

EASTERN OKLAHOMA STATE COLLEGE

**ASSOCIATE OF SCIENCE
LIFE SCIENCE PROGRAM REVIEW (005)
2023**

**PREPARED FOR OKLAHOMA STATE REGENTS FOR HIGHER LEARNING
500 EDUCATION BUILDING
STATE CAPITOL COMPLEX
OKLAHOMA CITY, OKLAHOMA 731**

**Program Review Report
Life Science Program Review 2023**

Institution Name: Eastern Oklahoma State College (EOSC)

Program Name and State Regents Code: Life Science Program; Program Code 005; HEGIS code 0401; CIP code 260101

Type of Degree: Associate of Science in Life Science

List Program Options: Biology Option
Pre-Professional Option
Environmental Science Option

List Embedded Certificates included in this review: N/A

Previous Review

Date (Year) of Last Review 2017-2018

1. Summarize key findings from previous internal and/or external reviews of this program.
2. What developments and actions have taken place since the last review?

In the previous report, one challenge that was mentioned that the Life Science Program faced was the decline in the number of students declaring it as a major from the start as well as the increasing number of students who start out in the program and switch their major to General Studies. Over the years, we have had many students tell us that they either will not declare Life Science as a major to begin with or that they plan to switch to a different major because of the difficult nature of the Life Science Program. The Life Science Program is a very rigorous program which cannot be changed without lowering standards. Therefore, little can be done to attract and retain students who are intimidated by the program's rigor. However, one factor at the time that was mentioned in the last report and might have been at play when it came to students declaring Life Science as a major at EOSC and then switching to General Studies was the General Zoology course requirement in the degree plan. As mentioned in the last report, General Zoology was required to be taken by all Life Science majors, but General Biology was not required--despite the fact that many students in the program had already taken General Biology or would end up taking it anyway at some point. Students did not want to take an additional four credit hour course that was more difficult than General Biology (General Zoology) so many would switch their major to General Studies to finish sooner. That has changed since the last report due to a degree plan change. Now students in the program are required to take General Biology and not required to take General Zoology. General Zoology is still one of the Life Science major courses that students can choose to take, however. This has helped the situation some, but it will not prevent some students who want a less difficult major that they can finish sooner from abandoning a Life Science major.

Budgetary concerns were also mentioned in the last report. The Life Science budget has improved since the last report which has enabled the gradual purchase and replacement of items specifically mentioned in the last report such as microscopes and BioPac units for physiology labs. Microscopes will continue to be gradually phased out and replaced with the most recent budget. Other much needed equipment has been purchased such as new magnetic stirring hot plates, glassware, microbial incubators, and a new autoclave and lab refrigerator for microbiology. More expensive needs mentioned in the last report such as the needed lab room renovation on the McAlester campus and renovations to Sullivan Hall have not occurred because those renovations cost amounts that are significantly over the Life Science budget. However, needs lists have been requested by the administration, and those have been submitted numerous times in hopes of obtaining grant money or other additional funds to make those changes a reality. No additional money has been received yet. However, with the new addition of a grant writer to our staff at EOSC since the last report, we are hopeful we will obtain funds in the future.

Current Review

Date (Year) of Current Review 2023

Review Criteria (*Institutions should address each criterion of OSRHE policy 3.7.5 as directed below*).

A. Centrality of the Program to the Institution's Mission:

Eastern Oklahoma State College is organized to generate student learning through its Associate degrees and other academic programs that effectively prepare graduates to complete baccalaureate or other program degrees, obtain productive employment, and lead enriched lives of learning. It is simultaneously the mission of the College to engage in educational programming and related activities that promote regional economic and community development. The Life Science program is designed to meet the needs of the individual student, in keeping with the mission of the College as defined by the Regents of Eastern Oklahoma State College. The basic curriculum of the Associate of Science degree in Life Science contains the traditional freshman and sophomore courses for students who wish to complete a four-year degree in several biology-based majors and allow students to enter the four-year college as a junior. The curriculum also contains courses that are required in the General Education portion of many students' degree plans as well as specific courses required in other degree plans (such as agriculture) offered by EOSC. Additionally, courses in the curriculum support the Associate of Applied Science degree in Nursing, the new online/hybrid LPN to RN program, and the Associate of Applied Science degree in Respiratory Therapy offered at EOSC.

