

# Degree Program Student Learning Report

Revised November 2019

## Select Academic Department

# AS in Biological Sciences

For 2020–2021 Academic Year

### PART 1

#### Degree Program Mission and Student Learning Outcomes

A. State the school, department, and degree program missions.

University Mission	School Mission	Department Mission	Degree Program Mission
Our mission is to ensure students develop the skills and knowledge required to achieve professional and personal goals in dynamic local and global communities.	Central to the mission of the School is the preparation of students to achieve professional and personal goals in their respective disciplines and to enable their success in dynamic local and global communities. Our strategy is to foster an academic setting of diverse curricula that inherently incorporates an environment of service and collegiality.	The mission of the Department of Biology at Rogers State University is to support students in their pursuit of knowledge in biology and life science.	The Associate of Science in Biological Science consists of the general education curriculum and the supporting science courses. In support of the mission of the University, the school, and the department, the degree seeks to develop a student with a broad and diverse background in science and general education.

B. Align school purposes, department purposes, and program student learning outcomes with their appropriate University commitments.

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
To provide quality associate, baccalaureate, and graduate degree	The School offers innovative degrees, which focus upon	To increase the student's critical thinking and reasoning abilities.	1. Demonstrate an understanding of general cellular processes.

<b>University Commitments</b>	<b>School Purposes</b>	<b>Department Purposes</b>	<b>Student Learning Outcomes</b>
<p>opportunities and educational experiences which foster student excellence in oral and written communications, scientific reasoning and critical and creative thinking.</p>	<p>developing skills in oral and written communication, critical thinking, creativity, empirical and evidenced-based inquiry, experimental investigation and theoretical explanation of natural phenomena, and innovative technology.</p>	<p>To prepare a student to matriculate into a four-year degree program in math or science related fields or graduate</p>	<p>2. Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms.</p> <p>3. Demonstrate an understanding of the atom, compounds, matter, gases, solutions, atomic theory, bonding chemical reactions, and chemical kinetics.</p>
<p>To promote an atmosphere of academic and intellectual freedom and respect for diverse expression in an environment of physical safety that is supportive of teaching and learning.</p>		<p>Demonstrate knowledge about the components and requirements of a safe lab environment</p> <p>To promote a positive learning environment in our classrooms and on campus.</p>	<p>4. Demonstrate knowledge about the components and requirements of a safe lab environment.</p>
<p>To provide a general liberal arts education that supports specialized academic programs and prepares students for lifelong learning and service in a diverse society.</p>	<p>The School educates its majors to think independently and have the knowledge, skills and vision to work in all types of situations and careers and communicate with all types of people.</p>	<p>To increase the student's understanding and appreciation of the biological world, and his/her ability to apply this understanding to his/her personal and professional life.</p> <p>To increase the student's ability to interpret and understand his/her world.</p>	
<p>To provide students with a diverse, innovative faculty dedicated to excellence in teaching, scholarly pursuits and continuous improvement of programs.</p>	<p>The School fosters a community of scholars among the faculty and students of the institution</p>		

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
To provide university-wide student services, activities and resources that complement academic programs.			
To support and strengthen student, faculty and administrative structures that promote shared governance of the institution.			
To promote and encourage student, faculty, staff and community interaction in a positive academic climate that creates opportunities for cultural, intellectual and personal enrichment for the University and the communities it serves.	The School will offer and promote artistic, scientific, cultural, and public affairs events on the campus and in the region.	To increase the student's awareness of the benefits of incorporation of technology into science studies.  To serve as a resource for the community; utilizing the expertise of the faculty.	

## PART 2

### Revisit Proposed Changes Made in Previous Assessment Cycle

Revisit each instructional/assessment change proposed in Part 5 of the degree program SLR for the preceding year. Indicate whether the proposed change was implemented and comment accordingly. Any changes the department implemented for this academic year, but which were not specifically proposed in the preceding report, should also be reported and discussed here. Please note if no changes were either proposed or implemented or this academic year.

