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

Fall 2021 – Spring 2022

Department of Mathematics & Physical Sciences

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.	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.	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 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 2020-2021 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 General Education Curriculum or Budget
Started assessing the Gen. Ed. Course MATH 2264 Calculus I, PHYS 1014 General Physical Science, and CHEM 1315 General Chemistry I. New SLO's were developed for these courses and assessed in 2021-22. New SLO's were developed for the new CHEM 1104 Principles of Chemistry course and assessment will begin in 2022-23. The following general education courses were not offered in 2021-22: GEOL 1114 Physical Geology	Y/N Y	Assessment of remaining general education courses will help to improve the overall quality of general education curriculum which will benefit the students. No budget changes.

GEOL 2124 Astronomy GEOL 1124 Physical Geography GEOL 1224 Historical Geology Scheduling Foundations classes in Co-requisite model on the same day (just before or after) the Parent class is scheduled.	Y	Expect to improve material understanding of students in the Co-requisite model.

PART 2

Discussion of the University Assessment Committee's 2020-2021 Peer Review Report

[Complete this part only if the general education course(s) was among those that were peer reviewed last year.] 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 changes were recommended.		

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)
Math 1513 – College Algebra	1a. All chapter exams.	1a. 70% of students will score 70% or better on the average of all college algebra chapter exams.	1a. All available college algebra students.	1a. 471 On-Ground: 371 Blended: 35 Online: 65	1a. Overall 306/471 (65%) scored 70% or better on the average of all college algebra chapter exams. On-Ground: 229/371 (62%) Blended: 27/35 (77%) Online: 50/65 (77%)	1a. Overall performance in chapter exams was below the expected standard by 5% for this year. It is a 2% decrease from 2020/21 (67% to 65%). Chapter exam performance of students in blended and online sections were above the expected standard. One possible reason being smaller number (or %) of co-requisite students in blended and online sections.	1a. N Y (2011-12) Y (2012-13) Y (2013-14) Y (2014-15) Y (2015-16) N (2016-17) N (2017-18) N (2018-19) No data (2019-20) N (2020-21) N (2021-22)

						Note: Overall Co-requisite Model student success 56/111 (50%) compared to other students 250/360 (69%). Out of several reasons, faculty see that the lack of student preparation for chapter exams and lack of dedication (especially among co-requisite students) as two main reasons for not getting to the expected standards.	
Math 1513 – College Algebra	1b. Students were assessed on four different course components using assignments: (1) Function Operations and Composition (2) Zeros of Polynomial Functions (3) Variation (4) Logarithmic	1b. 70% of all College Algebra students will perform at a 70% level or better in each of the four listed course components.	1b. All available college algebra students who completed the assignments.	1b. (1) 471 On-Ground: 371 Blended: 35 Online: 65	1b. (1) 301/471 (64%) On-Ground: 237/371 (64%) Blended: 17/35 (49%) Online: 47/65 (72%)	1b. (1) Students in Online sections did well compared to students in other modes for this course component. Overall students who understand Function Operations are close to the	1b. Y/N

	Functions			(2) 471 On-Ground: 371 Blended: 35 Online: 65 (3) 471 On-Ground: 371 Blended: 35 Online: 65	(2) 337/471 (72%) On-Ground: 262/371 (71%) Blended: 19/35 (54%) Online: 56/65 (86%) (3) 307/471(65%) On-Ground: 240/371 (65%) Blended: 15/35 (43%) Online: 52/65 (80%)	standards expected. (2) Overall, students who understand concepts related to Zeros of Polynomial Functions met the required standards expected. Students in blended, sections did not meet the performance standard for this course component. (3) Students in Online sections did well compared to students in other modes for this course component. Overall, students who understand concepts related to variation are close to the standards expected.	

				(4) 471 On-Ground: 371 Blended: 35 Online: 65	(4) 370/471 (79%) On-Ground: 281/371 (76%) Blended: 33/35 (94%) Online: 56/65 (86%)	(4) Students in all three modalities met the performance standard for this course component and understand the concepts related to Logarithmic Functions. Overall, standards were met for two of the four course components and close to meeting for the other two. Students seem to understand what is expected from them related to these important course components that help them increase their critical and creative thinking, and problem-solving abilities.	
MATH 1503-	1e. All chapter exams.	1e. 70% of students will	1e. All available Math	1e. 101	1e. Overall 61/101 (60%) scored	1e. Overall performance in	1e. N

Math for Critical Thinking		score 70% or better on the average of all Math for Critical Thinking chapter exams.	for Critical Thinking students	On-Ground: 82 Blended: N/A Online: 19	70% or better on the average of all Math for Critical Thinking chapter exams. On-Ground: 54/82 (66%) Blended: N/A Online: 7/19 (37%)	chapter exams was below the expected standard for this year. Faculty will monitor to see if it occurs continuously. Note: Overall Co-requisite Model student success 48/73 (66%) compared to other students 13/28 (46%)	
MATH 1613-Trigonometry	1f. All chapter exams.	1f. 70% of students will score 70% or better on the average of all Trigonometry chapter exams.	1f. All available Trigonometry students	1f. 79 On-Ground: 35 Blended: N/A Online: 44	1f. Overall 64/79 (81%) scored 70% or better on the average of all Trigonometry chapter exams. On-Ground: 35/35 (100%) Blended: N/A Online: 29/44	1f. Overall performance in chapter exams was above the expected standard. Students seem to understand required Trig concepts to the required standards.	1f. Y
MATH 1715-Precalculus	1g. All chapter exams.	1g. 70% of students will score 70% or better on the average of all precalculus chapter exams.	1g. All available precalculus students.	1g. N/A	1g. No data were available as the course wasn't taught during this academic year.	1g. N/A	1g. No Data as course was not offered (2021-2022)

