

General Education Student Learning Report (rev. 7/15)

Fall 2022 – Spring 2023

Department of Biology

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.

Relationship of Degree Program Learning Outcomes to Departmental and University Missions

RSU Mission	General Education 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	General Education at Rogers State University provides a broad foundation of intellectual skills, knowledge, and perspectives to enable students across the University to achieve professional and personal goals in a dynamic local or global society.
RSU Commitments	General Education 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.	<ol style="list-style-type: none">1) Think critically and creatively.2) Acquire, analyze, and evaluate knowledge of human cultures and the physical and natural world.3) Use written, oral, and visual communication effectively.4) Develop an individual perspective on the human experience, and demonstrate an understanding of diverse perspectives and values.5) Demonstrate civic knowledge and engagement, ethical reasoning, and skills for lifelong learning.
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.	
To provide a general liberal arts education that supports specialized academic programs and prepares students for lifelong learning and service in a diverse society.	<ol style="list-style-type: none">1) Think critically and creatively.2) Acquire, analyze, and evaluate knowledge of human cultures and the physical and natural world.3) Use written, oral, and visual communication effectively.4) Develop an individual perspective on the human experience, and demonstrate an understanding of diverse perspectives and values.5) Demonstrate civic knowledge and engagement, ethical reasoning,

RSU Mission	General Education Mission
	and skills for lifelong learning.
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.	

PART 1

Discussion of Instructional Changes Resulting from 2021-2022 General Education Student Learning Report

List and discuss all instructional or assessment changes proposed in Part 4 of last year's General Education 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 Curriculum or Budget
Biology initiated a small pilot study focusing on the adoption of a standardized rubric for assessing critical thinking in the general education program. It is hoped that this will become more formalized next fall. This would be implemented in BIOL 1114 and BIOL 1144.	N	While faculty clearly saw the value of the rubric being piloted, they found it difficult to apply it to the type of assignments being used in these 1000-level courses. Faculty developed some case study exercises as part of this pilot and may use these in the future.
Online lab sections are going to become hybridized with some take home labs that students can order and work at home. Applies to lab sections of BIOL 1114/1144.	N	This was not implemented in the

PART 2

Discussion of the University Assessment Committee's 2021-2022 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
No feedback provided.		

PART 3

Analysis of Evidence of Student Learning Outcomes

The five General Education Outcomes are listed below. For each outcome, indicate the General Education courses being assessed, and provide a brief narrative of 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 any relevant conclusions related to strengths and weaknesses of their performance. Finally, indicate whether the performance measure was met or not.

OUTCOME 1: Think critically and creatively.

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
BIOL 1114: General Biology	Science Literacy Quiz Comprises a 15-question multiple choice quiz on principles of science & the scientific method. This quiz is given in our lab sections.	70% of students will score 70% or above.	Given to all enrolled students in Fall & Spring terms.	98	This table summarizes for student scores. <u>Score Distribution</u> 0-49% 3 50-59% 6 60-69% 14 70-79% 20 80-89% 37 90-100% 18 Average: 77.2%	The average score was 77%. 76% (75 of 98) scored $\geq 70\%$. Below are average score and percentage that met the standard for the last five years. 2022-23 77.2 76% 2021-22 77.2 78% 2020-21 76.7 71% 2019-20 76.9 72% 2018-19 78.2 75% Student performance has met the standard in all of	Y

