Program Review

Based on the thorough program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This template is provided to assist institutions in providing a brief summary, which is to be presented to the institutional governing board prior to submission to the State Regents. Executive summaries should be possible within two pages using this template format.

Institution Name: Rose State College
Program Name and State Regents Code: Biological Sciences Associate in Science 0032
List Any Options:
Date of Review: October 2017 **Recommended Date of Next Review:** Fall 2022

Centrality to Institutional Mission:
The Rose State College Mission states: "As a public, open admissions, associate degree granting institution, Rose State College provides higher education preparation for lifelong learning through programs and services designed to serve a diverse community." The Biological Sciences program is central to the institutional mission by preparation of students requiring general education science courses and preparing majors students for transfer to four-year colleges and universities.

Program Objectives and Goals:
The Associate in Science degree program provides students with the analytical skills and scientific knowledge to expand and apply critical thinking to all facets of learning. The expected program outcome is to provide a comprehensive lower division education for students who plan to transfer to a baccalaureate degree program.

Upon completion, the graduate will be prepared to:

1. Describe the properties attributed to living organisms.
2. Apply quantitative measurements to problems and topics related to biological matters (such as population dynamics, genetics, etc).
3. Design experiments by applying critical thinking and scientific methodology to various biological inquires.
4. Evaluate how technology is used to answer questions related to the biological sciences, and be able to assess which tools are best suited to answer various questions related to living organisms.
5. Appraise current issues in the scientific community.

Quality Indicators Such As: – **Student Learning Outcomes** – **Effective Teaching** – **Effective Learning Environments** – **External Curricular Evaluation** – **Capacity to Meet Needs and Expectations of Constituencies**	**Student Outcomes:** • Students are evaluated by projects, exams, presentations (oral and written), and performance in the lab setting. o Sample evaluations: Presentations on identifying unknown microorganisms. Field trips to labs. Research on tree transpiration rates. o Botany students have presented their novel research at the national Botany Conference. • Students complete a capstone Biotechnology course that allows them to practice specialized lab techniques, and perform unique research o Sample evaluations: Present posters both internally and externally. • A robust Honors Program allows students to conduct individual research projects. o Sample projects: "Identifying microbes in cosmetics past the expiration date." "Use of electrocardiogram to evaluate an aortic valve condition." • Quantitative reasoning and effective writing skills are also assessed. o Sample writing assessment: Summaries of primary literature and evaluation of case studies. **Effective Teaching:** • In addition to standard student evaluations, faculty are allowed to perform a self-evaluation. They are observed and evaluated by administrators and peers. • Faculty implementation of innovative learning techniques such as; flipped classrooms, active learning, case studies, scientific paper critiques and discussions, and construction of biological models. • Faculty commitment to engage and assist students beyond classroom time and office hours. Readiness and accessibility to students. • Design of inquiry-based curriculum by biological science faculty that develops critical thinking skills. • Faculty have authored the lab manuals for Introduction to Biology, General Biology, Zoology, Botany, and Physiology. **Effective Learning Environments:** - Small class sizes provide individualized instruction. - All classrooms and lab rooms are equipped with computers, AV data projectors, and access to the world-wide-web. • Availability of computer stations in most life science lab rooms for immediate analysis and graphing of data collected during lab experiments.

- Recent capital improvements updated lighting to LED, replaced flooring, and remodeled bathrooms to be more ADA compliant.
- Comfortable seats in both lecture and lab classrooms promote student attention and contribute to a positive learning environment.
- Biological models, skulls, living specimens and posters on classroom walls create an immersion atmosphere for the learning of life sciences.
- Tutoring is available for students.
- Faculty maintain offices hours specifically to meet with students.
- Student centered support workshops and seminars are available.

External Curricular Evaluation:

- Participation with Oklahoma Regents for Higher Education Course Equivalency Project.
- Articulation agreements with UCO.
- Development of research lab experience with OU.

