

2022-23 Program Review Template

Directions for Lead Writers: Please use this template to complete your Unit's Program Review for this cycle. Instructions for submitting your completed template at the end of the spring semester will be provided in a few weeks. Click [here](#) to view our Glossary of Terms.

Other Resources:

[Program Review Handbook](#)

[Acronym Dictionary](#)

[Resource Link Library](#)

[Mesa 2030](#)

[Program Review Archives](#)

DEI Discussions: as part of your reflection with your unit, a workgroup has developed a Diversity, Equity, Inclusion, and Accessibility Discussion Guide. Please use this in your unit-level discussions as we move toward becoming more diverse, equitable, inclusive, and accessible through intentional and ongoing campus-wide reflections and revisions of policies and practices.

View the guide [here](#). Have reflections or feedback to share? Click [here](#).

| <i>Program Information & Executive Summary</i> | | |
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| Prompt | Guidance | Program Response |
| Describe the successes and challenges your unit has faced since the last comprehensive review. | | Successes: <ul style="list-style-type: none">Fully returned all courses to face-to-face since Covid-19.We have been able to maintain relatively high fill rates for our courses even with decreased enrollment. |

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| | | <ul style="list-style-type: none">• Faculty in our program (Daniela Bruckman, Leslie Seiger, Paul Detwiler) have been successful in obtaining grants for students. Daniela received funding through an NSF grant to incorporate multi-day field experiences at the UCI research station in Anza Borrego into the Bio 210B course and to support students in research projects. Paul Detwiler received a San Diego Mesa Foundation Innovation Grant to support a 10-week summer internship program in marine science for Mesa students at SDSU's Coastal Marine Institute Laboratory. The CMIL is an urban marine research facility where students and scientists conduct studies that help them better understand and address the environmental problems affecting the Southern California coastline. In fall 2022, a proposal to expand the program that Detwiler co-wrote with CMIL personnel received a 2023 <i>Pathways to Inclusive Research Training</i> award from California SeaGrant, resulting in funding to provide stipends for participants in summer 2023. Leslie is involved in the Invention and Inclusive Innovation (i3) Initiative Pilot Project, an interdisciplinary Workforce and Economic Development grant. The i3 is designed to develop 21st century workforce skills while solving community problems, provide experiential learning for students, teach students about using the entrepreneurial mindset as a skill, and learn as a cohort in an interdisciplinary environment while building confidence. A secondary goal is to gain experience to work related to STEM for students who have been traditionally underrepresented in these fields.• We had an unsuccessful search for a full-time faculty member in anatomy and physiology last spring (Sp22) but thankfully were successful in the search this past semester (F22) and have hired Thu (Tiffy) Nguyen as a new faculty member to teach these courses.• Multiple biology faculty are involved in mentoring students through field-based research projects that culminated in posters at the MCRC, with one faculty's (Dean Leavitt) students winning Best Experimental Poster. |
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- Faculty and ILTs are heavily involved in the Enrollment Management committee at various levels (subcommittees) to thoughtfully and effectively increase enrollment on our campus and pave the way for best practices at Mesa and our sister campuses.
- Anar Brahmhatt and Jennifer Carmichael have been a part of the HSI STEM Curriculum Workgroup (part of Mesa's Title III HSI-STEM E3: Equity, Excellence and Éxito). This is where we meet with our colleagues across the STEM courses (Physics Chemistry and Math) as well as STEM and Transfer counselors, and Institutional Research analyst to work collaboratively on how STEM curriculum for biology majors and allied health track support each other, where they do not, and how to create the best suggested pathways for student success.
- Todd White is a part of Platinum 5 project focused on the "Golden 4" areas of general education: critical thinking, written communication, mathematics/reasoning (STEM), and oral communication, and more recently the fifth addition: ethnic studies. One major goal of this project is to create informal cohorts of students using STEM majors as an inaugural group.

