Degree Program Student Learning Report (rev. 7/14)

Fall 2014 – Spring 2015

The Department of Biology in the School of Mathematics, Science & Health Sciences

Biological Sciences, A.S.

Effectively assessing a degree program should address a number of factors:

1) Valid student learning outcomes should be clearly articulated;
2) Valid assessment measures should be used, consistent with the standards of professional practice;
3) There should be evidence that assessment data are being used by faculty to make necessary instructional or assessment changes; and there should be evidence that instructional or assessment changes are being implemented to improve student learning.

PART 1 (A & B)

Relationship of Degree Program Learning Outcomes to Departmental and University Missions

A. Clearly 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. Three departments comprise this School, the Departments of	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

University Mission	School Mission	Department Mission	Degree Program Mission
	Biology, Health Science, and Math and Physical Science. These departments pledge to deliver existing and newly developed programs that meet student demands, and to be responsive to the evolving culture of academia in general and the sciences in particular. Our Strategy is to foster an academic setting of diverse curricula that inherently incorporates an environment of service and collegiality.		and general education.

B. Clearly state school purposes, department purposes and degree program student learning outcomes. Align student learning outcomes with their appropriate school and department purposes, and these outcomes and purposes with their appropriate university commitments.

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
To provide quality associate, baccalaureate, and graduate degree opportunities and educational experiences which foster student excellence in oral and written communications, scientific reasoning and critical and creative thinking.	The **Curriculum** utilizes academically rigorous methodologies delivered by a quality faculty who possess a broad base of content knowledge and promote the acquisition, application and discussion of current subject matter. The School uses effective instructional techniques, empirical and evidenced-based inquiry, innovative technology, and a variety of learning environments for the purpose of enhancing student learning	To increase the student's critical thinking and reasoning abilities. To prepare a student to matriculate into a four-year degree program in math or science related fields or graduate	1. Demonstrate an understanding of general cellular processes. 2. Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms. 3. Demonstrate an understanding of the atom, compounds, matter, gases, solutions, atomic theory, bonding chemical reactions, and chemical kinetics.
To promote an atmosphere of academic and intellectual freedom and respect for	The School promotes a challenging, positive, and inquisitive Collegial	Demonstrate knowledge about the components and requirements of a safe	4. Demonstrate knowledge about the components and requirements of a

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
diverse expression in an environment of physical safety that is supportive of teaching and learning.	environment of high ethical standards and of frequent interactions between faculty and students to foster independent thought and the collegial exchange of ideas	lab environment To promote a positive learning environment in our classrooms and on campus.	safe lab environment.
To provide a general liberal arts education that supports specialized academic program sand prepares students for lifelong learning and service in a diverse society.	The School recognizes the importance of scientific literacy in general education and its contribution to the liberal studies curriculum of the university.	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. To increase the student's ability to interpret and understand his/her world.	
To provide students with a diverse, innovative faculty dedicated to excellence in teaching, scholarly pursuits and continuous improvement of programs.			
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.	Our commitment to Service enhances the public welfare and economic development potential of our region by cultivating strategic partnerships with health and science-related industries, secondary and higher education institutions, and through active participation and leadership in civic and professional organizations by our faculty and students. These collaborative efforts are based on the belief that through shared relationships, service reinforces and strengthens learning, and learning	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.	

University Commitments	School Purposes	Department Purposes	Student Learning Outcomes
	reinforces and strengthens service. An emphasis of service encourages social awareness and responsibility among faculty and students.		

PART 2

Discussion of Instructional Changes Resulting from 2013-2014 Degree Program Student Learning Report

List and discuss all instructional or assessment changes proposed in Part 5 of last year's Degree Program Student Learning Report, whether implemented or not. Any other changes or assessment activities from last year, but not mentioned in last year's report, should be discussed here as well. Emphasis should be placed on student learning and considerations such as course improvements, the assessment process, and the budget. If no changes were planned or implemented, simply state "No changes were planned or implemented."