Proposed Change	Implemented? (Y/N)	Comments
No instructional changes were proposed for SLR 2020-2021	N/A	a. There were changes in the sizes of the class/lab and course delivery methods to accommodate the university recommendation due to the COVID 19 pandemic situation. b. There was a change in assessment methods in Zoology due to a new instructor of the course.

### PART 3

#### Response to University Assessment Committee Peer Review

The University Assessment Committee provides written feedback on departmental assessment plans through a regular peer review process. This faculty-led oversight is integral to RSU's commitment to the continuous improvement of student learning and institutional effectiveness. UAC recommendations are not compulsory and departments may implement them at their discretion. Nevertheless, respond below to each UAC recommendations from last year's peer review report. Indicate whether the recommendation was implemented and comment accordingly. Please indicate either if the UAC had no recommendations or if the program was not subject to review in the previous cycle.

Peer Review Feedback	Implemented (Y/N)	Comments
Include 'changes required by the response to COVID'	Y	<ol style="list-style-type: none"> <li>1. Number of students in the class and lab was reduced to meet the social distance requirement due to the COVID19</li> <li>2. Instructors and students wear masks during instruction both in class and lab</li> </ol>
Include 'changes brought about by new instructors or retiring faculty'	Y	There was a change in the assessment method in Zoology due to a new instructor who changed the assessment method to different unit exam material covered at a different schedule.
Include 'changes such as moving the lab test online'	Y	The lab safety test has been administered online to streamline the process for the last two years.
'Consider increasing the performance standard for SLOs#1 and #2 to set the bar a little higher for our students'	N	It may not be feasible this time due to the data collection method that we used to have. We may discuss it for the next assessment cycles.
'For SLO #3, consider adding a minimum score to the post-test in addition to the level of improvement to show that students are achieving an appropriate level of learning'	N	The minimum score to be achieved by any students who take the course should be discussed more by the faculty to ensure suitability.
For SLO#4, consider finding a different way to assess this SLO since students are required to retake the course until they pass'	N	We may be able to monitor students' progress, not the ultimate outcome, by implementing a tracking system that allows us to count the average number of tests each student takes until they pass the test. The new LMS (Blackboard) may give us better ways of doing this.

## PART 4

### Evidence of Student Learning

Evidence and analyze student progress for each of the student learning outcomes (same as listed in Part I B above) for the degree program. See the *Appendix* for a detailed description of each component. Note: The table below is for the first program learning outcome. Copy the table and insert it below for each additional outcome. SLO numbers should be updated accordingly.

A. Student Learning Outcome															
SLO #1: Demonstrate an understanding of General Cellular processes.															
B. Assessment Measure	C. Performance Standard	D. Sampling Method	E. Sample Size (n)	F. Results	G. Standard Met (Y/N)										
Comprehensive Post Exam. This is the same exam given for pre/post-exam evaluations for SLO # 3 but only the scores on the post-exam are being measured.  This pre/post-exam covers scientific method and evolution, basic chemistry, biological macromolecules, cellular energetics, cellular genetics, and cell reproduction.	70% of students declaring an AS in Biology major will score 70% or above on the post-exam	Pre/Post Exam given to all students in Spring terms but only the AS biology students were analyzed. The exam was not administered in the Fall semester as the final test was online due to COVID 19.	Sample size by semester:  Fall 20: 0 Spring 21: 2	The total number of students in BIOL 1144 for Spring semesters was 48 students. Among them, we had only 2 that could be assessed for the AS in Biology and they were enrolled for Spring 21.  The average post-exam score was 59% and 50% scored above 70%.      Below are our results from this assessment cycle.  <hr/> <b>Spring 21 Post test Score Distribution</b> <hr/>	N										
<table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 25%; text-align: right;">0-49%</td> <td style="width: 10%; text-align: center;">1</td> <td style="width: 65%;"></td> </tr> <tr> <td style="text-align: right;">50-59%</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: right;">60-69%</td> <td style="text-align: center;">0</td> <td></td> </tr> </tbody> </table>							0-49%	1		50-59%	0		60-69%	0	
0-49%	1														
50-59%	0														
60-69%	0														

**A.**  
**Student Learning Outcome**

SLO #1: Demonstrate an understanding of General Cellular processes.