Challenges:

- Autoclaves that were purchased for our Microbiology classes unfortunately have not come without issues. One unit was shipped with a faulty control panel. This renders this machine inoperable. We are working with our Dean and the service contractor to deal with this. Thankfully, we were able to secure an ongoing service contract to maintain the autoclaves, as it was already necessary to utilize this service. Currently, we have no alternative means for creating media. Therefore, we are asking on our BARC request for a Biosafety cabinet (BSC) and an ergonomic repeater pipettor. This is a standard piece of equipment for microbiology labs,

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| | | <p>one that we have needed but have done without, relying on outdated methods instead.</p> <ul style="list-style-type: none"> • The refrigeration systems for the microbiology labs are also currently not working. Without these, it is impossible to create/store the media necessary for lab exercises. We were recently informed that in order to get these refrigerators replaced, we will have to apply for BARC funding (BARC request completed). If we do not get the funding for this equipment, we will not be able to run microbiology labs, as these are vital to the course. • We have challenges finding qualified adjunct faculty to teach our anatomy and physiology classes and even with the new full-time hire, we could not run all of the classes we were hoping to. • We have broken and outdated equipment for lab classes (microscopes, spectrophotometers) that need to be replaced and microscopes will also require an ongoing service contract for maintenance. • One of our contract faculty (Jennifer Carmichael) was hired to fill the vacant Dean of Math & Sciences position, so we now will need to hire to replace her. • Faculty would like to attend more professional learning conferences off-campus/out of state but current conference and travel fund monies available to support these endeavors are not sufficient to cover all costs, thereby creating financial hardship to faculty in order to attend these events. |
| <p>If applicable, describe any major curricular or service changes your unit has engaged in and the impact of those changes since the last comprehensive review.</p> | <p>Optional</p> | <ul style="list-style-type: none"> • Our department continues to stay current with curriculum and update the Course Outline of Record for our courses. Since our last comprehensive review, we have collaborated with City College and Miramar College to update the following courses: Bio 210A, Bio 210B and Bio 230. Changes to the curriculum primarily center around creating more equitable and diverse courses in terms of access to textbooks (with the inclusion of OER choices for textbooks) and inclusion of individuals from diverse backgrounds who have contributed to the fields represented by these courses. |

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| | | <p>We hope that the overall impact is a positive one with these additions.</p> <ul style="list-style-type: none">• Several faculty members have engaged in FIGS (faculty inquiry groups) to help enhance curriculum. Caitlin Tiffany embarked on a FIG directed at Grading for Equity. Anar Brahmhatt & Jennifer Carmichael have completed a FIG for Bio 210A centered around a more coherent content delivery that also took into account inconsistencies in student pre-requisite knowledge and how to bridge those gaps. Daniela Bruckman, Paige Hu and Dean Leavitt used their FIG to create a Research 101 Canvas Shell so students could learn the basics of research, find research opportunities, and connect with student researchers at Mesa. As a consequence, our students are engaging more in research through the Eco Research Program, Honors Contracts with our faculty, and the Mesa Research Conference with greater opportunities to shine and be competitive for transfer and beyond in career development.• Anar Brahmhatt joined the 2021-2022 Equity Minded Assignments cohort to learn about and create an assignment for Bio 205 that would engage students in ways that allowed them to explore microbiology and diseases through an equity lens: learning about specific diseases of interest to each student and highlighting racial disparities that exist showcasing their knowledge in unique creative ways.• Anar Brahmhatt and Jennifer Carmichael have been a part of the HSI STEM Curriculum Workgroup (part of Mesa's Title III HSI-STEM E3: Equity, Excellence and Éxito) where we meet with our colleagues across the STEM courses (Physics Chemistry and Math) as well as STEM and Transfer counselors, and Institutional Research analyst to work collaboratively on how STEM curriculum for biology majors and allied health track support each other, where they do not, and how to create the best suggested pathways for student success.• Many of our lab courses have also been updated to provide |
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| | | <p>more inclusive and equitable practices. Of note is the procurement of mobile charging carts to service individual chromebooks or laptops for each student in the class in the Bio 210A and Bio 205 lab courses. Bio 107 has also obtained a set of new laptops for each student. These courses have (or have plans to) modify their lab curriculum to allow for smaller groups (individual or groups of two) to work on lab exercises and complete computer work in the classroom. With these curricular changes, students have the benefit of a working device and their peers as well as instructor help to complete lab tasks within the class period. This will allow for individual interaction for each student and thus greater engagement and understanding with the intent of greater retention and student success.</p> |
| <p>If applicable, describe the impact of any new resources (human, fiscal, etc.) on the unit and/or action plan implementation.</p> | <p>Optional</p> | <ul style="list-style-type: none"> • We were able to purchase and begin using two new autoclaves for Bio 205 labs. In theory, this will allow us to prepare microbiological media and handle waste in an efficient manner with the eventual increase in sections offered. Unfortunately, one of the new machines is not working (see above for more information). • We were provided with some monies from HEERF and the HSI grant which allowed us to update our biotechnology labs in bio 210A • We received funding for new laptops and transilluminators in our bio 107 labs, enabling us to increase student equity in relation to graphing data and technology skills (one of our CLOs) • We received funding for mobile charging carts to service individual chromebooks or laptops for each student in the class in the Bio 210A and Bio 205 lab courses. This will enable students to work individually on projects allowing them to complete necessary work during class time with peer and instructor support. • We also received laptops for our Bio 200 (Biological Statistics) course, but unfortunately was not able to procure a mobile charging cart for these 24 computers. |