Capacity to Meet Needs and Expectations of Constituencies:

- The college has developed statistically relevant student satisfaction questionnaires. These are conducted periodically to determine student needs and expectations. Resources are allocated based on the results of the questionnaires.
- An academic advisor is assigned to address student academic questions and issues.

<table>
<tr><td>Productivity for Most Recent 5 Years</td><td>Number of Degrees: 6 (2013), 7 (2014), 13 (2015), 9 (2016), 7 (2017): Avg = 8.4
Number of Majors: 96 (2013), 114 (2014), 122 (2015), 100 (2016), 111 (2017):
Avg: 108.6</td></tr>
<tr><td>Other Quantitative Measures Such As:
– Number of Courses for Major
– Student Credit Hour in Major
– Direct Instructional Costs
– Supporting Credit Hour Production
– Roster of faculty members including the number of FTE faculty in the specialized courses within the curriculum
– If available, information about employment or advanced studies of graduates of the program over the past five years
– If available, information about the success of students from this program who have transferred to another institution</td><td>• Number of courses for the major: 12 courses to select from within Chemistry, Biology, and Physics offerings.
• Student credit hour in major: 30 Credit Hours

Direct Instructional costs:
Travel $2,400.00
Equipment $7,600.00
Supplies $15,000.00
Full-Time Faculty $296,642.00
Adjunct Faculty $85,084.00
Classified Staff $49,355.00

Total $ 456,081.00

Supporting Credit Hour Production 22 credit hours

Full Time Faculty (Biological Sciences): 4
Adjoa Ahedor Ph.D. Botany
Amy Hurst Ph.D. Biomedical Sciences
Leanne May M.S. Animal Science
Cory Rubel Ph.D. Cell Biology

Degree Completion upon transfer
(National Student Clearinghouse)
<table><tr><th></th><th>Sent</th><th>Found</th><th>Transferred</th><th>Graduate from Transfer</th></tr><tr><td>Declared</td><td>296</td><td>165</td><td>135</td><td>33</td></tr><tr><td>Undeclared</td><td>488</td><td>301</td><td>238</td><td>71</td></tr></table></td></tr>
</table>

Duplication and Demand	**Duplication**: Other community colleges' in the state do offer Biology degrees. However, the Rose State College degree is more readily available to students in eastern Oklahoma county. Additionally, courses such as Introduction to Biology and General Biology meet general education requirements for lab sciences. Furthermore, these courses, along with Physiology, Microbiology, Zoology, and Microbiology meet requirements for other degree programs (such as Nursing, Pre-Pharmacy, Pre-Professional Health, Allied Health, General Science, Health Sciences, and Health & Sports Science). **Demand**: The Biological Sciences is a broad field that encompasses many types of job opportunities; technicians, zoologist and wildlife biologists, biochemists, and science teachers to name a few. According to the Bureau of Labor Statistics the median earning potential for a Biological Scientist nationally is $ 74,790 (https://www.bls.gov/oes/current/oes191029.htm). Additionally, the projected growth in the life, physical, and social sciences is "projected to grow 10 percent from 2016 to 2026, faster than the average for all occupations, which will result in about 122,900 new jobs." (https://www.bls.gov/ooh/life-physical-and-social-science/home.htm) • This demand is echoed by the number of students declaring Biology as a major. The degree has the fourth highest number of declared majors in the Engineering and Science Division at an average of 108.6. • The demand for Biologists is immeasurable. For instance, in response to human health issues (infectious disease outbreaks, cancer treatment, medical care, wildlife management, and more) biologists are often involved in the immediate response, development of treatments, or crafting policy to best serve the public.
Effective Use of Resources	**The Biological Sciences Department** has resources that facilitate the learning of complex topics through hands-on investigations. The following supplies and equipment are available to all students enrolled in life science courses: 1. High-quality microscopes. 2. Video cameras mounted on microscopes for the capture of still shots and video of microscopic life. 3. Quality materials for microbial culturing, dissection specimens, and biotechnology tools.

