Fall Terms



Winter Terms



Spring Terms



1 Retention & Success by academic year by course BIOL

course_	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
BIOL100	75% 91%	74% 87%	79% 90%	76% 87%	81% 90%	76% 90%
BIOL120	77% 90%	75% 92%	75% 89%	81% 95%	85% 95%	81% 92%
BIOL124	40% 59%	34% 54%	37% 55%	37% 57%	53% 69%	38% 61%
BIOL125	59% 74%	69% 85%	62% 76%	66% 81%	76% 88%	66% 86%
BIOL128	81% 89%	86% 94%	85% 92%	85% 89%	93% 94%	90% 95%
BIOL132	73% 90%	68% 86%	72% 83%	79% 89%	75% 90%	71% 90%
BIOL150	88% 90%	84% 86%	75% 89%	78% 86%	86% 95%	82% 95%
BIOL154	90% 94%	80% 89%	82% 91%	91% 100%	89% 89%	81% 92%
BIOL155	64% 75%	67% 87%	86% 86%	56% 78%	80% 86%	74% 86%
BIOL189	100% 100%	100% 100%	100% 100%	100% 100%	100% 100%	100% 100%
BIOL196				100% 100%	100% 100%	
Grand Total	67% 82%	65% 80%	67% 80%	67% 81%	76% 86%	66% 82%

Retention % and Success % for each course_ broken down by Academic Year. Color shows details about Retention % and Success %. The data is filtered on TERM_CODE, CB04, subject and course. The TERM_CODE filter excludes 201510, 201520, 201540, 202110 and 202130. The CB04 filter keeps C, D and N. The subject filter keeps BIOL. The course filter has multiple members selected.

Measure Names

- Retention %
- Success %

1 Retention & Success by summer term by course BIOL

Term Code_

course	Sum 2015	Sum 2016	Sum 2017	Sum 2018	Sum 2019	Sum 2020
BIOL100	84% 93%	85% 94%	80% 93%	85% 95%	86% 95%	89% 94%
BIOL120	86% 94%	84% 100%	91% 100%	86% 94%	78% 96%	86% 99%
BIOL124	81% 91%	25% 29%	25% 39%	15% 25%	65% 69%	
Grand Total	84% 93%	77% 87%	74% 87%	78% 87%	80% 93%	88% 95%

Measure Names

- Retention %
- Success %

1 Retention & Success by fall term by course BIOL

course_	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020
BIOL100	72% 90%	72% 86%	77% 88%	71% 83%	72% 85%	74% 89%
BIOL120	81% 92%	75% 92%	74% 85%	82% 95%	83% 96%	84% 92%
BIOL124	33% 50%	35% 53%	38% 53%	42% 59%	40% 60%	38% 60%
BIOL125	66% 77%	73% 88%	64% 79%	46% 67%	58% 79%	63% 86%
BIOL128	77% 86%	83% 93%	84% 91%	83% 90%	90% 92%	90% 94%
BIOL132	75% 83%	70% 89%	64% 72%	75% 82%	64% 85%	73% 92%
BIOL150	75% 80%	84% 89%	83% 96%	61% 77%	75% 97%	76% 92%
BIOL155	64% 75%	67% 87%	86% 86%	56% 78%	75% 78%	74% 86%
BIOL189	100% 100%	100% 100%	100% 100%	100% 100%	100% 100%	
BIOL196					100% 100%	
Grand Total	65% 79%	64% 80%	66% 78%	62% 76%	65% 80%	66% 81%

Measure Names

- Retention %
- Success %

1 Retention & Success by spring term by course BIOL

course_	Spring 2016	Spring 2017	Spring 2018	Spring 2019	Spring 2020	Spring 2021
BIOL100	74% 91%	71% 85%	82% 90%	79% 90%	92% 94%	77% 91%
BIOL120	71% 87%	71% 90%	69% 90%	77% 97%	93% 94%	77% 92%
BIOL124	40% 64%	35% 58%	37% 59%	33% 57%	70% 82%	38% 62%
BIOL125	52% 71%	64% 81%	59% 72%	80% 91%	95% 97%	69% 86%
BIOL128	86% 93%	90% 96%	85% 92%	86% 88%	96% 96%	90% 96%
BIOL132	72% 93%	65% 82%	79% 91%	82% 96%	95% 100%	67% 87%
BIOL150	96% 96%	83% 83%	68% 84%	88% 90%	93% 93%	87% 97%
BIOL154	90% 94%	80% 89%	82% 91%	91% 100%	89% 89%	81% 92%
BIOL155					88% 100%	
BIOL189	100% 100%	100% 100%	100% 100%	100% 100%		100% 100%
BIOL196				100% 100%		
Grand Total	65% 82%	64% 80%	67% 81%	70% 84%	88% 92%	67% 83%

Measure Names

- Retention %
- Success %

2 Program Demographics BIOL

Choose individual course via filter or see Appendix A for full demographic course details

course_
All

Academic Year

Age Category	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Under 20	509	107.4	459	104.4	556	124.9	576	132.0	657	150.1	570	131.3
20-24	811	199.1	843	220.3	851	219.4	852	239.1	829	227.5	744	203.7
25-29	258	63.6	232	60.4	231	57.8	230	67.4	253	68.8	227	61.2
30-34	93	22.8	109	28.6	70	18.3	106	31.1	102	30.7	121	34.5
35-39	56	11.7	44	10.1	38	9.4	51	14.3	44	11.5	63	17.2
40-49	61	11.4	43	11.1	42	9.6	38	9.0	44	10.4	40	10.2
50+	21	4.0	10	1.8	15	4.6	6	1.1	19	3.9	10	2.2

ETHNICITY	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Asian	69	17	56	15	50	13	42	12	41	10	34	11
Black	66	13	44	10	34	8	43	11	45	11	45	10
Filipino	80	21	75	21	71	19	77	24	83	23	73	19
Hispanic	1,007	238	1,015	259	1,001	254	939	260	951	254	817	216
NativeAm	31	7	20	5	22	6	33	8	40	11	39	11
Other			2	1	2	1			1	0	1	0
PacIsl	7	2	9	2	8	2	18	5	15	4	8	2
White	528	121	492	120	584	140	671	172	726	185	699	184

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Female	1,081	267	1,125	287	1,177	299	1,201	338	1,287	347	1,202	327
Male	706	153	585	145	591	142	614	153	609	151	494	122
Unknown			3	1	4	1	8	2	6	1	18	4

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
First Time	114	21	91	19	96	21	119	27	114	24	127	27
First Time Transfer	125	26	78	18	85	19	95	23	74	17	60	14
Continuing	1,437	344	1,470	373	1,525	383	1,495	415	1,623	432	1,438	385
Returning	121	25	90	21	80	18	102	24	92	21	105	25
Special Admit	29	4	16	2	18	2	38	5	41	5	15	2
Unknown	1	0										
Grand Total	**1,787**	**420**	**1,713**	**433**	**1,772**	**443**	**1,823**	**493**	**1,902**	**499**	**1,714**	**453**

2 Demographics Allan Hancock College Credit

Age Category	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Under 20	4,528	2,759	5,805	3,105	6,308	3,155	6,018	3,326	7,482	3,583	6,828	3,029
20-24	6,054	3,341	5,700	3,398	5,460	3,190	5,057	3,070	4,867	2,853	4,251	2,441
25-29	2,555	1,118	2,440	1,255	2,395	1,212	2,071	1,101	2,060	1,089	1,831	986
30-34	1,533	528	1,379	578	1,327	556	1,173	560	1,130	507	1,109	550
35-39	969	292	924	357	891	328	758	319	844	342	706	296
40-49	1,262	356	1,042	379	1,040	384	801	328	874	324	732	306
50+	966	248	789	227	676	210	608	189	583	185	447	151

ETHNICITY	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Asian	582	275	512	264	469	214	386	186	378	187	280	140
Black	673	359	583	326	555	278	459	259	491	278	437	232
Filipino	473	292	483	309	462	269	450	305	488	259	405	234
Hispanic	8,196	4,670	8,206	4,873	7,475	4,482	6,604	4,071	7,536	4,047	6,704	3,456
NativeAm	263	133	307	144	348	167	358	198	360	190	325	164
Other	2	0	4	1	5	2	2	1	2	1	2	1
PacIsl	97	50	119	62	141	62	131	74	167	81	128	62
White	6,728	2,862	7,016	3,146	7,819	3,541	7,236	3,751	7,129	3,648	6,533	3,319

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
Female	8,360	4,479	8,768	4,922	8,937	4,913	8,454	4,877	8,777	4,837	8,274	4,467
Male	8,643	4,159	8,340	4,181	8,126	4,049	7,027	3,916	7,521	3,767	6,316	3,053
Unknown	3	2	109	23	181	51	121	52	228	88	209	88

	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES	Headcount	FTES
First Time	2,920	1,185	2,777	1,194	2,562	1,089	2,666	1,240	2,620	1,189	2,263	995
First Time Transfer	2,634	616	2,111	541	2,352	656	1,766	564	1,540	447	1,312	380
Continuing	10,178	5,991	10,502	6,487	9,986	6,305	9,576	6,120	9,325	5,977	8,237	5,234
Returning	3,196	675	2,277	551	2,382	539	1,964	496	2,231	504	1,926	495
Special Admit	935	173	2,260	353	2,578	424	2,281	425	3,521	574	3,288	505
Unknown	6	2	4	0	1	0	1	0	2	0		
Grand Total	**17,004**	**8,641**	**17,217**	**9,126**	**17,235**	**9,014**	**15,597**	**8,845**	**16,523**	**8,691**	**14,794**	**7,608**

3 Program Equity Outcomes BIOL

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Under 20	570	618	1	131	81.2%	-0.6%	5	63.5%	-2.3%	15
20-24	744	896	9	204	83.8%	1.9%		66.6%	0.6%	
25-29	227	269	1	61	80.2%	-2.4%	7	68.3%	0.1%	
30-34	121	151	0	34	82.8%	0.1%		72.8%	6.4%	
35-39	63	74	1	17	87.7%	2.6%		68.5%	0.1%	
40-49	40	46	1	10	80.0%	-3.2%	2	66.7%	-0.9%	1
50+	10	10	0	2	60.0%	-20.0%	3	50.0%	-13.8%	2
Grand Total	**1,746**	**2,064**	**13**	**460**	**82.4%**			**66.4%**		

3 Program Equity Outcomes BIOL

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Asian	34	47	0	11	80.9%	-1.2%	1	76.6%	10.4%	
Black	45	48	0	10	83.3%	1.4%		66.7%	-2.3%	2
Filipino	73	87	1	19	83.7%	1.1%		70.9%	3.3%	
Hispanic	817	967	7	216	80.9%	-2.6%	26	62.3%	-7.0%	68
Native Am	39	44	0	11	70.5%	-11.4%	6	54.5%	-11.0%	5
Other	1	1	0	0	100.0%			100.0%		
Pac Isl	8	9	0	2	66.7%			55.6%		
White	699	828	5	184	84.7%	3.6%		70.5%	6.8%	
Unknown	32	33	0	7	84.8%	1.3%		72.7%	4.6%	
Grand Total	**1,746**	**2,064**	**13**	**460**	**82.4%**			**66.4%**		

3 Program Equity Outcomes BIOL

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
Female	1,223	1,464	7	332	82.0%	-1.6%	24	65.1%	-4.6%	67
Male	502	577	6	123	83.4%	1.7%		70.1%	5.5%	
Unknown	21	23	0	5	82.6%	-0.9%	1	52.2%	-16.2%	4
Grand Total	**1,746**	**2,064**	**13**	**460**	**82.4%**			**66.4%**		

3 Program Equity Outcomes BIOL

Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity.

Equity Outcomes only work for a single subject. Contact IE to get data for multiple subjects

	Academic Year 2020-21									
	Headcount	Enrollment	EW count	FTES	Retention %	PPG Retention Mod	PPG Retention Impact	Success %	PPG Success Mod	PPG Success Impact
First Time	130	130	1	28	82.2%	0.0%		57.4%	-8.0%	11
First Time Tran..	65	66	0	15	77.3%	-1.5%	1	63.6%	0.8%	
Continuing	1,463	1,745	11	390	82.9%	0.7%		67.3%	3.0%	
Returning	105	108	1	25	76.6%	-4.1%	5	61.7%	-3.6%	4
Special Admit	15	15	0	2	93.3%	13.3%		80.0%	15.3%	
Grand Total	**1,746**	**2,064**	**13**	**460**	**82.4%**			**66.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Age

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Under 20	6,318	21,130	40	2,684	89.4%	1.3%	
20-24	3,806	14,590	42	2,106	87.5%	-1.7%	242
25-29	1,639	5,059	13	842	87.6%	-0.8%	41
30-34	1,009	3,021	15	472	88.6%	0.3%	
35-39	642	1,812	15	258	90.5%	1.4%	
40-49	660	1,821	7	266	89.0%	0.2%	
50+	407	1,058	13	134	91.0%	1.9%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Under 20	6,318	21,130	40	2,684	71.0%	-3.9%	831
20-24	3,806	14,590	42	2,106	73.1%	-0.6%	89
25-29	1,639	5,059	13	842	75.4%	2.2%	
30-34	1,009	3,021	15	472	77.6%	4.6%	
35-39	642	1,812	15	258	80.9%	6.7%	
40-49	660	1,821	7	266	79.9%	5.7%	
50+	407	1,058	13	134	81.1%	6.5%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Ethnicity

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Asian	242	833	0	120	90.3%	1.7%	
Black	398	1,352	7	202	88.1%	-1.1%	15
Filipino	378	1,445	2	207	90.6%	1.8%	
Hispanic	6,317	21,790	55	3,035	87.9%	-1.6%	349
Native Am	308	1,013	8	145	85.9%	-2.7%	28
Other	2	6	0	1	83.3%		
Pac Isl	125	418	0	56	87.1%	-1.6%	7
White	5,871	20,576	72	2,859	89.4%	1.7%	
Unknown	363	1,058	1	137	88.7%	0.0%	
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Asian	242	833	0	120	77.4%	4.8%	
Black	398	1,352	7	202	69.3%	-5.8%	78
Filipino	378	1,445	2	207	78.9%	5.3%	
Hispanic	6,317	21,790	55	3,035	70.9%	-4.6%	1,010
Native Am	308	1,013	8	145	67.7%	-5.9%	60
Other	2	6	0	1	83.3%		
Pac Isl	125	418	0	56	68.9%	-3.7%	15
White	5,871	20,576	72	2,859	76.2%	5.0%	
Unknown	363	1,058	1	137	73.1%	-0.6%	6
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21

DemoChoice
Gender

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
Female	7,724	27,366	75	3,881	88.9%	0.6%	
Male	5,985	20,284	69	2,770	88.3%	-0.5%	99
Unknown	283	841	1	111	87.0%	-1.8%	15
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
Female	7,724	27,366	75	3,881	74.4%	2.3%	
Male	5,985	20,284	69	2,770	72.4%	-1.8%	361
Unknown	283	841	1	111	66.1%	-8.0%	68
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

3 Allan Hancock College Credit Equity Outcomes

Equity:
Percentage Point Gap (PPG)-compare a group outcome to the overall outcome, if group is 3% less or lower than overall then group is disproportionately impacted.
PPG Mod-same as PPG except overall outcome is modified to NOT include group outcome.
PPG Impact-amount of students needed to have a positive outcome in order to have the group reach equity

Academic Year
- 2015-16
- 2016-17
- 2017-18
- 2018-19
- 2019-20
- (●) 2020-21

DemoChoice
Student Type

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Retention %	PPG AHC Retention Mod	PPG AHC Retention Impact
First Time	2,157	7,000	27	898	86.4%	-2.2%	157
First Time Tran..	978	2,011	4	302	89.6%	1.8%	
Continuing	8,004	31,977	98	4,704	87.9%	-2.5%	798
Returning	1,544	2,932	11	385	87.8%	-0.3%	10
Special Admit	3,298	4,570	5	472	97.7%	9.7%	
Unknown	1	1	0	0	100.0%		
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**88.6%**		

Academic Year
2020-21

	Headcount	Enrollment	EW count	FTES	Success %	PPG AHC Success Mod	PPG AHC Success Impact
First Time	2,157	7,000	27	898	60.4%	-13.5%	945
First Time Tran..	978	2,011	4	302	78.4%	5.8%	
Continuing	8,004	31,977	98	4,704	74.0%	0.6%	
Returning	1,544	2,932	11	385	73.1%	0.8%	
Special Admit	3,298	4,570	5	472	87.3%	14.6%	
Unknown	1	1	0	0	100.0%		
Grand Total	**13,986**	**48,491**	**145**	**6,762**	**73.4%**		

4 Online / Onsite course comparison BIOL

All online courses and matching onsite courses

			Academic Year																	
			2015-16				2016-17				2017-18				2018-19				2019-20			
subject	course	Course Type	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES	Hea..	Enr..	Sect..	FTES
BIOL	BIOL100	Onsite																				
	BIOL120	Online	166	168	5	16.3	155	164	5	15.9	179	183	5	17.8	213	215	6	20.9	229	230	5	22.3
		Onsite	159	159	6	17.1	70	70	2	7.3	77	77	2	8.0	42	42	2	4.4	63	63	2	6.6

4 Online / Onsite course comparison BIOL

All online courses and matching onsite courses

subject	course	Course Type	Academic Year 2020-21 Hea..	Enr..	Sect..	FTES
BIOL	BIOL100	Onsite	808	825	31	198.0
	BIOL120	Online	218	219	6	21.3
		Onsite	59	59	2	6.2

4 Online / Onsite Retention & Success course comparison BIOL
All online courses and matching onsite courses

			Academic Year				
subject_	course	Course..	2015-16	2016-17	2017-18	2018-19	2019-20
BIOL	BIOL100	Onsite					
	BIOL120	Online	77% 89%	77% 93%	79% 94%	85% 96%	84% 96%
		Onsite	77% 91%	70% 91%	64% 78%	64% 88%	86% 92%

Measure Names
- Retention %
- Success %

4 Online / Onsite Retention & Success course comparison BIOL
All online courses and matching onsite courses

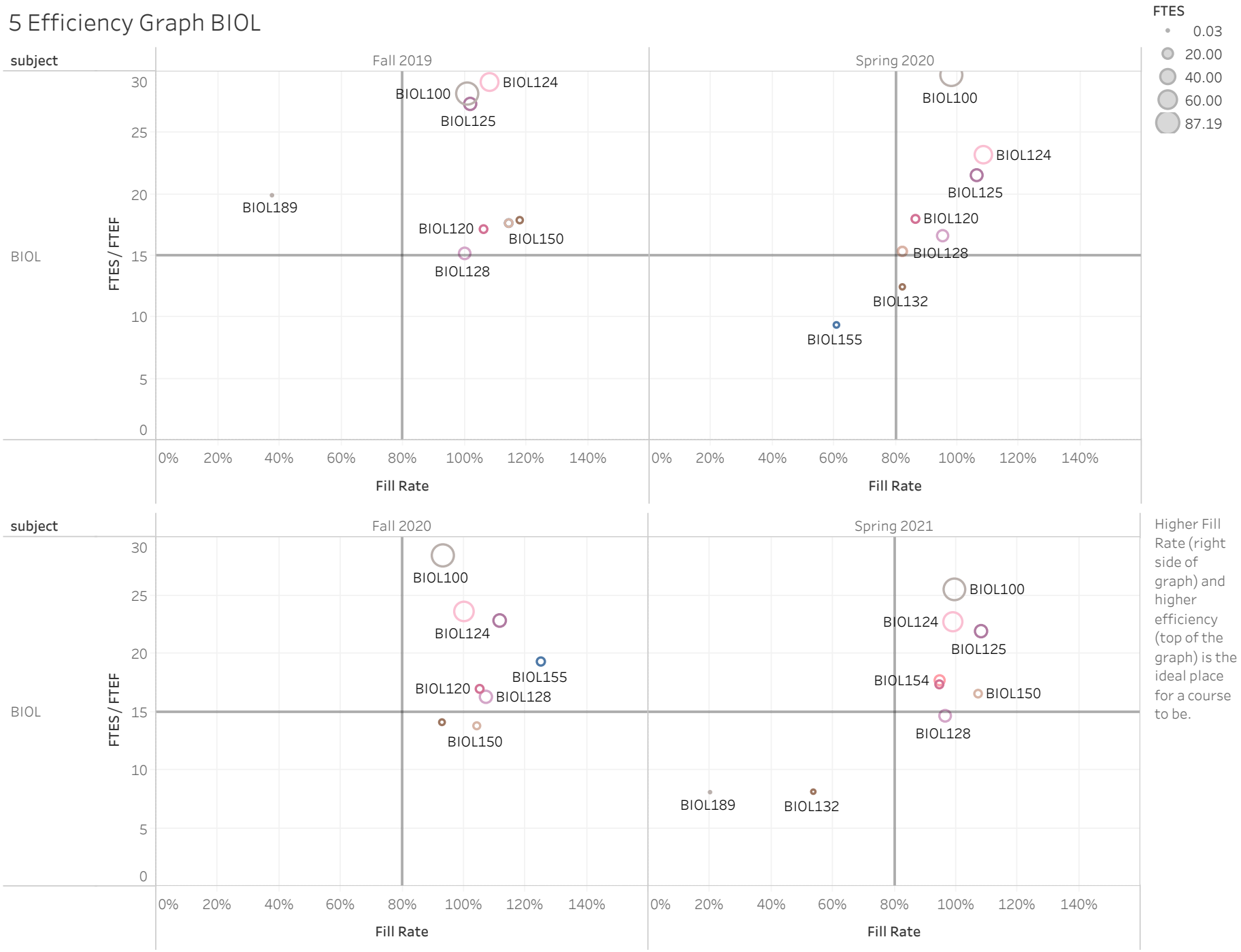
			Academic Year
subject_	course	Course..	2020-21
BIOL	BIOL100	Onsite	78% 90%
	BIOL120	Online	83% 94%
		Onsite	76% 92%

Measure Names
- Retention %
- Success %

4 Online / Onsite credit course comparison Allan Hancock College

		Academic Year					
Course Type		2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Online	Headcount	7,580	7,006	7,152	6,744	7,040	7,440
	Enrollment	15,710	15,695	15,548	15,081	15,957	18,025
	Sections	509	517	501	457	487	586
	Retention %	83%	83%	84%	85%	87%	87%
	Success %	64%	66%	67%	68%	73%	71%
	FTES	1,496	1,524	1,523	1,490	1,569	1,790
Onsite	Headcount	13,623	14,458	14,466	13,515	14,715	13,013
	Enrollment	50,973	51,353	49,698	48,165	50,024	39,626
	Sections	2,284	2,279	2,231	2,164	2,278	1,965
	Retention %	90%	90%	89%	89%	91%	90%
	Success %	75%	76%	76%	75%	80%	76%
	FTES	7,145	7,775	7,511	7,403	7,313	5,969
Grand Total	Headcount	**17,009**	**17,251**	**17,276**	**15,700**	**17,034**	**15,177**
	Enrollment	**66,683**	**67,048**	**65,246**	**63,246**	**65,981**	**57,651**
	Sections	**2,793**	**2,796**	**2,732**	**2,621**	**2,765**	**2,551**
	Retention %	**88%**	**88%**	**88%**	**88%**	**90%**	**89%**
	Success %	**72%**	**74%**	**74%**	**73%**	**78%**	**74%**
	FTES	**8,642**	**9,298**	**9,034**	**8,893**	**8,881**	**7,759**

5 Efficiency Graph BIOL



Higher Fill Rate (right side of graph) and higher efficiency (top of the graph) is the ideal place for a course to be.