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| | | <ul style="list-style-type: none"> We hired Michael Williams as a new contact faculty member to teach microbiology, general biology, and majors biology, as well as Thu Nguyen for anatomy & physiology. We hired two ILTs (Devin Di Pierro and Thieny Trinh) to provide needed support for our laboratory courses. We received approval for funding for new laptops/chromebooks for our microbiology and 210 classes, which will improve student equity as now each student can work on their own computer during the labs. We were able to secure HEERF funding to order 4 new anatomy models (2 per lab room) |
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| Please confirm that the department has reviewed the Course Learning Outcomes listed in CurricuNet for each course and verify accuracy. | Select One | <input checked="" type="checkbox"/> Reviewed and accurate <input type="checkbox"/> Reviewed not accurate, update in progress <input type="checkbox"/> Reviewed not accurate, need support |
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Data Reflection

| Prompt | Guidance | Program Response |
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| Describe the trends you see in your program/service area's data. | Instructional Data you may consider: enrollment trends, course & program learning outcomes, Institutional Learning Outcomes, course success and retention rates, degree completion, transfer, employment, labor market analysis, other data relevant to your unit's work | <p>Looking at data Fall 21/Spring 22:</p> <p>Percentage point gap: Overall success rate all bio courses: 68.2% (F2F classes) – compared to School (Math/Natural Sciences) (67.9%) & Campus (71.5%)</p> <p>Equity gaps: 19.3% Black/African American/ 14.2% Latinx in bio classes overall, versus 13.3% B/AA & 12.3% Latinx for the School, and 9.9% B/AA & 7.6% Latinx for Campus</p> <p>Overall Bio Retention rates: 78.2 B/AA & 80.9 Latinx</p> <p>Overall Bio Success rates: 50% B/AA & 59.8 Latinx</p> <p>Success rate in Allied Health Track courses (Bio 205/230/235) – 67.2% overall (79.1/56.5/74.2%)</p> <p>Equity gaps in Allied Health Track courses: 24.2% Black/African American/ 13.4% Latinx</p> <p>Retention rates in Allied Health Track courses: 74.1 B/AA & 74.4 Latinx</p> |
| | Service/Admin Area Data you may consider - service usage, service access, demand for services, student service/administrative unit outcomes, types of services offered and used, headcount of services usage, trends in reason for service use, other data relevant to your unit's work | |