	1h. Students were assessed on two different course components using assignments: (1) Functions (Non-Trig) (2) Trigonometric Functions	1h. 70% of all Precalculus students will perform at a 70% level or better in each of the two listed course components.	1h. All available Precalculus students who completed the assignments.	1h. (1) N/A On-Ground: N/A Blended: N/A Online: N/A	1h. (1) No data were available as the course wasn't taught during this academic year. On-Ground: N/A Blended: N/A Online: N/A	1h. (1) N/A	1h. No Data as course was not offered (2021-2022)
Math 1413 – Introduction to Statistics	1i. All chapter exams.	1i. 70% of students will score 70% or better on the average of all Introduction to Statistics chapter exams.	1i. All available Introduction to Statistics students.	1i. 146 On-Ground: 55 Online: 73 Web-based: 18	1i. Overall 98/146 (67%) scored 70% or better on the average of all Introduction to Statistics chapter exams. On-Ground: 37/55 (67%) Online: 45/73 (62%) Web-based: 16/18 (89%)	1i. Overall performance in chapter exams was below the expected Performance standard for this year by 3%. Overall, out of several reasons, faculty see that students in the Coreq model, not up to the required standards to follow the course, the lack of student preparation, and lack of dedication as three main reasons for not getting to the	1i. N

						expected standards.	
	1j. Students were assessed on Hypothesis testing: Testing a claim about a proportion)	1j. 70% of all Introduction to Statistics students will perform at a 70% level or better on Hypothesis testing assignment.	1j. All available Introduction to Statistics students who completed the assignments.	1j. 146 On-Ground: 55 Online: 73 Web-based: 18	1j.75/146 (51%) On-Ground: 27/55 (49%) Online: 37/73 (51%) Web-based: 11/18 (61%)	1j. Performance standard was not met. Overall, out of several reasons, faculty see that students in the Coreq model, not up to the required standards to follow the course, the lack of student preparation and lack of dedication as three main reasons for not getting to the expected standards.	1j. N (2021-22)
Math 2264 – Calculus I	1k. All four hourly chapter exams.	1k. 70% of students will score 70% or better on the average of all four hourly chapter exams.	1k. All available Calculus I students.	1k. 4 On-Ground: 4 Blended: N/A Online: N/A	1k. Overall 3/4 (75%) scored 70% or better on the average of all four hourly chapter exams. On-Ground: 3/4 (75%) Blended: N/A Online: N/A	1k. Overall, students seem to understand concepts taught in this course that help them increase their critical and creative thinking, and problem-solving abilities.	1k. Y (2021-22)

	1l. Students were assessed on three different course components related to concepts: (1) Limit and Asymptotes (2) Rates (3) Optimization	1l. 70% of all Calculus I students will perform at a 70% level or better on assignments from these components.	1l. All available Calculus I students who completed the assignments.	1l. (1) 4 On-Ground: 4 Blended: N/A Online: N/A (2) 4 On-Ground: 4 Blended: N/A Online: N/A (3) 4 On-Ground: 4 Blended: N/A Online: N/A	1l. (1) 4/4 (100%) On-Ground: 4/4 (100%) Blended: N/A Online: N/A (2) 4/4 (100%) On-Ground: 4/4 (100%) Blended: N/A Online: N/A (3) 3/4 (75%) On-Ground: 3/4 (75%) Blended: N/A Online: N/A	1l. Students seem to understand well the concepts taught in these course components to the standards expected that help them increase their critical and creative thinking, and problem-solving abilities.	1l. Y (2021-22)
CHEM 1104 Principles of Chemistry	1m. ACS Standardized Exam; the condensed - General-Organic-Biochemistry exam.	1m. 50% of students will score in the 50th %-ile or better on the condensed - General-Organic-Biochemistry exam.	1a. All CHEM 1104 students who take the ACS exam.				
CHEM 1315 General Chemistry I	1n. Comprehensive Final Exam	1n. 70% of students will score 70% or better on the comprehensive final General chemistry I exam.	1n. All available General chemistry I students.	1n. 38	1n. 71% (27/38) of all General chemistry I students who took the comprehensive evaluation scored 70% or higher. <u>Distribution</u>: 0-49% (2)	1n. 71% (27/38) of General chemistry I students met assessment performance	1n. **Y**

					50-59% (6) 60-69% (3) 70-79% (6) 80-89% (6) 90-100% (15)	standard in 2021-22.	

OUTCOME 2: Acquire, analyze, and evaluate knowledge of human cultures and the physical and natural world.