5 Efficiency Table BIOL

Academic Year	Term Code_	course_	FTES	FTEF+	FTES / FTEF	Enrollment	Maximum Enrollment	MaxEnroll..	Fill Rate
2019-20	Sum 2019	BIOL100	21	2.012	10.6	107	112	28	96%
		BIOL120	8	0.212	37.1	81	80	80	101%
		BIOL124	5	0.816	6.4	26	28	28	93%
		Total	**34**	**3.040**	**11.3**	**214**	**220**	**37**	**97%**
	Fall 2019	BIOL100	87	3.092	28.2	367	364	28	101%
		BIOL120	10	0.600	17.2	104	98	33	106%
		BIOL124	56	1.928	29.1	241	223	28	108%
		BIOL125	26	0.964	27.4	114	112	28	102%
		BIOL128	23	1.539	15.2	84	84	28	100%
		BIOL132	7	0.388	17.9	33	28	28	118%
		BIOL150	10	0.575	17.7	32	28	28	114%
		BIOL155	10	0.575	17.7	32	28	28	114%
		BIOL189	0	0.013	19.9	6	16	8	38%
		BIOL196	0	0.000		1	1	1	100%
		Total	**231**	**9.674**	**23.9**	**1,014**	**982**	**27**	**103%**
	Spring 2020	BIOL100	86	2.904	29.7	355	362	28	98%
		BIOL120	11	0.600	18.0	108	125	42	86%
		BIOL124	54	2.316	23.2	243	224	28	108%
		BIOL125	25	1.152	21.6	118	111	28	106%
		BIOL128	22	1.339	16.6	80	84	28	95%
		BIOL132	5	0.388	12.5	23	28	28	82%
		BIOL150	15	0.950	15.4	46	56	28	82%
		BIOL154	15	0.950	15.4	46	56	28	82%
		BIOL155	5	0.575	9.4	17	28	28	61%
		Total	**237**	**11.174**	**21.2**	**1,036**	**1,074**	**29**	**96%**
	Total		**503**	**23.888**	**21.1**	**2,264**	**2,276**	**28**	**99%**
2020-21	Sum 2020	BIOL100	37	1.212	30.2	126	140	28	90%
		BIOL120	7	0.424	16.3	71	75	38	95%
		Total	**43**	**1.636**	**26.6**	**197**	**215**	**31**	**92%**
	Fall 2020	BIOL100	83	2.904	28.4	339	364	28	93%
		BIOL120	10	0.600	17.0	103	98	33	105%

5 Efficiency Table BIOL

Academic Year	Term Code_	course_	FTES	FTEF+	FTES / FTEF	Enrollment	Maximum Enrollment	MaxEnroll..	Fill Rate
2020-21	Fall 2020	BIOL124	64	2.704	23.6	279	279	28	100%
		BIOL125	26	1.152	22.8	125	112	28	112%
		BIOL128	25	1.539	16.3	90	84	28	107%
		BIOL132	5	0.388	14.1	26	28	28	93%
		BIOL150	8	0.575	13.8	25	24	24	104%
		BIOL155	11	0.575	19.3	35	28	28	125%
		Total	**232**	**10.437**	**22.3**	**1,022**	**1,017**	**28**	**100%**
	Spring 2021	BIOL100	79	3.092	25.5	360	362	28	99%
		BIOL120	10	0.600	17.4	104	110	37	95%
		BIOL124	61	2.692	22.7	278	281	26	99%
		BIOL125	25	1.152	21.9	120	111	28	108%
		BIOL128	23	1.539	14.7	81	84	28	96%
		BIOL132	3	0.388	8.1	15	28	28	54%
		BIOL150	10	0.575	16.6	30	28	28	107%
		BIOL154	17	0.950	17.7	53	56	28	95%
		BIOL189	0	0.004	8.1	1	5	5	20%
		Total	**228**	**10.992**	**20.7**	**1,042**	**1,065**	**27**	**98%**
	Total		**504**	**23.065**	**21.8**	**2,261**	**2,297**	**28**	**98%**
Grand Total			**1,007**	**46.953**	**21.4**	**4,525**	**4,573**	**28**	**99%**

6 Degree/Certificate Biology

					Academic Year Graduation Desc					
	Program Desc	Degree	Degree Major	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Unduplicated	Biology	AA	Biology	Associate in Arts	13	11	13	13	13	13
		AS-T	Biology for Transfer ..	Associate in Science-Transfer			1	4	6	4
			Biology for Transfer ..	Associate in Science-Transfer					3	13
Duplicated	Biology	AA	Biology	Associate in Arts	13	11	13	13	13	13
		AS-T	Biology for Transfer ..	Associate in Science-Transfer			1	4	6	4
			Biology for Transfer ..	Associate in Science-Transfer					3	13
Unduplicated	Total				**13**	**11**	**13**	**14**	**18**	**24**
Duplicated	Total				**13**	**11**	**14**	**17**	**22**	**30**

6 Majors Biology - Headcount

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Biology	949	1,059	1,032	905	720	467
Biology for Transfer CSU				150	282	260
Biology for Transfer UC					59	163
Grand Total	**949**	**1,059**	**1,032**	**1,016**	**1,014**	**864**

6 Biology Award|Major Match

--If a student has the same program of study and major as the award earned they will be a 'Major Match'. If not they will be a 'Major Split'.

--Headcount & Percentages are the students who are a major match/split for a specific award.

--Data is sorted by program/major of the earned award.

					Academic Year Graduation Desc											
					2015-2016		2016-2017		2017-2018		2018-2019		2019-2020		2020-2021	
Program..	Degree	Degree Major	Degree Desc (group)	Major ..	HC	%	HC	%	HC	%	HC	%	HC	%	HC	%
Biology	AA	Biology	Associate in Arts	Match	8	62%	9	82%	10	77%	10	77%	8	62%	9	69%
				Split	5	38%	2	18%	3	23%	3	23%	5	38%	4	31%
	AS-T	Biology for Transfer CSU	Associate in Science-Transfer	Match									2	33%		
				Split					1	100%	4	100%	4	67%	4	100%
		Biology for Transfer UC	Associate in Science-Transfer	Match											3	23%
				Split									3	100%	10	77%
	Total				13	100%	11	100%	13		14		18		24	

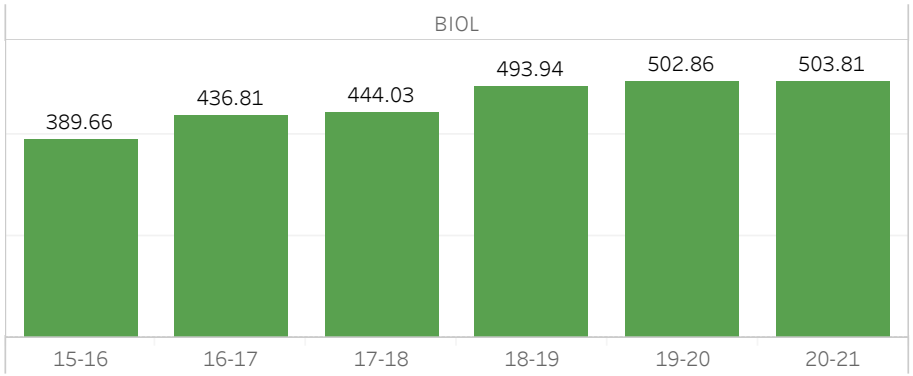
6 Degree/Certificate Allan Hancock College

		Academic Year Graduation Desc					
	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Unduplicated	Associate in Arts	494	523	493	589	882	885
	Associate in Arts - Transfer	92	126	159	164	218	262
	Associate in Science	277	319	313	321	304	310
	Associate in Science-Transfer	95	128	126	191	228	249
	Certificate of Accomplishment	381	419	416	372	423	328
	Certificate of Achievement	681	795	791	876	810	1,156
	NC Cert 48 to <96 hrs	3	10	22	21	22	5
	NC Cert 144 to <192 hrs						6
	NC Cert 192 to <288 hrs	7	5	1	6	13	
	NC Cert 288 to <480 hrs	2	27	46	38	32	3
	NC Cert 480 to <960 hrs			2	9	32	
Duplicated	Associate in Arts	709	726	737	814	1,437	1,616
	Associate in Arts - Transfer	95	130	163	165	229	341
	Associate in Science	307	347	345	350	335	332
	Associate in Science-Transfer	99	133	138	207	237	323
	Certificate of Accomplishment	404	501	491	417	478	373
	Certificate of Achievement	722	846	870	958	865	1,636
	NC Cert 48 to <96 hrs	3	10	23	21	22	5
	NC Cert 144 to <192 hrs						6
	NC Cert 192 to <288 hrs	7	5	1	6	13	
	NC Cert 288 to <480 hrs	2	34	46	39	33	3
	NC Cert 480 to <960 hrs			2	9	32	
Unduplicated	Total	**1,491**	**1,703**	**1,673**	**1,804**	**1,972**	**1,983**
Duplicated	Total	**2,348**	**2,732**	**2,816**	**2,986**	**3,681**	**4,635**

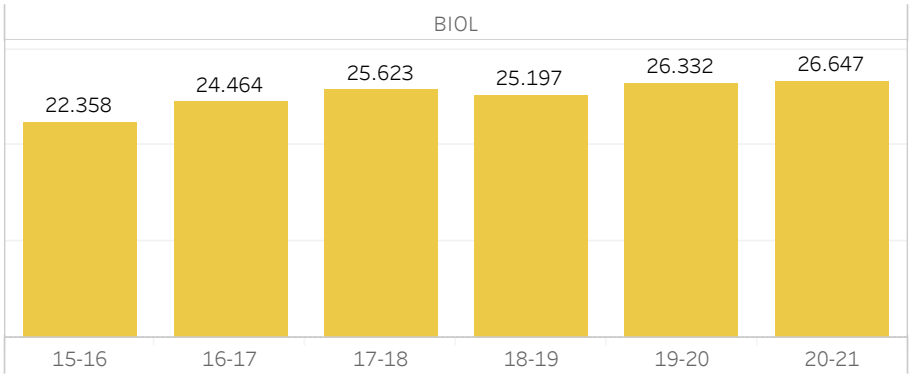
7 FTEF+Overload, FTES & Efficiency - BIOL

Academic Year																	
2015-2016			2016-2017			2017-2018			2018-2019			2019-2020			2020-2021		
FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF	FTEF+	FTES	FTES / FTEF
22.358	389.66	17.4	24.464	436.81	17.9	25.623	444.03	17.3	25.197	493.94	19.6	26.332	502.86	19.1	26.647	503.81	18.9

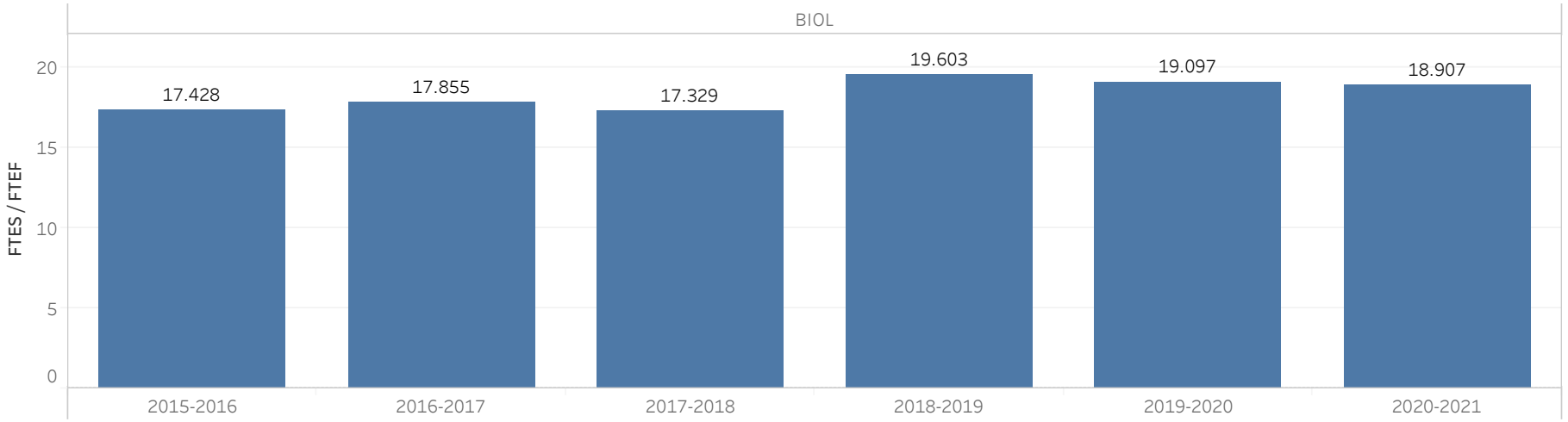
FTES



FTEF



FTEF/ FTES

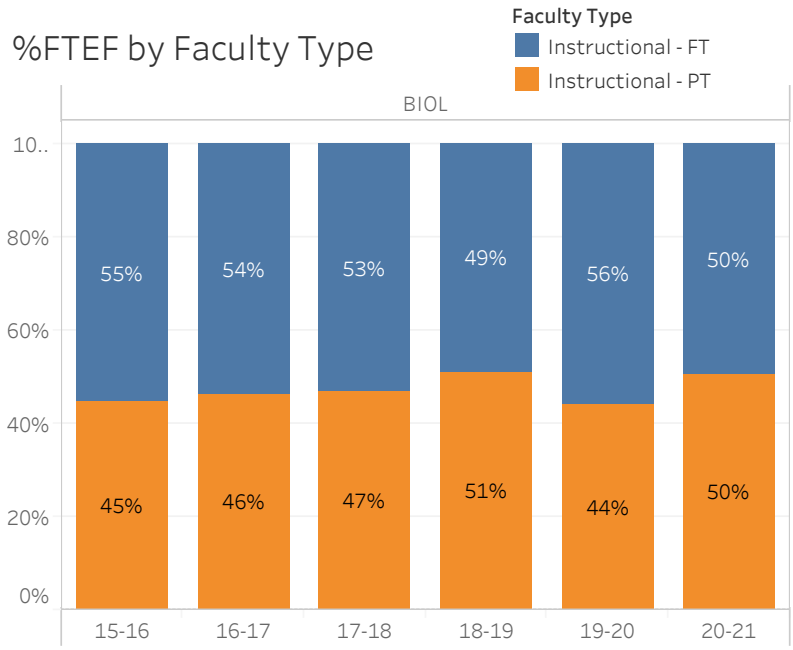


Faculty Type

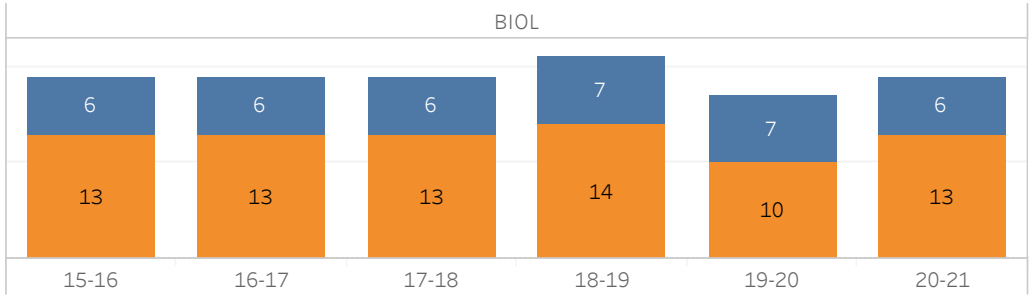
subject_	Faculty Type	2015-2016 FTEF	2015-2016 Overload_	2015-2016 Faculty	2015-2016 Sections	2016-2017 FTEF	2016-2017 Overload_	2016-2017 Faculty	2016-2017 Sections	2017-2018 FTEF	2017-2018 Overload_	2017-2018 Faculty	2017-2018 Sections
BIOL	Instructional - FT	11.993	0.714	6	38	12.426	1.460	6	40	12.701	1.770	6	40
	Instructional - PT	9.651	0.000	13	33	10.578	0.000	13	34	11.152	0.000	13	38
Grand Total		**21.644**	**0.714**	**19**	**71**	**23.004**	**1.460**	**19**	**74**	**23.853**	**1.770**	**19**	**77**

subject_	Faculty Type	2018-2019 FTEF	2018-2019 Overload_	2018-2019 Faculty	2018-2019 Sections	2019-2020 FTEF	2019-2020 Overload_	2019-2020 Faculty	2019-2020 Sections	2020-2021 FTEF	2020-2021 Overload_	2020-2021 Faculty	2020-2021 Sections
BIOL	Instructional - FT	10.82	3.24	7	41	12.47	4.07	7	46	11.57	3.36	6	43
	Instructional - PT	11.14	0.00	14	39	9.79	0.00	10	32	11.72	0.00	13	39
Grand Total		**21.96**	**3.24**	**19**	**79**	**22.26**	**4.07**	**17**	**78**	**23.28**	**3.36**	**19**	**82**

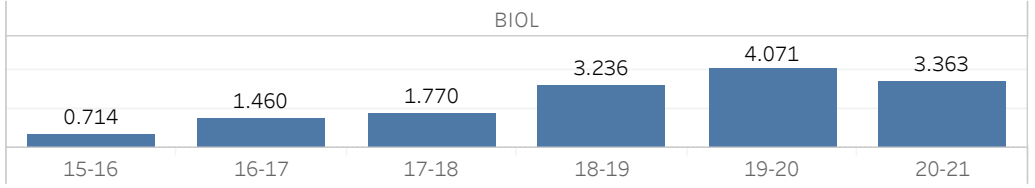
%FTEF by Faculty Type



Faculty count by type



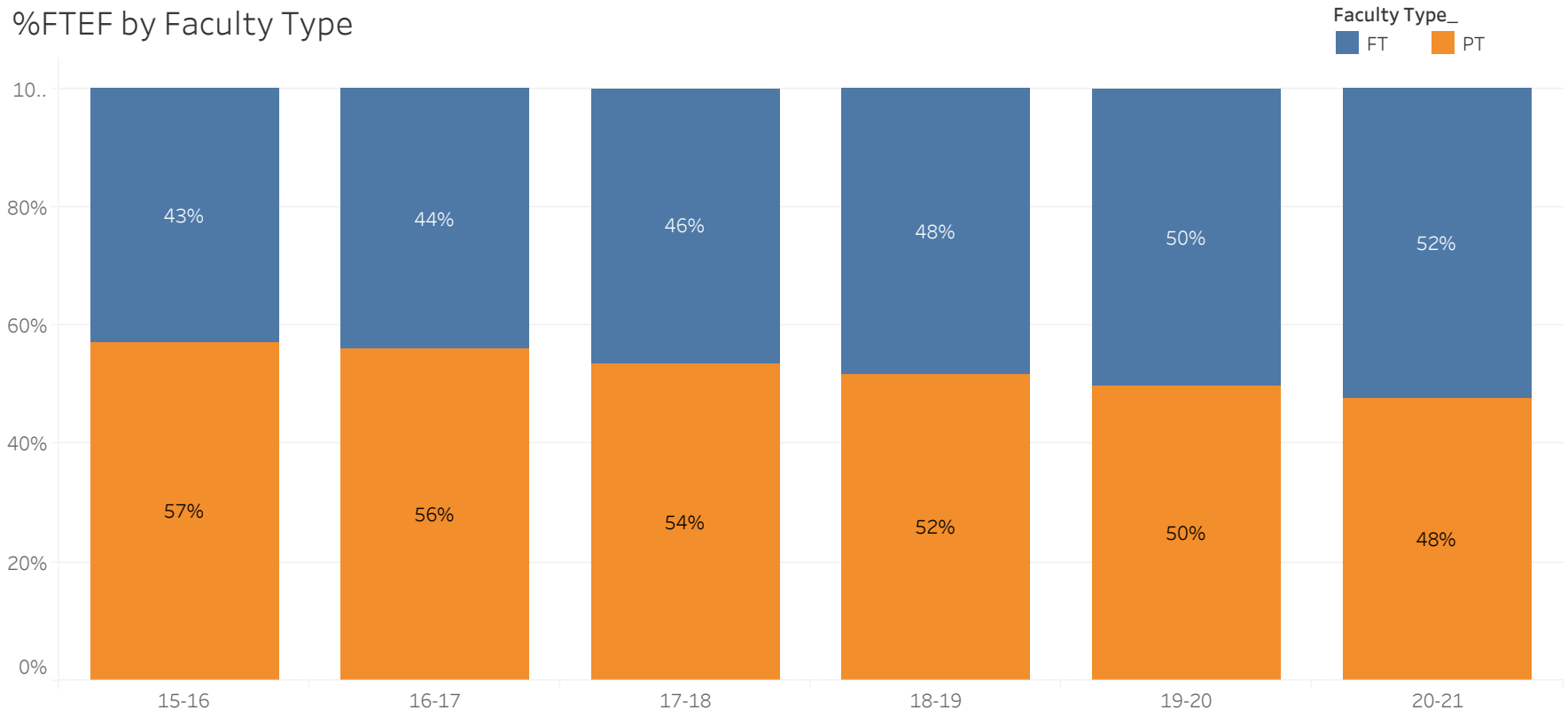
Overload



7 FTEF+Overload by Faculty Type Allan Hancock College

		Academic Year					
Instruction ..	Faculty Type	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Instructional	Instructional - FT	310.594	331.703	344.107	343.923	340.591	328.688
	Instructional - PT	359.820	355.797	331.111	315.432	300.351	263.265
	Total	**670.414**	**687.500**	**675.218**	**659.355**	**640.942**	**591.953**
Grand Total		**670.414**	**687.500**	**675.218**	**659.355**	**640.942**	**591.953**