<b>B.</b> <b>Assessment Measure</b>	<b>C.</b> <b>Performance Standard</b>	<b>D.</b> <b>Sampling Method</b>	<b>E.</b> <b>Sample Size (n)</b>	<b>F.</b> <b>Results</b>	<b>G.</b> <b>Standard Met (Y/N)</b>								
				<table border="0"> <tr><td>70-79%</td><td>1</td></tr> <tr><td>80-89%</td><td>0</td></tr> <tr><td>90-100%</td><td>0</td></tr> <tr><td>Total</td><td>2</td></tr> </table>	70-79%	1	80-89%	0	90-100%	0	Total	2	
70-79%	1												
80-89%	0												
90-100%	0												
Total	2												

**H.**  
**Conclusions**

We have not met our performance standards.

Since only declared AS in biology students were analyzed this is an extremely small sample size. Also, it is worth noting that we were not able to administer the post-exam in the Fall semester due to the change of instruction method from on-ground to online. We were able to assess only 2 students and even if we include last years' SLR we still only have a total of 60 students. The faculty believed this is still too small of a sample size to be statistically significant. We plan to continue to separate out the AS students and over the next few more years to increase our total numbers and cumulatively add up the results to make our assessment measurement more robust.

The strength of this assessment measure is that we will be able to better assess just the AS majors in the future.

The weakness of this measure is the low number of students that we are currently able to assess. Faculty cannot currently make valid instructional changes with such a low number of students assessed.

**A.**  
**Student Learning Outcome**

SLO #2: Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms.

<b>B. Assessment Measure</b>	<b>C. Performance Standard</b>	<b>D. Sampling Method</b>	<b>E. Sample Size (n)</b>	<b>F. Results</b>	<b>G. Standard Met (Y/N)</b>																																										
2a. The final exam of General Botany was a comprehensive test and it covered taxonomy, morphology, and physiology of plants.	2a. At least 70% of students in General Botany (BIOL 2104) declaring an AS in Biology will score 70% or better on the final comprehensive exam.	2a. All students in General Botany will be given a comprehensive final exam pertaining to this objective but only the AS students will be analyzed by the faculty involved.	2a. Sample size by semester: Fall: 0 Spring: 1	Only a single AS student took botany during AY 2020-21. This student made an 85% on the final.	Y																																										
2b Unit exams that assess the understanding of taxonomy, morphology, and physiology of animals.  Unit exam 1 Covers Evolution and Taxonomy  Unit exams 2-6 cover the morphology, physiology, and phylogeny of specific animal phyla	2b. At least 70% of students declaring an AS in Biology in General Zoology (BIOL 2205) will score 70% or better on all unit exams.	2b. All students General Zoology (BIOL 2205) will be given unit exams pertaining to this objective and each of these unit exams will be analyzed by the faculty involved. Only the declared AS in Biology students will be reported.	2b. Sample size by semester: Fall: 1 Spring: 0	2b. During the Fall 2020 and Spring 2021, Zoology had only one student out of 61 students were AS Biology majors. The following Table summarizes the Fall 2020 and Spring 2021 results.  FALL 2020 and SPRING 2021 SCORE DISTRIBUTIONS  <table border="1"> <thead> <tr> <th>Exam</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>100-90%</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>89-80%</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>79-70%</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>69-60%</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>0-59%</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> During the Fall 2020 and Spring 2021, the single AS students scored an average of 67% across all six exams. The student showed	Exam	1	2	3	4	5	6	100-90%	0	0	0	0	0	0	89-80%	0	0	0	0	0	0	79-70%	0	0	0	0	0	1	69-60%	0	1	1	1	1	0	0-59%	1	0	0	0	0	0	N
Exam	1	2	3	4	5	6																																									
100-90%	0	0	0	0	0	0																																									
89-80%	0	0	0	0	0	0																																									
79-70%	0	0	0	0	0	1																																									
69-60%	0	1	1	1	1	0																																									
0-59%	1	0	0	0	0	0																																									

**A.**  
**Student Learning Outcome**

SLO #2: Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms.