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| | | <p>Success rates in Allied Health Track courses: 44.4% B/AA & 59.1 Latinx</p> <p>Success rate in Majors Biology track courses (Bio 210A/210B) – 72.9% overall (65.7/84.4%)</p> <p>Equity gaps for ethnicity in Majors Biology track courses: 32.6% Black/African American & 18.1% Latinx for combined data When looking at individual course data for the last 2 semesters provided (F21/Sp22) there were not enough Black/African American students who took each course to provide data, but Latinx data for each class was 25.2% for 210A and 15.1% for 210B.</p> <p>We chose to evaluate data for these tracks because they represent the largest numbers of students in our program, as well as the greatest number of degrees awarded in our program. Unfortunately, these numbers are similar to what we have seen in the past, even with faculty consciously, collaboratively and intentionally making changes in their courses to improve equity outcomes.</p> <p>Biology degrees awarded 2021/2022 – 149 (6.7% Black/African American; 35.6% Latinx; 15.4% Asian/Pacific Islander; 26.2 White)</p> |
| <p>Describe any equity gaps you see in these data. Are there differences and/or patterns observed by demographics (e.g. race/ethnicity, gender, age, etc.)?</p> | <p>Equity gaps refer to disparities in educational outcomes and student success metrics across race/ethnicity, socioeconomic status, gender, and other demographic traits and intersectionalities.</p> | <p>We chose to look at aggregate data for our allied health and bio major students, as these students represent the largest numbers within our program. These educational tracks do include two of the most challenging courses that we offer (bio 210A and bio 230), and faculty in these courses are continuing to implement multiple strategies to improve student success. One interesting observation in regards to our allied health students, when we looked at each course individually, Bio 205 had no disproportionate impact equity gap for Latinx with 38.2% for B/AA while Bio 235 had no disproportionate impact equity gap for B/AA with 14.1 gap for Latinx. Bio 230 had disproportionate gaps for both groups (23.3% B/AA and 17.1% Latinx). This becomes challenging to analyze as these courses serve the same populations of allied health majors. Human Anatomy (Bio 230) is the most challenging course taught in the biology department. It has historically had one of the lowest success rates (for all groups).</p> |

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| | | <p>Instructors have been working together to figure out ways to improve student success (for all populations) as well as reduce equity gaps but there is only so much that can be done in a course this rigorous. One plan that we have is to create a prerequisite course that better prepares students for the rigor of this course. We do see improved success rates as students move through the usual course sequence of taking 230, then 235 and finally 205, but for various reasons, this is not always how students choose to take (and are sometimes counseled to take) these classes. Additionally, we will be meeting with our colleagues in math and science to review curriculum in terms of skills and knowledge needed from one course or discipline to another. This will be beneficial for potentially increasing student success and improving equity gaps in the Bio 210A course (first course for majors) which is also an extremely rigorous course. Even though we are still seeing significant equity gaps in our Black and Latinx students, we are pleased to note that they do represent a large proportion of students who are receiving allied health and biology degrees. In fact, Latinx students represent the largest degree receiving group overall (35.6%).</p> |
| <p>Describe the discussion(s) that took place about the unit's learning outcomes assessment data.</p> | <p>Department Outcomes Coordinators (DOCs) facilitate a department wide discussion on learning outcomes data each year during "Outcomes Across Campus". DOC's may helpful in supporting this section.</p> | <p>All course and program outcomes were successfully evaluated over the previous evaluation cycle. For the new cycle, the DOCs led a discussion to review all CLOs and PLOs and made changes as necessary. To facilitate the ability to more easily assess CLOs for this upcoming shortened cycle, especially with the majority of our classes having multiple sections and often taught by adjuncts as well as contract faculty, DOCs created a shared file containing the specific assessment tools that will be used in each course. We will create a timeline indicating when each course will be assessed, and then the DOCs will distribute the evaluation tools to each faculty member teaching the class. Data will be collected by the DOCs and lead faculty, with the lead faculty evaluating and reporting on the data. Our various endeavors in further developing curriculum (see "Curricular changes" section) have aided in enhancing our discussion about course outcomes data analysis and future best practices.</p> |