%FTEF by Faculty Type



Appendix A: Program/Course Demographics by Outcome BIOL

		Academic Year											
		2018-19				2019-20				2020-21			
		Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %
BIOL100	Under 20	317	76.4	90%	77%	340	80.1	91%	81%	283	65.8	90%	74%
	20-24	335	79.8	85%	73%	345	83.9	89%	81%	298	69.7	92%	78%
	25-29	62	15.4	87%	81%	80	18.8	87%	78%	59	14.1	83%	76%
	30-34	26	6.6	89%	86%	25	5.8	96%	96%	18	4.5	84%	79%
	35-39	12	2.9	100%	100%	10	2.4	100%	100%	16	3.9	71%	47%
	40-49	11	2.7	73%	64%	13	3.2	100%	92%	12	2.8	91%	82%
	50+	3	0.6	67%	67%	3	0.6	100%	100%	3	0.7	33%	33%
BIOL120	Under 20	93	9.1	99%	85%	128	12.6	94%	81%	89	8.8	93%	79%
	20-24	95	9.5	97%	84%	110	10.9	98%	88%	73	7.4	95%	85%
	25-29	36	3.5	86%	72%	23	2.3	95%	82%	23	2.3	78%	65%
	30-34	11	1.1	100%	82%	8	0.8	88%	88%	13	1.3	92%	85%
	35-39	7	0.7	100%	71%	5	0.5	100%	80%	4	0.4	100%	100%
	40-49	11	1.1	82%	73%	8	0.9	100%	89%	3	0.3	100%	100%
	50+	2	0.3	33%	33%	10	1.0	89%	89%	1	0.1	100%	100%
BIOL124	Under 20	122	28.7	44%	25%	152	35.9	64%	48%	145	34.1	51%	27%
	20-24	221	57.5	57%	37%	174	43.9	67%	49%	192	46.6	60%	35%
	25-29	74	19.8	64%	46%	74	18.2	77%	66%	83	21.6	65%	47%
	30-34	42	10.2	70%	48%	33	8.6	74%	68%	47	12.0	73%	55%
	35-39	18	4.8	65%	50%	18	4.4	80%	53%	29	7.1	86%	64%
	40-49	6	1.5	67%	50%	11	2.8	82%	55%	13	2.7	77%	62%
	50+	1	0.2	100%	0%	5	1.3	60%	60%	4	0.9	50%	25%
BIOL125	Under 20	14	3.0	86%	79%	13	2.8	92%	67%	31	6.9	85%	76%
	20-24	101	25.1	83%	63%	111	27.2	82%	69%	99	22.9	86%	60%
	25-29	44	11.1	83%	73%	47	10.6	96%	83%	43	9.7	91%	74%
	30-34	25	6.8	70%	52%	29	7.2	91%	82%	33	7.2	82%	71%
	35-39	13	3.3	79%	71%	8	1.7	100%	100%	14	2.9	100%	71%
	40-49	5	1.1	80%	80%	5	1.2	100%	100%	7	1.9	56%	33%
	50+					2	0.5	100%	100%				
BIOL128	Under 20	8	2.6	88%	88%	11	3.1	100%	100%	7	1.9	100%	86%
	20-24	90	30.7	90%	86%	70	20.6	89%	87%	90	25.6	92%	85%

Appendix A: Program/Course Demographics by Outcome BIOL

		Academic Year											
		2018-19				2019-20				2020-21			
		Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %
BIOL128	25-29	28	11.1	93%	90%	40	11.1	100%	100%	28	7.8	100%	100%
	30-34	14	4.8	71%	71%	22	6.4	95%	95%	29	8.1	97%	97%
	35-39	7	1.9	86%	71%	9	2.5	100%	100%	9	2.5	100%	100%
	40-49	7	2.2	100%	86%	7	1.9	86%	86%	6	1.7	100%	83%
BIOL132	Under 20	23	4.8	91%	83%	26	5.5	88%	71%	17	3.6	94%	65%
	20-24	30	6.3	90%	77%	23	4.8	90%	76%	15	3.2	87%	67%
	25-29	2	0.4	50%	50%	5	1.1	100%	80%	5	1.1	100%	100%
	30-34									1	0.2	0%	0%
	35-39	1	0.2	100%	100%								
	40-49									1	0.2	100%	100%
	50+					2	0.4	100%	100%	2	0.4	100%	100%
BIOL150	Under 20	20	6.3	95%	85%	20	6.3	100%	90%	18	5.7	100%	94%
	20-24	45	14.9	83%	74%	43	14.9	93%	83%	27	9.8	90%	71%
	25-29	11	3.5	82%	82%	8	2.5	88%	88%	3	1.0	100%	100%
	30-34	4	1.3	75%	75%	3	1.0	100%	100%	1	0.3	100%	100%
	35-39	1	0.3	100%	100%					1	0.3	100%	100%
	40-49									1	0.3	100%	100%
BIOL154	Under 20	2	0.6	100%	50%	6	1.9	100%	100%	10	3.2	100%	80%
	20-24	25	7.9	100%	96%	31	9.8	90%	90%	35	11.1	91%	79%
	25-29	4	1.3	100%	75%	6	1.9	83%	83%	7	2.2	86%	86%
	30-34	1	0.3	100%	100%	2	0.6	100%	100%	1	0.3	100%	100%
	40-49	1	0.3	100%	100%	1	0.3	0%	0%				
BIOL155	Under 20	1	0.3	100%	100%	6	1.9	100%	100%	4	1.3	75%	75%
	20-24	22	7.0	77%	55%	34	11.1	86%	77%	23	7.3	91%	74%
	25-29	4	1.3	75%	50%	7	2.2	86%	86%	5	1.6	80%	80%
	30-34					1	0.3	0%	0%	2	0.6	100%	100%
	40-49									1	0.3	0%	0%
BIOL189	20-24	6	0.2	100%	100%	4	0.2	100%	100%	1	0.0	100%	100%
	25-29	1	0.0	100%	100%	1	0.0	100%	100%				
	30-34	1	0.0	100%	100%								

Appendix A: Program/Course Demographics by Outcome BIOL

		Academic Year											
		2018-19				2019-20				2020-21			
		Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %	Headcou..	FTES	Retention %	Success %
BIOL189	35-39	1	0.0	100%	100%	1	0.0	100%	100%				
	40-49	2	0.1	100%	100%								
BIOL196	20-24	3	0.1	100%	100%								
	25-29	1	0.0	100%	100%								
	30-34					1	0.0	100%	100%				
	35-39	1	0.0	100%	100%								

Appendix B: Major match detail

--If a student has the same program of study and major as the award earned they will be a 'Major Match'. If not they will be a 'Major Split'.
--Headcount & Percentages are the students who are a major match/split for a specific award.
--Data is sorted by program/major of the earned award.

						Academic Year Graduation Desc					
Major Match	Program Desc	Degree	Degree Major	Student Major	Degree Desc (group)	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Match	Biology	AA	Biology	Biology	Associate in Arts	8	9	10	10	8	9
		AS-T	Biology for Transfer CSU	Biology for Transfer CSU	Associate in Science-Tra..					2	
			Biology for Transfer UC	Biology for Transfer UC	Associate in Science-Tra..						3
		Total				**8**	**9**	**10**	**10**	**10**	**12**
	Total					**8**	**9**	**10**	**10**	**10**	**12**
Split	Biology	AA	Biology	Biology for Transfer CSU	Associate in Arts					3	1
				Biology for Transfer UC	Associate in Arts						1
				Chemistry	Associate in Arts	1	1				
				Chemistry for Transfer CSU	Associate in Arts					1	
				Engineering	Associate in Arts		1	1			
				English for Transfer CSU	Associate in Arts					1	
				Liberal Arts	Associate in Arts	1					
				Mathematics and Science CSU	Associate in Arts	1			2		
				Mathematics and Science UC	Associate in Arts				1		2
				Psychology	Associate in Arts	1		1			
				Undeclared	Associate in Arts	1		1			
		AS-T	Biology for Transfer CSU	Arts and Humanities CSU	Associate in Science-Tra..						1
				Biology	Associate in Science-Tra..				3	3	1
				Biology for Transfer UC	Associate in Science-Tra..						2
				Chemistry for Transfer CSU	Associate in Science-Tra..					1	
				Mathematics and Science CSU	Associate in Science-Tra..				1		
				Psychology	Associate in Science-Tra..			1			
			Biology for Transfer UC	Arts and Humanities CSU	Associate in Science-Tra..						1
				Biology	Associate in Science-Tra..					2	2
				Biology for Transfer CSU	Associate in Science-Tra..					1	3
				Mathematics and Science UC	Associate in Science-Tra..						4
		Total				**5**	**2**	**3**	**6**	**11**	**16**
	Total					**5**	**2**	**3**	**6**	**11**	**16**
Grand Total						**13**	**11**	**13**	**14**	**18**	**24**

Program Learning Outcomes (PLO): Biology- List of PLOs for the selected program.

Biology	BIOL PSLO - Apply biological knowledge in environments other than the classroom.	.
	BIOL PSLO - Demonstrate current knowledge of evolutionary principles.	.
	BIOL PSLO - Demonstrate effective communication using the language, concepts and models of biology.	.
	BIOL PSLO - Demonstrate effective content knowledge of biodiversity.	.
	BIOL PSLO - Demonstrate proficient research skills in data gathering and analysis.	.

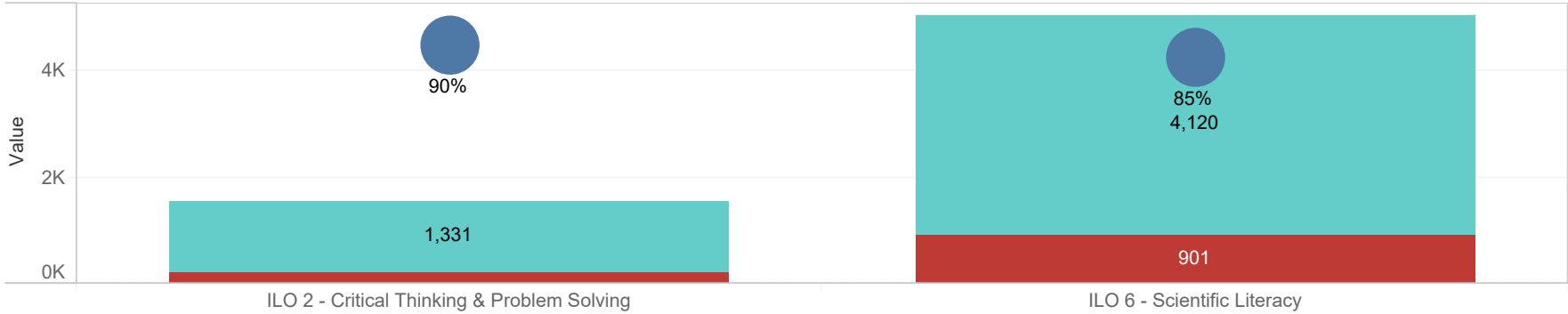
The view is broken down by Department and SLO. The view is filtered on Department, which keeps Biology.

Biology

Program

Number Met
Number Not Met
Avg. Percent Met

ILO Performance Chart: Biology- This is the ILO performance of the program for the past 6 academic years in a table that includes the number of courses that are connected to each ILO.



ILO Performance Table: Biology- This is the ILO performance of the program for the past 6 academic years.

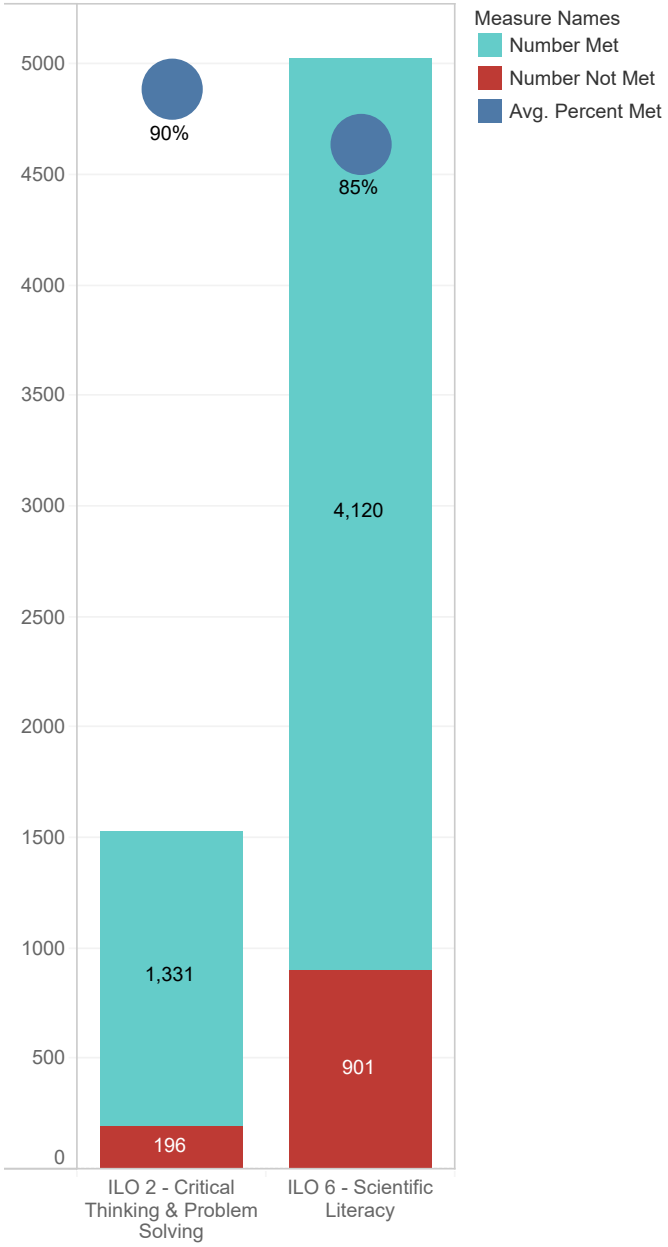
	# of Connected Courses	Avg. Percent Met	Number Met	Number Not Met
ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.	4	90%	1,331	196
ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges.	8	85%	4,120	901

ILO Performance Table: Biology- This is the ILO performance of the program for the past 6 academic years.

	# of Connected Courses	Avg. Percent Met	Number Met	Number Not Met
ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.	4	90%	1,331	196
ILO 6 - Scientific Literacy: Use scientific knowledge and methodologies to assess potential solutions to real-life challenges.	8	85%	4,120	901

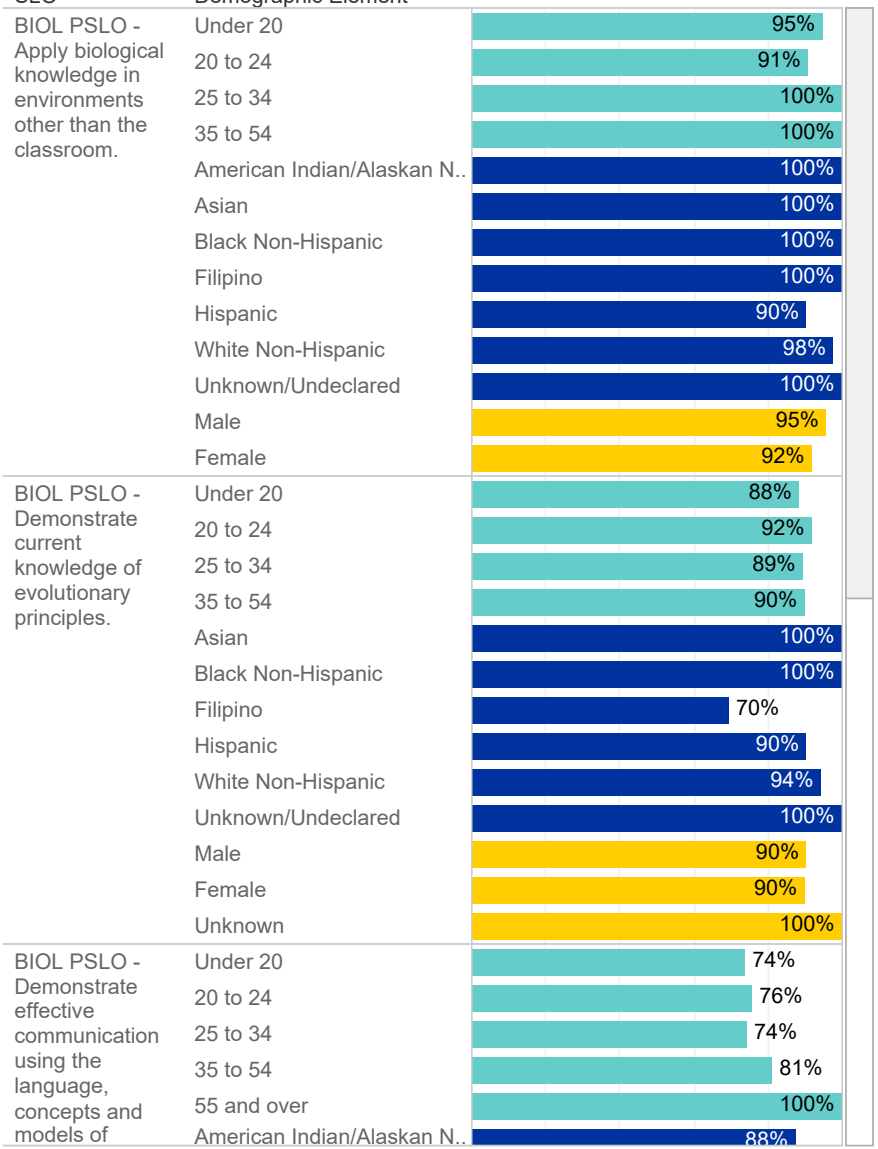
ILO Performance Chart: Biology-

This is the ILO performance of the program for the past 6 academic years in a table that includes the number of courses that are connected to each ILO.