Instructional or Assessment Changes	Changes Implemented (Y/N)	Impact of Changes on Degree Program Curriculum or Budget
Outcomes 1 & 3 The AS Biology students will be "teased out" from the other majors in Gen. Cellular Biology (Biol. 1144) Biol. 1144: General Cell Biology Encourage more instructors to adopt the Mastering Biology online learning system.	Y Y/N	This change will allow the department to accurately tease out pertinent data that applies to only the AS Biology students. Because of low numbers of declared AS in Biology numbers to make the assessment pertinent several years of data will have to be collected. Several instructors feel this is an added expense (approximately $125 more) that with increasing tuition, increasing textbook cost this is an added burden that some students cannot afford. Many faculty believe with the free tutoring and tutoring.com that students have additional support if they are encouraged to seek it out.
Outcome 2A Biol. 2104 To improve student success and understanding a greater emphasis will be given to difficult materials. More frequent testing will be implemented to reduce material per exam so students will have more time to prepare and ask for additional explanation of concepts.	Y/N	More frequent testing was not implemented but increased use of study guides and addition study materials were used. With the additional materials many students ask questions and are more involve with the material.
Outcome 4	Y	A new adjunct lab coordinator has been hired and this should improve the collection of

We have hired a lab coordinator for Biol. 1144.		assessment information from the variety of lab instructors now teaching General Biology 114 laboratory. Besides collecting information this laboratory coordinator is in the process of revising the safety exercise and is constructing a written quiz over laboratory safety.	

PART 3

Discussion About the University Assessment Committee's 2012-2013 Peer Review Report

The University Assessment Committee in its Degree Program Peer Review Report provided feedback and recommendations for improvement in assessment. List or accurately summarize all feedback and recommendations from the committee, and state whether they were implemented or will be implemented at a future date. If they were not or will not be implemented, please explain why. If no changes were recommended last year, simply state "No changes were recommended."

Feedback and Recommended Changes from the University Assessment Committee	Suggestions Implemented (Y/N)	Changes that Were or Will Be Implemented, or Rationale for Changes that Were Not Implemented
Difficulty of Cellular Biology course, suggest making General Biology a prerequisite to Cellular Biology. This challenge is exacerbated by students who take Biology courses without having a declared major and if weak in science could be influencing assessment data negatively.	N	This is a continual discussion within the department and our enrollment coordinator, as to what is the best way of handling a prerequisite for Cellular Biology. If we were to have Gen. Biology as a prerequisite this would affect the number of hours our nursing majors take from the biology department (currently nursing majors are required to take cell biology, anatomy and physiology, and microbiology) and this number is not very flexible. Advisers have been suggesting students with an ACT below 19 to take Gen. Biology before Cellular Biology but it is not a requirement.
Encourage more instructors to adopt the Mastering	N	Several instructors feel this is an added expense (approximately $125 more) with

Biology online learning system so potentially improve student progress.		increasing tuition, increasing textbook cost this is an added burden that some students cannot afford. It is the Faculty's belief with the availability of free tutoring and tutoring.com that students have additional support if they are encouraged to seek it out.
Unable to identify/dialogue strengths of the program.	N	Need clarification of reviewer's comment to provide adequate response.
Outdated facilities, building of a new science building	N	We totally agree with the Assessment Committee.

PART 4

Analysis of Evidence of Student Learning Outcomes

For all student learning outcomes (as listed in Part 1 B above), describe the assessment measures and performance standards used, as well as the sampling methods and sample sizes. For each measure, document the results of the activity measured and draw relevant conclusions related to strengths and weaknesses of their performance.