<b>B.</b> <b>Assessment Measure</b>	<b>C.</b> <b>Performance Standard</b>	<b>D.</b> <b>Sampling Method</b>	<b>E.</b> <b>Sample Size (n)</b>	<b>F.</b> <b>Results</b>	<b>G.</b> <b>Standard Met (Y/N)</b>
				<p>continual improvement throughout the course exams, raising individual exam scores on average 2% better on each exam and the course progressed.</p> <p>In Fall 2019, a new full time professor began instructing Zoology for RSU. As such, a direct comparison of previous AS scores to current AS scores may not be an accurate comparison between years.</p>	

**H.**  
**Conclusions**

2a. For Fall 20 and Spring 21 we met our performance standards on the final exam. We only assessed 1 student this academic year and the number is still not significantly large enough to make a conclusive conclusion based on the assessment result. We have had only 24 students since our SLR 2015-2016 still a statistically small number but using a cumulative number in the future and should help us eventually make for a better assessment in the future.

2b. For Fall 2020 and Spring 2021, we did not meet our performance standards on unit exams. To date, we have only six AS students across the last two years to compare since the new full time instructor joined our university. Analyzing a total of six students presents a challenge due to small sample size, leading to false conclusions and incorrect statistical analyses. As such, a direct comparison of previous AS scores (past instructors) to current AS scores may not be an accurate comparison between years until a larger sample size of the current instructor may be accumulated across semesters between years. In the future, the current instructor will be utilizing course time to review main course concepts prior to unit exams.



**A.**  
**Student Learning Outcome**

**SLO #3:** Demonstrate an understanding of the atom, compounds, matter, gases, solutions, atomic theory, bonding chemical reactions, and chemical kinetics.

<b>B. Assessment Measure</b>	<b>C. Performance Standard</b>	<b>D. Sampling Method</b>	<b>E. Sample Size (n)</b>	<b>F. Results</b>	<b>G. Standard Met (Y/N)</b>																						
Comprehensive Pre-Post Exam.	70% of AS in Biology students will improve on the post-test by 20% or greater over the pre-test	Pre/Post Exam given to all students in Spring terms but only the AS biology students were analyzed. The exam was not administered in the Fall semester as the final test was online due to COVID 19.  Conducted as Pre/Post Exam.	Sample size by semester: Fall 20: 0 Spring 21: 2	This table summarizes the difference in student scores for the pre & post exam scores for Spring 21.  Spring 20 Score Distribution (Post-Exam Improvement) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0-10%</td><td>0</td></tr> <tr><td>10-20%</td><td>1</td></tr> <tr><td>20-30%</td><td>1</td></tr> <tr><td>30-40%</td><td>0</td></tr> <tr><td>40-50%</td><td>0</td></tr> <tr><td>50-60%</td><td>0</td></tr> <tr><td>60-70%</td><td>0</td></tr> <tr><td>70-80%</td><td>0</td></tr> <tr><td>80-90%</td><td>0</td></tr> <tr><td>90-100%</td><td>0</td></tr> <tr><td><b>Average gain:</b></td><td><b>23%</b></td></tr> </table>	0-10%	0	10-20%	1	20-30%	1	30-40%	0	40-50%	0	50-60%	0	60-70%	0	70-80%	0	80-90%	0	90-100%	0	<b>Average gain:</b>	<b>23%</b>	N
0-10%	0																										
10-20%	1																										
20-30%	1																										
30-40%	0																										
40-50%	0																										
50-60%	0																										
60-70%	0																										
70-80%	0																										
80-90%	0																										
90-100%	0																										
<b>Average gain:</b>	<b>23%</b>																										

**H.**  
**Conclusions**

Students improved on the post-test by an average of 23% compared to that of pre-exam for Spring 21. Our goal of at least a 20% increase was met. However, there was only 50% of the students achieved the goal of more than 20% improvement on the post-exam compared to the pre-exam that was due to an extremely small number of the sample.