Program	Demographic Category	Term
Biology	All	All

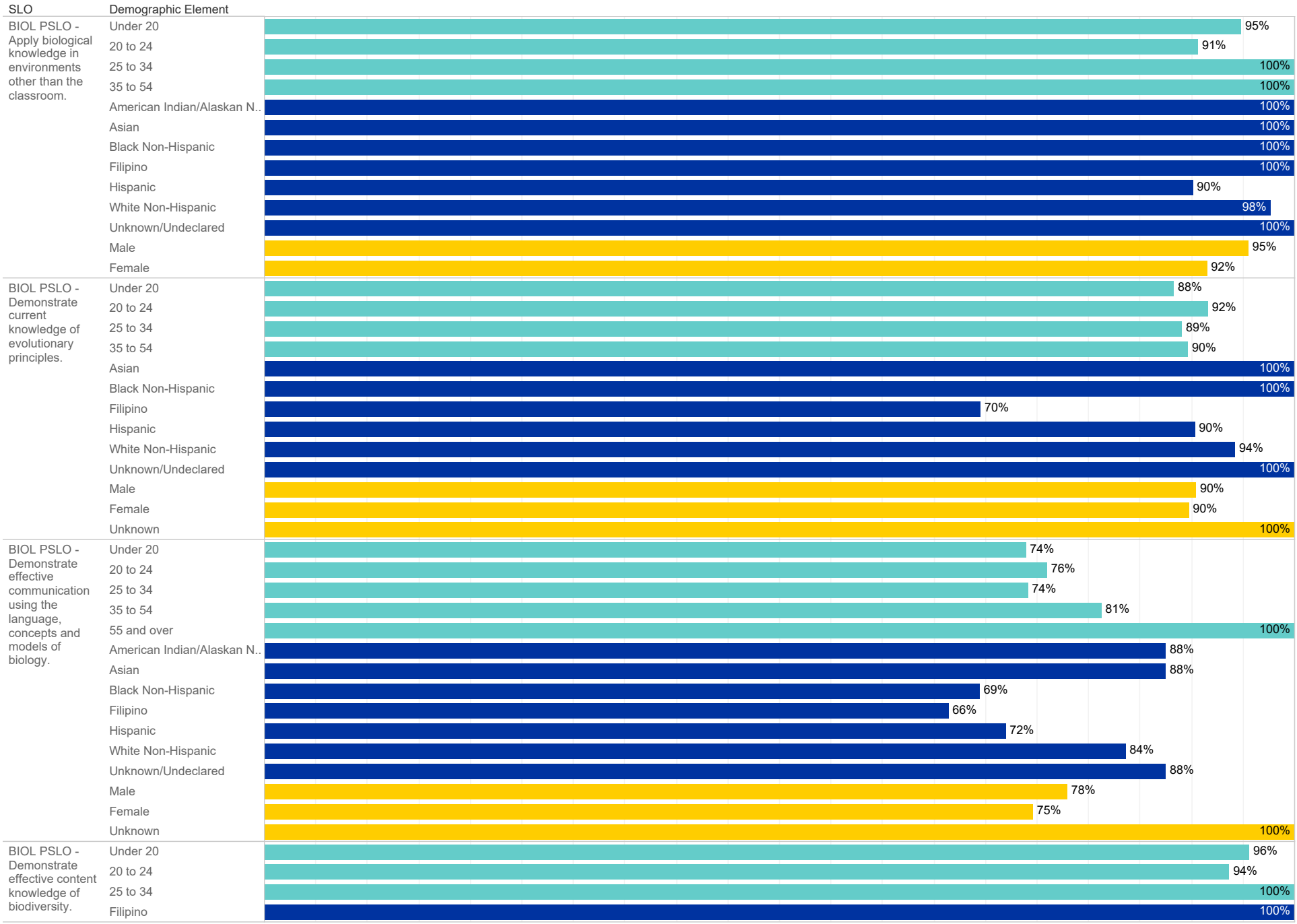
PLO Performance by Demographic Chart: Biology- This is the chart of the **percent of students that met the standard** of the given PLO.



PLO Performance by Demographic: Biology- This chart shows the PLO performance reported by gender, ethnicity, first-gen, etc.

		Met	Not Met	Percent ..
BIOL PSLO - Apply biological knowledge in environments other than the classroom.	Under 20	74	4	95%
	20 to 24	116	12	91%
	25 to 34	24	0	100%
	35 to 54	8	0	100%
	American Indian/Alaska..	2	0	100%
	Asian	9	0	100%
	Black Non-Hispanic	4	0	100%
	Filipino	6	0	100%
	Hispanic	110	12	90%
	White Non-Hispanic	83	2	98%
	Unknown/Undeclared	2	0	100%
	Female	119	11	92%
	Male	106	5	95%
	Total	663	46	94%
BIOL PSLO - Demonstrate current knowledge of evolutionary principles.	Under 20	30	4	88%
	20 to 24	142	13	92%
	25 to 34	90	11	89%
	35 to 54	26	3	90%
	Asian	2	0	100%
	Black Non-Hispanic	4	0	100%
	Filipino	16	7	70%
	Hispanic	159	17	90%
	White Non-Hispanic	98	6	94%
	Unknown/Undeclared	2	0	100%
	Female	211	24	90%
	Male	76	8	90%
	Unknown	2	0	100%
	Total	858	93	90%
BIOL PSLO - Demonstrate effective communication using the language, concepts and models of biology.	Under 20	227	80	74%
	20 to 24	676	214	76%
	25 to 34	356	124	74%
	35 to 54	91	21	81%

PLO Performance by Demographic Chart: Biology- This is the chart of the **percent of students that met the standard** of the given PLO.



PLO Performance by Demographic Chart: Biology- This is the chart of the **percent of students that met the standard** of the given PLO.

PLO Performance by Demographic: Biology- This chart shows the PLO performance reported by gender, ethnicity, first-gen, etc.

		Met	Not Met	Percent ..
BIOL PSLO - Apply biological knowledge in environments other than the classroom.	Under 20	74	4	95%
	20 to 24	116	12	91%
	25 to 34	24	0	100%
	35 to 54	8	0	100%
	American Indian/Alaska..	2	0	100%
	Asian	9	0	100%
	Black Non-Hispanic	4	0	100%
	Filipino	6	0	100%
	Hispanic	110	12	90%
	White Non-Hispanic	83	2	98%
	Unknown/Undeclared	2	0	100%
	Female	119	11	92%
	Male	106	5	95%
	Total	663	46	94%
BIOL PSLO - Demonstrate current knowledge of evolutionary principles.	Under 20	30	4	88%
	20 to 24	142	13	92%
	25 to 34	90	11	89%
	35 to 54	26	3	90%
	Asian	2	0	100%
	Black Non-Hispanic	4	0	100%
	Filipino	16	7	70%
	Hispanic	159	17	90%
	White Non-Hispanic	98	6	94%
	Unknown/Undeclared	2	0	100%
	Female	211	24	90%
	Male	76	8	90%
	Unknown	2	0	100%
	Total	858	93	90%
BIOL PSLO - Demonstrate effective communication using the language, concepts and models of biology.	Under 20	227	80	74%
	20 to 24	676	214	76%
	25 to 34	356	124	74%
	35 to 54	91	21	81%

PLO Performance by Demographic: Biology- This chart shows the PLO performance reported by gender, ethnicity, first-gen, etc.

		Met	Not Met	Percent ..
BIOL PSLO - Demonstrate effective communication using the language, concepts and models of biology.	55 and over	4	0	100%
	American Indian/Alaska..	14	2	88%
	Asian	49	7	88%
	Black Non-Hispanic	25	11	69%
	Filipino	79	40	66%
	Hispanic	720	281	72%
	White Non-Hispanic	454	89	84%
	Unknown/Undeclared	7	1	88%
	Female	965	328	75%
	Male	391	111	78%
	Unknown	2	0	100%
	Total	4,060	1,309	76%
BIOL PSLO - Demonstrate effective content knowledge of biodiversity.	Under 20	22	1	96%
	20 to 24	44	3	94%
	25 to 34	8	0	100%
	Filipino	4	0	100%
	Hispanic	39	3	93%
	White Non-Hispanic	25	1	96%
	Female	46	1	98%
	Male	28	3	90%
	Total	216	12	95%
BIOL PSLO - Demonstrate proficient research skills in data gathering and analysis.	Under 20	76	7	92%
	20 to 24	258	35	88%
	25 to 34	151	11	93%
	35 to 54	34	6	85%
	American Indian/Alaska..	3	0	100%
	Asian	17	1	94%
	Black Non-Hispanic	5	2	71%
	Filipino	40	5	89%
	Hispanic	274	38	88%
	White Non-Hispanic	170	11	94%
	Female	377	43	90%

PLO Performance by Demographic: Biology- This chart shows the PLO performance reported by gender, ethnicity, first-gen, etc.

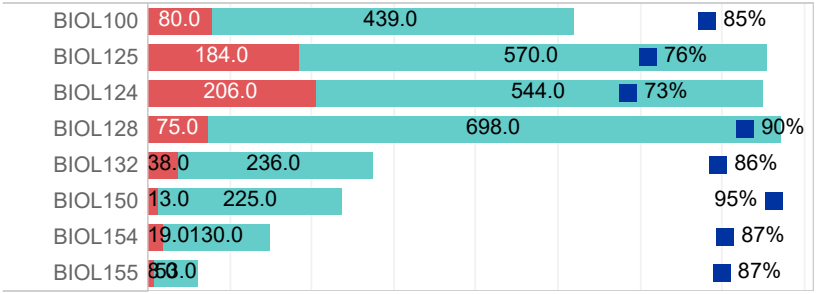
		Met	Not Met	Percent ..
Demonstrate proficient research skills in data gathering and analysis.	Male	145	17	90%
	Total	1,550	176	90%

Program
Biology

Term
All

Number Met
Number Not Met
Percent Met

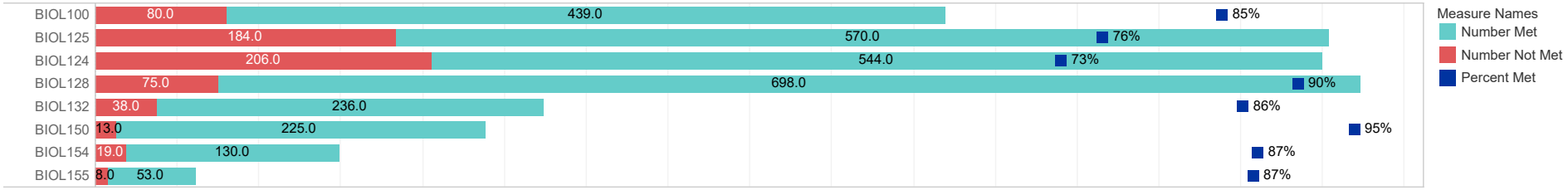
6. Historical Course Performance: Biology- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Biology- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
BIOL100	BIOL100.1	BIOL100 SLO1 - Identify and describe each level of biological organization, from the chemical to the ecosystem level.	30.0	10.0	75%
	BIOL100.2	BIOL100 SLO2 - Describe metabolism at the cellular level and how it is central to life processes, such as respiration, reproduction, a..	106.0	44.0	71%
	BIOL100.3	BIOL100 SLO3 - Describe evolution in a scientific context.	75.0	13.0	85%
	BIOL100.4	BIOL100 SLO4 - Differentiate between the taxonomic classification of living organisms.	41.0	13.0	76%
	BIOL100.5	BIOL100 SLO5 - Apply the scientific method to specific biological investigations.	99.0	0.0	100%
	BIOL100.6	BIOL100 SLO6 - Demonstrate appropriate lab technique and lab safety protocols.	88.0	0.0	100%
BIOL124	BIOL124.1	BIOL124 SLO1 - Distinguish the roles of organ system components in maintaining organismic function.	99.0	67.0	60%
	BIOL124.2	BIOL124 SLO2 - Recognize the structural and functional characteristics of organ systems involved in support, movement, inte..	147.0	84.0	64%
	BIOL124.3	BIOL124 SLO3 - Learn the functional anatomy of respiratory, digestive, and urinary systems.	166.0	15.0	92%
	BIOL124.4	BIOL124 SLO4 - Distinguish the male and female reproductive systems with a respect to their roles in the human reproductive process.	132.0	40.0	77%
BIOL125	BIOL125.1	BIOL125 SLO1 - Compare and contrast physiological cell functions.	82.0	63.0	57%
	BIOL125.2	BIOL125 SLO2 - Compare and contrast regulatory processes.			

6. Historical Course Performance: Biology- This is SLO assessment by course, including percent and number of students that met standards.



Historical CLO Performance Table: Biology- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
BIOL100	BIOL100.1	BIOL100 SLO1 - Identify and describe each level of biological organization, from the chemical to the ecosystem level.	30.0	10.0	75%
	BIOL100.2	BIOL100 SLO2 - Describe metabolism at the cellular level and how it is central to life processes, such as respiration, reproduction, a..	106.0	44.0	71%
	BIOL100.3	BIOL100 SLO3 - Describe evolution in a scientific context.	75.0	13.0	85%
	BIOL100.4	BIOL100 SLO4 - Differentiate between the taxonomic classification of living organisms.	41.0	13.0	76%
	BIOL100.5	BIOL100 SLO5 - Apply the scientific method to specific biological investigations.	99.0	0.0	100%
	BIOL100.6	BIOL100 SLO6 - Demonstrate appropriate lab technique and lab safety protocols.	88.0	0.0	100%
BIOL124	BIOL124.1	BIOL124 SLO1 - Distinguish the roles of organ system components in maintaining organismic function.	99.0	67.0	60%
	BIOL124.2	BIOL124 SLO2 - Recognize the structural and functional characteristics of organ systems involved in support, movement, inte..	147.0	84.0	64%
	BIOL124.3	BIOL124 SLO3 - Learn the functional anatomy of respiratory, digestive, and urinary systems.	166.0	15.0	92%
	BIOL124.4	BIOL124 SLO4 - Distinguish the male and female reproductive systems with a respect to their roles in the human reproductive process.	132.0	40.0	77%
BIOL125	BIOL125.1	BIOL125 SLO1 - Compare and contrast physiological cell functions.	82.0	63.0	57%

Historical CLO Performance Table: Biology- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
BIOL125	BIOL125.2	BIOL125 SLO2 - Compare and contrast regulatory processes.	75.0	21.0	78%
	BIOL125.3	BIOL125 SLO3 - Distinguish the interactive roles of various organ systems.	143.0	54.0	73%
	BIOL125.4	BIOL125 SLO4 - Synthesize physiological concepts into an understanding of the broader process of organic metabolism.	173.0	21.0	89%
	BIOL125.5	BIOL125 SLO5 - Analyze bioelectrical phenomena.	97.0	25.0	80%
BIOL128	BIOL128.1	BIOL128 SLO1 - Demonstrate the ability to identify, describe and compare prokaryotic and eukaryotic cell structures.	176.0	20.0	90%
	BIOL128.2	BIOL128 SLO2 - Demonstrate the ability to identify and explain the major catabolic and anabolic pathways of cells and/or processes ..	121.0	22.0	85%
	BIOL128.3	BIOL128 SLO3 - Use and explain the equipment, materials and procedures for the cultivation, identification and investigation of bacteria.	95.0	3.0	97%
	BIOL128.4	BIOL128 SLO4 - Demonstrate the ability to define the general concept of aseptic technique and to list/describe/explain specific applicat..	52.0	0.0	100%
	BIOL128.5	BIOL128 SLO5 - Demonstrate the ability to identify and/or discuss principles of disease and epidemiology and host defenses for ..	254.0	30.0	89%
BIOL132	BIOL132.1	BIOL132 SLO1 - Investigate, identify and discuss the abiotic and biotic adaptations of marine organisms to tidal communities.	66.0	7.0	90%
	BIOL132.2	BIOL132 SLO2 - Identify and discuss the geological development and influence of geology on the ecology of the world's oceans.	7.0	3.0	70%

Historical CLO Performance Table: Biology- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
BIOL132	BIOL132.3	BIOL132 SLO3 - Demonstrate an understanding of the differences of the major marine communities along the California Central Coast.	65.0	9.0	88%
	BIOL132.4	BIOL132 SLO4 - Discuss the impact of human's activities on the marine environment.	51.0	8.0	86%
	BIOL132.5	BIOL132 SLO5 - Analyze the functional design of pelagic and benthic marine animals to their respective marine habitat.	7.0	3.0	70%
	BIOL132.6	BIOL132 SLO6 - Compare and contrast evolutionary complexity within and between taxonomic groups of marine vertebrates, invert..	40.0	8.0	83%
BIOL150	BIOL150.1	BIOL150 SLO1 - Compare and contrast the major types of cells.	75.0	5.0	94%
	BIOL150.2	BIOL150 SLO2 - Discuss the metabolic pathways of photosynthesis, respiration, and the storage and degradation of biologic..	45.0	5.0	90%
	BIOL150.3	BIOL150 SLO3 - Investigate and analyze problems utilizing the scientific method to formulate an understanding of enzymatic action, ..	20.0	3.0	87%
	BIOL150.4	BIOL150 SLO4 - Solve problems, hypothesize, and investigate hereditary patterns related to transmission genetics.	43.0	0.0	100%
	BIOL150.5	BIOL150 SLO5 - Demonstrate an understanding of DNA technology and critically evaluate their potential uses.	42.0	0.0	100%
BIOL154	BIOL154.2	BIOL154 SLO2 -Describe physiological process related to photosynthesis, transpiration and translocation and how..	57.0	6.0	90%
	BIOL154.3	BIOL154 SLO3 - Display understanding of the development of phylogenies and the evolutionary adaptations of..	18.0	8.0	69%

Historical CLO Performance Table: Biology- This is a chart of the table above.

			Number Met	Number Not Met	Percent Met
BIOL154	BIOL154.4	BIOL154 SLO4 - Analyze the process of evolution as reflected in the current taxonomy of botanical organisms.	29.0	0.0	100%
	BIOL154.6	BIOL154 SLO6 - Employ scientific reasoning to written exercises and laboratory exercises, and ethical practices in..	26.0	5.0	84%
BIOL155	BIOL155.1	BIOL155 SLO1 - Identify examples of animal behaviors and evolutionary significance of these behaviors.	16.0	4.0	80%
		BIOL155 SLO1 - Recognize ecological patterns and discern the roles of significant species within complex communities.	22.0	0.0	100%
	BIOL155.5	BIOL155 SLO5 - Distinguish anatomical structures of members of both invertebrate and vertebrate taxa	15.0	4.0	79%

Course Learning Outcomes- Program
Biology

Toggle PLO/CLO

Course Learning Outcomes: Biology- List of CLOs for the selected program.

Course	CLO ERP	
BIOL128	BIOL128.5	
BIOL132	BIOL132.1	BIOL132 SLO1 - Investigate, identify and discuss the abiotic and biotic adaptations of marine organisms to tidal communities.
	BIOL132.2	BIOL132 SLO2 - Identify and discuss the geological development and influence of geology on the ecology of the world's oceans.
	BIOL132.3	BIOL132 SLO3 - Demonstrate an understanding of the differences of the major marine communities along the California Central Coast.
	BIOL132.4	BIOL132 SLO4 - Discuss the impact of human's activities on the marine environment.
	BIOL132.5	BIOL132 SLO5 - Analyze the functional design of pelagic and benthic marine animals to their respective marine habitat.
	BIOL132.6	BIOL132 SLO6 - Compare and contrast evolutionary complexity within and between taxonomic groups of marine vertebrates, invertebrates, and marine plants.
BIOL150	BIOL150.1	BIOL150 SLO1 - Compare and contrast the major types of cells.
	BIOL150.2	BIOL150 SLO2 - Discuss the metabolic pathways of photosynthesis, respiration, and the storage and degradation of biological molecules.
	BIOL150.3	BIOL150 SLO3 - Investigate and analyze problems utilizing the scientific method to formulate an understanding of enzymatic action, cellular transport, photosynthesis, genetics, and cellular respiration.
	BIOL150.4	BIOL150 SLO4 - Solve problems, hypothesize, and investigate hereditary patterns related to transmission genetics.
	BIOL150.5	BIOL150 SLO5 - Demonstrate an understanding of DNA technology and critically evaluate their potential uses.
BIOL154	BIOL154.1	BIOL154 SLO1 - Identify and discuss the anatomical structures of plants and how they relate to ecological niches.
	BIOL154.2	BIOL154 SLO2 - Compare and contrast the metabolic processes and their importance in maintaining the viability of a plant. ...

Course Learning Outcomes: **Biology-** List of CLOs for the selected program.

Course	CLO_ERP	
BIOL100	BIOL100.1	BIOL100 SLO1 - Identify and describe each level of biological organization, from the chemical to the ecosystem level.
	BIOL100.2	BIOL100 SLO2 - Describe metabolism at the cellular level and how it is central to life processes, such as respiration, reproduction, and inheritance.
	BIOL100.3	BIOL100 SLO3 - Describe evolution in a scientific context.
	BIOL100.4	BIOL100 SLO4 - Differentiate between the taxonomic classification of living organisms.
	BIOL100.5	BIOL100 SLO5 - Apply the scientific method to specific biological investigations.
	BIOL100.6	BIOL100 SLO6 - Demonstrate appropriate lab technique and lab safety protocols.
BIOL120	BIOL120.1	BIOL120 SLO1 - Identify, outline, and explain human impacts and resource use on natural systems.
	BIOL120.2	BIOL120 SLO2 - Describe and/or evaluate the role of science in identifying or solving environmental problems.
	BIOL120.3	BIOL120 SLO3 - Identify and describe the major concepts of ecosystem structure and function.
	BIOL120.4	BIOL120 SLO4 - Enumerate and explain basic features and concepts of population biology and apply these concepts to human populations.
	BIOL120.5	BIOL120 SLO5 - Identify and describe the specific factors important in the growth or change of human populations.
	BIOL120.6	BIOL120 SLO6 - Define and describe the concepts and values of biological diversity and identify current trends in biodiversity and their causative factors.
BIOL124	BIOL124.1	BIOL124 SLO1 - Distinguish the roles of organ system components in maintaining organismic function.

CLO broken down by Course and CLO_ERP. The data is filtered on Program, which keeps Biology.

Course Learning Outcomes: **Biology-** List of CLOs for the selected program.

Course	CLO_ERP	
BIOL124	BIOL124.2	BIOL124 SLO2 - Recognize the structural and functional characteristics of organ systems involved in support, movement, integration, and transport.
	BIOL124.3	BIOL124 SLO3 - Learn the functional anatomy of respiratory, digestive, and urinary systems.
	BIOL124.4	BIOL124 SLO4 - Distinguish the male and female reproductive systems with a respect to their roles in the human reproductive process.
BIOL125	BIOL125.1	BIOL125 SLO1 - Compare and contrast physiological cell functions.
	BIOL125.2	BIOL125 SLO2 - Compare and contrast regulatory processes.
	BIOL125.3	BIOL125 SLO3 - Distinguish the interactive roles of various organ systems.
	BIOL125.4	BIOL125 SLO4 - Synthesize physiological concepts into an understanding of the broader process of organic metabolism.
	BIOL125.5	BIOL125 SLO5 - Analyze bioelectrical phenomena.
BIOL128	BIOL128.1	BIOL128 SLO1 - Demonstrate the ability to identify, describe and compare prokaryotic and eukaryotic cell structures.
	BIOL128.2	BIOL128 SLO2 - Demonstrate the ability to identify and explain the major catabolic and anabolic pathways of cells and/or processes of heredity in microorganisms.
	BIOL128.3	BIOL128 SLO3 - Use and explain the equipment, materials and procedures for the cultivation, identification and investigation of bacteria.
	BIOL128.4	BIOL128 SLO4 - Demonstrate the ability to define the general concept of aseptic technique and to list/describe/explain specific applications of aseptic technique in a microbiology laboratory setting.
	BIOL128.5	BIOL128 SLO5 - Demonstrate the ability to identify and/or discuss principles of disease and epidemiology and host defenses for infectious disease.

