



Instructional Annual Program Review Update Form

BACKGROUND:

Program Review (PR) is an integral part of the campus planning process. As programs and areas monitor their progress on the current comprehensive four-year program review, changes in need and scope can be expected. This PR Update Form is designed to outline and request modifications to the current program review that occur between comprehensive four-year review cycles, as needed.

Examples of a requested change include new information such as action plans, outcomes modifications, personnel changes, technology needs, and capital expenditures requirements. As programs and areas monitor their progress on the previous comprehensive four-year program review, the form provides the basis to suggest a change in plans and processes to improve student success and institutional effectiveness.

DIRECTIONS:

This form shall be completed annually by ALL instructional programs.

- All instructional programs must submit their Annual Program Review Update Form to their dean or manager by **Monday, March 6**.
- All deans or managers will forward the completed form to the Program Review Committee Chair by **Monday, March 13**.

SUBMISSION:

Program: BIOLOGY Division: NATURAL SCIENCES Date: 2023-03-06

We have reviewed our most recent self-study and **have not identified** any significant changes that necessitate resource requests for the upcoming academic year. *(Complete only pages 1 and 2)*

We have reviewed our most recent self-study and **have identified** significant changes that necessitate additional resource requests, which are attached in our submission. *(Complete the entire form)*

Program Signature(s): _____  Printed Name: Spiros Dimitratos, Ph.D.

PPRC Endorsement: Yes No

Part 1: Review of Data

Instructional Program Review Annual Update Data AY 2021/2022

Biology

Course Success Institution-Set Standard	Completion (Retention) Institution-Set Standard
Below Standard: Less than 61.2%	Below Standard: Less than 74.5%
Warning: Between 61.2% and 64.6%	Warning: Between 74.5% and 78.6%
+: Above 64.6%	++: Above 78.6%

Course Success and Completion by Program

Subject	Enrollments	Avg. Success	Success Standard	Avg. Completion	Completion Standard
BIOL	2,305	62.0%	Warning	76.5%	Warning

Course Success and Completion by Course

Course	Enrollments	Avg. Success	Success Standard	Avg. Completion	Completion Standard
BIOL 100 F	152	65.8%	+	72.4%	Below Standard
BIOL 101 F	930	64.5%	Warning	81.6%	+
BIOL 101HF	8	100.0%	+	100.0%	+
BIOL 102 F	409	55.7%	Below Standard	77.3%	Warning
BIOL 102LF	98	73.5%	+	81.6%	+
BIOL 109 F	85	64.7%	+	69.4%	Below Standard
BIOL 170 F	276	39.9%	Below Standard	52.9%	Below Standard
BIOL 190 F	48	58.3%	Below Standard	75.0%	Warning
BIOL 190LF	24	62.5%	Warning	75.0%	Warning
BIOL 191 F	31	80.6%	+	90.3%	+
BIOL 192 F	5	100.0%	+	100.0%	+
BIOL 193 F	8	100.0%	+	100.0%	+
BIOL 194 F	13	92.3%	+	92.3%	+
BIOL 196 F	19	89.5%	+	94.7%	+
BIOL 272 F	86	75.6%	+	79.1%	+
BIOL 274 F	65	75.4%	+	83.1%	+
BIOL 276 F	40	72.5%	+	82.5%	+
BIOL 297 F	8	50.0%	Below Standard	62.5%	Below Standard

1. Use the data provided by the Office of Institutional Effectiveness (OIE) to review your course completion and success rates and provide a comparison to the Institution Set Standards for course completion and success rates.

Departmental course completion rates remain at ~77% and have been steady for the past ~6 years. While this figure is marginally lower than the campus average of 82%, our completion rates are consistent and comparable to the data from other Natural Sciences departments. Likewise, our course success rates averaged ~ 62% over the last 6 years.

Our analysis of success rates indicates that the variability for an individual instructor generally tracks the variability for all sections of a particular course, implying that success rates may be influenced by factors other than instructor selection. Whereas success rates are slightly lower than the campus average, we noted a steady increase from 2018 to 2021 (+5%) and are providing enhanced resources to our students. One trend evident from the data is an association between higher success rates and the smaller sections taught by full time faculty in our majors courses. We have therefore focused our attention on maximizing resources for our students, including access to our faculty for guidance and mentoring.

Below, we discuss resources including more embedded tutoring, faculty-led study sessions, mentoring, boot camps, an increased number of OER materials, and the approved STEM Center that we are now able to organize and house on campus. These resources are all part of our approach to maintaining high success rates and equitable access to our curriculum.