	4. Living and preserved specimens for lab investigations: including bacteria, protists, and fungal cultures, live plants and live animals. 5. Educational software including interactive study guides, complex concept animations, and laboratory simulations. 6. Storage for specimens including an ultrafreezer (-80C) 7. Biocapture devices can calculate EMG, ECG, and EEG 8. Biological safety equipment (safety hoods and autoclaves) **Media and Materials** The Learning Resource Center (LRC) at Rose State College holds a wealth of resources in the life sciences that include: 1. Reference publications including books, dictionaries and encyclopedias 2. Books in biology and health related topics 3. Audiovisual items including CD ROMs, DVDs, and VHS 4. Journals (hardcopy) of medical, and health-related organizations 5. Online journal databases including EBSCO and DynaMed.
Strengths and Weaknesses	***Strengths:*** • Highly qualified faculty members with a diverse educational and research background. • Highly qualified lab assistant to help faculty in setting up labs and preparing lab materials. • Willingness of faculty to implement innovative learning techniques inside and outside of class. Examples include; active learning, flipped classrooms, case studies, scientific paper critiques and discussions, construction of biological models, and research projects. • Faculty commitment to engage and assist students beyond classroom time and office hours. Faculty members routinely take students to lectures on science (such as Neuro night at OUHSC) and field trips (such as OMRF research labs, OADDL, Myriad Botanical Gardens, and Martin Park). Our faculty and advisors are committed to providing accessibility to students. • Reworked program degree sheet for clarity. • Partnership with ECU, OSU, UCO, and OU to provide scholarships, research opportunities and a smooth transfer to baccalaureate programs for under-represented students. For example the Langston University NASA Advanced Research (LUNAR) grant.

	• Facilities are well equipped with technology to assist in student learning. For example, Physiology recently received updated probes for data collection such as heart rate, temperature, and much more. General Biology and Microbiology have state of the art image collection equipment for image capture of gel electrophoresis and microbial plate counting. • Administration, at both the division and institution level, is supportive of the STEM field and recognizes the need to not only recruit and retain quality faculty, but also provide resources for those faculty. • Technology funds are often made available for the purchase of some necessary items to enhance student learning. ***Weaknesses:*** • The current lab pay rate of 0.57 hr/lab hour lags behind lab compensation in other Oklahoma community colleges. A revision of teaching lab pay to make it equal to comparable colleges in Oklahoma may help in the retention of qualified instructors who are willing to teach life science labs. • Need more faculty; students are being turned from General Biology and Physiology every semester because the department does not have enough qualified faculty to offer enough sections. This is also due to high adjunct turnover as a result of insufficient pay. • No step increases for faculty and lab assistant. Lab assistant is currently responsible for managing over 20 lab sections and 8 different preparations. Could easily have a senior "Lab Manager" designation and also have a lab assistant to help the lab manager. • Utilization of lab rooms is near maximum, not only preventing the opportunity for the development of new courses, but also limiting the number of sections of existing classes that can be offered. For instance, General Biology I & II, Zoology, and Botany all share the same lab space. • Lack of adequate facilities for growing and maintaining living plants, animals, or for the conduction of student experiments involving larger living organisms. Without these facilities, the cost of buying from other locations is expensive and inconvenient. • Limited whole and life/preserved specimens and models in Biology, Zoology, and Physiology labs. • Students are entering the program with inadequate writing and math skills, and limited background in biological science.