CLO broken down by Course and CLO_ERP. The data is filtered on Program, which keeps Biology.

Course Learning Outcomes: Biology- List of CLOs for the selected program.

Course	CLO_ERP	
BIOL132	BIOL132.1	BIOL132 SLO1 - Investigate, identify and discuss the abiotic and biotic adaptations of marine organisms to tidal communities.
	BIOL132.2	BIOL132 SLO2 - Identify and discuss the geological development and influence of geology on the ecology of the world's oceans.
	BIOL132.3	BIOL132 SLO3 - Demonstrate an understanding of the differences of the major marine communities along the California Central Coast.
	BIOL132.4	BIOL132 SLO4 - Discuss the impact of human's activities on the marine environment.
	BIOL132.5	BIOL132 SLO5 - Analyze the functional design of pelagic and benthic marine animals to their respective marine habitat.
	BIOL132.6	BIOL132 SLO6 - Compare and contrast evolutionary complexity within and between taxonomic groups of marine vertebrates, invertebrates, and marine plants.
BIOL150	BIOL150.1	BIOL150 SLO1 - Compare and contrast the major types of cells.
	BIOL150.2	BIOL150 SLO2 - Discuss the metabolic pathways of photosynthesis, respiration, and the storage and degradation of biological molecules.
	BIOL150.3	BIOL150 SLO3 - Investigate and analyze problems utilizing the scientific method to formulate an understanding of enzymatic action, cellular transport, photosynthesis, genetics, and cellular respiration.
	BIOL150.4	BIOL150 SLO4 - Solve problems, hypothesize, and investigate hereditary patterns related to transmission genetics.
	BIOL150.5	BIOL150 SLO5 - Demonstrate an understanding of DNA technology and critically evaluate their potential uses.
BIOL154	BIOL154.1	BIOL154 SLO1 - Identify and discuss the anatomical structures of plants and how they relate to ecological niches.
	BIOL154.2	BIOL154 SLO2 - Compare and contrast the metabolic processes and their importance in maintaining the viability of a plant. ...

CLO broken down by Course and CLO_ERP. The data is filtered on Program, which keeps Biology.

Course Learning Outcomes: **Biology-** List of CLOs for the selected program.

Course	CLO_ERP	
BIOL154	BIOL154.3	BIOL154 SLO3 - Display understanding of the development of phylogenies and the evolutionary adaptations of botanical taxa.
	BIOL154.4	BIOL154 SLO4 - Analyze the process of evolution as reflected in the current taxonomy of botanical organisms. BIOL154 SLO4 -Describe the reproductive strategies as reflected in the life cycles of fungi, protists and plants.
	BIOL154.5	BIOL154 SLO5 - Demonstrate understanding of nutrient recycling and trophic levels of ecosystems, populations and communities.
	BIOL154.6	BIOL154 SLO6 - Employ scientific reasoning to written exercises and laboratory exercises, and ethical practices in reporting data.
BIOL155	BIOL155.1	BIOL155 SLO1 - Identify examples of animal behaviors and evolutionary significance of these behaviors. BIOL155 SLO1 - Recognize ecological patterns and discern the roles of significant species within complex communities.
	BIOL155.2	BIOL155 SLO2 - Identify the major characteristics and significant evolutionary trends in structure and function in the animal phyla.
	BIOL155.3	BIOL155 SLO3 - Discuss the non-photosynthetic, one celled eukaryotic taxa to the origin of multicellularity.
	BIOL155.4	BIOL155 SLO4 - Compare and contrast the physiological functions in the animal phyla.
	BIOL155.5	BIOL155 SLO5 - Describe mechanisms of evolutionary change and evidence for evolution. BIOL155 SLO5 - Distinguish anatomical structures of members of both invertebrate and vertebrate taxa
	BIOL155.6	BIOL155 SLO6 - Apply the scientific method and critical thinking skills through experimentation.
	BIOL155.7	BIOL155 SLO7 - Demonstrate scientific writing skills through the acquisition, use, and citation of scientific literature.

CLO broken down by Course and CLO_ERP. The data is filtered on Program, which keeps Biology.

Articulation Status of Courses

CATALOG DESCRIPTION

An introduction to the concepts of biology with emphasis on their relevance to current problems of the world. Designed for majors in fields other than biological science, the course stresses genetics, cell biology, evolution, reproduction, ecology, behavior, and diversity of plants and animals.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	BIO 1150 & And BIO 1150L	Basic Biology (3) And Basic Biology Lab (1)
or +BIOL 150	Cal Poly San Luis Obispo	BIO 111 Or BIO 213 And BMED 213	General Biology (4) Life Science for Engineers (2) Bioengineering Fundamentals (2)
	CSU Bakersfield	BIOL 1009	Perspectives in Biology (5)
	CSU Channel Islands	BIOL 100 Or BIOL 170	Exploring the Living World (4) Or Foundations of Life Sciences (4)
Or BIOL 150	CSU Chico	BIOL 102	Introductions to Living Systems (3)
	CSU Dominguez Hills	BIO 102 and BIO 103	General Biology (3) and Lab (1)
	CSU East Bay	BIOL 100 Or BIOL 101 and BIOL 102	Basic Concepts in Biology (5) Or Introduction to Biology (4) and Introduction to Biology Laboratory (1)
	CSU Fresno	BIOL10	Life Science (3)
	CSU Fullerton	BIOL 101 and 101L	Elements of Biology (3) and Lab (1)
	CSU Long Beach	BIOL 200	General Biology (4)
	CSU Los Angeles	**NEED Artic Request**	BIOL 101, General Biology (3)
	CSU Monterey Bay	BIO 204	Introduction to Life Sciences (2-3)
	CSU Northridge	BIOL 100 and BIOL 100L	Introductory Biology (3) and Introductory Biology Lab (1)
	CSU Sacramento	- - - - - - - - - - - - - - - - - -	Denied Articulation request not accepted because no equivalent major preparation course
	CSU San Bernardino	BIOL 1000	Introduction to Biology (4)

		and BIOL 1000L	and Introduction to Biology Lab (1)
	CSU San Marcos	- - - - - - - - - - - - - - - - - -	NEC
	CSU Stanislaus	- - - - - - - - - - - - - - - - - -	NEC
	Humboldt State	BIOL 104	General Biology (4)
NOTE: Very old articulation. SDSU doesn't update our articulations.	San Diego State	BIOL100 and BIOL100L	General Biology (3) and General Biology Lab (1)
	San Francisco State	- - - - - - - - - - - - - - - - - -	NEC
	San Jose State	BIOL 10	The Living World (3)
	Sonoma State	BIOL 110	Biological Inquiry (4)
	UC Transferable	Yes	
	UC Berkeley	BIOLOGY 11 and BIOLOGY 11L	Introductory Science Living Organisms (3) and Laboratory For Biology (2)
	UC Davis	BIOL SCI 10	General Biology (4)
	UC Irvine	- - - - - - - - - - - - - - - - - -	Denied Articulation request not accepted because no equivalent major preparation course
	UC Los Angeles	- - - - - - - - - - - - - - - - - -	NEC
	UC Merced	- - - - - - - - - - - - - - - - - -	NEC
	UC Riverside	BIOL 3	Organisms in Their Environment (4)
	UC San Diego	BILD 10	Fundamental Concepts of Modern Biology (4)
	UC Santa Barbara	MCDB 20	Concepts of Biology (4)
	UC Santa Cruz	- - - - - - - - - - - - - - - - - -	NEC
	C-ID	N/A	
	CSU GE	B2	
	IGETC	5B/5C	

BIOL 120 Humans and the Environment (3) **04/16/22**

CATALOG DESCRIPTION

Explores contemporary problems generated by human scientific, social and ethical interaction with the environment. Lectures examine the scope of present environmental problems, possible future impacts, and potential solutions. Topics include human impact on the environment, ecological controversies, ecosystem operation, water and energy perspectives, and values of wilderness preservation. Emphasis is on both local and global dimensions of the above topics.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	- - - - - - - - - - - - - - - - - -	Upper-Division Equivalent [Subject Credit Only for BIO 304]
	Cal Poly San Luis Obispo	- - - - - - - - - - - - - - - - - -	No Equivalent Course
	CSU Bakersfield	BIOL 1039	Principles of Ecology (5)
	CSU Channel Islands	ESRM 100	Introduction to Environmental Science and Resource Management (3)
	CSU Chico	- - - - - - - - - - - - - - - - - -	NEC
	CSU Dominguez Hills	- - - - - - - - - - - - - - - - - -	NEC
	CSU East Bay	- - - - - - - - - - - - - - - - - -	NEC
	CSU Fresno	- - - - - - - - - - - - - - - - - -	NEC
	CSU Fullerton	- - - - - - - - - - - - - - - - - -	NEC
	CSU Long Beach	- - - - - - - - - - - - - - - - - -	NEC
	CSU Los Angeles	- - - - - - - - - - - - - - - - - -	NEC
	CSU Monterey Bay	- - - - - - - - - - - - - - - - - -	NEC
	CSU Northridge	- - - - - - - - - - - - - - - - - -	NEC
	CSU Sacramento	- - - - - - - - - - - - - - - - - -	NEC
	CSU San Bernardino	- - - - - - - - - - - - - - - - - -	NEC
	CSU San Marcos	- - - - - - - - - - - - - - - - - -	Upper-Division Course BIOL 338, Human Impact on the Environment)
	CSU Stanislaus	BIOL 2650	Environmental Biology (3)
	Humboldt State	ENST 195	Topics in Nature/Culture (3)
Old articulation as SDSU doesn't articulate with us.	San Diego State	ENV S 100	Environmental Sciences (3)
	San Francisco State	NEED Artic Request	ENVS 130, Environmental Studies (3)
	San Jose State	ENVS 1	Introduction to Environmental Issues (3)
	Sonoma State	- - - - - - - - - - - - - - - - - -	NEC
	UC Transferable	Yes	
	UC Berkeley	Articulation Denied	[ENV SCI 10, Introduction to Environmental Sciences]
	UC Davis	BIOL SCI 10	Everyday Biology (3)
	UC Irvine	- - - - - - - - - - - - - - - - - -	NEC
	UC Los Angeles	- - - - - - - - - - - - - - - - - -	NEC

	UC Merced	- - - - - - - - - - - - - - - - - -	No Equivalent Course
	UC Riverside	- - - - - - - - - - - - - - - - - -	NEC
	UC San Diego	BILD 18	Human Impact on the Environment (4)
+GEOL 141	UC Santa Barbara	ENV S 1 Or ENVS 2	Introduction to Environmental Studies (4) Or Introduction to Environmental Studies (4)
	UC Santa Cruz	Articulation Denied	[BIOL 20C, Ecology and Evolution]
	C-ID	N/A	
	CSU GE	B2	
	IGETC	5B	

BIOL 124 Human Anatomy (4) **04/16/2022**

CATALOG DESCRIPTION

An examination of the functional anatomy of the human organism. Lectures and laboratories investigate the microscopic and macroscopic structures of the major organ systems.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	ZOO 2340 & ZOO 2340L	Human Anatomy (3) & Human Anatomy Lab (2)
+ BIOL 125	Cal Poly San Luis Obispo	BIO 231 & BIO 232	Human Anatomy & Physiology I (5) & Human Anatomy & Physiology II (5)
	CSU Bakersfield	BIOL 2210	Human Anatomy (5)
+ BIOL 125	CSU Channel Islands	BIOL 210 & BIOL 211	Human Anatomy & Physiology I (4) & Human Anatomy & Physiology II (4)
	CSU Chico	BIOL 103	Human Anatomy (4)
+ BIOL 125	CSU Dominguez Hills	BIO 250 and BIO 251	Elements of Human Anatomy and Physiology (3) and Elements of Human Anatomy and Physiology Laboratory (1)
+ BIOL 125	CSU East Bay	BIOL 270 and BIOL 271	Human Physiology & Anatomy I (5) and Human Physiology & Anatomy II (4)
+ BIOL 125	CSU Fresno	BIOL 67A And BIOL 67B	Human Anatomy & Physiology I (4) And Human Anatomy & Physiology II (4)
+ BIOL 125	CSU Fullerton	BIOL191A and BIOL 191B	Integrated Human Anatomy & Physiology (4) and Integrated Human Anatomy & Physiology (4)
	CSU Long Beach	BIOL 208	Human Anatomy (4)
+ BIOL 125	CSU Los Angeles	BIOL 2030	Human Anatomy (4)
	CSU Monterey Bay	- - - - - - - - - - - - - - - - - - -	NEC
	CSU Northridge	BIOL 213 and BIOL 212	Human Anatomy for Health Science (3) and Laboratory Studies I Human Anatomy (1)
+ BIOL 125	CSU Sacramento	BIO 22 Or BIO 25 and BIO 26	Introduction Human Anatomy (4) Or Human Anatomy & Physiology I for Allied Health Majors (4) and Human Anatomy & Physiology II for Allied Health

			Majors (4)
+ BIOL 125	CSU San Bernardino	BIOL 2230 and BIOL 2240	Human Physiology & Anatomy I (5) and Human Physiology & Anatomy II (5)
+ BIOL 125 + BIOL 125	CSU San Marcos	BIOL 175 and BIOL 176 Or BIOL 177 and BIOL 178	Intro to Human Anatomy & Physiology I (4) and Intro to Human Anatomy & Physiology II (4) Or Intro to Human Anatomy for Kinesiology I (4) and Intro to Human Anatomy for Kinesiology II (4)
	CSU Stanislaus	ZOOL 2250	Human Anatomy (4)
	Humboldt State	ZOOL 270	Human Anatomy (4)
Old articulation because SDSU doesn't articulate with the college.	San Diego State	BIOL 212	Human Anatomy (4)
	San Francisco State	BIOL 220	Principles of Human Anatomy (3)
	San Jose State	BIOL 650	Human Anatomy (4)
	Sonoma State	BIOL 220	Human Anatomy (4)
	UC Transferable	Yes	
	UC Berkeley		Human Anatomy: one course w/lab
	UC Davis	- - - - - - - - - - - - - - - - - - -	UDE: CHA 101, Human Gross Anatomy
	UC Irvine	- - - - - - - - - - - - - - - - - - -	NEC
	UC Los Angeles	- - - - - - - - - - - - - - - - - - -	Non-Major Prep: Physio Sci, 13, Introduction to Human Anatomy (5)
	UC Merced	- - - - - - - - - - - - - - - - - - -	NEC
	UC Riverside	- - - - - - - - - - - - - - - - - - -	NEC
	UC San Diego	- - - - - - - - - - - - - - - - - - -	NEC
	UC Santa Barbara	- - - - - - - - - - - - - - - - - - -	NEC
	UC Santa Cruz	- - - - - - - - - - - - - - - - - - -	NEC
	C-ID	BIOL 110B	Human Anatomy, With Lab
	CSU GE	B2/B3	
	IGETC	5B/5C	

BIOL 125 Human Physiology (4) **04/16/2022**

CATALOG DESCRIPTION

A study of the functions and interactions of human cells, tissues, organs, and organ systems. Metabolic processes, negative feedback mechanisms, and homeostatic regulation are investigated in both lecture and laboratory sections. Emphasis is on the interaction of physiological processes responsible for the maintenance of normal body functions.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	BIO 2350 and BIO 2350L	Human Physiology (4) and Human Physiology Lab (1)
+ BIOL 124	Cal Poly San Luis Obispo	BIO 231 and BIO 232	Human Anatomy & Physiology I (5) and Human Anatomy & Physiology II (5)
	CSU Bakersfield	BIOL 2200	Human Physiology (4)
+ BIOL 124	CSU Channel Islands	BIOL 210 and BIOL 211	Human Anatomy & Physiology I (4) and Human Anatomy & Physiology II (4)
	CSU Chico	BIOL 104	Human Physiology (4)
+ BIOL 124	CSU Dominguez Hills	BIO 250 and BIO 251	Elements of Human Anatomy and Physiology (3) and Elements of Human Anatomy and Physiology Laboratory (1)
+ BIOL 124	CSU East Bay	BIOL 270 and BIOL 271	Human Anatomy & Physiology I (4) and Human Anatomy & Physiology II (4)
+ BIOL 124	CSU Fresno	BIOL 67A And BIOL 67B	Anatomy & Physiology I (4) And Anatomy & Physiology II (4)
+ BIOL 124	CSU Fullerton	BIOL 191A and BIOL 191B	Integrated Human Anatomy & Physiology (4) and Integrated Human Anatomy & Physiology (4)
	CSU Long Beach	BIOL 207	Human Physiology (4)
	CSU Los Angeles	BIOL 2040	Human Physiology (4)
	CSU Monterey Bay	- - - - - - - - - - - - - - - - - - -	NEC
	CSU Northridge	BIOL 281 and BIOL 282	Human Physiology (3) and Laboratory Experiments in Human Physiology (1)
+ BIOL 124	CSU Sacramento	BIO 25 and BIO 26	Human Anatomy & Physiology I (4) and Human Anatomy & Physiology II (4)

+ BIOL 124	CSU San Bernardino	BIOL 2230 and BIOL 2240	Human Physiology & Anatomy I for Allied Health Majors (5) and Human Physiology & Anatomy II for Allied health Majors (5)
+ BIOL 124 + BIOL 124	CSU San Marcos	BIOL 175 and BIOL176 Or BIOL 177 and BIOL 178	Intro: Anatomy & Physiology I (4) and Intro: Anatomy & Physiology II (4) Or Intro: Human Anatomy & Physiology for Kinesiology I (4) and Intro: Human Anatomy & Physiology for Kinesiology II (4)
	CSU Stanislaus	ZOOL 2235	Human Physiology (4)
	Humboldt State	ZOOL 113	Human Physiology (4)
Old articulation because SDSU doesn't articulate with the college	San Diego State	BIOL 261	Human Physiology (4)
	San Francisco State	BIOL 212 and BIOL 213	Principles of Human Physiology (3) and Principles of Human Physiology Lab (1)
	San Jose State	BIOL 66	Human Physiology (4)
	Sonoma State	BIOL 224	Human Physiology (4)
	UC Transferable	**Yes**	
	UC Berkeley	MCELLBI 32 and MCELLBI 32L	Introduction to Human Physiology (3) and Introduction to Human Physiology Lab (1)
	UC Davis	NE PH B 10	Elementary Human Physiology (3)
	UC Irvine	- - - - - - - - - - - - - - - - - - - -	Upper Division: BIO SCI E 109, Human Physiology (4) And Upper Division: BIO SCI 112L, Physiology Laboratory (3)
	UC Los Angeles	- - - - - - - - - - - - - - - - - - - -	Not Major Prep: Physio. Sci, 13, Introduction to Human Anatomy (5)
	UC Merced	- - - - - - - - - - - - - - - - - - - -	NEC
	UC Riverside	- - - - - - - - - - - - - - - - - - - -	NEC
	UC San Diego	BILD 26	Human Physiology (4)
	UC Santa Barbara	- - - - - - - - - - - - - - - - - - - -	NEC
	UC Santa Cruz	- - - - - - - - - - - - - - - - - - - -	NEC
	C-ID	C-ID BIOL 120B	Human Physiology with Lab
	CSU GE	B2/B3	

	IGETC	5B/5C	

BIOL 128 Microbiology (5) **04/18/2022**

CATALOG DESCRIPTION

An introduction to microorganisms, including morphology, physiology, and growth of bacteria and other microorganisms such as viruses. The role of bacteria and viruses as part of the human microbiome and host defenses against pathogens are emphasized. Laboratory procedures include identification, growth and metabolism of bacteria.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	BIO 2060 and BIO 2060L	Basic Microbiology (3) and Basic Microbiology Lab (1)
	Cal Poly San Luis Obispo	MCRO 221 Or MCRO 224	Microbiology (4) Or General Microbiology I (5)
	CSU Bakersfield	BIOL 2230	Microbiology (4)
	CSU Channel Islands	BIOL 217	Medical Microbiology (4)
	CSU Chico	BIOL 211	Allied Health Microbiology (4)
	CSU Dominguez Hills	- - - - - - - - - - - - - - - - - -	Upper-Division Course (BIO 324, Microbiologu)
	CSU East Bay	BIOL 230	Introduction to Clinical Microbiology (4)
	CSU Fresno	BIOL 20	Introductory Microbiology (4)
	CSU Fullerton	**NEED Artic Request**	BIOL 202, Microbiology for Nursing & Allied Health Professionals (4)
	CSU Long Beach	BIOL 201	General Microbiology for Health Profession (4)
	CSU Los Angeles	MICR 1010	Introduction to Microbiology (3)
	CSU Monterey Bay	- - - - - - - - - - - - - - - - - - - -	NEC
	CSU Northridge	BIOL 215 & BIOL 215L	Introductory Microbiology (2) & Introductory Microbiology Lab (2)
	CSU Sacramento	- - - - - - - - - - - - - - - - - -	NEC
	CSU San Bernardino	BIOL 2200	Microbiology for Allied Health Majors (4)
	CSU San Marcos	BIOL 160	Microbiology for Health Sciences (4)
	CSU Stanislaus	- - - - - - - - - - - - - - - - - - - -	No Equivalent Course
	Humboldt State	- - - - - - - - - - - - - - - - - -	NEC
	San Diego State	BIOL 211 & BIOL 211L	Fundamentals of Microbiology (2) & Fundamentals of Microbiology Lab (2)
	San Francisco State	BIOL 210 & BIOL 211	General Microbiology and Public Health (3) & General Microbiology and Public Health Lab (1)
	San Jose State	MICR 20	General Bacteriology (5)
	Sonoma State	BIOL 240	General Microbiology (4)
	UC Transferable	Yes	
	UC Berkeley	- - - - - - - - - - - - - - - - - - - -	Microbiology: one course w/lab
	UC Davis	- - - - - - - - - - - - - - - - - -	

