

# Degree Program Student Learning Report

Revised August 2017

## Department of Biology

# AS in Biological Sciences

For 2018-2019 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.

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
opportunities and educational experiences which foster student excellence in oral and written communications, scientific reasoning and critical and creative thinking.	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.	To prepare a student to matriculate into a four-year degree program in math or science related fields or graduate	<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>
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>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>	4. Demonstrate knowledge about the components and requirements of a safe lab environment.
To provide a general liberal arts education that supports specialized academic program and prepares students for lifelong learning and service in a diverse society.	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>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>	
To provide students with a diverse, innovative faculty dedicated to excellence in teaching, scholarly pursuits and continuous improvement of programs.	The School fosters a community of scholars among the faculty and students of the institution.		

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.	<p>To increase the student's awareness of the benefits of incorporation of technology into science studies.</p> <p>To serve as a resource for the community; utilizing the expertise of the faculty.</p>	

## 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 2017-2018		

### 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
AS Biology degree program was not reviewed during previous assessment cycle.		

### 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	70% of students	Administered to all	Fall 18 and Spring 19	The total number of students in BIOL 1144	N

**A.  
Student Learning Outcome**

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

<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>														
<p>Exam. This is the same exam given for pre/post- test evaluations for SLO # 3 but only the scores on the post exam are being measured.</p> <p>This pre/post exam covers scientific method and evolution, basic chemistry, biological macromolecules, cellular energetics, cellular genetics and cell reproduction.</p>	<p>declaring an AS in Biology major will score 70% or above on the post-exam</p>	<p>students in General Cellular Biology (BIOL 1144) during both Fall and Spring terms but only the declared AS in Biology students was analyzed.</p>	<p>15 students</p>	<p>for both semesters was-282 students. Among them, we had only 15 that could be assessed for the AS in Biology. Average post test score was 61.6% and only 40% scored above 70% (29% in the Fall 18 and 50% in the Spring 19).</p> <p style="text-align: center;">Below are our results from this assessment cycle.</p> <p style="text-align: center;"><b>Fall 18 and Spring 19 Post test Score Distribution</b></p> <hr style="width: 20%; margin: auto;"/> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>0-49%</td> <td style="text-align: right;">3</td> </tr> <tr> <td>50-59%</td> <td style="text-align: right;">4</td> </tr> <tr> <td>60-69%</td> <td style="text-align: right;">2</td> </tr> <tr> <td>70-79%</td> <td style="text-align: right;">3</td> </tr> <tr> <td>80-89%</td> <td style="text-align: right;">3</td> </tr> <tr> <td><u>90-100%</u></td> <td style="text-align: right;"><u>0</u></td> </tr> <tr> <td>Total</td> <td style="text-align: right;">15</td> </tr> </table>	0-49%	3	50-59%	4	60-69%	2	70-79%	3	80-89%	3	<u>90-100%</u>	<u>0</u>	Total	15	
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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)
H. Conclusions					
<p>We did not meet our performance standard.</p> <p>Since only declared AS in biology students were analyzed this is an extremely small sample size. We were able to assess only 15 students and even if we include last years' SLR we still only have a total of 44 students. The faculty believed this is still too small of a sample sized to be statistically significant. Our plan is to continue to separate out the AS students and over the next few years to increase our total numbers and cumulatively add up the results to make our assessment measurement more robust.</p> <p>The strengths for this assessment measure is that we will be able to better assess just the AS majors in the future.</p> <p>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.</p>					

A. Student Learning Outcome										
SLO #2: Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms.										
B. Assessment Measure	C. Performance Standard	D. Sampling Method	E. Sample Size (n)	F. Results	G. Standard Met (Y/N)					
2a. Unit exams that assess the understanding of taxonomy, morphology, and physiology of plants.  Exam 1-covers	2a. At least 70% of students in General Botany (BIOL 2104) declaring an AS in Biology will score 70% or better on all units exams.	2a. All students in General Botany will be given unit exams pertaining to this objective and each of these unit exams but only the AS students will be analyzed by	2a. Fall of 2018 had 1 and Spring of 2019 had 3 students assessed	2a. During the Fall of 2018 Botany had only 1 student out- 37students were AS Biology majors. The following Table summarizes the Fall 18 results  <p style="text-align: center;">FALL 2018 SCORE DISTRIBUTIONS</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Exam</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	Exam	1	2	3	4	Y
Exam	1	2	3	4						