B. Vitality of the Program:

B.1. Program Objectives and Goals:

The two primary goals of the Life Science program are (1) to provide a complete, comprehensive program that includes general education courses and 1000 and 2000 level biological sciences courses that provide the necessary foundation to adequately prepare students for seamless matriculation into a Life Science/Biological Sciences baccalaureate program, and (2) to provide Life Science courses that support other degree programs such as those of nursing, respiratory therapy, and agriculture. Students successfully completing the Life Science Program at Eastern

should be well-prepared to enter a four-year college or university at the junior year level, focusing on the biological sciences, as they prepare for their post-graduate Masters and Doctoral research programs or for program at schools of Medicine, Dentistry, Pharmacy, Physical Therapy, Nursing, Occupational Therapy, Speech and Language Pathology, Pharmacy, and Veterinary Medicine. The program also prepares students for entry into a number of specialized health programs, both at the Associates and Bachelor levels, such as Radiology Technician, Respiratory Therapy, Dental Hygiene, Physical or Occupational Therapy Assistant, and Medical Laboratory Technician. The curriculum of the Life Scienc Program will give students the opportunity to reach a level of superior skills in Human Anatomy, Human Physiology, Microbiology, Nutrition, Botany, and Zoology and enhance students' critical thinking and quantitative reasoning skills.

Specific objectives and goals for the program are to provide broad knowledge and develop skills, abilities, and competencies in the Biological Sciences field. Our specific expectations of graduates of the Life Science Program are as follows:

- Students will be able to apply biological knowledge to solve problems in their everyday lives.
- Students will be able to demonstrate knowledge of the scientific method.
- Students will be able to apply the scientific method to solve biological problems.
- Students will be able to demonstrate mastery of basic biological content.
- Students will be able to effectively find and use resources from primary literature.
- Students will demonstrate effective communication of underlying principles of biology using (1)oral, (2) written, and (3) visual methods (e.g., poster, PowerPoint, or demonstration).
- Students will be able to demonstrate mathematical knowledge and skills in the biological sciences.
- Students will be able to correctly use a microscope to locate and identify biological specimens and their parts.
- Students will be able to describe and practice laboratory safety guidelines relating to working with chemicals, microorganisms, and/or dissection specimens.
- Students will be able to work well independently and in small groups, showing self-direction and motivation and contributing to group work.
- Students will be able to interpret graphical quantitative information and explain that interpretation.
- Students will be able to graph quantitative information.
- Students will be able to demonstrate critical thinking processes and problem-solving skills.
- Students will be able to apply ethical principles of the discipline regarding human and animal subjects, environmental protection, use of resources, and collaboration with colleagues.
- Students will be able to legally (copyright) and ethically (plagiarism) retrieve and utilize information confidently and use technology appropriate for biological sciences.

B.2. Quality Indicators (including Higher Learning Commission criteria and requirements):

Multiple tools are used to evaluate the Life Science Program. These tools consist of student evaluation of individual courses, review of student success, and analysis of faculty performance.

Students evaluate their instructors and the strengths/weaknesses of their courses as a measure of program effectiveness. A standardized faculty evaluation form available through BlackBoard is used by students to evaluate teacher performance that includes questions and various choices from which they can choose. The evaluation also allows students the opportunity to provide written comments about a class and/or instructor. Results of the course evaluations are reviewed by the Vice President of Academic Affairs, the Division Dean, and the faculty member of each course. There is also a survey administered to all Life Science graduates that assesses how satisfied students are with the Life Science Program and how prepared they feel for the next step after having finished the program.

Student success is also evaluated through Eastern's assessment program. Student assessment is conducted in several ways. Entry-level assessment is used to determine appropriate enrollment of new students to ensure student success. During the 5-year period that this report covers, ACT scores were evaluated and if any of the sub-scores in reading, English, or mathematics fell below 19, students were enrolled in and completed developmental courses in that subject area as required by OSRHE policy. Students placed in developmental courses according to their ACT scores had the option of taking the ACCUPLACER Test to provide additional entry-level assessment. Student learning outcomes were developed for the general education courses that are taught in the Biology Department such as General Biology and Environmental Science as a part of the general education assessment that is done each year. Student learning outcomes were also created for the program-level assessment. Specific assignments, test questions, etc. were designed to assess those learning outcomes. Assessment data is continuously collected from those assessment items and reported.