	UC Irvine	- - - - - - - - - - - - - - - - - - -	NEC
	UC Los Angeles	- - - - - - - - - - - - - - - - - -	NEC
	UC Merced	- - - - - - - - - - - - - - - - - - -	Upper-Division Course (BIS 120, General Microbiology and BIS 120L General Microbiology Lab)
	UC Riverside	- - - - - - - - - - - - - - - - - - -	Upper-Division Course (MCBL 121, Introduction to Microbiology)
	UC San Diego	- - - - - - - - - - - - - - - - - - -	NEC
	UC Santa Barbara	- - - - - - - - - - - - - - - - - - -	Upper-Division Course (MCB|DB 131, General Microbiology)
	UC Santa Cruz	- - - - - - - - - - - - - - - - - - -	Upper-Division Course (BIOL 119, Microbiology)
	C-ID	N/A	
	CSU GE	2B	
	IGETC	5B	

BIOL 132 Marine Biology (4) **04/18/2022**

CATALOG DESCRIPTION

An introductory study of marine organisms and their interactions in marine ecosystems with an emphasis on the organisms and ecosystems of the Central California coast. Several field trips to the marine shore required.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	- - - - - - - - - - - - - - - - - - -	**Upper Division Equivalent** [BIO 330, Marine Biology]
	Cal Poly San Luis Obispo	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIO 328, Marine Biology]
	CSU Bakersfield	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	CSU Channel Islands	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 312, Marine Biology]
	CSU Chico	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	CSU Dominguez Hills	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIO 360, Marine Biology]
	CSU East Bay	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	CSU Fresno	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [ECOL 135, Marine Biology]
	CSU Fullerton	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIO 317, Marine Biology]
	CSU Long Beach	BIOL 153	Introduction to Marine Biology (3)
	CSU Los Angeles	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	CSU Monterey Bay	- - - - - - - - - - - - - - - - - - -	**Upper Division Coursework**
	CSU Northridge	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 421/421L, Marine Biology and Lab]
	CSU Sacramento	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [MSCI 103, Marine Ecology]
	CSU San Bernardino	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 455, Marine Biology and Ecology]
	CSU San Marcos	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 388, Marine Communities]
	CSU Stanislaus	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 4630, Marine Ecology]
	Humboldt State	BIOL 255	Marine Biology (3)
	San Diego State	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIOL 324, Life in the Sea]
	San Francisco State	- - - - - - - - - - - - - - - - - -	NEC
	San Jose State	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [MS 103, Marine Ecology]
	Sonoma State	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent**

			[BIOL 312, Biological Oceanography]
	UC Transferable	Yes	
	UC Berkeley	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	UC Davis	- - - - - - - - - - - - - - - - - - -	**Articulation Denied** **[EVE 12/GEOLOGY 16]**
	UC Irvine	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [BIO SC 178, Ocean Ecology]
	UC Los Angeles	- - - - - - - - - - - - - - - - - - -	Articulation Denied [BIOL 25, Marine Biology] Not a major preparation course
	UC Merced	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	UC Riverside	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	UC San Diego	- - - - - - - - - - - - - - - - - - -	No Equivalent Course
	UC Santa Barbara	- - - - - - - - - - - - - - - - - - -	**Upper-Division Equivalent** [EEMB 152, Applied Marine Ecology]
	UC Santa Cruz	- - - - - - - - - - - - - - - - - - -	Articulation Request Denied (OCEA 1, The Ocean)
	C-ID	N/A	
	CSU GE	2B	
	IGETC	5B	

BIOL 150, Cellular Biology (5) **04/18/2022**

CATALOG DESCRIPTION

A study of the nature of life, emphasizing its molecular and cellular aspects of life, particularly cellular reactions as governs organismic metabolism, biological and chemical evolution, and Mendelian genetics.

AHC Special Notes	Articulation Institution	Prefix	Title
	Cal Poly Pomona	BIO 1210 and BIO 1210L	Foundations of Biology: Energy and Matter-Cycles and Flows (3) and Foundations of Biology: Energy and Matter-Cycles and Flows Lab (2)
+ BIOL 154 & 155	Cal Poly San Luis Obispo	BIO 161 Or BIO 160 And BIO 161 And BIO 162	Introduction to Cell and Molecular Biology (4) Or Diversity and the History of Life (4) And Introduction to Cell and Molecular Biology (4) And Introduction to Organismal Form and Function (4)
	CSU Bakersfield	BIOL 2010	Introductory Biology-Cells (4)
	CSU Channel Islands	BIOL 201	Principles of Cell & Molecular Biology (4)
Or BIO 100	CSU Chico	BIOL 162	Principles of Cellular and Molecular Biology (4)
	CSU Dominguez Hills	BIO 120 & Bio 121	Principles of Biology I (3) & Principles of Biology Lab I (1)
+ BIOL 154 & 155	CSU East Bay	BIOL 140A or BIOL 140B	Principles of Cellular Molecular Biology (5) or Principles of Organismal Biology (5)
	CSU Fresno	BIOL 1A	Introductory Biology (4)
	CSU Fullerton	BIOL 151	Cellular & Molecular Biology 54)
	CSU Long Beach	BIOL 212	Introduction to Cell and Molecular Biology (4)
	CSU Los Angeles	BIOL 1011	Cellular Basis of Life (5)
	CSU Monterey Bay	BIO 210 and BIO 210L	Molecular/ Cell Biology & Animal Physiology (4) and Molecular/ Cell Biology & Animal Physiology (1)
+ BIOL 154 & 155	CSU Northridge	BIOL 106 And BIOL106L Or BIOL 107 And BIOL107L	Biological Principles I (3) And Biological Principles I Lab (1) Or Biological Principles II (3) And Biological Principles II Lab (1)

+ BIOL 154 & BIOL 155	CSU Sacramento	BIO 1 and BIO 2	Biodiversity, Evolution, and Ecology (5) and Cells, Molecules, and Genes (5)
+ BIOL 154 & 155	CSU San Bernardino	BIOL 2010 and BIOL 2020	Principles of Biology I (5) and Principles of Biology II (5)
+ BIOL 154 & 155	CSU San Marcos	BIOL 210 and BIOL 211	Intro to Cellular and Molecular Biology (4) and Intro to Organismal and Population Biology(4)
	CSU Stanislaus	BIOL 1010	Principles of Biology (3)
	Humboldt State	BIOL 105	Principles of Biology (4)
Old articulation. SDSU doesn't articulate with the college.	San Diego State	BIOL 203 And BIOL 203L	Principles of Cell and Molecular Biology (3) And Principles of Cell and Molecular Biology Lab (1)
+ BIOL 154 & BIOL 155	San Francisco State	BIOL 230 Or BIOL 230 and BIOL 240	Introductory Biology I (5) Or Introductory Biology I (5) and Introductory Biology II (5)
+ BIOL 154 & BIOL 155	San Jose State	BIOL 30	Principles of Biology I (5)
	Sonoma State	BIOL 130	Introduction to Cell Biology & Genetics (4)
	UC Transferable	Yes	
+ BIOL 155 + BIOL 154	UC Berkeley	BIOLOGY 1A and BIOLOGY 1AL or BIOLOGY 1B	General Biology: Genetics, Animal Forms & Function (3) and General Biology Lab (2) or General Biology: Plant Form Ecology Evolution (4)
	UC Davis	BOILSCI 2A	Introductory Biology; Essentials pf Lif on Earth (5)
	UC Irvine	BIO SCI 93	From DNA to Organisms (4)
+ BIOL 155	UC Los Angeles	LIFE SCI 7A rr LIFE SCI 7B and LIFESCI 23L	Cells, Tissues & Organs (3) or General, Evolution and Ecology (5) and Introduction to Laboratory & Scientific Method (2)
+ BIOL 154 & 155	UC Merced	BIO 1 and BIO 1L	Contemporary Biology (4) and Contemporary Biology Lab (1)
	UC Riverside	BIOL 5A And BIOL 5L	Introduction to Cell & Molecular Bio (4) and Introduction to Cell & Molecular Bio Lab (1)

+ BIOL 154 & 155 + BIOL 154 & 155 + BIOL 154 & 155 + BIOL 154 & 155	UC San Diego	BILD 1 Or BILD 2 Or BILD 3 Or BILD 4	The Cell (4) Or Multicellular Life (4) Or Organismic & Evolutionary Biology (4) Or Introductory Biology Lab (2)
+ BIOL 154 & 155	UC Santa Barbara	MCDB 1A And MCDB 1AL and MCDB 1B And MCDB 1BL and EEMB 2 and EEMB 3 and EEMB 3L **OR** **aCDB 1A** **And** **MCDB 1B** **And** **MCDB1LL** **and** **EEMB 2** **and** **EEMB 2LL** **and** **EEMB 3**	Introductory Biology I (4) and Introductory Biology Laboratory I (1) and Introductory Biology II – Physiology (3) and Introductory Biology Laboratory II (1) and Introductory Biology II – Ecology and Evolution (3) and Introductory Biology III (3) and Introductory Biology Laboratory III (1) **OR** **Introductory Biology I (4)** **and** **Introductory Biology II – Physiology (3)** **and** **Introductory Biology Laboratory I (1)** **and** **Introductory Biology II- Ecology and Evolution (3)** **and** **Introductory Biology Lab II (1.5)** **and** **Introductory Biology Lab III (3)**
	UC Santa Cruz	BIOL 20A	Cell & Molecular Biology (5)
	C-ID	C-ID BIOL 190	Cell & Molecular Biology
	CSU GE	B2	
	IGETC	5B	

BIOL 154, General Botany (5) **04/18/2022**

CATALOG DESCRIPTION

A survey of the plant kingdom, including structure and functions, heredity, evolution and ecology, economic uses, taxonomic classification, the role of plants in the ecosystem, and important problems common to all plants.

AHC Special Notes	Articulation Institution	Prefix	Title
+ BIOL 154 & 155	Cal Poly Pomona	BIO 2052 and BIO 2050L or BIO 1220 and BIO1220L	Form and Function in Plants (3.00) and Form and Function in Plants Laboratory (1.00) or Foundations of Biology: Energy & Matter (3) and Foundations of Biology: Energy & Matter Lab (2)
+ BIOL 150 & 155	Cal Poly San Luis Obispo	BOT 121 Or BIO 160 & BIO 161 & BIO 162	General Botany (4) Or Diversity and the History of Life (4) & Introduction to Cell and Molecular Biology(4) & Introduction to Organismal Form and Function (4)
	CSU Bakersfield	BIOL 2120	Introductory Biology - Plants (4)
+ BIOL 155	CSU Channel Islands	BIOL 200	Principals of Organismal & Population Biology (4)
+ BIOL 155	CSU Chico	BIOL 161	Principles of Ecology, Evolutionary, and Organismal Biology (4)
+ BIOL 150 & 155	CSU Dominguez Hills	BIO 120 and BIO 121 and BIO 122 and BIO 123	Principles of Biology I (3) and Principles of Biology I Laboratory (1) And Principles of Biology II (3) and Principles of Biology II Laboratory (1)
BIOL 150 & 155 BIOL 155	CSU East Bay	BIOL 140A and BIOL 140B or BIOL 140B	Principles of Cell and Molecular Biology (5.00) and Principles of Organismal Biology (5) or Principles of Organismal Biology (5)
+ BIOL 155	CSU Fresno	BIOL 1B and BIOL 1BL	Introductory Biology (3) and Introductory Biology Lab (2)

+ BIOL 150 & 155	CSU Fullerton	BIOL 152 and BIOL 252 and BIOL 245L	Organismal Biology (4) and Principles of Ecology (3) and Research Skills for Ecology and Organismal Biology (1)
+ BIOL 155 + BIOL 155	CSU Long Beach	BIOL 211 or BIOL 213	Introduction to Evolution and Diversity (4) or Introduction to Ecology and Physiology (4)
	CSU Los Angeles	- - - - - - - - - - - - - - - - - -	NEC
+ BIO 155	CSU Monterey Bay	BIO 211 and BIO 211L	Ecology, Evolution, Biodiversity & Plants & Animals (4) and Ecology, Evolution, Biodiversity & Plants, Animals Lab (1)
+ BIOL 150 & 155	CSU Northridge	BIOL 106 And BIOL106L Or BIOL 107 And BIOL107L	Biological Principles I (3) And Biological Principles I Lab (1) or Biological Principles II (3) And Biological Principles II Lab (1)
+ BIOL150 & BIOL155	CSU Sacramento	BIO 1 and BIO 2	Biodiversity, Evolution, & Ecology (5) and Cells, Molecules, & Genes (5)
+ BIOL 150 & 155	CSU San Bernardino	BIOL 2010 and BIOL 2020	Principles of Biology I (5) and Principles of Biology II (5)
+ BIOL 150 & 155	CSU San Marcos	BIOL 210 and BIOL 211	Intro to Cellular and Molecular Biology (4) and Intro to Organismal and Population Biology (4)
	CSU Stanislaus	BIOL 1050 and BIOL 1150	General Biology I (4) and General Biology II (4)
	Humboldt State	BOT 105	General Botany (4)
+ BIOL 155 [old articulation as SDSU doesn't articulate with the college]	San Diego State	BIOL 204 And BIOL 204L	Principles of Organismal Biology (3) and Principles of Organismal Biology Lab (1)
+ BIOL 150 & 155	San Francisco State	BIOL 230 or BIOL 240	Introductory Biology I (5) or Introductory Biology II (5)
	San Jose State	BIOL 31	Principles of Biology II (4)
+ BIOL 155	Sonoma State	BIOL 131	Biology, Diversity, and Ecology (4)

	UC Transferable	Yes	
+ BIOL 150	UC Berkeley	BIOLOGY 1B	General Biology (Plant Form & Function, Ecology, Evolution) (4)
+ BIOL 155 + BIOL 155	UC Davis	BIOLSCI 2B or BIOLSCI 2C	Introductory Biology: Principles of Ecology and Evolution (5) or Introduction: Biodiversity & the Tree of Life (5)
Or BIOL 155 (Preferred)	UC Irvine	BIO SCI 94	From Organisms to Ecosystems
	UC Los Angeles	- - - - - - - - - - - - - - - - - -	NEC
+ BIOL 150 & 155	UC Merced	BIO 1 and BIO 1L	Contemporary Biology (4) and Contemporary Biology Lab (1)
+ BIOL 155	UC Riverside	BIOL 5B	Introduction to Organismal Biology (4)
+ BIOL 150 & 155	UC San Diego	BILD 1 and BILD 2 and BILD 3 and BILD 4	The Cell (4) and Multicellular Life (4) and Organismic & Evolutionary Biology (4) and Introductory Biology Lab (2)
+ BIOL 154 & 155 + BIOL 154 & 155	UC Santa Barbara	MCDB 1A & 1AL And MCDB 1B And EEMB 2 And EEMB 3 & 3AL Or MCDB 1A & !al And MCDB 1B And EEMB 2 And Either MCDB 1 BL Or EEMB 2L	Introductory Biology I & Lab And Introductory Biology II - Physiology And Introductory Biology II – Ecology and Evolution And Introductory Biology III & Lab Or Introductory Biology I & Lab And Introductory Biology II – Physiology And Introductory Biology II – Ecology and Evolution And Either Introductory Biology Lab II Or Introductory Biology Lab II
+ BIOL 155	UC Santa Cruz	BIOL 20C	Ecology & Evolution (5)
	C-ID	BIOL 155	Botany/Plant Diversity and Ecology
	CSU GE	B2	
	IGETC	5B	

BIOL 155, General Zoology (5) **04/18/2022**

CATALOG DESCRIPTION

Intended for the biology major, an exploration and survey of the animal phyla and non-photosynthetic, single-celled, eukaryotic taxa. Comparative structure, function, and life cycles of animals, as well as principles of evolution, taxonomy, and systematics are covered. Topics include development, morphology and physiology, phylogeny, and behavior of animals, as well as principles of evolution, mechanisms of evolutionary change, and speciation.

AHC Special Notes	Articulation Institution	Prefix	Title
+ BIOL 150 & 154	Cal Poly Pomona	BIO 2070 and BIO 2070L or BIO 1220 and BIO1220L	Animal Biology (3) and Animal Biology Laboratory (1) or Foundations of Biology: Energy & Matter (3) and Foundations of Biology: Energy & Matter Lab (2)
+ BIOL 150 & 154	Cal Poly San Luis Obispo	BIO 160 & BIO 161 & BIO 162	Diversity and the History of Life (4) & Introduction to Cell and Molecular Biology (4) & Introduction to Organismal Form and Function (4)
	CSU Bakersfield	BIOL 202	Introductory to Biology-Animals (5)
+ BIOL 154	CSU Channel Islands	BIOL 215 BIOL 220	Animal Diversity Principles of Organismal and Population Biology (4)
	CSU Chico	BIOL 152	Principles of Ecology, Evolutionary, and Organismal Biology (4)
	CSU Dominguez Hills	- - - - - - - - - - - - - - - - - - -	NEC
+ BIOL 154 & 155 + BIOL 154	CSU East Bay	BIOL 140A and BIOL 140B or BIOL 140B	Principles of Cell and Molecular Biology (5.00) and Principles of Organismal Biology (5) or Principles of Organismal Biology (5)
+ BIOL 154	CSU Fresno	BIOSC 1B & BIOSCI 1BL	Introduction to Biology (3) & Introduction to Biology Lab (2)
+ BIOL 150 &154	CSU Fullerton	BIOL 152 and BIOL 252 and BIOL 245L	Organismal Biology (4) and Principles of Ecology (3) and Research Skills for Ecology and Organismal Biology (1)

+ BIOL 154 + BIOL 154	CSU Long Beach	BIOL 211 Or BIOL 213	Introduction to Evolution and Diversity (4) or Introduction to Ecology and Physiology (4)
	CSU Los Angeles	BIOL 1010	General Biology (3)
+BIOL 150	CSU Monterey Bay	BIO 210 & BIO 210L	Molecular/Cell Biodiverse & Animal Physiology(4) Molecular/Cell Bio & Animal Physiology Lab (1)
+ BIOL150 & BIOL 154	CSU Northridge	BIOL 106 And BIOL106L Or BIOL 107 And BIOL107L	Biological Principles I (3) And Biological Principles I Lab (1) or Biological Principles II (3) And Biological Principles II Lab (1)
+ BIOL 150 & BIOL 155	CSU Sacramento	BIO 1 & BIO 2	Biodiversity, Evolution, & Ecology (5) & Cells, Molecules, & Genes (5)
+ BIOL 150 & 154	CSU San Bernardino	BIOL 2010 and BIOL 2020	Principles of Biology I (5) and Principles of Biology II (5)
+ BIOL 150 & 154	CSU San Marcos	BIOL 210 And BIOL 211	Intro to Cellular and Molecular Biology (4) And Intro to Organismal and Population Biology (4)
+ BIOL 154	CSU Stanislaus	BIOL 1050 & BIOL 1150	General Biology I (4) General Biology II (4)
	Humboldt State	ZOOL 110	Introduction ton Zoology (4)
+ BIOL 155 [old articulation as SDSU doesn't articulate with the colleg4	San Diego State	BIOL 204 And BIOL 204L	Principles of Organismal Biology (3) and Principles of Organismal Biology Lab (1)
+ BIOL 150 & 154	San Francisco State	BIOL 230 Or BIOL 240	Introductory Biology I (5) Or Introductory Biology II (5)
	San Jose State	- - - - - - - - - - - - - - - - - - -	NEC in Lower Division
+ BIOL 154	Sonoma State	BIOL 131	Biology Diversity and Ecology (4)
	UC Transferable	Yes	
+ BIOL 150	UC Berkeley	BIOLOGY 1A and BIOLOGY 1AL	General Biology Lecture (Cells, Genetics, Animal Form & Function (3) and General Biology Laboratory (2)
+ BIOL 154	UC Davis	BIOL SCI 2B & BIOLSCI 2C	Intro Biology: Ecology and Evolution (3) Intro Biology: Ecology & Evolution (5)
Or BIOL 154 (BIOL 155 Preferred)	UC Irvine	BIO SCI 94 &	From Organisms to Ecosystems (4)
	UC Los Angeles	- - - - - - - - - - - - - - - - - - -	NEC