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
1. Demonstrate an understanding of General Cellular processes.	Comprehensive Pre-Post Exam Comprises a 50 multiple-choice question exam on basic	70% of students declaring an AS in Biology will score 70% or above.	Administered to all students in General Cellular Biology (Biol. 1144) during both Fall and	Fall 14 11 Spring 15 0	This is the first assessment cycle were the AS in Biology students were "teased" out of the General Cellular Biology 1144. The total number of students in Biol. 1144 for both semesters was 330 students so out these we had only 11 that were declared AS in Biology.	We did not meet our performance standard. Since only declared AS in biology students were analyzed this is an extremely small sample size (11 total)	N

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
	concepts covered in the course. This exam was administered as a pre-post test. We consider two results: 1) post test scores, and 2) the difference in pre-post test scores. Here, we discuss the post-test score results. Change in pre-post scores is discussed in next section..		Spring terms but only the declared AS in Biology students will be analyzed. . Pre-test was given in first class meeting Post-test was given at time of final exam		Below are our results from this assessment cycle. **Fall 14** **Score Distribution** Fall 14 0-49% 2 50-59% 3 60-69% 2 70-79% 1 80-89% 1 90-100% 2 For the fall 14 only 36% made 70% or better on the post test.	and the faculty believed this is too small of sample sized to be statistically significant. Our plan is to continue to separate out the AS students and over the years increase our total numbers to make our assessment measurement more robust. The strengths for 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 Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
					Spring 15 Score Distribution Sp15 0-49% 0 50-59% 0 60-69% 0 70-79% 0 80-89% 0 90-100% 0 For the spring the Spring 15 we had no students declared as AS in Biology majors so no assessment could be analyzed		
2. Apply understanding of the taxonomy, morphology, and physiology of the Animal and Plant Kingdoms.	2a Unit exams that assess the understanding of 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%	2a. All students in General Botany will be given unit exams pertaining to this objective and each of	2a. Fall of 2014 had 4 and Spring of 2015 had 5 students assessed	2a. During the Fall of 2014, 100% of the AS students scored 70% or better on all 4 unit exams. During the Spring of 2015 60% of the AS students scored 70% or better on the 4 unit exams provided. During the Fall of 2014 Botany had only 4 students out 47 students were AS Biology majors.	2a Our results were better in this cycle and showed an improvement in the fraction of students scoring 70% or higher because the students assessed were only AS students.	N/Y

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
		or better on all units exams.	these unit exams but only the AS students will be analyzed by the faculty involved.		The following Table summarizes the Fall 14 results FALL 2014 SCORE DISTRIBUTIONS Exam 1 2 3 4 100-90% = 2 1 1 3 89-80% = 0 3 2 1 79-70% = 2 0 0 0 69-60% = 0 0 1 0 0- 59% = 0 0 0 0 Percent of students making 70% or better on Unit Exams Exam 1 = 100% Exam 2 = 100% Exam 3 = 75% Exam 4 = 100% During the Spring 2015 60% of AS students made 70% or better on all the unit exams. During the Spring of 2015, Botany had only 5 students out of 43 students were AS Biology majors. The following Table summarizes the Spring 15 results. SPRING 2015 SCORE DISTRIBUTION Exam 1 2 3 4 100-90% = 2 2 3 1 89-80% = 1 1 0 1 79-70% = 0 1 1 1 69-60% = 1 0 0 1 0 -59% = 1 1 1 1	When comparing Exam 1, Fall 2014 the overall class 94% of the students scored 70% or better whereas 100% of the AS students scored 70% or higher. Exam 2, Fall 2014 the overall class 98% of the students scored 70% or better whereas 100% of the AS students scored 70% or higher. Exam 3, Fall 2014 the overall class 93% of the students scored 70% or better whereas 75% of the AS students scored 70% or higher. Exam 4, Fall 2014 the overall class 88% of the students scored 70% or better whereas 100% of the AS students scored 70% or higher. For the Spring of 2015, Exam one the overall class 88% of the students scored 70% or better whereas 60% of the AS students scored 70% or higher.	