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)																															
						<p>the last five years.</p> <p>This demonstrates that students can apply critical thinking in evaluating scientific evidence.</p>																																
<p>BIOL 1144: General Cell Biology</p>	<p>Science Literacy Quiz</p> <p>Comprises a 15-question multiple choice assessment on the principles of science and the scientific method.</p> <p>This quiz is given in our lab sections.</p>	<p>70% of students will score 70% or above.</p>	<p>Given to all enrolled students in Fall & Spring terms.</p>	<p>210</p>	<p>This table summarizes student scores.</p> <table border="1" data-bbox="1041 565 1350 829"> <thead> <tr> <th colspan="2">Score Distribution</th> </tr> </thead> <tbody> <tr> <td>0-49%</td> <td>10</td> </tr> <tr> <td>50-59%</td> <td>10</td> </tr> <tr> <td>60-69%</td> <td>43</td> </tr> <tr> <td>70-79%</td> <td>24</td> </tr> <tr> <td>80-89%</td> <td>79</td> </tr> <tr> <td>90-100%</td> <td>44</td> </tr> <tr> <td>Average:</td> <td>75.8 %</td> </tr> </tbody> </table>	Score Distribution		0-49%	10	50-59%	10	60-69%	43	70-79%	24	80-89%	79	90-100%	44	Average:	75.8 %	<p>The average score was 76%.</p> <p>70% (147 of 210) scored ≥70%.</p> <p>Below are average score and percentage that met the standard for the last five years.</p> <table border="1" data-bbox="1371 760 1661 894"> <tbody> <tr> <td>2022-23</td> <td>75.8</td> <td>70%</td> </tr> <tr> <td>2021-22</td> <td>78.8</td> <td>77%</td> </tr> <tr> <td>2020-21</td> <td>79.5</td> <td>80%</td> </tr> <tr> <td>2019-20</td> <td>76.5</td> <td>77%</td> </tr> <tr> <td>2018-19</td> <td>76.8</td> <td>76%</td> </tr> </tbody> </table> <p>Students have met the standard in all of the last five years.</p> <p>This demonstrates that students can apply critical thinking in evaluating scientific evidence.</p>	2022-23	75.8	70%	2021-22	78.8	77%	2020-21	79.5	80%	2019-20	76.5	77%	2018-19	76.8	76%	<p>Y</p>
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OUTCOME 2: Acquire, analyze, and evaluate knowledge of human cultures and the physical and natural world.

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<p>BIOL 1114: General Biology</p>	<p>Comprehensive Pre-Post Exam 50 multiple-choice question exam on basic concepts of biology. Administered on first day of lecture class and at the time of final exam. 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.</p>	<p>70% of students will score 70% or above.</p>	<p>Given to all enrolled students in Fall & Spring terms.</p>	<p>60</p>	<p>This table summarizes student scores.</p> <table border="1" data-bbox="1050 422 1312 682"> <thead> <tr> <th colspan="2">Score Distribution</th> </tr> </thead> <tbody> <tr> <td>0-49%</td> <td>26</td> </tr> <tr> <td>50-59%</td> <td>15</td> </tr> <tr> <td>60-69%</td> <td>12</td> </tr> <tr> <td>70-79%</td> <td>6</td> </tr> <tr> <td>80-89%</td> <td>1</td> </tr> <tr> <td>90-100%</td> <td>0</td> </tr> <tr> <td>Average:</td> <td>53.5%</td> </tr> </tbody> </table>	Score Distribution		0-49%	26	50-59%	15	60-69%	12	70-79%	6	80-89%	1	90-100%	0	Average:	53.5%	<p>The average score was 54% 12% (7 of 60) scored \geq 70% Below are average scores and percentage that met the standard for the last five years.</p> <table border="1" data-bbox="1386 625 1627 771"> <tbody> <tr> <td>2022-23</td> <td>53.5</td> <td>12%</td> </tr> <tr> <td>2021-22</td> <td>69.4</td> <td>54%</td> </tr> <tr> <td>2020-21</td> <td>72.6</td> <td>62%</td> </tr> <tr> <td>2019-20</td> <td>73.1</td> <td>67%</td> </tr> <tr> <td>2018-19</td> <td>67.8</td> <td>47%</td> </tr> </tbody> </table> <p>Student performance on this measure hit a historic low in AY 2022-23. We saw a similar decline in student performance on the pre-post test in BIOL 1144 in AY 2021-22. Such drops are possibly due to the lingering effects of the COVID crisis of 2020-2021. Students in BIOL 1144 did return to long term norms this year, so maybe this will also be a blip for this course.</p>	2022-23	53.5	12%	2021-22	69.4	54%	2020-21	72.6	62%	2019-20	73.1	67%	2018-19	67.8	47%	<p>N</p>
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<p>BIOL 1114: General Biology</p>	<p>Comprehensive Pre-Post Exam 50 multiple-</p>	<p>70% of students will improve on</p>	<p>Given to all enrolled students in</p>	<p>57</p>	<p>This table summarizes the change in student scores for the pre & post</p>	<p>Mean improvement was 17 percentage points. 48% % (29 of 57) of</p>	<p>N</p>																															