<p>anatomy &amp; physiology of tissues of vascular plants</p> <p>Exam 2-covers anatomy &amp; physiology of roots and soils</p> <p>Exam 3-covers anatomy and physiology of stems and leaves</p> <p>Exam 4-covers anatomy &amp; physiology of flowers, fruits, seeds and photosynthesis</p>		<p>the faculty involved.</p>		<p>100-90% = 0 1 0 0  89-80% = 0 0 1 0  79-70% = 1 0 0 1  69-60% = 0 0 0 0  0- 59% = 0 0 0 0</p> <p><u>Percent of students making 70% or better on Unit Exams</u>  Exam 1 = 100%  Exam 2 = 100%  Exam 3 = 100%  Exam 4 = 100%</p> <p>During the Spring 2019 Botany had only 3 students out of 46 students were AS Biology majors. The following Table summarizes the Spring 19 results</p> <p style="text-align: center;">SPRING 2019 SCORE DISTRIBUTIONS</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Exam</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>100-90% =</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>89-80% =</td> <td>0</td> <td>2</td> <td>2</td> <td>0</td> </tr> <tr> <td>79-70% =</td> <td>2</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>69-60% =</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0- 59% =</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p><u>Percent of students making 70% or better on Unit Exams</u>  Exam 1 = 100%  Exam 2 = 100%  Exam 3 = 100%  Exam 4 = 100%</p>	Exam	1	2	3	4	100-90% =	1	1	0	1	89-80% =	0	2	2	0	79-70% =	2	0	1	2	69-60% =	0	0	0	0	0- 59% =	0	0	0	0	
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<p>2b Unit exams that</p>	<p>2b. At least 70% of</p>	<p>2b. All students</p>	<p>2b.6 students</p>	<p>2b. During the Fall 2018 and Spring 19</p>	<p>N</p>																														

<p>assess the understanding of taxonomy, morphology, and physiology of animals.</p> <p>Unit exam 1 Covers Evolution and Taxonomy</p> <p>Unit exams 2-6 cover the morphology, physiology, and phylogeny of specific animal phyla</p>	<p>students declaring an AS in Biology in General Zoology (BIOL 2205) will score 70% or better on all unit exams.</p>	<p>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.</p>	<p>assessed</p>	<p>Zoology had only 6 students out 70 students were AS Biology majors. The following Table summarizes the Fall 18 and Spring 19 results.</p> <p style="text-align: center;">FALL 2018 and SPRING 19 SCORE DISTRIBUTIONS</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <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>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>89-80% =</td> <td>0</td> <td>2</td> <td>1</td> <td>1</td> <td>3</td> <td>0</td> </tr> <tr> <td>79-70% =</td> <td>4</td> <td>0</td> <td>1</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td>69-60% =</td> <td>1</td> <td>1</td> <td>2</td> <td>0</td> <td>10</td> <td>0</td> </tr> <tr> <td>0- 59% =</td> <td>1</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> <td>1</td> </tr> </tbody> </table> <p><u>Percent of students making 70% or better on Unit Exams for Fall 18 and Spring 19</u></p> <p>Exam 1 = 83%</p> <p>Exam 2 = 33%</p> <p>Exam 3 = 33%</p> <p>Exam 4 = 83%</p> <p>Exam 5 = 83%</p> <p>Exam 6 = 67%</p> <p>During the Fall 2018 and Spring 19 70% of AS students made 70% or better on three of the six unit exams. It should be noted that only five exams were given during the spring 2019 semester (exams 5 and 6 were combined).</p> <p>Because of low numbers of AS Biology students we combined scores from previous semesters to obtain a more robust analysis. All of the Fall semesters from 2013-2017 are combined together and all of the Spring semesters from 2014-2019</p>	Exam	1	2	3	4	5	6	100-90% =	0	0	0	1	0	1	89-80% =	0	2	1	1	3	0	79-70% =	4	0	1	3	2	1	69-60% =	1	1	2	0	10	0	0- 59% =	1	3	2	1	0	1
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				<p>are combined together to give an overall analysis of all students that were declared AS Biology majors. We combined the Fall semester together and Spring semesters together to also analyze any differences between the two semesters.</p> <p>Percent of students making 70% or better on Unit Exams for Fall 13, Fall 14 , Fall 15, Fall 16, Fall 17 &amp; Fall 18</p> <p>Exam 1 = 61%</p> <p>Exam 2 = 61%</p> <p>Exam 3 = 67%</p> <p>Exam 4 = 78%</p> <p>Exam 5 = 83%</p> <p>Exam 6 = 78%</p> <p>Percent of students making 70% or better on Unit Exams for Spring 14, Spring 15 , Spring 16, Spring 17, Spring 18 &amp; Spring 19</p> <p>Exam 1 = 70%</p> <p>Exam 2 = 70%</p> <p>Exam 3 = 70%</p> <p>Exam 4 = 83%</p> <p>Exam 5 = 87%</p> <p>Exam 6 = 87%</p>	
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**H.  
Conclusions**