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
					Percent of students making 70% or better on Unit Exams Exam 1 = 60% Exam 2 = 80% Exam 3 = 60% Exam 4 = 80% During the Spring 2015 60% of AS students made 70% or better on all the unit exams.	Exam 2, Spring 2015 the overall class 86% of the students scored 70% or better whereas 80% of the AS students scored 70% or higher. Exam 3, Spring 2015 the overall class 88% of the students scored 70% or better whereas 80% of the AS students scored 70% or higher. Exam 4, Spring 2015 the overall class 90% of the students scored 70% or better whereas 90% of the AS students scored 70% or higher. No instructional changes are planned due to the small number of students seeking Associate Degrees at this time.	

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
	2b Unit exams that assess the understanding of taxonomy, morphology, and physiology of animals.	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.17 assessed	2b. During the Fall 2013 and Fall 2014 Zoology had only 6 students out 40 students were AS Biology majors. . Because of low numbers of AS Biology students we combined scores from previous semesters to obtain a more robust analysis (we are still only looking at 6 students for the two semesters The following Table summarizes the Fall 13 and Fall 14 results. FALL 2013 and FALL 2014 SCORE DISTRIBUTIONS Exam 1 2 3 4 5 6 100-90% = 0 2 1 1 0 1 89-80% = 2 1 0 1 2 2 79-70% = 3 2 1 1 1 0 69-60% = 1 0 0 0 0 0 0- 59% = 0 1 1 0 0 0 Note during the Fall 13 two AS students did not complete the course and during the Fall 14 one AS student did not complete the course which resulted in fewer students assessed on exams 3-6. Percent of students making 70% or better on Unit Exams for Fall 13 and Fall 14 Exam 1 = 83% Exam 2 = 83% Exam 3 = 67% Exam 4 = 100% Exam 5 = 100% Exam 6 = 100% During the Fall 2013 and Fall 2014 70% of AS students made 70% or better on all the unit exams	2b. Although overall unit exams scores have improved we have only been "teasing out" the AS students for the last two SLRs and have yet to accumulate enough students to determine any statistically significant differences (again only a total of 17 AS students have been assessed over the last two SLRs) There is an interesting trend that has developed for the last two SLRs for Exam 3, which has had the lowest scores for the six unit exams Because this is such a low number of students assessed it is believed that this is not a statistically significant number to warrant any instructional changes at this time. No new instructional changes are planned but if the trend continues for lower scores on Exam 3 this	Y/N

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
					except for Exam 3 (67%). During the Spring of 2014 and Spring 2015 Zoology had 11 students out of 30 students declared AS Biology majors. The following Table summarizes the Spring 14 and Spring 15 results. SPRING 2014 & SPRING 2015 SCORE DISTRIBUTION Exam 1 2 3 4 5 6 100-90% = 1 2 0 1 6 1 89-80% = 6 2 4 2 1 1 79-70% = 2 4 3 5 2 6 69-60% = 1 3 4 1 1 2 0 -59% = 1 0 0 1 0 0 Note; One AS student did not complete the course during the Spring of 15 which resulted in fewer students assessed on exams 4-6 Percent of students making 70% or better on Unit Exams for Spring 14 and Spring 15. Exam 1 = 82% Exam 2 = 73% Exam 3 = 64% Exam 4 = 80% Exam 5 = 90% Exam 6 = 80% During the Spring of 2014 and Spring of 2015 70% of AS students made 70% or better on all the unit exams but Exam 3 (64%).	exam will be studied for possible ways to improve scores.	
3. Demonstrate	The difference in	70% of AS in	Given to all	Fall 14	These tables summarize the difference in student	Student scores on the	Y