Practice Reflection

| Prompt | Guidance | Program Response |
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| <p>Describe current practices your unit has engaged in that you believe impact the above data trends and equity gaps.</p> | <p>Items to consider: new actions specifically focused on issues of equity, major curricular changes, professional learning, policy or process changes, data-informed unit dialogue, community outreach.</p> | <ul style="list-style-type: none"> • Faculty have been working on FIGs within the department and across schools to support students and improve equity outcomes. Examples include: Daniela Bruckman, Paige Hu, Dean Leavitt (Biology), Erin Evans (Sociology) and Waverly Ray (Geology) to create a research resource titled, "Teaching Research for Equity and Excellence". This resource will take the form of a Canvas website where students will be able to access research opportunities, find community, build research skills view models of successful research endeavors. • Caitlin Tiffany's FIG on Grading for equity as well as the Bio 210A FIG conducted by Anar Brahmbhatt and Jennifer Carmichael centered around a more coherent content delivery that also took into account inconsistencies in student pre-requisite knowledge and how to bridge those gaps have also helped to decrease equity gaps. • Multiple faculty have participated in the CEER (Curriculum Equity and Excellence Review) summer institute to examine the cultural contexts that they bring to the classroom, re-imagine classroom activities and assignments, and develop strategies to be more responsive to students in order to increase equitable practices. • Faculty have participated in Path to STEM Success as well as the HSI E3 STEM Curriculum Workgroup workshops and events. We will also be collaborating with colleagues across our School's disciplines in a STEM curriculum summit to discuss curriculum especially in terms of skills and knowledge needed from one course or discipline to another. This will include the challenges from pandemic teaching and learning, legislative changes, and barriers to transfer with an equity focus. • Faculty have attended out of state conferences at large personal expense (Anne Geller, Kevin Krown – HAPS) that included update speakers and workshops on improving DEI specifically in anatomy and physiology classes. |

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| | | <ul style="list-style-type: none"> Faculty are involved in mentoring students through field-based research projects (Eco Research Scholar Program in 2020/2021 and currently independently) that culminate in posters at the MCRC. |
| What other factors (internal or external) might also impact the above data trends and equity gaps? | Items to consider: legislative changes, fiscal changes, staffing changes, recruitment, hiring, and retention practices. | <ul style="list-style-type: none"> In general, faculty have found that many of our students had challenges returning to in person instruction after remote instruction due to Covid-19, especially in relation to motivation, study skills, and time management. Absences due to COVID-19 have compounded students' abilities to stay on top of content and remain engaged in their courses. There is a lack of support services available for evening students (DSPS, STEM center, food) which negatively impacts these students. While we have seen increased success rates and improved equity outcomes when students utilize tutoring services (STEM center, embedded tutors and peer mentors) we have difficulty recruiting and keeping quality tutors. When such tutors have been available, we have seen that students are better supported and as a consequence more successful (to date we have had tutors and mentors for Bio 107, Bio 235 and 230, Bio 210A/B). |

Unit Goals and Action Plans

| Prompt | Guidance | Program Response |
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| Unit Goals | Goals should connect to Data and Practice Reflections. Goals should be Specific, Measurable, Attainable, Relevant, and Time-bound. | <p>Goal 1: Hire new contract faculty to replace loss of Jennifer Carmichael in our department.</p> <p>Goal 2: Develop a Human Biology course (lecture/lab) as a prerequisite for our allied health track students to increase student success in our 200 level classes (bio 230/235/205)</p> <p>Goal 3: Provide additional faculty support for research endeavors for our bio students. Many of them are pursuing careers in academia are greatly benefited from the opportunity to participate in real scientific studies. ESUs or release time would incentivize more faculty to get involved in serving as mentors and funds (relatively small) for</p> |