	• Students do not always take the courses in the recommended sequence. Therefore, they will end up in classes for which they do not have the prerequisites and this will impede their success. • Students are being advised away from taking degrees that require a capstone projects. Students that express an interest in Biology, Allied Health, Pre-medical, and related degrees are being advised to graduate with Enterprise Development degrees that only require 23 hours in *any* course work to meet program requirements. This results in a weak science foundation for the students and can pose severe challenges as they further their studies at four-year institutions.
Recommendations	The Biology degree enrollment numbers have grown since 2013, peaking in 2015 and declining slightly in the past 2 years. The number of graduates for 2015 was at a record high for the last 5 year period. The strengths of the faculty and administrative support has helped to achieve this growth, but loss of control regarding advisement has caused declines. State level funding shortfalls impact the ability to make facility upgrades or purchase additional specimens. Every effort should be made to **expand** the number of students declaring the Biological Sciences degree to a *minimum of the 2015 levels and maximum of 130 declared majors and 15 graduates*. Therefore it is recommended that the <u>following key points be addressed</u>; • The retention of current faculty is necessary for continued growth. Increasing lab pay rates will help to retain faculty and bolster a supportive workplace environment. • At the staffing level, create a Lab Manager designation for senior lab assistant, increase pay, and create an assistant position to help alleviate work load. • Increase the rooms dedicated to labs. • Institutionally, students need to be guided to the appropriate division level advisor as soon as they arrive on campus. • Create a 1 credit hour "STEM Graduate Planning" course that allows Biological Sciences faculty to directly advise students regarding the courses needed to complete their degree, the order and timing of courses in the degree, and the benefits of completing a degree in the Biological Sciences. • Create a unit with the STEM Graduate Planning course that introduces and reinforces necessary skills such as; measurements, scientific literature, technical writing, etc.

	• Identify students that are underprepared for Biology and direct them to Introduction to Biology (BIOL 1114) before enrolling in the major's track General Biology (BIOL 1124). • Continue seeking external partnerships and grants as a necessary part of the current educational environment. Discussions are ongoing with OU regarding establishment of research partnerships to facilitate students completing capstones the ability to transfer into identified OU researcher labs to continue their undergraduate research experience. • The Engineering and Science Division is working to create a formal Institutional Review Board (IRB) that would allow for the expanded ability to apply for grants.

Program Review Summary Template
3.7 Academic Program Review
(optional)

Based on the thorough internal or external program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This program review template is provided to assist institutions in compiling the program review information, which is to be presented to the institutional governing board prior to submission to the State Regents. Executive Summaries should be possible within two pages using the provided template (Program Review Executive Summary Template).

Description of the program's connection to the institutional mission and goals:

The Rose State College Mission states: "As a public, open admissions, associate degree granting institution, Rose State College provides higher education preparation for lifelong learning through programs and services designed to serve a diverse community." The Biological Sciences program is central to the institutional mission by preparation of students requiring general education science courses and preparing majors students for transfer to four-year colleges and universities.

3.7.5 Process (Internal/External Review):
Previous Reviews and Actions from those reviews:

Analysis and Assessment (including quantitative and qualitative measures) noting key findings from internal or external reviews and including developments since the last review:

- Changed the course prefixes from LFSC **to BIOL** to more easily accommodate transferability.
- Measurable Program Objectives have been created since the last review:
  Upon completion, the graduate will be prepared to:
  1. Describe the properties attributed to living organisms.
  2. Apply quantitative measurements to problems and topics related to biological matters (such as population dynamics, genetics, etc).
  3. Design experiments by applying critical thinking and scientific methodology to various biological inquires.
  4. Evaluate how technology is used to answer questions related to the biological sciences, and be able to assess which tools are best suited to answer various questions related to living organisms.
  5. Appraise current issues in the scientific community.
- Enrollment numbers have grown since 2013, peaking in 2015 and declining slightly in the past 2 years. The number of graduates for 2015 was at a record high for the last 5 year period. State level funding shortfalls impact the ability to make facility upgrades or purchase additional specimens.
- Reworked Biology Degree in 2016 for clarity. Reduced number of BIOL courses, but made clearer which ones were necessary for transfer.