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
an understanding of the atom, compounds, matter, gases, solutions, atomic theory, bonding chemical reactions, and chemical kinetics. The program outcome "chemical kinetics" Has been dropped as a program outcome.	pre and post test scores was calculated for each student. These values were used in this analysis .	Biology students will improve on the post-test by 20% or greater over the pre-test	students in both Fall and Spring terms but only the AS biology students will be analyzed. Conducted as pre-post test. Pre-test was given in first class meeting Post-test was given at time of final exam.	11 Spring 15 0	scores for the pre & post test scores for Fall 14 and Spring 15 **Fall 14** **Score Distribution** (Post Test Improvement) 0-10% 1 10-20% 2 20-30% 2 30-40% 3 40-50% 2 50-60% 0 60-70% 0 70-80% 0 80-90% 0 90-100% 0 **Average gain:** 26.8 Spring 15 Score Distribution (Post Test Improvement) 0-10% 0 10-20% 0 20-30% 0 30-40% 0 40-50% 0 50-60% 0 60-70% 0 70-80% 0 80-90% 0 90-100% 0	post-test improved by an average of 26.8% for the Fall 14. Our goal of as least a 20% increase was met. The Spring 15 semester could not be analyzed because of no declared AS in biology majors.	
4. Demonstrate knowledge about the	A laboratory exercise and worksheet will be	100% of the students in Biol. 1144L will	All students in majors biology course (Bio.	418	Out of the 418 students only 15 were required to repeat the exercise upon which they received a passing grade.	Although our goal was achieved and students are learning proper	Y

A. Student Learning Outcomes	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
components and requirements of a safe lab environment.	administered to all students in Biol. 1144.	complete and pass the worksheet 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.	1144L) were sampled during the Fall 2013 and Spring 2014			laboratory safety, the coordination and implementation of this process has proved challenging because of the number of adjuncts teaching the labs. To improve implementation, we have hired an adjunct lab coordinator (started August 1, 2015) and she is in the process of revising the safety exercise and is constructing a written quiz over laboratory safety.	

PART 5

Proposed Instructional Changes Based on Conclusions Drawn from Evidence Presented Above

State any proposed instructional or assessment changes to be implemented for the next academic year. They should be based on conclusions reported in Part 4 (above) or on informal activities, such as faculty meetings and discussions, conferences, pilot projects, textbook adoption, new course proposals, curriculum modifications, etc. Explain the rationale for these changes and how they will impact student learning and other considerations, such as curriculum, degree plan, assessment process, or budget. If no changes are planned, simply state "No changes are planned."

Student Learning Outcomes	Instructional or Assessment Changes	Rationale for Changes	Impact of Planned Changes on Student Learning and Other Considerations.
No changes are proposed			

PART 6

Shared Pedagogical Insight that Improves Student Learning or Classroom Engagement

(OPTIONAL) If your department or a faculty member has developed a method or technique of teaching that seems especially effective in improving student learning or student engagement in the classroom, please provide a brief description below. More detail can be communicated during the face to face peer review session.

Description
None

PART 7 (A & B)

Assessment Measures and Faculty Participation

A. Assessment Measures:

1) How many different assessment measures were used? 3

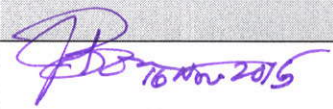
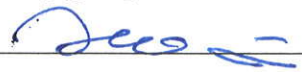
2) List the direct measures (see rubric):

Pretest and post-test in Cellular Biology (BIOL 1144)
Unit exam scores in General Botany (BIOL 2104)
Unit exam scores in General Zoology (BIOL 2205)

3) List the indirect measures (see rubric): 0

B.

1) Provide the names and signatures of all faculty members who contributed to this report and indicate their respective roles:

Faculty Members	Roles in the Assessment Process (e.g., collect data, analyze data, prepare report, review report, etc.)	Signatures
Dr. Jerry Bowen	Collected data for Biol. 1144, reviewed report	
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. Sue Katz	Reviewed report	
Dr. Craig Zimmerman	Collected data for Biol. 1144, analyzed data	
Dr. Eric Lee	Collected data for Biol. 1144, reviewed report	
Dr, Jin Seo	Collected data for Biol. 1144, reviewed report	

2) Reviewed by:

Titles	Names	Signatures	Date
Department Head	Dr. Jerry Bowen		16 Nov 2015
Dean	Dr. Keith Martin		11/20/2015