+ BIOL 150 & 154	UC Merced	BIO 1 and BIO 1L	Contemporary Biology (4) and Contemporary Biology Lab (1)
+ BIOL 154	UC Riverside	BIOL 5B	Introduction to Organismal Biology (4)
+ BIOL 150 & 154	UC San Diego	BILD 1 and BILD 2 and BILD 3 and BILD 4	The Cell (4) and Multicellular Life (4) and Organismic & Evolutionary Biology (4) and Introduction Biology Lab (2)
+ BIOL 154 & 155 + BIOL 154 & 155	UC Santa Barbara	MCDB 1A & 1AL And MCDB 1B And EEMB 2 And EEMB 3 & 3AL Or MCDB 1A & !al And MCDB 1B And EEMB 2 And Either MCDB 1 BL Or EEMB 2L	Introductory Biology I & Lab And Introductory Biology II - Physiology And Introductory Biology II – Ecology and Evolution And Introductory Biology III & Lab Or Introductory Biology I & Lab And Introductory Biology II – Physiology And Introductory Biology II – Ecology and Evolution And Either Introductory Biology Lab II Or Introductory Biology Lab II
+ BIOL 154	UC Santa Cruz	BIOL 20C	Ecology & Evolution (5)
	C-ID	BIOL 150	Zoology / Animal Diversity and Evolution]
	CSU GE	B2	
	IGETC	B5	

Anatomy Model Replacement Schedule

2 Star Replace ASAP List

Item Description	Vendor	Item number	Quantity
Eye Diagram	Hubbard Scientific	AMED561	1
Rolling Male Model	SOMSO Modelle	AS 2/2	
Rolling Female Model	3B Scientific GmbH	1013882 [B51]	1
Brain Model #3	3B Scientific GmbH	1000224 [C16]	1
Skeleton (labeled)	SOMSO Modelle	QS 10	1
Pancreas Model	SOMSO Modelle	JS 11	2
Female Genital Organs	SOMSO Modelle	MS 8/3	2
Internal and External Male Sexual Organs	SOMSO Modelle	MS 3	3
Nephron	SOMSO Modelle	LS 6	1
Bronchial Tree Model	Kilgore Interntional	HS 8/4	1
Left Knee	Fisher Scientific	N40	1
Eye Model #1	SOMSO Modelle	DS 3	1
Eye Model #3	3B Scientific GmbH	1000252 [E12]	1
Large Ear Model #2	SOMSO Modelle	DS 3	1
Heart and Lungs #1	SOMSO Modelle	HS 7	1
Heart with Pericardial Sac	SOMSO Modelle	HS 1/1	1
Large Larynz w/out muscle			

1 Star Needs to be replaced but lower priority than 2 Star

Item Description	Vendor	Item number	Quantity
Nervous Sysytem Diagram	American Educational Products, LL	ADIB0065874IC	1
Spinal Cord, x.s.	SOMSO Modelle	BS32	1
Multi-polar Neuron (White Fiber)			1
Large Brain #1	Denoyer Geppert	A409	1

Internal (Deep) Brain (Medulla)	SOMSO Modelle	BS 23/2	1
Ventricular System of the Human Brain	SOMSO Modelle	BS 24	1
Pancreas Model	SOMSO Modelle	JS 11	2
Abdominal Circulation			1
Hand Muscle Model	SOMSO Modelle	NS 13	1
Liver	SOMSO Modelle	JS 5 & JS 8	2
Kidney			1
Alveoli Model	SOMSO Modelle	GS 4/3	1
Giant Heart with Pericardium and Diaphrag	Denoyer Geppert	0101-00	1
Integument	SOMSO Modelle	KS 3	1
Left Foot Skeleton	SOMSO Modelle	QS 25	1
Bony Labyrinth	SOMSO Modelle	DS 18	2
Middle Ear Bone	SOMSO Modelle	60640	1
Organ of Corti Model	SOMSO Modelle	DS 10	1
Liver Lobule			1
Sagittal Model of Male Reproductive Syste	3B Scientific GmbH		1
Development of the Human Embryo	SOMSO Modelle	MS 15/1	1
Fertilization and Development of Human Ovum		MS 15	1

Rotation List Purchase 1/year

Item Description	Vendor	Item number	Quantity
Arm Muscle Model #2	SOMSO Modelle	NS 15	1
Arm Muscle Model #3	Ward's Scientific	NS 15	1
Leg Muscle Model #2	Ward's Scientific	NS 10	1
Foot Model	SOMSO Modelle	NS 9	1
Leg Muscle Model #3	SOMSO Modelle	NS 10	1
Head Model #1	SOMSO Modelle	BS 17	1

Head Model #2	SOMSO Modelle	BS 17	1
Head Model #3	SOMSO Modelle	BS 17	1
Rolling Male Model	SOMSO Modelle	AS 2/2	1
1/2 Size Muscle Model #1	SOMSO Modelle	AS 3	1
1/2 Size Muscle Model #2	SOMSO Modelle	AS 3	1
1/2 Size Muscle Model #3	SOMSO Modelle	AS 3	1
1/2 Size Muscle Model #4	Ward's Scientific	AS 3	1
1/4 Size Muscle Model #1	SOMSO Modelle	AS 3	1
1/4 Size Muscle Model #2	SOMSO Modelle	AS 3	1
1/4 Size Muscle Model #3	SOMSO Modelle	AS 3	1
1/4 Size Muscle Model #4	Ward's Scientific	AS 3	1
1/4 Size Muscle Model #5	Ward's Scientific	AS 3	1
Heart #1	SOMSO Modelle	HS 6	1
Heart #2	SOMSO Modelle	HS 6	1
Heart #4	SOMSO Modelle	HS 6	1
Heart #5	SOMSO Modelle	HS 6	1
Heart #6	Ward's Scientific	HS 6	1
Bone Microanatomy	SOMSO Modelle	QS 61	2

Need quotes 2 star list	Make	Model #	Vendor	Catalog Price	Vendor	Catalog Price	Vendor	Catalog Price	Vendor	Catalog Price
Skeleton w/ points of origin labeled	SOMSO	QS 10/9	Biomedical Models	price on request	Holt Anatomical	$2,759	GT Simulators	$2,982		
Pancreas with Spleen and Duodenum	SOMSO	JS 11	Biomedical Models	price on request	Holt Anatomical	$351	GT Simulators	$395		
Female Genital Organs	SOMSO	MS 8/3	Biomedical Models	price on request	Holt Anatomical	$526	GT Simulators	$592		
Male Genital Organs	SOMSO	MS 3	Biomedical Models	price on request	Holt Anatomical	$1,221	Carolina Biological	$1,510		
Nephron	SOMSO	LS 6	Biomedical Models	price on request	Holt Anatomical	$154	GT Simulators	$173		
Large Ear Model #1	SOMSO	DS 3	Biomedical Models	price on request	Holt Anatomical	$440	GT Simulators	$495		
Large Ear Model #2	SOMSO	DS 3	Biomedical Models	price on request	Holt Anatomical	$440	GT Simulators	$495		
Lungs with Heart #1	SOMSO	HS 7	Biomedical Models	price on request	Holt Anatomical	$1,193	GT Simulators	$1,289.00		
Heart with Pericardial Sac	SOMSO	HS 1/1	Biomedical Models	price on request	Somso	price on request	GT Simulators	price on request		
Rolling Male Model	SOMSO	AS 2/2	Biomedical Models	price on request	Holt Anatomical	$14,496	GT Simulators	price on request		
Rolling Female Model	3B Scientific	B51	Wards Science	$9,850	Fisher Scientific	price on request	GT Simulators	$8,051		
Left Knee	SOMSO	NS 19	Biomedical Models	price on request	Holt Anatomical	$241	GT Simulators	$272.00		
Eyeball w/ Part of Orbit, 3X	SOMSO	CS 2	Biomedical Models	price on request	Holt Anatomical	$660	GT Simulators	$744		
Human Brain, 4 parts	3B Scientific	C16	Wards Science	$299	Holt Anatomical	$235	GT Simulators	$247	3B Scientific	
Eyeball Model #3	3B Scientific	F12	Universal Medical	$381	3B Scientific	$418	GT Simulators	$353		
Eyeball Model #7	3B Scientific	F12	Universal Medical	$381	3B Scientific	$418	GT Simulators	$353		
Larynx w/ Trachea	SOMSO	GS 4/2	Biomedical Models	price on request	Holt Anatomical	$697	Carolina	$915.00	Kilgore	$745
Eye Diagram	Hubbard Scientific	AMED561	The Science Bank	price on request	Walmart	$49.99	Kmart	$49.99		

Appendices

Approved Course Outlines

BIOL 100
BIOL 150

Remaining BIOL courses are in Curricunet review process

Board Approval: 04/20/1999
PCA Established: 05/15/2015
DL Conversion: 05/16/2006
Date Reviewed: Fall 2021
Catalog Year: 2022 - 2023

Allan Hancock College
Course Outline

Discipline Placement: Biological Sciences (Masters Required)
Department: Life & Physical Sciences
Prefix and Number: BIOL 100
Catalog Course Title: Introductory Biology
Banner Course Title: Introductory Biology

Units and Hours

	Hours per Week	Total Hours per Term (Based on 16-18 Weeks)	Total Units
Lecture	3.000	48.0 - 54.0	
Lab	3.000	48.0 - 54.0	
Outside-of-Class Hours	6.000	96.0 - 108.0	
Total Student Learning Hours	12.0	192.0 - 216.0	4.0
Total Contact Hours	6.0	96.0 - 108.0	

Number of Times Course may be Repeated
0

Grading Method
Letter Grade or Pass/No Pass

Requisites

Advisories
Eligible for ENGL 101 or completion of

Advisories
ENGL 514 Writing Skills 4

Entrance Skills

Upon entering this course, the student should be able to:

1. ENGL 514 - Writing Skills 4

Catalog Description

An introduction to the concepts of biology. Designed for majors in fields other than biological science, the course investigates the nature of science, cells, genetics, evolution, ecology, and biodiversity. Lecture: 3 hours weekly. Lab: 3 hours weekly.

Course Content

Lecture

1. Nature of science
    - Understand the goal of science is to collect and analyze evidence to develop testable explanations and make predictions about natural phenomena.
2. Cells
    - Investigate cell structures and functions and their role in the maintenance and growth of organisms.
3. Genetics
    - Describe the process in which DNA codes for instructions for characteristics passed from parents to offspring.
4. Evolution
    - Explain how the mechanisms of evolution: mutation, genetic drift, gene flow, and natural selection, can change the distribution of traits in populations over time demonstrating the unity and diversity of life.
5. Ecology
    - Investigate the interactions of abiotic and biotic components of ecosystems.

Course Objectives

At the end of the course, the student will be able to:

1. Understand the goal of science is to collect and analyze evidence to develop testable explanations and make predictions about natural phenomena.
2. Classify the molecules of living systems and apply basic principles of chemistry to their interaction.
3. Describe the structures and functions of cells that are necessary for the growth and maintenance of organisms.
4. Compare and contrast the processes of photosynthesis and cellular respiration in terms of energy transformation in cells.
5. Evaluate how organisms reproduce and exhibit hereditary patterns.
6. Assess how population and community dynamics are affected by ecological interactions.
7. Describe how the systems of the human body interact to maintain homeostasis.
8. Understand how evolution explains both the unity and diversity of life.

Methods of Instruction

- **Lab**
- **Lecture**
- **Methods of Instruction Description:**

  Lecture meetings include presentations and demonstrations developed from the textbook and other current scientific literature, and activities to engage and support student learning (e.g., collaborative learning, investigations, assignments). In lab meetings, students will practice the scientific procedures and experimentation about the course content.

Assignments

None

Methods of Evaluation

- **Exams/Tests**
- **Quizzes**
- **Research Projects**
- **Papers**

- **Oral Presentation**
- **Projects**
- **Field Trips**
- **Simulation**
- **Group Projects**
- **Class Participation**
- **Class Work**
- **Home Work**
- **Lab Activities**
- **Other**
    0. Lecture exams
    1. Lecture quizzes
    2. Lecture assignments (various modalities)
    3. Lab quizzes
    4. Lab assignments (various modalities)

Texts and Other Instructional Materials

Adopted Textbook

1. Sylvia S. Mader & Michael Windelspecht *Essentials of Biology* Edition: 6th 2021

Supplemental Texts

1. Mader, Sylvia S., and Michael Windelspecht. 2017. Essentials of Biology. 5th ed. Columbus, OH: McGraw-Hill Education.
2. Weiner, Jonathan. The Beak of the Finch : a Story of Evolution in Our Time. New York :Knopf : Distributed by Random House, 1994.
3. Biol 100 Lab Manual available at the AHC Bookstore.

Instructional Materials

None

Student Learning Outcomes

1. BIOL100 SLO1 Collect and analyze evidence to develop testable explanations and make predictions about natural phenomena.
2. BIOL100 SLO2 Describe how cell structures and functions contribute to organism's maintenance and growth.
3. BIOL100 SLO3 Describe the process in which DNA codes for instructions for characteristics passed from parents to offspring.

4. BIOL100 SLO4 Explain how the mechanisms of evolution: mutation, genetic drift, gene flow, and natural selection, can change the distribution of traits in populations over time demonstrating the unity and diversity of life.
5. BIOL100 SLO5 Demonstrate knowledge of biotic and abiotic interactions in ecosystems.
6. BIOL100 SLO6 - Demonstrate appropriate lab technique and lab safety protocols.

Distance Education

Delivery Methods

- Audio/videoconferencing (Zoom, Cranium Café), etc.
- Internet
- Other Method (explain)
- Other

  Internet for lecture, onsite for lab.

Instructor Initiated Contact Hours Per Week: 6.000

Contact Types

1. Discussion Board
2. Telephone Contacts
3. Email Communication (group and/or individual communications)
4. Orientation Sessions
5. Review Session
6. Labs
7. Testing

Adjustments to Assignments

Instructors may employ a variety of online tools to make the necessary adjustments in an ERT/ DE setting for this course.

- Assignments will be submitted primarily through the district Course Management System(CMS).
- Students can submit multiple files types, type in a textbox to submit their assignments, or submit links to their work in the cloud or other web related service such as Google Docs.
- Students can also submit assignments through district email or the messaging service in the district CMS.
- The district CMS contains many tools instructors can use to facilitate different assignment types.

- Instructors may use the assignments tool and / or discussion tool to facilitate student to student interaction.
- Instructors may use the feedback features of the district CMS to facilitate instructor - initiated contact.
- When appropriate, instructors may use group assignments.

Possible tools employed to adjust for ERT / DE course may include, but not limited to:

- District CMS assignments
- Threaded discussion forums
- District Email
- District CMS messaging service
- Announcements in the district CMS
- Feedback of student work through use of Speed Grader or other tools
- Synchronous audio / videoconferencing(Zoom, Cranium Café)
- Interactive mobile technologies
- Chat, text, Twitter
- Telephone
- Virtual offices hours
- Other: None

Adjustments to Evaluation Tools

- ERT/DE courses allow for multiple evaluation tools with online technology.
- This course will be able to use interactive quizzes which allow for automated assessment performance for certain question types and the use of the mastery gradebook.
- If the assessment requires necessary student authentication, the instructor can employ machine automated proctoring services available through the current district CMS.
- Use of these features (quizzes, discussions, and assignments) provide the necessary tools to evaluate student progress toward the objectives of the course.

Strategies to Make Course Accessible to Disabled Students
All courses must meet the WCAG 2.0 level AA standards including but not limited to the items listed below:

1. Images, graphs, charts or animation. A text equivalent or alt text is provided for every non-text element, including all types of images and animated objects. This will enable a screen reader to read the text equivalent to a blind student.
2. Multimedia. Equivalent alternatives for any multimedia presentation are synchronized with the presentation. Videos and live audio must be closed captioned. For archived audio, a transcript maybe sufficient.
3. Documents and other learning materials. PDFs, Microsoft Word documents, PowerPoint presentations, Adobe Flash and other content must be as accessible

as possible. If it cannot be made accessible, consider using HTML or, if no other option is available, provide an accessible alternative. PDF documents must be properly tagged for accessibility.

4. Timed quizzes/exams. Extended time on quizzes and exams is one of the most common accommodations. Instructions for extending time in Canvas.
5. Outside webpages and links
6. Ensure that all webpages meet 508 standards by testing through Cynthia Says. Follow the Accessibility Guidelines WCAG 2.0 Level AA
7. Ensure links make sense out of context. Every link should make sense if the link text is read by itself. Screen reader users may choose to read only the links on a web page. Certain phrases like "click here" and "more" must be avoided.
8. Applications, software, and outside learning systems. All required outside applications and/or learning systems (e.g MyMathLab, Aleks, etc.) are accessible OR an alternative is provided. Test with WebAIM WAVE toolbar.
9. Avoid text images. Images of text are avoided, OR an alternative is provided. (Examples of images of text are PDFs made from scanned pages, and word art.)
10. Color contrast. Text and background color have sufficient contrast on all documents, PowerPoints, and webpages both inside and outside of the LMS.
11. Text objects. If the shape, color, or styling of any text object conveys information, that information is conveyed in plain text as well.
12. Disability statement. The course syllabus contains the college's suggested Disability Statement as well as current information on the location and contact information for the Learning Assistance Program (LAP).

Inform Students

Students contacted via email and learning management system (Canvas).

Additional Comments

N/A

Board Approval: 05/15/2001
PCA Established: 05/15/2015
DL Conversion: 12/15/2020
Date Reviewed: Fall 2021
Catalog Year: 2022 - 2023

Allan Hancock College
Course Outline

Discipline Placement: Biological Sciences (Masters Required)
Department: Life & Physical Sciences
Prefix and Number: BIOL 150
Catalog Course Title: Cellular Biology
Banner Course Title: Cellular Biology

Units and Hours

	Hours per Week	Total Hours per Term (Based on 16-18 Weeks)	Total Units
Lecture	3.000	48.0 - 54.0	
Lab	6.000	96.0 - 108.0	
Outside-of-Class Hours	6.000	96.0 - 108.0	
Total Student Learning Hours	15.0	240.0 - 270.0	5.0
Total Contact Hours	9.0	144.0 - 162.0	

Number of Times Course may be Repeated
0

Grading Method
Letter Grade Only

Requisites

Prerequisite
CHEM 150 General Chemistry 1

Entrance Skills

Upon entering this course, the student should be able to:

1. identify chemical terms and give definitions and/or descriptions of those terms.
2. properly use and write chemical formulas and chemical equations.
3. convert between various units of measure and understand the concepts of density and temperature.
4. classify matter into various subgroups.
5. determine the name, family and number of electrons, protons, and neutrons of a particular element from its position on the periodic table.
6. relate the structure of an element to the element's properties.
7. describe reactions in solution by writing molecular, complete ionic and net ionic equations.
8. perform stoichiometric calculations involving mole to mole, mass to mass, mass to volume, and volume to volume relationships.
9. calculate the change in enthalpy of a chemical reaction using Hess's Law, enthalpies of formation and bond energies.
10. perform calculations involving calorimetry.
11. describe the structure of atoms using the quantum mechanical model.
12. write electron configurations for atoms and ions and relate to the properties of atoms and the periodic table.
13. understand various period trends such as ionization energy and atomic radius.
14. describe the different forms of chemical bonding such as covalent and ionic bonding and relate bond type to the properties of compounds.
15. draw Lewis structures of molecules.
16. identify the molecule geometry of molecules using VSEPR theory including the concepts of hybrid orbitals and molecular orbitals.
17. demonstrate skill in calculations involving the various gas laws.
18. relate, understand and explain the behavior of gases as described by the kinetic molecular theory.
19. describe the properties of liquids and solids based on intermolecular forces.

Catalog Description

A study of the nature of life, emphasizing its molecular and cellular aspects of life, particularly cellular reactions as governs organismic metabolism, biological and chemical evolution, and Mendelian genetics. Lecture: 3 hours weekly. Lab: 6 hours weekly.

Course Content

Lecture

1. Unity and Diversity Themes
2. Evolution—Mechanisms and Trends
3. Cellular Basics of Life
4. Energy Requirements
5. Chemical Basis of Life
6. Genetics—Molecular and Organismic

Course Objectives

At the end of the course, the student will be able to:

1. identify the major types of cells.
2. discuss the phototropic and chemotropic metabolic pathways of photosynthesis and cellular respiration.
3. utilize the scientific method and experimental designs to identify the cellular process of reproduction, enzymatic action, cellular transport, and molecular biology.
4. discuss hereditary patterns and solve problems related to transmission genetics.
5. identify examples of DNA technology and critically evaluate their potential uses.

Methods of Instruction

- **Lab**
- **Lecture**
- **Methods of Instruction Description:**

  Lecture format with biological demonstrations when appropriate to supplement textbook material. Laboratory experiments will give the students hands-on experience. Additional readings may include articles from recent periodicals such as Nature, Scientific American, and Science to include recent developments in the world of biology. Also, Internet and other multi-media resources may be included in the class at the instructor's discretion.

Assignments

- **Other Assignments**

  Sample writing assignment: Fragile X syndrome is the leading genetic cause of mental retardation. The FRAXA Research Foundation website contains information about the disease, and also posts information about current research projects. Use the information at this site to supplement what you know about the screening and treatment of Fragile X syndrome. a) Describe the features of the Fragile X children shown at this site. What differences can you see between the boys and the girls? Is it worth using physical appearance to identify children with this syndrome? b) Why is Fragile X more common in males than in females, with the symptoms becoming more severe in successive generations. c) What do you think might explain why most affected boys are mentally retarded, but only 1/3 to ½ of the girls are similarly impaired? Men who inherit the mutant gene (FMRI) that causes Fragile X syndrome but have a normal phenotype are called transmitter males. Explain why mothers of transmitter males are normal, and have a low risk of having Fragile X children, but daughters of transmitter males have a higher risk of having affected children.