2. If your program meets or exceeds the standard for completion and success, to what do you attribute your success? If your program does not meet this standard, please examine the possible reasons, and note any actions that should be taken, if appropriate.

Our success and completion rates are comparable to those of other Natural Sciences departments and reflect our challenging curriculum. We have noted reduced completion rates for certain online courses and attribute this to the rigor and requirements of our discipline. Majors may take several STEM courses concurrently in order to meet their degree and/or transfer goals. To assist students we are focusing on equity, consistency, and accessibility: maintaining an anti-racist campus environment, improving access to services such as mentoring in order to address student needs, and improving the student experience with preparation, embedded tutoring, study/review sessions, and more resources. Our student-oriented services and resources will be centralized *via* the approved STEM Center.

We have standardized policies in multi-section courses and have implemented equitable grading practices such as standardizing assignments and points values, omitting the lowest score for assignments and/or quizzes, and including embedded tutors. The rigorous curriculum and return to on-campus instruction have presented challenges to our students who have spent a significant portion of their college experience in remote instruction. For example, anecdotally, students have mentioned to us that BIOL 170 is their first in-person class. Success has improved with the return to campus due to increased in-person contact hours between students and instructors. We will enrich the student experience further with the STEM Center, a readily accessible pedagogic and mentoring resource for our students.

Regarding individual courses noted in the data table:

BIOL 100: This course is designed for non-majors to fulfill GE requirements with no prerequisites or laboratory. We have offered this course as a hybrid to maximize availability and provide more versatility for working and/or nontraditional students to prepare and review the material. Our plans include increasing resource and instructor availability to students by utilizing the STEM Center.

BIOL 101: This non-majors course with a laboratory is often the first science course for students. We have limited lectures to a single CRN of 24; we have hybridized the lecture to serve more students and provide videos; we will use STEM Center resources to assist students. We have also reinstated boot camps (*e.g.*, for mitosis and meiosis) post-pandemic, are utilizing embedded tutors, and have introduced fully OER sections for equitable access. We are including a funding request for better laboratory demonstration sets to assist students.

BIOL 102: This non-majors course is being offered only by full-time faculty, with a section scheduled in the evenings to increase access. We regularly assess CSLOs for BIOL 102 to monitor outcomes and will offer increased faculty-student contact, tutoring, and other resources at the STEM Center.

BIOL 109: This is a non-majors course with no associated laboratory that serves as prerequisite for students preparing for professional schools in various healthcare-allied fields. BIOL 109 is a challenging course that deals with recent developments in our discipline and has no prerequisites; the challenging nature of the material for students who may have not taken other science courses is reflected in the recorded success rates. We regularly assess CSLOs for BIOL 109 to monitor outcomes and have alternatively offered the course as a hybrid with an on-campus, in-person component or as an online course in order to serve as many students as possible and allow students to select an option that will maximize their potential for success by working best with their schedules. Our current plans include increasing resource and instructor availability to students by utilizing the STEM center.

BIOL 170: Organismal biology is the prerequisite core course for biology majors and for students preparing for medical, dental, veterinary, and other professional or graduate schools. We recommend taking BIOL 101 before BIOL 170 to help prepare for the workload and depth of a majors biology course. We also offer boot camps in cell processes, genetics, science essay writing, and study skills, and are using embedded tutors. The course is only taught by full-time faculty to maintain consistency across sections and uniform course policies.

To improve student access, we use the same textbook for our first two majors courses, BIOL 170 and BIOL 272, reducing student costs. We also employ pedagogical techniques that improve critical thinking by using a flipped classroom in some sections. This format allows students to watch recorded lectures before coming into class for

discussion, group activities and real-time assignments and provides instructors with more time to answer individual questions rather than spending a 2-hour lecture doling out information. Flipped classrooms have been shown to increase student engagement with curriculum.

We have improved and updated the microscopy equipment used in BIOL 170. However, our collection of biological specimens is worn out and needs to be updated. We are therefore including a funding request to update our specimen collection with this update.

BIOL 190, BIOL 190L: These rigorous foundational biotechnology courses, part of our DE and CTE curriculum, utilize embedded tutors, mentoring, OER materials, and skills workshops. Subsequent biotechnology courses have higher success rates and successful students are likely to complete the rest of the biotechnology curriculum successfully.