The Science and Mathematics Division includes four departments: Chemistry, Physics, Mathematics, and Biology. Department chairpersons perform formal evaluations of non-tenured and tenured faculty in their departments. The Division Dean evaluates all department chairpersons. These evaluations are designed to assess faculty members' performance in order to identify strengths and weaknesses and to implement any plans for improvement, if required.

Before each new fall semester, the Science and Mathematics Division faculty and staff meet. At this meeting, performance of individual programs and associated activities of the previous academic year are reviewed, goals for the upcoming year are established, and upcoming activities are coordinated.

B.3. Minimum Productivity Indicators:

TABLE 1: Number of Life Science majors enrolled in each fall semester of the 5-year period covered in this report (2018-2023).

| Year | Fall 2018 | Fall 2019 | Fall 2020 | Fall 2021 | Fall 2022 | Average |
|---------------|-----------|-----------|-----------|-----------|-----------|---------|
| Majors | 67 | 67 | 58 | 44 | 62 | 59.6 |

Over the last 5 years, there has been a total of 298 students enrolled in the Life Science Program (Table 1). Some students declare a General Studies major in which to complete the requirements for an AS degree but have Life Science career paths and complete at least 18 credit hours of the life science courses. These are not counted in the above table.

TABLE 2: Number of Life Science graduates for each year of the 5-year period covered in this report (2018-2023).

| Year | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | Average |
|------------------|-----------|-----------|-----------|-----------|-----------|---------|
| Graduates | 16 | 16 | 19 | 9 | 17 | 15.4 |

Over the last 5 years, the Life Science Program has graduated a total of 77 students (TABLE 2).

B.4. Other Quantitative Measures:

b.4.a.

TABLE 3: Number and enrollment of courses taught for the major for each year of the 5-year period covered in this report (2018-2023).

| COURSE | YEAR | | | | | TOTAL | AVERAGE |
|--------------------|-----------|-----------|-----------|-----------|-----------|-------|---------|
| | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | | |
| BIOL 1114 | 166 | 165 | 158 | 185 | 69 | 743 | 148.6 |
| BIOL 2103 | 112 | 108 | 99 | 93 | 65 | 477 | 95.4 |
| BIOL 2114 | 177 | 160 | 201 | 151 | 131 | 820 | 164.0 |
| BIOL 2155 | 12 | 14 | 10 | 11 | 5 | 53 | 10.6 |
| BIOL 2214 | 10 | 18 | 14 | 11 | 7 | 60 | 12.0 |
| BOT 1114 | 10 | 15 | 10 | 6 | 11 | 52 | 10.4 |
| NUTRIT 1203 | 166 | 181 | 188 | 149 | 74 | 758 | 151.6 |
| ZOO 1114 | 32 | 26 | 11 | 9 | 1 | 79 | 15.8 |

b.4.b.

TABLE 4: Student credit hours by course level (i.e., 1000, 2000) generated in all major courses in the degree program for five years.

| Course Level | YEAR | | | | | | TOTAL | AVERAGE |
|---------------|-----------|-----------|-----------|-----------|-----------|-------|---------|---------|
| | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | | | |
| *1000 | 1,330 | 1,367 | 1,280 | 1,247 | 546 | 5,770 | 1,154 | |
| **2000 | 1,144 | 1,106 | 1,207 | 982 | 772 | 5,211 | 1,042.2 | |

*1000 level courses include: BIOL 1114, BOT 1114, NUTRIT 1203, and ZOO 1114.

**2000 level courses include: BIOL 2103, 2114, 2155, and 2214.

b.4.c. Direct instructional costs for the program during the review period:

The amount paid in salaries for the current two full time instructors and four previously employed full-time instructors for the years of 2018-2023 is approximately \$1,060,525.

The educational budget for the 2022-2023 academic year for the Life Science/Biology Department was \$30,800. In reviewing this allocation of funds based on the enrollment in the department's program and FTE generated, average expenditures per student were approximately \$496.77/student -or- \$354.84/FTE.

b.4.d.