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

The Rose State College Mission states: "As a public, open admissions, associate degree granting institution, Rose State College provides higher education preparation for lifelong learning through programs and services designed to serve a diverse community." The Biological Sciences program is central to the institutional mission by preparation of students requiring general education science courses and preparing majors students for transfer to four-year colleges and universities

B. Vitality of the Program:

B.1.Program Objectives and Goals:

The Associate in Science degree program provides students with the analytical skills and scientific knowledge to expand and apply critical thinking to all facets of learning. The expected program outcome is to provide a comprehensive lower division education for students who plan to transfer to a baccalaureate degree program.

Upon completion, the graduate will be prepared to:

1. Describe the properties attributed to living organisms.
2. Apply quantitative measurements to problems and topics related to biological matters (such as population dynamics, genetics, etc).
3. Design experiments by applying critical thinking and scientific methodology to various biological inquires.
4. Evaluate how technology is used to answer questions related to the biological sciences, and be able to assess which tools are best suited to answer various questions related to living organisms.
5. Appraise current issues in the scientific community.

B.2 Quality Indicators (including Higher Learning Commission issues):

Student Outcomes:

- Students are evaluated by projects, exams, presentations (oral and written), and performance in the lab setting.
  - Sample evaluations: Presentations on identifying unknown microorganisms. Field trips to labs. Research on tree transpiration rates.
  - Botany students have presented their novel research at the national Botany Conference.
- Students complete a capstone Biotechnology course that allows them to practice specialized lab techniques, and perform unique research
  - Sample evaluations: Present posters both internally and externally.
- A robust Honors Program allows students to conduct individual research projects.
  - Sample projects: "Identifying microbes in cosmetics past the expiration date." "Use of electrocardiogram to evaluate an aortic valve condition."
- Quantitative reasoning and effective writing skills are also assessed.

- Sample writing assessment: Summaries of primary literature and evaluation of case studies.

Effective Teaching:

- In addition to standard student evaluations, faculty are allowed to perform a self-evaluation. They are observed and evaluated by administrators and peers.
- Faculty implementation of innovative learning techniques such as; flipped classrooms, active learning, case studies, scientific paper critiques and discussions, and construction of biological models.
- Faculty commitment to engage and assist students beyond classroom time and office hours. Readiness and accessibility to students.
- Design of inquiry-based curriculum by biological science faculty that develops critical thinking skills.
- Faculty have authored the lab manuals for Introduction to Biology, General Biology, Zoology, Botany, and Physiology.

Effective Learning Environments:

- Small class sizes provide individualized instruction.
- All classrooms and lab rooms are equipped with computers, AV data projectors, and access to the world-wide-web.
- Availability of computer stations in most life science lab rooms for immediate analysis and graphing of data collected during lab experiments.
- Recent capital improvements updated lighting to LED, replaced flooring, and remodeled bathrooms to be more ADA compliant.
- Comfortable seats in both lecture and lab classrooms promote student attention and contribute to a positive learning environment.
- Biological models, skulls, living specimens and posters on classroom walls create an immersion atmosphere for the learning of life sciences.
- Tutoring is available for students.
- Faculty maintain offices hours specifically to meet with students.
- Student centered support workshops and seminars are available.

External Curricular Evaluation:

- Participation with Oklahoma Regents for Higher Education Course Equivalency Project.
- Articulation agreements with UCO.
- Development of research lab experience with OU.

Capacity to Meet Needs and Expectations of Constituencies:

- The college has developed statistically relevant student satisfaction questionnaires. These are conducted periodically to determine student needs and expectations. Resources are allocated based on the results of the questionnaires.
- An academic advisor is assigned to address student academic questions and issues.