BIOL 297: The above data do not reflect the nature or success of BIOL 297, a course that provides internships in academic or industrial laboratories or in the field, helps equip students for academic research positions and/or the workforce, and is an important part of our efforts to address equity gaps. Small cohorts mean the data can be affected by a single student's outcome. BIOL 297 has allowed us to establish working relationships with colleagues elsewhere from which our students will continue to benefit.

For example, this semester our faculty have initiated a collaboration with faculty at CSUF that is enabling FC student interns to perform research involving RNA splicing. Other students are working at the Oak Canyon Nature Center. We can prepare students for such experiences but cannot always provide them on our campus; by placing our students as interns in the appropriate laboratories or in the field, we are taking steps toward addressing equity gaps and access gaps for our community. To serve more students, we may expand this program by seeking NSF funding in the future.

Part 2: Additional Resource Request Reasoning and Support

Request Justification (Note: Expand all areas as needed to support your resource request)

Briefly summarize your new / modified resource request. Is it imperative that this resource request be processed now rather than during the next comprehensive program review?

- 1. If the Resource Request is personnel-related, include support and associated details/data in support of this request.**
- 2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?**
- 3. How will this resource enhance your area or program? Have you considered the College Mission or Strategic Initiatives, physical/organizational restructuring, and or your program's goals for improvement, as stated in your last program review?**

Provide any additional information that supports your request in the space below. Expand as necessary.

The Biology Department supports the College Mission, Vision, Values, and Goals by equitably promoting critical thinking, inquiry and intellectual curiosity, leading to life-long learners. Our programs explore diversity on many levels of life while holding students to high levels of integrity and ethics. To support the college and community, it is important that we continue working toward increased student retention and success through tutoring, supplemental instruction, workshops, boot camps, seminars, field trips, and educational events that promote science and support student success.

Our requests fully reflect our mission, remain aligned with our Program Review history, and include funding for course-specific resources and for resources and improvements to the area approved to house a STEM Center that will benefit all STEM students. As our community recovers from the pandemic, our institution must continue to promote equity in education and provide enhanced, updated resources to our students. We consider our mission imperative, and our requests are therefore timely. We justify line-items costs, provide background information substantiating our requests, and expand upon our goals below.

BIOL 101 Resource Requests: This course serves as an elective for many non-majors, is recommended as preparation for BIOL 170 to majors, and is often the first college science course these students take. We request replacements for worn out or deteriorating items and enhanced/expanded demonstration sets to meet our growing needs in our labs and the STEM Center.

BIOL 101 resources requested include the following hands-on models for in-class laboratory activities, tutoring sessions, and STEM Center activities: Hominid Skull Set with Primate Comparison Skulls - \$2553.10; Pop-It Beads Chromosome Sets - \$113.00; Protein Synthesis Manipulation Demo Kit - \$375.50; Changing Ecosystems Kit, Modeling Communities, Ecology - \$80.00; 3D Protein Folding Model Kit - \$27.93.

BIOL 170 Resource Requests: Our biology students study the living world through various hands-on laboratory activities. These labs require extensive collections of diverse organisms, models, and manipulatives to offer students an appropriate laboratory experience. We would like to replace deteriorating specimens as well as expand our collections for BIOL 170 (Organismal Biology), the first course in the Biology majors sequence. The specimens, models, and slides listed in Part 3 (Resource Request Funding) would provide students an additional resource for learning biological concepts taught in the classroom. Having visual representations of topics learned in class helps improve interest and leads to discussion in the classroom. Engaging students in this mode of active learning leads to increased confidence reported by students and has been shown to generate positive student outcomes. A number of the current specimens, models, and slides necessary for BIOL 170 are no longer usable and a new set is needed to replace them. Also, having a set of slides and models available in the STEM Center would help enhance the student experience there. This spare set would allow for simultaneous instruction to take place both inside the classroom and outside of it. With a number of students now missing instruction days for minor illnesses in this post-pandemic environment, instruction in the STEM Center outside of the classroom becomes all the more crucial. Furthermore, students will be able to practice outside of class time with models and slides used in laboratory assessments, offering an opportunity for increased success.