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)
GEOL 1014 – Earth Science	2a. Term Project: Students were required to analyze data from 25 earth events. Based on this data they are to determine all of the earth spheres (lithosphere, atmosphere, hydrosphere, biosphere, and exosphere) that were impacted by each earth event.	2a. GEOL 1014 Earth Science students will score at the 70% level or higher on the overall data acquisition and analysis for their term project.	2a. All GEOL 1014 students	2a. 119 online students	2a. 64% of the students in two online sections of Earth Science were assessed and failed to meet the performance standard of 70% or higher.	2a. This is a broad, semester-long project requiring multiple skills like data acquisition and analysis. It is an excellent measure for student learning and the rubric used to grade the assessment is complex. A 70% percentile standard sets an appropriate benchmark for success in the rest of the course.	2a. N

PHYS 1014-General Physical Science	2.b. Comprehensive post evaluation. Thirty-question multiple choice instrument concentrating on basic physical science concepts.	2.b. 70% of GPS students will score a 70% or higher.	2.b. All PHYS 1014 students	2.b. 33 on ground GPS students	2.b. 60% (20/33) of all on ground GPS students who took the comprehensive evaluation scored a 70% or higher. Distribution: 0-49% (5) 50-59% (4) 60-69% (5) 70-79% (6) 80-89% (7) 90-100% (6)	2.b. 60% of the students met the standard of 70% or higher. This is the first SLO report on GPS students for a very long time, if ever at RSU. It will take some time to build a cohort of data to effectively analyze the evaluation instrument and the performance standard of 70% success.	2.b. No
CHEM 1104 Principles of Chemistry	2c. Lab Activity: "Analysis of Stomach Antacids"	2c. 70% of students will score 70% or better on the "Stomach Acids" lab.	2c. All available CHEM 1104 students.				
CHEM 1315 General chemistry I	2d. Composite lab Grade in CHEM1315 General chemistry I	2d. 80% of students will achieve a composite grade of 80% or better in General chemistry I	2d. All available General chemistry I students.	2d. 38	2d. 89% (34/38) of all General chemistry I students who took General chemistry I lab scored 80% or higher for a	2d. 89% (34/38) of General chemistry I students met assessment performance	2d. **Y**

		lab.			composite lab grade. Distribution: 0-49% (0) 50-59% (0) 60-69% (0) 70-79% (4) 80-89% (6) 90-100% (28)	standard in 2021-22.	

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)

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)
GEOL 1014 – Earth Science	4a. Term Project: Students were required to analyze earth event data for their	4a.70% of Earth Science (GEOL 1014) students will score the 70% level or higher on	4a. All GEOL 1014 – Earth Science students.	4.a. 119 Online earth science students	4a. 64% of the students in two online sections of Earth Science were assessed and failed to meet the performance standard of 70% or higher.	4a. This is a broad, semester-long project requiring multiple skills like data acquisition and analysis. It is an excellent measure for student learning and the rubric used to grade the	4.a. N

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)
	term project (see discussion in section1). The data are evaluated to determine the impact each event had on humans, both positive and detrimental discussion in section1) is to research and analyze each earth science event and its impact.	their recognition and evaluation of the aftermath of various natural disasters and the impact of these events on humans.				assessment is complex. A 70% percentile standard sets an appropriate benchmark for success in the rest of the course.	

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)

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. They should be based on conclusions reported in Part 3 (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."

General Education Outcomes	Instructional or Assessment Changes	Rationale for Changes	Impact of Planned Changes on Student Learning and Other Considerations.
Assessment measures and data were implemented and collected for the following general education courses offered in 2021-22: MATH 2264 Calculus I MATH 1613 Trigonometry CHEM 1315 General Chemistry I CHEM 1104 Princ. of Chemistry PHYS 1114 General Physics I	Scheduling Foundations classes in Co-requisite model on the same day (just before or after) the Parent class is scheduled.	To help students in the Co-requisite model to get immediate help.	Expect to improve material understanding of students in the Co-requisite model.

PART 5

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

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 (e.g., collect data, analyze data, prepare report, review report, etc.)	Signatures
Mr. Larry Elzo	Collected and analyzed MATH 1513 and MATH 1413 data.	
Dr. Ram Adhikari	Collected and Analyzed MATH 1413 and MATH 1513 data.	
Dr. Kirk Voska	Collected and Analyzed CHEM 1315 and CHEM 1104 data.	
Dr. Kasia Roberts	Collected and Analyzed CHEM 1315 data.	
Dr. Min Soe	Collected and analyzed MATH 1513 and MATH 1613 data.	
Dr. Wiley White	Collected and analyzed MATH 1503 data.	
Dr. Chris Shelton	Collected and Analyzed GEOL 1014 and PHYS 1014 data.	
Dr. Sukhitha Vidurupola	Collected and Analyzed MATH 1513 and MATH 1413 data; prepared and reviewed report.	Sukhitha Vidurupola

B. Reviewed by:

Titles	Names	Signatures	Date
Department Head	NA		
Dean	Dr. Keith W. Martin	Keith W. Martin	6/3/2022