B.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5 year span)	Head Count	Graduates
2013	96	6
2014	114	7
2015	122	13
2016	100	9
2017	111	7

B.4. Other Quantitative Measures:

a. Number of courses taught exclusively for the major program for each of the last five years and the size of classes:

BIOL 1124 General Biology (24 maximum per section)
BIOL 1134 General Biology II (24 maximum per section)
BIOL 1215 Botany (24 maximum per section)
BIOL 1315 Zoology (32 maximum per section)
BIOL 2103 Cell Biology (24 maximum per section)
BIOL 2203 Biotechnology – Capstone (16 per section)
BIOL 2035 Microbiology (20 maximum per section)
BIOL 2424 Physiology (32 maximum per section)

b. Student credit hours by level generated in all major courses that make up the degree program for five years:

Number of Courses Taught		Number of Enrollments		Number of Credit Hrs	
2013	76	2013	1228	2013	5340
2014	70	2014	1142	2014	4906
2015	79	2015	1242	2015	5362
2016	76	2016	1191	2016	5091
2017	75	2017	1318	2017	5522

c. Direct instructional costs for the program for the review period:

Direct Instructional costs:	
Travel	$2,400.00
Equipment	$7,600.00
Supplies	$15,000.00
Full-Time Faculty	$296,642.00
Adjunct Faculty	$85,084.00
Classified Staff	$49,355.00
Total	$ 456,081.00

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

Number of Courses Taught		Number of Enrollments		Number of Credit Hrs	
2013	81	2013	1653	2013	6612
2014	73	2014	1452	2014	5808
2015	80	2015	1419	2015	5676
2016	84	2016	1331	2016	5324
2017	78	2017	1318	2017	5272

e. A roster of faculty members, faculty credentials and faculty credential institution(s). Also include the number of full time equivalent faculty in the specialized courses within the curriculum:

Faculty	Credential	Institution that granted degree
Adjoa Ahedor	PhD	University of Oklahoma
Amy Hurst	PhD	Oklahoma State University
Leanne May	MS	Oklahoma State University
Cory Rubel	PhD	Baylor University
Adjuncts	MS, PhD	Varies

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

g. If available, information about the success of students from this program who have transferred to another institution:

(National Student Clearinghouse)

	Sent	Found	Transferred	Graduate from Transfer
Declared	296	165	135	33
Undeclared	488	301	238	71

B.5. Duplication and Demand:

In cases where program titles imply duplication, programs should be carefully compared to determine the extent of the duplication and the extent to which that duplication is unnecessary. An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various publics served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

B.5. Duplication and Demand Issues:

Address Duplication:

Other community colleges' in the state do offer Biology degrees. However, the Rose State College degree is more readily available to students in eastern Oklahoma county. Additionally, courses such as Introduction to Biology and General Biology meet general education requirements for lab sciences. Furthermore, these courses, along with Physiology, Microbiology, Zoology, and Microbiology meet requirements for other degree programs (such as Nursing, Pre-Pharmacy, Pre-Professional Health, Allied Health, General Science, Health Sciences, and Health & Sports Science).

Address Demand:

The Biological Sciences is a broad field that encompasses many types of job opportunities; technicians, zoologist and wildlife biologists, biochemists, and science teachers to name a few. According to the Bureau of Labor Statistics the median earning potential for a Biological Scientist nationally is $ 74,790 (https://www.bls.gov/oes/current/oes191029.htm). Additionally, the projected growth in the life, physical, and social sciences is "projected to grow 10 percent from 2016 to 2026, faster than the average for all occupations, which will result in about 122,900 new jobs." (https://www.bls.gov/ooh/life-physical-and-social-science/home.htm)

- This demand is echoed by the number of students declaring Biology as a major. The degree has the fourth highest number of declared majors in the Engineering and Science Division at an average of 108.6.
- The demand for Biologists is immeasurable. For instance, in response to human health issues (infectious disease outbreaks, cancer treatment, medical care, wildlife management, and more) biologists are often involved in the immediate response, development of treatments, or crafting policy to best serve the public.