BIOL 170 resources include the following preserved specimens: Finger sponge, 10 - \$39.95; Wool sponge, 3 - \$50.85; Sponge collection, 2 - \$31.98; Jellyfish, 10 - \$39.99; Obelia colony - \$19.99; Gonionemus medusa, 10 - \$19.95; Sea anemone, 10 - \$54.95; Comb jelly, 10 - \$19.95; Tapeworm, 3 - \$41.97; Fluke, 10 - \$38.95; Leech, 10 - \$29.95; Platyhelminth set - \$49.99; Squid, 5 - \$49.95; Octopus, 5 - \$79.10; Snail, 10 - \$19.95; Chiton, 10 - \$36.20; Mussel, 10 - \$129.95; Scallop, 10 - \$24.99; Clam, 5 - \$17.25; Slug, 10 - \$55.60; Sandworm, 3 - \$8.55; Annelid and mollusc set - \$104.99; Barnacle, 10 - \$14.95; Crustacea set - \$104.99; Sea urchin, 10 - \$25.25; Sea cucumber, 5 - \$4.75; Sea squirt, 10 - \$17.95; Sea peach tunicate, 3 - \$41.97; Lancelet, 10 - \$24.99; Pigeon, 3 - \$54.27; Bat, 3 - \$38.85; Vertebrate survey set - \$79.99; Marchantia set - \$19.95; Fern life history set - \$19.95; Plant kingdom set, 2 - \$209.98; Animal survey set with student guide, 2 - \$517.80; Glass storage jars, 240 - \$1,266; Formalin preservative solution - \$1469.50.

We also request the following models for BIOL 170: Plant cell model - \$212.30; Paramecium model - \$931.40; Euglena model - \$490.00; Amoeba model - \$475.00; Cleavage and gastrulation model - estimated \$2,000; Earthworm model - \$1,010.60; Hydra polyp model - \$1,032.00; Fish dissection model, 2 - \$1,985.40; Rat dissection model, 2 - \$319.98; Vertebrate brain model set - \$1,356.30; Vertebrate heart model set, 2 - \$6,648.80; Moss life stages model - \$1,100.80.

Slides requested for BIOL 170 include: Euglena, 25 - \$137.50; Diatoms, 25 - \$145.00; Planaria, 25 - \$323.75; Ascaris, 25 - \$339.75; Earthworm, 25 - \$199.75; Rotifers, 10 - \$77.50; Mnium archegonia, 25 - \$273.75; Mnium antheridia, 25 - \$162.50; Fern prothallium, 25 - \$312.25; Fern sorus, 25 - \$190.00; Pine cone male & female, 25 - \$235.00; Lilium ovary embryo sac, 25 - \$25; Lilium anther, 25 - \$162.25; Monocot/dicot leaves, 10 - \$85.00.

BIOL 272 Resource Requests: Students studying cellular biology will benefit from an enhanced visualization and greater understanding of molecular biology processes. The requested resources will be used to illustrate concepts in BIOL 272 laboratories and during BIOL 272 tutoring or office hours held at the STEM center.

BIOL 272 resources requested include the following hands-on models for in-class laboratory activities, tutoring sessions, and STEM Center activities: Pop-It Beads Chromosome Sets - \$113.00; Protein Synthesis Manipulation Demo Kit - \$375.50; 3D Protein Folding Model Kit - \$27.93.

STEM Center Resource Requests: The STEM Center has been a long-standing need, requested in our Program Review Self Studies for ~10 years. Space for the STEM Center has been approved in RM1246; we therefore request resources to adapt this space to students' needs and personnel to staff the Center.

The resources requested will adapt and equip the STEM Center for uses and activities including but not limited to:

Embedded, Hornets, and PAL Tutors: We have discussed, established, and continue to implement equitable grading practices while increasing our utilization of the Hornets Tutoring program. Recently we have increased the frequency of embedded tutors in some of our high-enrollment non-majors classes, such as BIOL 101. The tutors hired by our department consistently represent a diverse grouping of students and are one facet of our plan to provide a greater sense of belonging to our students. Other focus areas include academic and resume development for the students selected as tutors. The STEM Center will provide a location for all STEM tutoring as necessary: a welcoming, curriculum-specific, inclusive environment for students, tutors, faculty, and counselors to interact. We will thus provide a more integrative, comprehensive and inclusive campus climate that could help to reduce socioeconomic, academic, and/or background/race-based achievement gaps.