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| | | <p>materials would go a long way.</p> <p>Goal 4: Acquire new and replacement equipment in Microbiology (Bio 205) lab to maintain excellence in curriculum, allow for innovation, and ensure quality instruction that is more in line with current clinical and research fields.</p> |
| <p>Mesa2030 Roadmap Strategic Objective (SO) Alignment</p> | <p>Review Mesa2030 and the Roadmap to Mesa2030, only link to SO's that your goal clearly and intentionally is meant to contribute to, each goal should link to 1 or more SOs</p> | <p>Goal 1:</p> <p>SO: Completion</p> <ul style="list-style-type: none"> • Develop pathways that provide students with clarity about degree, certificate, and transfer requirements • Develop cross-functional teams that support student success and include integrated career and transfer counseling. • Design and promote programs and services that intentionally target a reduction in equity gap completion outcomes. <p>SO: Scholarship</p> <ul style="list-style-type: none"> • Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success. <p>SO: Pathways and Partnerships</p> <ul style="list-style-type: none"> • Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. <p>SO: Stewardship</p> <ul style="list-style-type: none"> • Develop a proactive hiring plan that includes a review of advertising, screening, and interviewing with a goal of establishing a diverse and competent workforce that is reflective of the student population and the local community. <p>Goal 2:</p> <p>SO: Completion</p> <ul style="list-style-type: none"> • Develop pathways that provide students with clarity about degree, certificate, and transfer requirements • Develop cross-functional teams that support student success and include integrated career and transfer counseling. |

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| | | <ul style="list-style-type: none">• Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes. <p>SO: Scholarship</p> <ul style="list-style-type: none">• Assess impact of prerequisites and corequisites on student success and revise curriculum, as needed.• Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success. <p>Goal 3:</p> <p>SO: Completion</p> <ul style="list-style-type: none">• Develop pathways that provide students with clarity about degree, certificate, and transfer requirements• Develop cross-functional teams that support student success and include integrated career and transfer counseling.• Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes. <p>SO: Scholarship</p> <ul style="list-style-type: none">• Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success. <p>SO: Pathways and Partnerships</p> <ul style="list-style-type: none">• Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. <p>Goal 4:</p> <p>SO: Completion</p> <ul style="list-style-type: none">• Develop pathways that provide students with clarity about degree, certificate, and transfer requirements• Develop cross-functional teams that support student success and include integrated career and transfer counseling.• Design and promote programs and services that intentionally target a reduction in equity gaps in completion |
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| | | <p>outcomes.</p> <p>SO: Scholarship</p> <ul style="list-style-type: none"> Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success. <p>SO: Pathways and Partnerships</p> <ul style="list-style-type: none"> Develop and implement frameworks to create communities that can provide more targeted delivery of educational resources and support services. |
| Identify specific actions your program/service area will engage in to accomplish this goal. | Examples may include: policy or practice changes; unit initiatives, curricular changes, etc. | <p>Goal 1</p> <ol style="list-style-type: none"> Fill out necessary request forms for faculty hiring With approval, form hiring committee <p>Goal 2</p> <ol style="list-style-type: none"> Create a FIG to evaluate feasibility of new course, including working with articulation office, reviewing other similar courses, and discussing with district colleagues. Develop and launch course outline <p>Goal 3</p> <ol style="list-style-type: none"> Enlist a core group of faculty dedicated to research endeavors Request/research areas of additional funding for support for faculty development and mentoring of student research projects <p>Goal 4:</p> <ol style="list-style-type: none"> Fill out necessary request forms for BARC |
| Does this Action Plan require resources | if yes, complete resource request form | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Lead Writer and Manager Information | | |
| Lead writer Name(s) | Anne Geller and Anar Brahmhatt | |

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| Name of Program/Unit | Biology |
| Manager Name | Jennifer Carmichael |
| Submission Date of Program Review Draft to Manager for feedback | 4/4/23 |
| Submission Date of Program Review Final Draft to Office of Institutional Effectiveness | 5/15/23 |