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	<p>choice question exam on basic concepts of biology.</p> <p>Administered on first day of lecture class and at the time of final exam.</p> <p>We consider two results: 1) post test scores, and 2) the difference in pre-post test scores</p> <p>Here, we discuss the change between pre and pre-post test scores.</p>	<p>the post-test by 20% or greater over the pre-test.</p>	<p>Fall & Spring terms.</p>		<p>test scores.</p> <p>Score Distribution (Post Test Improvement)</p> <table border="1" data-bbox="1066 418 1339 678"> <tr><td>0-10%</td><td>12</td></tr> <tr><td>10-20%</td><td>16</td></tr> <tr><td>20-30%</td><td>25</td></tr> <tr><td>30-40%</td><td>4</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>Average gain:</td><td>17.3</td></tr> </table>	0-10%	12	10-20%	16	20-30%	25	30-40%	4	40-50%	0	50-60%	0	60-70%	0	Average gain:	17.3	<p>students improved their score by 20 percentage points or more.</p> <p>Below are the average score improvement and percentage that met the standard for the last six years.</p> <table border="1" data-bbox="1402 557 1661 691"> <tr><td>2022-23</td><td>17.3</td><td>48%</td></tr> <tr><td>2020-21</td><td>28.3</td><td>84%</td></tr> <tr><td>2019-20</td><td>37.2</td><td>90%</td></tr> <tr><td>2018-19</td><td>29.1</td><td>70%</td></tr> <tr><td>2017-18</td><td>25.6</td><td>74%</td></tr> </table> <p>Student performance on this measure hit a historic low in AY 2022-23. We saw a similar decline in student performance on the pre-post test in BIOL 1144 in AY 2021-22. Such drops are possibly due to the lingering effects of the COVID crisis of 2020-2021. Students in BIOL 1144 did return to long term norms this year, so maybe this will also be a blip for this course.</p>	2022-23	17.3	48%	2020-21	28.3	84%	2019-20	37.2	90%	2018-19	29.1	70%	2017-18	25.6	74%	
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<p>BIOL 1114R: General Biology (Online)</p>	<p>Comprehensive Final Exam</p> <p>Comprehensive review of topics covered over the entire term.</p>	<p>70% of students will score 70% or above.</p>	<p>Given to all enrolled students in Fall & Spring terms.</p>	<p>133</p>	<p>This frequency table summarizes student scores.</p>	<p>The average score was 88%.</p> <p>98% (129 of 133) scored ≥70%.</p> <p>Below are exam averages and percentage that met the standard for the last</p>	<p>Y</p>																															