B.5.a. Detail demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

The projected growth in the life, physical, and social sciences is "projected to grow 10 percent from 2016 to 2026, faster than the average for all occupations, which will result in about 122,900 new jobs." (https://www.bls.gov/ooh/life-physical-and-social-science/home.htm)

B.5.b. Detail demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

95% of Rose State Graduates have a job.

B.5.c. Detail demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

Intellectual property is not a program outcome.

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

The demand for Biologists is immeasurable. For instance, in response to human health issues (infectious disease outbreaks, cancer treatment, medical care, wildlife management, and more) biologists are often involved in the immediate response, development of treatments, or crafting policy to best serve the public.

B.5.e. The process of program review should address meeting demands for the program through alternative forms of delivery. Detail how the program has met these demands:

- There is 1 section of online Introduction to Biology (BIOL 1114)
- There is 1 section of hybrid Introduction to Biology (BIOL 1114) in each 8-week period.
- There is 1 section of hybrid General Biology (BIOL 1124) that meets only on Friday of each week.
- 8-week sections of BIOL 1114, BIOL 1124, BIOL 2424, and BIOL 2035 are offered during the summer session.
- Night/Evening sections are offered for BIOL 1114, BIOL 1124, BIOL 1315, BIOL 2424, and BIOL 2035.

B.6. Effective Use of Resources:

Resources include financial support, (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services, appropriate use of technology in the instructional design and delivery processes, and the human resources of faculty and staff.

The following supplies and equipment are available to all students enrolled in life science courses:

1. High-quality microscopes.
2. Video cameras mounted on microscopes for the capture of still shots and video of microscopic life.
3. Quality materials for microbial culturing, dissection specimens, and biotechnology tools.
4. Living and preserved specimens for lab investigations: including bacteria, protists, and fungal cultures, live plants and live animals.
5. Educational software including interactive study guides, complex concept animations, and laboratory simulations.

6. Storage for specimens including an ultrafreezer (-80C)
7. Biocapture devices can calculate EMG, ECG, and EEG
8. Biological safety equipment (safety hoods and autoclaves)

Media and Materials

The Learning Resource Center (LRC) at Rose State College holds a wealth of resources in the life sciences that include:

1. Reference publications including books, dictionaries and encyclopedias
2. Books in biology and health related topics
3. Audiovisual items including CD ROMs, DVDs, and VHS
4. Journals (hardcopy) of medical, and health-related organizations
5. Online journal databases including EBSCO and DynaMed.

*Low Producing Program Reviews follow a different format and template.

Institutional Program Recommendations: (describe detailed recommendations for the program as a result of this thorough review and how these recommendations will be implemented, as well as the timeline for key elements)

Recommendations	Implementation Plan	Target Date
• The retention of current faculty.	• Increasing lab pay rates.	• ASAP
• Address staffing levels.	• Create a Lab Manager designation for senior lab assistant, increase pay, and create an assistant position.	• ASAP
• Guided students to the appropriate division level advisor	• Address at institutional level via Faculty Senate and Academic Affairs.	• Fall 2018
• Create a 1 credit hour "STEM Graduate Planning" course	• Propose course to Curriculum Committee	• Propose Fall 2017/ Implement Fall 2018
• Identify students that are underprepared for Biology	• Unit within STEM Graduate Planning course that introduces measurements, scientific literature, technical writing, etc.	• Fall 2018
• Seek external partnerships and grants	• Meet with OU, OSU, UCO, ECU	• Ongoing
• Create a formal Institutional Review Board (IRB)	• Division level	• Fall 2017

Summary of Recommendations:

	Department	School/College	Institutional
Possible Recommendations:	Biology	Engineering and Science	Rose State College
Expand program (# of students)	**Expand from 111 to a minimum of 130.**		
Maintain program at current level			
Reduce program in size or scope			
Reorganize program			
Suspend program			
Delete program			

Department/
Program Head _____ Date 11.01.17
(Signature)

Dean _____ Date 11/3/17
(Signature)