Office Hours, Events, Counseling, and Faculty Mentoring: Our faculty and STEM Counselor will offer office hours and mentoring sessions at the STEM Center. The STEM Center will facilitate closer cooperation with STEM counseling while providing student-focused advising to improve success rates. Low income, underrepresented, and non-traditional students will receive individualized guidance to select a pathway that increases their chances of success while managing their nonacademic responsibilities. We will also centralize our faculty mentoring to students in a student-centered environment that will foster a sense of belonging for all students, helping each student feel that they matter to the faculty, to each other, and to our institution. This sense of belonging may help reduce race-based and other achievement gaps. The Center will enhance research experiences for students and provide them with accessible, relatable information on our field and the career paths available to them. The STEM Center would assist these efforts by providing a centralized way for us to contact students and disperse information about opportunities while housing various displays, models, and resources.

Requested STEM Center resources thus include:

STEM Coordinator: A staff member is necessary to keep the Center open to students throughout the day, coordinate Center activities, interface with and assist students, and facilitate faculty/staff events with students at the Center. Furthermore, since community college students do not have the same access to research programs and internships as their counterparts from four-year institutions, they are at a disadvantage. Our students thus do not enjoy the same access to research/internship experiences as their peers who are at universities. The STEM Coordinator will help inform students of opportunities generated as a result of faculty collaborations, internal or external grants, and other initiatives. The STEM Coordinator will be in charge of student and faculty mixers, study spaces, and community outreach events. We note that our district already supports an analogous position at our sister campus, Cypress College. We request \$87,000 renewed annually.

Architectural costs: We request \$22,400 for Center-related architectural costs.

Electrical Engineering costs: We request \$3,100 for an electrical engineer to plan the electrical systems in the Center.

Cost Estimation: We request \$3,000 in specialist fees.

Permitting: We request \$5,000 to cover the necessary permits for enhancements and needed modifications to the Center.

Reimbursables: We request \$750 as indicated.

Furniture and Installation: We request \$80,000 to furnish the STEM Center and provide study areas, meeting areas, presentation areas, and consultation areas.

Construction: We request \$385,000 for construction costs to build up the approved area into the STEM Center. This includes interior spaces and renovations.

Electrical/Data: We request \$100,000 for wiring and installation related to electrical systems and data systems for the Center.

**** NOTE:** Please note that the STEM Center is a *shared* resource and area. Therefore the funding requested will not be used exclusively by any single department in our division but will benefit all STEM and allied departments campus-wide.

Part 3: Resource Request Funding

Directions:

- **Complete and submit this section ONLY if you have a NEW resource request**
- **Each NEW resource request must include the associated justification (Page 3).**
- **Complete as many resource requests, as necessary. Support each resource request with appropriate and relevant detail (Page 3).**

Submission:

Requested by: Spiros Dimitratos Email: sdimitratos@fullcoll.edu Phone: x27465

Division: Natural Sciences Department: Biology Total Requested: **\$714,344**

This request is intended as an update to a previously submitted program review. List and provide the cost to implement this request. Describe equipment location and include a description of additional space or maintenance, if needed.

BIOL 101 RESOURCES	Requested Dollar Amount	Potential Funding Source
Personnel		
Facilities		
Equipment	<u>Models, Demonstration Sets, and Laboratory Manipulatives</u> \$3,149.53	Instructional Equipment Funds
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	\$3,150	

BIOL 170 RESOURCES	Requested Dollar Amount	Potential Funding Source
Personnel		
Facilities		
Equipment	<u>Preserved Specimens for BIOL 170</u> Subtotal: \$3831.17 <u>Models for BIOL 170</u> Subtotal: \$17,562.58 <u>Slides for BIOL 170</u> Subtotal: \$2,993.75	Instructional Equipment Funds
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	\$24,428	

BIOL 272 RESOURCES	Requested Dollar Amount	Potential Funding Source
Personnel		
Facilities		
Equipment	<u>Models, Demonstration Sets, and Laboratory Manipulatives</u> \$516.43	Instructional Equipment Funds
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	\$516	

STEM CENTER RESOURCES	Requested Dollar Amount	Potential Funding Source
Personnel	STEM Coordinator: \$87,000 annually	General Fund
Facilities	Furniture, installed: \$80,000 Construction: \$385,000 Electrical/Data: \$100,000	Measure J Bond or Carryover
Equipment		
Supplies		
Computer Hardware		
Computer Software		
Training		
Other	Architectural Costs: \$22,400 Cost Estimation: \$3,000 Permitting: \$5,000 Reimbursables: \$750 Electrical Engineering: \$3,100	Measure J Bond or Carryover
Total Requested Amount:	\$686,250	

Approval:

Dean: Signature/Approval: Bridget Salzameda

Date: 3/6/2023

Rank (if appropriate): Dean Priority Ranking: _____ of _____