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<p>BIOL 1144: General Cell Biology</p>	<p>Comprehensive Pre-Post Exam</p> <p>50 multiple-choice question exam on basic concepts of biology.</p> <p>Administered on first day of lecture class and at the time of final exam.</p> <p>We consider two results: 1) post test scores, and 2) the difference in pre-post test scores</p>	<p>70% of students will improve on the post-test by 20% or greater over the pre-test.</p>	<p>Given to all enrolled students in Fall & Spring terms.</p>	<p>174</p>	<p>This frequency table summarizes student scores.</p> <p style="text-align: center;">Score Distribution (Post Test Improvement)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0-10%</td><td>7</td></tr> <tr><td>10-20%</td><td>31</td></tr> <tr><td>20-30%</td><td>37</td></tr> <tr><td>30-40%</td><td>48</td></tr> <tr><td>40-50%</td><td>36</td></tr> <tr><td>50-60%</td><td>10</td></tr> <tr><td>60-70%</td><td>5</td></tr> <tr><td>Average gain:</td><td>31.0</td></tr> </table>	0-10%	7	10-20%	31	20-30%	37	30-40%	48	40-50%	36	50-60%	10	60-70%	5	Average gain:	31.0	<p>Mean improvement was 31 percentage points.</p> <p>77% (136 of 174) of students improved their score by $\geq 20\%$.</p> <p>Below are the average score improvement and percentage that met the standard for the last five years.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>2022-23</td><td>31.0</td><td>77%</td></tr> <tr><td>2021-22</td><td>18.9</td><td>46%</td></tr> <tr><td>2020-21</td><td>33.1</td><td>94%</td></tr> <tr><td>2019-20</td><td>33.2</td><td>77%</td></tr> <tr><td>2018-19</td><td>28.5</td><td>71%</td></tr> </table> <p>Student performance on this measure hit a historic low in AY 2021-22.</p>	2022-23	31.0	77%	2021-22	18.9	46%	2020-21	33.1	94%	2019-20	33.2	77%	2018-19	28.5	71%	<p>Y</p>
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	Here, we discuss the change between pre and pre-post test scores.					Fortunately, performance in this current year is more aligned with past performance. While students do not meet the expected standard for the post-score component of this measure, they do show satisfactory gain between the pre and post scores.																													
BIOL 1144: General Cell Biology (Online)	Comprehensive Final Exam	70% of students will score 70% or higher.	Given to all enrolled students in Fall & Spring terms.	36	<p>This frequency table summarizes student scores.</p> <table border="1" data-bbox="1060 738 1323 998"> <thead> <tr> <th colspan="2">Score Distribution</th> </tr> </thead> <tbody> <tr> <td>0-49%</td> <td>13</td> </tr> <tr> <td>50-59%</td> <td>15</td> </tr> <tr> <td>60-69%</td> <td>4</td> </tr> <tr> <td>70-79%</td> <td>3</td> </tr> <tr> <td>80-89%</td> <td>1</td> </tr> <tr> <td>90-100%</td> <td>0</td> </tr> <tr> <td>Average:</td> <td>54.3%</td> </tr> </tbody> </table>	Score Distribution		0-49%	13	50-59%	15	60-69%	4	70-79%	3	80-89%	1	90-100%	0	Average:	54.3%	<p>The average score was 54%. 11% (4 of 36) scored $\geq 70\%$.</p> <p>While current numbers are slightly better than last year, they are still well below the standard.</p> <p>Below are the average post-test score and the percentage of students that met the standard for the last four years.</p> <table border="1" data-bbox="1407 1079 1627 1193"> <tbody> <tr> <td>2022-23</td> <td>54.3</td> <td>11%</td> </tr> <tr> <td>2021-22</td> <td>53.8</td> <td>29%</td> </tr> <tr> <td>2020-21</td> <td>49.7</td> <td>17%</td> </tr> <tr> <td>2019-20</td> <td>45.6</td> <td>10%</td> </tr> </tbody> </table> <p>Final exam scores in this online course have been notably low. The unit exam scores, in contrast, are much higher. The instructor indicates that</p>	2022-23	54.3	11%	2021-22	53.8	29%	2020-21	49.7	17%	2019-20	45.6	10%	N
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A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
						the final is proctored, while the individual unit exams are not. This suggests that some students may be cheating in the unproctored exams and are not adequately prepared for the proctored final. The instructor is exploring ways to improve this situation.	
BIOL 1134: General Environmental Biology	Comprehensive Final Exam Multiple-choice comprehensive exam of the concepts covered during the semester.	70% of students will score 70% or higher.	Given to all enrolled students in the Fall & Spring terms	NA	NA	Course not taught this AY.	NA
BIOL 1134R: General Environmental Biology (Online)	Final Exam or Average of Unit Exams	70% of students will score 70% or above.	Given to all enrolled students in online sections	55	This frequency table summarizes student scores. Score Distribution 0-49% 0 50-59% 0 60-69% 0 70-79% 9 80-89% 29 90-100% 17 Average: 86.1%	The average score was 86%. 100% (17 of 18) scored ≥70%. Shown are the average test score and the percentage of students that met the standard for the last five years. 2022-23 86.1 100% 2021-22 82.1 94% 2020-21 80.0 88% 2019-20 77.0 83% 2018-19 78.2 89% Students that had a score	Y

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
						<p>>70% has exceeded 80% in three of the last five years.</p> <p>The 86% average of this AY is the highest over this time period.</p> <p>Moreover, 100% of students met the desired standard. This is also the highest in this period.</p> <p>This shows that students demonstrate an ability to acquire and analyze knowledge about the natural world.</p>	

OUTCOME 3: Use written, oral, and visual communication effectively.

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)																						
BIOL 3103: Plants and Civilization	Written Paper This term students presented their research as a poster for the whole class.	70% of students will score 70% or higher.	Given to all enrolled students in the semester.	9	<p>This table summarizes student scores.</p> <table border="1"> <thead> <tr> <th colspan="2">Score Distribution</th> </tr> </thead> <tbody> <tr> <td>0-49%</td> <td>0</td> </tr> <tr> <td>50-59%</td> <td>0</td> </tr> <tr> <td>60-69%</td> <td>0</td> </tr> <tr> <td>70-79%</td> <td>0</td> </tr> <tr> <td>80-89%</td> <td>0</td> </tr> <tr> <td>90-100%</td> <td>9</td> </tr> <tr> <td>Average:</td> <td>92.2%</td> </tr> </tbody> </table>	Score Distribution		0-49%	0	50-59%	0	60-69%	0	70-79%	0	80-89%	0	90-100%	9	Average:	92.2%	<p>The average score was 92%.</p> <p>100% (12 of 12) scored ≥70%.</p> <p>Shown are the average test score and the percentage of students that met the standard for the last five years.</p> <table border="1"> <tbody> <tr> <td>2022-23</td> <td>92.2</td> <td>100%</td> </tr> <tr> <td>2021-22</td> <td>88.1</td> <td>100%</td> </tr> </tbody> </table>	2022-23	92.2	100%	2021-22	88.1	100%	Y
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A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
						2020-21 87.2 100% 2019-20 88.2 100% 2018-19 85.9 100% Student achievement with this measure has been strong. The desired standard has been met in all of the past five years. This shows students are meeting the goal of effective written & visual communication.	