2a. For Fall 18 and Spring 19 we met our performance stands on all four unit exams-. We only assessed 4 students 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 19 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 18 and Spring 19, we did not meet our performance standards on three out of the six unit exams. Analyzing only one year with a total of only

6 students is such a small sample that it is not statistically valuable. So we have begun the process of combining several years of data (the last five SLRs to obtain a more statistically significant analysis. Although “teasing out” the AS students for the last five SLRs have yet to accumulate a significant number of students, if we combine the last five SLRs we are still analyzing only 45 students. With the combined semesters we are still meeting our standards except on one Unit exam 1 during the Spring semesters. During our last SLR we were not meeting our standard on only one of the six unit exams. To illustrate how easily these low number skewer our analysis by adding only two more students to our results during the Fall semester caused us to not meet our standards in only three out the six unit exams, while during the previous SLR all six of the units measures were meet. A similar result occurs when analyzing the Spring results. During the previous SLR we did not meet our standard on Exam 1, but with adding four more students to the spring semester comparisons in our current SLR analysis all six unit exam standards were meet. The point being, until we can accumulate more student data the results jump for not be meet to being meet or vice versa and makes it extremely difficult to constructively make changes without having a statistically significant number of students to evaluate. So until we get a larger sample size to make our statistics more robust, that no instructional changes are required at this time. It should be noted that Zoology is currently taught by one faculty and since this faculty member is retiring this course and the evaluation process will probably have significant changes for the next SLR

**A.  
Student Learning Outcome**

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

<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 Test given to all students in both Fall and Spring terms but only the AS biology students were analyzed.  Conducted as pre/post- test.	Fall 18 4  Spring 19 8	This table summarizes the difference in student scores for the pre & post test scores for- Fall 18 and Spring 19.  Fall 18 and Spring 19 Score Distribution (Post Test Improvement) <hr/> 0-10%                    2 10-20%                   2 <hr/> 20-30%                   2 30-40%                   2 40-50%                   4 50-60%                   0 60-70%                   0 70-80%                   0	Y

				80-90%	0	
				90-100%	0	
				<b>Average gain:</b>	28.2%	

**H.**

**Conclusions**

Student scores on the post-test improved by an average of 62% for the Fall 18 and Spring 19. Our goal of as least a 20% increase was met.

Even with our small sample size our standard was met.

**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 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	All students in majors biology course ( BIOL 1144L) were sampled during the Fall 2018 and Spring 2019	291	Out of the 291 students all completed the exercise with a passing grade.	Y

	will be required to repeat the exercise until they can pass.				
<b>H. Conclusions</b>					
Although our goal was achieved and students are learning proper laboratory safety, the coordination and implementation of this process has continued to be challenging because of the number of adjuncts teaching the labs, but with increased communication and coordination by our Department Head it has become a more seamless process and will be offered on-line in the future.					

## PART 5

### 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
No instructional changes are planned at this time.		

**PART 6**  
**Summary of Assessment Measures**

A. How many different assessment measures were used? 3

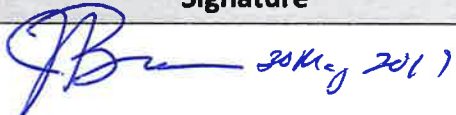



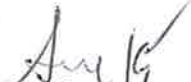

B. List the direct measures (see appendix):


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

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



**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	Reviewed report, collected data	
Mrs. Claudia Glass	Collected data for BIOL 1144, and BIOL 2104, analyzed data, prepared report, and reviewed report	
Mr. Don Glass	Collected data for BIOL 1144 and BIOL 2205 analyzed data, prepared report, and reviewed report	
Dr. Jaeho Kim	Prepared and reviewed report	
Dr. Sue Katz	Reviewed report	
Dr. Craig Zimmerman	Collected data for BIOL 1144, analyzed data	

Dr, Jin Seo	Reviewed report, collected data	
Dr. Lisa Overall	Reviewed report, collected data	

**B. Reviewed by:**

Titles	Name	Signature	Date
Department Head	Dr. Jerry Bowen		30 May 2019
Dean	Dr. Keith Martin		6/10/19