**A.**  
**Student Learning Outcome**

SLO #4: Demonstrate knowledge about the components and requirements of a safe lab environment.

<b>B. Assessment Measure</b>	<b>C. Performance Standard</b>	<b>D. Sampling Method</b>	<b>E. Sample Size (n)</b>	<b>F. Results</b>	<b>G. Standard Met (Y/N)</b>
A laboratory exercise and worksheet will be administered to all students in Biol. 1144.	100% of the students in BIOL 1144L will complete and 100% will pass the quiz over laboratory safety. This exercise requires students to learn biology laboratory protocols and safety equipment and its proper use and function. This will be a pass/fail exercise. Any student not passing the exercise will be required to repeat the exercise until they can pass.	All students in majors biology course ( BIOL 1144L) were sampled during the Fall 2020 and Spring 2021 Tests were administered in an online format.	270	Out of the 270 students, all completed the exercise with a passing grade.	Y

**H.**  
**Conclusions**

Our set goal was achieved and students are learning proper laboratory safety across the multiple lab sections. The lab test was administered online which allowed instructors to monitor students' qualification to attend the rest of the labs on a real-time basis. To accommodate the recommendation from the University Assessment Committee, we may change our assessment method in a way that allows instructors to monitor student's progress rather than a final outcome.

### Proposed Instructional or Assessment Changes

Learning outcomes assessment can generate actionable evidence of student performance that can be used to improve student success and institutional effectiveness. Knowledge of student strengths and weakness gained through assessment can inform faculty efforts to improve course instruction and program curriculum. Below discuss potential changes the department is considering which are aimed at improving student learning or the assessment process. Indicate which student learning outcome(s) will be affected and provide a rationale for each proposed change. These proposals will be revisited in next assessment cycle.

Proposed Change	Applicable Learning Outcomes	Rationale and Impact
Accommodations made due to the COVID 19 pandemic situation will be revisited based on the university recommendations	Expect to see overall improvement on the established learning outcomes	Expect to have a better instructional environment by lifting mask mandate without compromising possible COVID 19 infection.
Changes in assessment methods of Zoology from unit exams to Pre and post exam given to all students enrolled in Zoology.	All the aspects of learning outcomes previously covered by the unit exams will be assessed.	We expect to be able to directly compare students' knowledge gained after course completion. This exam format will allow for more accurate comparisons with smaller sample sizes.

### PART 6

#### Summary of Assessment Measures

A. How many different assessment measures were used? 3

B. List the direct measures (see appendix):









- Pre/Post tests in Cellular Biology (BIOL1144)
- Lab Safety Test in Cellular Biology (BIOL1144L)
- Unit exam scores in General Botany (BIOL2014)
- Unit exam scores in General Zoology (BIOL2205)

C. List the indirect measures (see appendix): 0


AS SLR

**PART 7**  
**Faculty Participation and Signatures**

A. Provide the names and signatures of all full time and adjunct faculty who contributed to this report.

Faculty Name	Assessment Role	Signature
Dr. Jerry Bowen	Collected data, reviewed report	
Dr. Jaeho Kim	Prepared and reviewed report	
Mrs. Cheyann Olson	Reviewed report	
Dr. Lisa Overall	Reviewed report	
Dr. Mark Peaden	Collected data, reviewed report	
Dr. Jin Seo	Reviewed report	
Dr. Uduak Udoh	Reviewed report	
Dr. Craig Zimmerman	Collected data, reviewed report	

B. Reviewed by:

Titles	Name	Signature	Date
Department Head	Dr. Jerry Bowen		02 Dec 2021
Dean	Dr. Keith Martin		