Methods of Evaluation

- **Exams/Tests**
- **Quizzes**
- **Papers**
- **Simulations**
- **Class Participation**
- **Lab Activities**
- **Other**

  1. Solve descriptive qualitative and quantitative genetic problems. 2. Written papers (article critiques) 3. Cumulative final examination. 4. Formal laboratory reports and laboratory notebook. 5. Exams including essay and objective components. Sample Essay Question: Metabolism is considered an important characteristic of life. Humans are open systems that need a constant supply of energy. Explain how humans obtain food to the formation of usable chemical energy. Include relevant summary equations and cellular processes.

Texts and Other Instructional Materials

Adopted Textbook

1. Raven, P. Johnson, G. Mason, K. Losos, J. and Singer,S. *Biology* Edition: 12th Ed 2019

Supplemental Texts

1. Scientific American
2. Nature
3. Internet sites designed specifically for biology: http://www.ncbi.nlm.nih.gov/ (National Center for Biotechnology Information), http://www.dnalc.org/(DNA Learning Center), https://www.hhmi.org/ (Howard Hughes Medical Institute)

Instructional Materials
None

Student Learning Outcomes

1. BIOL150 SLO1 - Compare and contrast the major types of cells.
2. BIOL150 SLO2 - Discuss the metabolic pathways of photosynthesis, respiration, and the storage and degradation of biological molecules.
3. BIOL150 SLO3 - Investigate and analyze problems utilizing the scientific method to formulate an understanding of enzymatic action, cellular transport, photosynthesis, genetics, and cellular respiration.
4. BIOL150 SLO4 - Solve problems, hypothesize, and investigate hereditary patterns related to transmission genetics.
5. BIOL150 SLO5 - Demonstrate an understanding of DNA technology and critically evaluate their potential uses.

Distance Education

Delivery Methods

- Internet

Instructor Initiated Contact Hours Per Week: 9.000

Contact Types

1. Discussion Board

   N/A

2. Email Communication (group and/or individual communications)

   N/A

3. Labs

   ERT will have remote labs. Other scenarios may have in person labs.

4. Orientation Sessions

   N/A

5. Other (please specify)

   Live lecture and lab content explained by instructor using Zoom or ConexED.

Adjustments to Assignments
Instructors may employ a variety of online tools to make the necessary adjustments in an ERT/ DE setting for this course.

- Assignments will be submitted primarily through the district Course Management System(CMS).
- Students can submit multiple files types, type in a textbox to submit their assignments, or submit links to their work in the cloud or other web related service such as Google Docs.
- Students can also submit assignments through district email or the messaging service in the district CMS.
- The district CMS contains many tools instructors can use to facilitate different assignment types.
- Instructors may use the assignments tool and / or discussion tool to facilitate student to student interaction.
- Instructors may use the feedback features of the district CMS to facilitate instructor - initiated contact.
- When appropriate, instructors may use group assignments.

Possible tools employed to adjust for ERT / DE course may include, but not limited to:

- District CMS assignments
- Threaded discussion forums
- District Email
- District CMS messaging service
- Announcements in the district CMS
- Feedback of student work through use of Speed Grader or other tools
- Synchronous audio / videoconferencing(Zoom, Cranium Café)

- Interactive mobile technologies
- Chat, text, Twitter
- Telephone
- Virtual offices hours
- Other: None

Adjustments to Evaluation Tools

- ERT/DE courses allow for multiple evaluation tools with online technology.
- This course will be able to use interactive quizzes which allow for automated assessment performance for certain question types and the use of the mastery gradebook.
- If the assessment requires necessary student authentication, the instructor can employ machine automated proctoring services available through the current district CMS.
- Use of these features (quizzes, discussions, and assignments) provide the necessary tools to evaluate student progress toward the objectives of the course.

Strategies to Make Course Accessible to Disabled Students
All courses must meet the WCAG 2.0 level AA standards including but not limited to the items listed below:

1. Images, graphs, charts or animation. A text equivalent or alt text is provided for every non-text element, including all types of images and animated objects. This will enable a screen reader to read the text equivalent to a blind student.
2. Multimedia. Equivalent alternatives for any multimedia presentation are synchronized with the presentation. Videos and live audio must be closed captioned. For archived audio, a transcript maybe sufficient.
3. Documents and other learning materials. PDFs, Microsoft Word documents, PowerPoint presentations, Adobe Flash and other content must be as accessible as possible. If it cannot be made accessible, consider using HTML or, if no other option is available, provide an accessible alternative. PDF documents must be properly tagged for accessibility.
4. Timed quizzes/exams. Extended time on quizzes and exams is one of the most common accommodations. Instructions for extending time in Canvas.
5. Outside webpages and links
6. Ensure that all webpages meet 508 standards by testing through Cynthia Says. Follow the Accessibility Guidelines WCAG 2.0 Level AA
7. Ensure links make sense out of context. Every link should make sense if the link text is read by itself. Screen reader users may choose to read only the links on a web page. Certain phrases like "click here" and "more" must be avoided.
8. Applications, software, and outside learning systems. All required outside applications and/or learning systems (e.g MyMathLab, Aleks, etc.) are accessible OR an alternative is provided. Test with WebAIM WAVE toolbar.

9. Avoid text images. Images of text are avoided, OR an alternative is provided. (Examples of images of text are PDFs made from scanned pages, and word art.)
10. Color contrast. Text and background color have sufficient contrast on all documents, PowerPoints, and webpages both inside and outside of the LMS.
11. Text objects. If the shape, color, or styling of any text object conveys information, that information is conveyed in plain text as well.
12. Disability statement. The course syllabus contains the college's suggested Disability Statement as well as current information on the location and contact information for the Learning Assistance Program (LAP).

Inform Students

Via Canvas, email, and Zoom contact.

Additional Comments

In DL format, the class is taught as a hybrid. The course has 3 hours lecture online and 6 hours lab in person per week for a total of 9 hours.

Degree and Certificate Requirements

Allan Hancock College
Program Outline

Title: Biology
Award Type: Associate in Arts

The associate degree in biology prepares students to move into a curriculum in a four-year institution leading to a baccalaureate degree in such areas as botany, zoology, conservation, and teaching. The biologist with a baccalaureate degree is prepared to enter graduate or professional programs of specialized study such as medicine, dentistry, medical technology, osteopathy, and veterinary medicine.

The graduate of the Associate in Arts in Biology will:

- Demonstrate proficient research skills in data gathering and analysis.
- Demonstrate effective communication using the language, concepts and models of biology.
- Demonstrate effective content knowledge of biodiversity.

Program Requirements

A major of 23 units is required for the degree.

Required core courses (15 units):

Units: 15

BIOL150	Cellular Biology	5
BIOL154	General Botany	5
BIOL155	General Zoology	5

Plus a minimum of 8 units selected from the following:

Units: 8

All of which are required for the baccalaureate degree

CHEM150	General Chemistry 1	5
CHEM151	General Chemistry 2	5
PHYS141	General Physics 1	4

PHYS142	General Physics 2	4

Recommended electives:

Not required

BIOL132	Marine Biology	4
BIOL179	Experimental Courses in Biology	0.5 - 3
BIOL189	Independent Projects in Biology	1 - 3
BIOL199	Special Topics in Biology	1 - 3

Total Program Units

23

Allan Hancock College
Program Outline

Title: Biology
Award Type: Associate in Science for Transfer

The associate in science in biology for transfer program prepares students to move into a curriculum in a California State University, as well as other four-year institutions leading to a baccalaureate degree in such areas as botany, zoology, conservation and teaching. The biologist with a baccalaureate degree is prepared to enter graduate or professional programs of specialized study such as medicine, dentistry, medical technology, osteopathy and veterinary medicine.

Associate Degree for Transfer Requirements
Completion of 60 semester units that are eligible for transfer to the California State University, including the following:

1. Completion of the Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education-Breadth (CSU GE).
2. A minimum of 18 semester units in a major or area of emphasis as determined by the community college district.
3, Obtainment of an overall minimum grade point average of 2.0.
4. Minimum grade of C, or P grade, for each course in the major.

[The following Allan Hancock College graduation requirements will not be required: Health and Wellness, Multicultural Gender Studies and Allan Hancock College General Education.]

The graduate of the Associate in Science for Transfer in Biology will:

- Demonstrate proficient research skills in data gathering and analysis.
- Demonstrate effective communication using the language, concepts and models of biology.
- Demonstrate effective content knowledge of biodiversity.

Program Requirements

A major of 37 units is required for the degree.

Units: 37

BIOL150	Cellular Biology	5
BIOL154	General Botany	5
BIOL155	General Zoology	5

CHEM150	General Chemistry 1	5
CHEM151	General Chemistry 2	5
MATH181	Calculus 1	4
PHYS141 and	General Physics 1	4
PHYS142 or	General Physics 2	4
PHYS161 and	Engineering Physics 1	4
PHYS163	Engineering Physics 3	4

General Education

Units: 31

Complete the following:

a) IGETC (Intersegmental General Education Transfer Curriculum) for STEM 31 units

Double Counting:
A maximum of 10 units can be double counted for the major and general education requirements.

Select additional CSU transferrable units, as needed, to achieve the 60 units required for the degree.

Total Program Units

68

Validation

EXECUTIVE SUMMARY
(Validation Team Report)

The Validation Team for the 2022 Biology six-year program review—consisting of Counseling faculty member Brooke Souza, Physics faculty member Brian Youngblood, Chemistry faculty member Sean Gottlieb, author of the Program Review and Biology faculty member Ashley Wise, and Dean Sean J. Abel—met to review and discuss the comprehensive program review for approximately 60 minutes on Wednesday May 26, 2022. It was clear that each member of the team had reviewed the document with care and came prepared to provide feedback and suggestions to the document's author.

1. MAJOR FINDINGS

Strengths of the program/discipline:

The team members noted the attention to detail, consideration, and thought that was evident throughout the document. The team was able to discuss the content of the document and work with the author to clarify the impact of the document to the program.

As the team reviewed and reflected upon the document together, they commented on the strength of the curriculum, particularly in support of pre-requisites for allied health disciplines which are now being offered at both campuses, with the newly inclusion of Physiology at LVC effective Fall 2022. This completeness of curriculum was overwhelmingly reflected in positive student survey feedback. The students were particularly enthusiastic about the quality of instruction, contributions to their intellectual growth, and that the content of the courses was applicable to their educational goals.

The team remarked on the impact of the Biology program upon nearly every degree-seeking student at the college as part of their pursuit of a broad liberal arts education. Members noted a growth and evolutionary mindset within the program which has resulted in the approval of an additional Biology faculty member as well as an in-depth examination and revision of program learning outcomes. The dedicated faculty of the Biology department impressed the team with their participation in innovative projects that benefit the students and community, several of which were noted specifically. One such project is an NSF grant designed to support pilot activities in the community garden to be Monarch Waystations and Certified National Wildlife Federation Habitats. This project is a collaboration with the AHC Agriculture program and two other California community colleges. Finally, the members of the team expressed their enthusiasm for the Biology program's cadaver program and noted the high level of experiences possible at AHC not found at other similar institutions.

Concerns regarding the program/discipline:

As the team discussed the document with the author, challenges for the program were remarked upon by all. Two highly impactful main themes were discussed—space/facilities and staffing resources—and now those issues may become more critical with the passage of time and growth of all programs within Life and Physical Sciences at both the Santa Maria and Lompoc Valley Center campuses.

There are a number of issues creating space use problems that directly affect scheduling of Biology classes to allow for timely student completion. The first of these is a need for large lecture halls that accommodate students from two lab sections simultaneously. Not only does this impact Biology, but other disciplines including Chemistry, Agriculture, Geology, and Physics. Having several large lecture rooms that seat up to 60 students would create flexibility in scheduling to improve student throughput. There are also issues with a lack of lab classroom space. This is a more indirect need as we must schedule Agriculture, Viticulture/Enology, and Veterinary Technology classes in Biology lab rooms which impinges upon the department's ability to schedule additional needed Biology offerings. This limited space prevents the program from scheduling certain less-common classes throughout the day and/or multiple semesters.

Although the Biology program is well-supported by the campus, some staffing and other resource issues were also noted in the Validation Team's discussion. The first of these relates to lab support personnel. Team members noted difficulty retaining the Lab Assistant position employees due to relatively low salary when compared with other positions across campus. Additionally, the incumbents in this position have needed to work after the hours of the Lab Specialist making the position more independent than the salary level and job description indicate. The space uses listed above have led to the Biology Lab Specialist assisting with the Agriculture and Veterinary Technology programs on an occasional but regular basis. This overloads that employee's work schedule. Additionally, growth of all the sciences at the Lompoc Valley Center will soon go past current space and staffing limits, requiring expansion. Finally, the AHC Cadaver program was also discussed. Team members noted that this highly valuable part of our Biological Sciences program has been paused due to pandemic and/or funding.

2. RECOMMENDATIONS

Based on the discussion and program challenges, the team and author proposed recommendations. The most impactful recommendations would be addressed with additional space. Future construction should account for adding an appropriate number of large classrooms on the Santa Maria campus to accommodate Biology as well as other Lab science courses needing them. Additionally, future construction should account for adding Lab spaces for Agriculture, Viticulture/Enology, and Veterinary Technology on the Santa Maria campus. In the nearer term, conversion of LVC-3-109 to a science lab space should be planned to account for growing needs for allied health pre-requisites. The second set of recommendations is regarding support staffing. The Santa Maria Lab Assistant position should be upgraded to a Lab Associate to reflect the increased level of responsibility of independent work being done after the working hours of the Lab Specialists. When the recommended additional

facilities come online (or sooner), a shared Lab Specialist should be added for the Agriculture and Veterinary Technology programs. Similarly, as the number of Life and Physical Sciences courses increases at the Lompoc Valley Center, a Lab Assistant or Lab Associate will need to be added. Finally, the team recommends that funding for resumption and continuation of Cadaver program be added to the budget for the 2022-2023 Academic Year and beyond.

Summary prepared by Sean J. Abel
Dean, Academic Affairs

VALIDATION TEAM SIGNATURE PAGE

Sean Gottlieb (May 25, 2022 14:28 PDT)

Brian Youngblood (May 25, 2022 15:08 PDT)

Brooke Souza

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

DEPARTMENT Life and Physical Sciences PROGRAM Biology

Identify the actions the discipline/program plans to take during the next six years. Be as specific as possible and indicate target dates. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan. The completed final plan should be reviewed by the department as a whole.

RECOMMENDATIONS TO IMPROVE DESIRED **STUDENT OUTCOMES** AND IMPROVE STUDENT PERFORMANCE	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
1. Continue efforts to increase the transfer of Biology Program students into academic and professional programs at four-year colleges, universities and other institutions. In particular, continue work on the NSF grant with Antelope Valley College and College of the Canyons as well as Anatomy Open Lab with Cal Poly, Luis Obispo.	1. SLS2, SLS3	1. Ongoing
2. Continue to promote high academic standards for Biology Program students and success in achieving Program Learning Outcomes, while making every effort to make biology accessible to as many students as possible.	2. SLS6, SLS7	2. Ongoing
3. Maintain and increase currency in technology specific to biology, as well as technology directed at education and information literacy.	3. IR3	3. Ongoing
4. Utilize the STEM Center to increase accessibility to resources and tutoring to support students in biology courses.	4. SLS2, SLS3	4. Ongoing

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Enrollment Changes		
1. Continue to offer as many sections as possible at different times of day to accommodate a diverse student body, many of whom work and/or have care-giver responsibilities.	1. SLS2, SLS3, SLS5, SLS6, SLS7	1. Ongoing
2. Increase lecture/classroom space to accommodate 60 students.	2. SLS2, IR2	2. Ongoing
3. Incorporate additional instructional assistance for laboratory sections (lab assistants, graders, student peer mentors, additional faculty etc.).	3. SLS2, IR1	3. Ongoing
4. Maintain the number of full-time faculty and increase faculty as needed. Immediately replace vacancies due to retirement, resignation, etc…	4. SLS2, IR1	4. Ongoing
5. Continue to recruit highly qualified adjunct instructors who demonstrate an understanding of, and sensitivity to, our student population.	5. SLS2, IR1	5. Ongoing
Demographic Changes		
1. Maintain or increase biology class offerings at both the Santa Maria campus and the Lompoc Valley Center.	1. SLS2, SLS3	1. Ongoing

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Curricular Changes		
1. Continue to reevaluate and update curriculum, maintaining course currency through AP&P.	1. SLS1, SLS2, SLS3	1. Ongoing
2. Recommend that all biology courses with writing and math related components modify their outlines and syllabi to include advisories or prerequisites of appropriate English and Math classes.	2. SLS2, SLS3, SLS6	2. Fall 2025
3. Revisit specific prerequisites for the appropriate biology courses, including Human Anatomy and Microbiology.	3. SLS2, SLS3, SLS6	3. Fall 2025
4. Reinstate cadaver program with new Cadaver Lab course.	4. SLS1, SLS2, SLS3	4. Spring 2023

Co-Curricular Changes 1. Continue on-going communications with local high schools to review and discuss articulation agreements between high school and college courses.	1. SLS2, SLS3, SLS6	1. Ongoing
Neighboring College and University Plans 1. Promote the transfer of Biology Program students to neighboring Colleges and Universities.	1. SLS2, SLS3, SLS6	1. Ongoing
Related Community Plans 1. Continue to participate in college outreach efforts to promote the Biology Program to local secondary and high school students.	1. SLS2, SLS3, SLS6	1. Ongoing

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.	1. SLS2, IR1	1. Fall 2023
2. Hire an additional full time biology instructor for the Lompoc Valley Center Santa Maria campus, as need dictates. Replace vacancies immediately.	2. SLS2, IR1	2. Fall 2022 and ongoing
3. Augment budgets for student workers for SM and LVC, as needed.	3. SLS2, IR3	3. Ongoing
4. Create dedicated travel budget for lab support travel between campuses and local vendors.	4. SLS2, IR1	4. Fall 2022
5. Upgrade lab assistant to lab associate position.	5. SLS2, IR1	5. Spring 2023
6. Shared lab specialist for Agriculture and Veterinary Technology programs.	6. SLS2, IR1	6. Fall 2023
7. Lab assistant/associate for Lompoc Valley Center as needed due to increased sections being offered.	7. SLS2, IR1	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	1. SLS2, IR3	1. Fall 2023
2. Equipment for a forensic investigation	2. SLS2, IR3	2. Fall 2023
3. Compensation for enology instructor that gives a tour of wine-making at A	3. SLS6, IR1, IR2	3. Fall 2023
Human Anatomy 1. Human skeletons (real bone)	1. SLS2, IR3	1. Ongoing, as needed.
2. Replacement microscopes	2. SLS2, IR3	2. Fall 2023
3. Replacement models for Santa Maria campus – see specific list in Exhibits	3. SLS2, IR3	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	1. SLS2, IR3	1. Fall 2023
2. Replacement autoclave	2. SLS2, IR3	2. Fall 2024. Urgent need if broken.
3. Replacement refrigerators (3)	3. IR3	3. Fall 2023
4. Hot plates (2)	4. SLS2, IR3	4. Spring 2023
5. Water baths (2)	5. SLS2, IR3	5. Fall 2022
6. Replacement fume hood for sterile culturing	6. SLS2, IR3	6. Fall 2023. Urgent need if broken.
7. Bunsen burners need to be replaced	7. SLS2, IR3	7. Fall 2022
Cellular Biology 1. Power supplies (2)	1. SLS2, IR3	1. Spring 2023
General Zoology 1. Formlabs 3D Printer ($5000)	1. SLS2, IR3	1. Fall 2023
2. Trail cameras - RECONYX HyperFire 2 Covert IR Camera, OD Green, HF2X (6 cameras at $400 each = $2400)	2. SLS2, IR3	2. Fall 2023
General Botany 1. Plant anatomy models	1. SLS2, IR3	1. Ongoing, as needed.
2. Greenhouse heater	2. SLS2, IR3	2. Spring 2023
Marine Biology 1. Cold water marine aquarium touch tank	1. SLS2, IR3	1. Fall 2023
2. Water testing equipment to be used in the field	2. SLS2, IR3	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
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
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
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
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

PLAN OF ACTION – Post-Validation

Review and Approval

Plan Prepared By

Ashley Wise Date: 6/8/2022

_____ Date:_____

_____ Date:_____

_____ Date:_____

_____ Date:_____

Reviewed:

Department Chair*

_____ Date: 8/11/22

*Signature of Department Chair indicates approval by department of Plan of Action.

Reviewed:

Dean of Academic Affairs

Sean Abel (Aug 11, 2022 15:02 PDT) Date: 8/11/2022

Vice President, Academic Affairs

Robert Curry (Aug 26, 2022 15:02 PDT) Date: Aug 26, 2022

Pages from BIOL Program Review Final

Final Audit Report 2022-08-26

Created:	2022-08-22
By:	Lisa Gutierrez (lisa.gutierrez@hancockcollege.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAAacPAV53JMyzlxlNiQDrpSX3NFapW8x9Q

"Pages from BIOL Program Review Final" History

Document created by Lisa Gutierrez (lisa.gutierrez@hancockcollege.edu)
2022-08-22 - 10:02:00 PM GMT- IP address: 209.129.94.61

Document emailed to Robert Curry (rcurry@hancockcollege.edu) for signature
2022-08-22 - 10:02:33 PM GMT

Email viewed by Robert Curry (rcurry@hancockcollege.edu)
2022-08-22 - 11:20:20 PM GMT- IP address: 209.129.94.61

Document e-signed by Robert Curry (rcurry@hancockcollege.edu)
Signature Date: 2022-08-26 - 10:02:01 PM GMT - Time Source: server- IP address: 209.129.94.61

Agreement completed.
2022-08-26 - 10:02:01 PM GMT