OUTCOME 4: Develop an individual perspective on the human experience, and demonstrate an understanding of diverse perspectives and values.

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
BIOL 3103: Plants and Civilization	Comprehensive Final Exam	70% of students will score 70% or higher.	Given to all enrolled students in the semester.	9	This table summarizes student scores. Score Distribution 0-49% 0 50-59% 1 60-69% 1 70-79% 2 80-89% 4 90-100% 1 Average: 77.5%	The average score was 78%. 78% (7 of 9) scored ≥70%. Shown are the average test score and the percentage of students that met the standard for the last five years. 2022-23 77.5 78% 2021-22 82.9 92% 2020-21 76.2 88% 2019-20 82.0 97% 2018-19 89.6 100% Student progress in this	Y

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
						measure has remained robust over the last five years. The desired standard has been met in every year it has been assessed. This shows students are meeting the goal of developing an understanding of the human experience.	

OUTCOME 5: Demonstrate civic knowledge and engagement, ethical reasoning, and skills for lifelong learning.

A. Course	B. Assessment Measures	C. Performance Standards	D. Sampling Methods	E. Sample Size (N)	F. Results	G. Conclusions	H. Performance Standards Met (Y/N)
N/A							

PART 4

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. 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."

General Education Outcomes	Instructional or Assessment Changes	Rationale for Changes	Impact of Planned Changes on Student Learning and Other Considerations.
SLO 1 / SLO 2	Online lab sections are going to become hybridized with some take home labs that students can order and work at home. Applies to lab sections of BIOL 1114/1144.	The department expects a growth in online instruction. Ensuring consistency of content and rigor between online and on-ground sections is needed.	Consistency of rigor and content across online and on-ground sections will ensure the students graduating with a biology degree will receive quality education regardless of mode of delivery.
SLO 1 / SLO 2	BIOL 1134R was QM certified in Spring 2023.	QM certification ensures quality online instruction. It is a key part of the university initiative to deliver quality distance learning.	QM review results in better course design, which makes navigation easier for students, reduces barriers to student achievement, and results in better outcomes.
SLO 1 / SLO 2	BIOL 1114R is scheduled to be QM certified in Fall 2023.	QM certification ensures quality online instruction. It is a key part of the university initiative to deliver quality distance learning.	QM review results in better course design, which makes navigation easier for students, reduces barriers to student achievement, and results in better outcomes
SLO 1 / SLO 2	BIOL 1144R is scheduled to be QM certified in Fall 2023.	QM certification ensures quality online instruction. It is a key part of the university initiative to deliver quality distance learning.	QM review results in better course design, which makes navigation easier for students, reduces barriers to student achievement, and results in better outcomes

PART 6 (A & B)

Documentation of Faculty Participation and Review

A. 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	Signatures
Craig Zimmermann	Provided data, analyzed data, prepared report	
Jerry Bowen	Provided data and reviewed report	
Mark Peaden	Provided data and reviewed report	
Hannah King	Provided data and reviewed report	
Rance Kingfisher	Provided data and reviewed report	
Cheyenne Olson	Provided data and reviewed report	
Jae-Ho Kim	Reviewed report	
Jin Seo	Reviewed report	
Gifty Benson	Provided data	

B. Reviewed by:

Titles	Names	Signatures	Date
Department Head			
Dean			

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Craig Zimmermann	Provided data, analyzed data, prepared report	<i>Craig Zimmermann</i> 5/30/23
Jerry Bowen	Provided data and reviewed report	<i>Jerry Bowen</i> 31 May 2023
Mark Peaden	Provided data and reviewed report	
Hannah King	Provided data and reviewed report	
Rance Kingfisher	Provided data and reviewed report	<i>Rance Kingfisher</i> 5/30/23
Cheyenne Olson	Provided data and reviewed report	<i>Cheyenne Olson</i> 5/30/23
Jae-Ho Kim	Reviewed report	
Jin Seo	Reviewed report	<i>Jin Seo</i> 5/31/23
Gifty Benson	Provided data	

B. Reviewed by:

Titles	Names	Signatures	Date
Department Head	<i>Jerry Bowen</i>	<i>Jerry Bowen</i>	31 May 2023
Dean		<i>Keith W. Mead</i>	5/31/23