TABLE 5: The number of credits and credit hours generated in the program that support the general education component and other degree programs including certificates.

| COURSE | YEAR | | | | | TOTAL | AVERAGE |
|--------------------|-----------|-----------|-----------|-----------|-----------|-------|---------|
| | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | | |
| BIOL 1114 | 664 | 660 | 632 | 740 | 276 | 2,972 | 594.40 |
| BIOL 2103 | 336 | 324 | 297 | 279 | 195 | 1,431 | 286.20 |
| BIOL 2114 | 708 | 640 | 804 | 604 | 524 | 3,280 | 656.0 |
| BIOL 2124 | 368 | 364 | 300 | 416 | 308 | 1,756 | 351.20 |
| BIOL 2155 | 60 | 70 | 50 | 55 | 25 | 260 | 52.0 |
| BIOL 2204 | 316 | 292 | 320 | 308 | 184 | 1,420 | 284.0 |
| BIOL 2214 | 40 | 72 | 56 | 44 | 28 | 240 | 48.0 |
| BOT 1114 | 40 | 60 | 40 | 24 | 44 | 208 | 41.60 |
| NUTRIT 1203 | 498 | 543 | 564 | 447 | 222 | 2,274 | 454.80 |
| ZOO 1114 | 128 | 104 | 44 | 36 | 4 | 316 | 63.20 |

b.4.d. A roster of faculty members, faculty credentials, and faculty credential institution(s).

| Faculty | Credential (i.e., MFA, PhD) | Institution that granted degree |
|--|--|--|
| Dr. Andrea Green, Professor of Biology | Ph.D. | University of Arkansas (2013) |
| Dr. Julie Collins, Professor of Biology | Ph.D. | Oklahoma State University (2003) |

b.4.e. If available, information about employment or advanced studies of graduates of the program over the past five years:

As graduation nears each year, biology professors administer a survey to life science majors who are graduating. One of the questions on that survey asks students to put down what institution they are moving on to. We have found that most of our graduates transfer to Northeastern State University, Oklahoma State University, the University of Oklahoma, East Central University, or Southeastern Oklahoma State University.

b.4.f. If available, information about the success of students from this program who transferred to other institutions:

No formal system is in place to track students' success at their transfer institutions. However, by visiting with students when they come by to see us, by hearing through word of mouth, or by contact made via social media platforms, we have occasionally learned of their success at other institutions and what professions they entered.

B.5. Duplication and Demand:

Duplication: N/A

Demand:

b.5.a. Describe demand from students, considering the profiles of applicants, enrollment, completion data, and occupational data:

Courses taught in this program are in demand because any student wanting to attend EOSC and take classes that will prepare them for a career in the biological sciences, which includes the healthcare field, will need the classes our program offers. Additional demand is created by the fact that some courses in the program, such as General Biology and Environmental Science, also serve as general education courses that fulfill the general education requirement to graduate with any degree that EOSC offers. Pre-nursing and pre-respiratory courses taught in our program are also in high demand because students must take them before entering or upon entering either of those two programs.

- b.5.b.** Describe demand for students produced by the program, considering employer demands, demands for skills of graduates, and job placement data:

The Life Science Program offers courses that are taken by students who plan on entering the healthcare field in the future. Healthcare workers of all types are always in demand by employers in the areas around EOSC, elsewhere in Oklahoma, and even all over the nation.

- b.5.c.** Describe demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

From time to time over the last 5 years, we have been asked by members of the community or employees at EOSC for our expertise to help with certain things such as identification of plants, insects/plant pests, fungi, birds, and mammals. We have also been asked by greenhouse, meat lab, and farm personnel for help with microbial, water, and fecal matter testing (for parasites). Members of the community have also sought our help on matters such as nonchemical methods of pest control, bird nestbox construction and location, proper hummingbird food preparation, bird feeder placement, seed type suggestions, and much more. We are also occasionally invited to be guest speakers at area K-12 public schools.

- b.5.d.** Describe indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

Every year the faculty of all four departments in the Science and Mathematics Division serve as science fair judges at the Eastern Oklahoma Regional Science and Engineering Fair. The same faculty assist area public schools with their local science fairs mainly by serving as judges for those fairs too. Our Life Science students have helped with local blood drives and flu shot clinics.

- b.5.e.** The process of program review should address meeting demands for the program through alternative forms of delivery. Describe how the program has met these demands:

Instructors in the Life Science Program have answered the demands of a changing academic world by creating online and hybrid versions of several of our life science courses. In addition to offering in-person versions of all life science courses, we have created and offered hybrid versions of General Biology and Botany courses as well as fully online General Biology, Environmental Science, and Human Anatomy courses. We have also created fully online versions of Introduction to Microbiology (nursing emphasis) and Human Physiology (nursing emphasis). While those last two courses are not Life Science major courses, they are supporting courses for the Nursing and Respiratory Therapy Programs at EOSC.

B.6. Effective Use of Resources:

b.6. a. Financial: An annual budget is prepared each year to meet the financial requirements of the Life Science Program. Purchase of equipment and supplies (most are consumable supplies), photocopying, maintenance of equipment, and instructor travel to other campuses are possible because of state funds and tuition fees received by the Biology Department. The latest U.S. Department of Education Title III NASNTI grant helped provide our department with new laptop computers, spectrophotometers, several new BioPac systems for physiology lab (purchased with budget and grant money), renal dialysis kits, 3-D printers, and much more.

b.6.b. Library: The Eastern Oklahoma State College library maintains electronic periodical and media resources for students to use in support of their curricular requirements. The library is also a source of complementary textbooks for students. In addition to reference materials, the Eastern Oklahoma State College library is affiliated with an interlibrary loan program provided by OnLine Computerized Library Center. Students may secure magazine articles, books, and textbooks within three (3) to five (5) working days through the interlibrary loan program. The library staff are always willing to secure any requested materials if funds are available. The library also provides computers for students to utilize to prepare reports, complete assignments, etc. The newly renovated library, made possible by the U.S. Department of Education Title III NASNTI grant, also houses study rooms that students can use to study in a quiet, distraction-free environment.

b.6. c. Equipment and Technology: The Life Science Program uses computers with appropriate learning software and ancillary equipment, printers, classroom projection systems, Promethean ActivBoard and ActivInspire student response systems, the Kahoot classroom response system, microscopes, and many other types of laboratory-based equipment as well as Zoom and lab simulation technology. In addition, the science labs provide students with hands-on manipulation of preserved animals, microbes, and cellular processes.

b.6.d. Support services: Students are supported in their efforts by a number of campus-based services. Multiple computer labs are available for research, report writing, and tutorial assistance. Tutors are hired through work study and RCE programs. The Phi Theta Kappa honorary fraternity and the Presidential Scholars Program provide student tutors on a volunteer basis. Professional and peer tutors are available through the Student Support Services (TRIO) program based on the Wilburton campus. Tutoring assistance is available from Tutor.com at no cost to the students. Faculty provide lab and classroom instruction. They also serve as academic advisors and assist with the placement of graduates at four-year institutions. Students may obtain assistance in any courses from instructors outside of class at regularly scheduled office hours or by appointment. Opportunities that are available for students to grow academically, socially, and culturally include Eastern's Student Government Association, college band and choir, theater program, college newspaper, various clubs, and athletic teams for both men and women.

Recommendation(s)

A. Recommendation for the Program (3.7.7.A.4):

- Maintain the program at the current level.
- Continue the program with modifications as noted below and detailed in the comment section below.
 - Expand the program
 - Reduce program in size or scope
 - Merge or consolidate program
 - Reorganize program/curricular modifications*
- Suspend program to allow an opportunity to consider recommendations detailed in the section below*
- Delete program*

**Requires a Request for Degree Program Modification and governing board approval.*

B. Specific comments regarding recommendations:

| Recommendations | Implementation Plan | Target Date |
|--|---|--|
| Continue recruiting efforts of traditional students and non-traditional students. | Making visits to area schools and various community events to tell them about our program. | December 2023-August 2024. |
| Fill the faculty vacancies in our department. | Continue advertising for qualified candidates to fill the part-time vacancy at the Idabel campus and the full-time vacancy at the Wilburton/McAlester campuses. | The search that has been in progress will continue until these two positions are filled. |
| Continue to search for grants and other funding to obtain needed equipment and building renovations. | Work with our grant writer, Stephanie Giacomo, to secure the funds we need. | We applied for one grant earlier this semester and will hear back from it by this coming spring. |

Department/
Program Head Dr. Andrea Green Date: **10/29/2023**
(Signature)

Dean Dr. Andrea Green Date: **10/29/2023**
(Signature)

Chief
Academic
Officer _____ Date: [Click here to enter a date](#)
(Signature)

President _____ Date: [Click here to enter a date](#)
(Signature)