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

Fall 2015 – Spring 2016

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

Physical Science, 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 learning dynamic local and global communities. Three departments comprise this School, the Departments of Biology, Health Science, and Math and Physical Science. These departments	The mission of the Department of Mathematics and Physical Sciences at Rogers State University is to support students in their pursuit of knowledge in mathematics and physical science.	The Associate of Science in Physical Science consists of general education curriculum and courses supporting other departmental programs. In support of the mission of the university, the school, and the department, the degree seeks to provide a solid general education component for all university students, provide curriculum in the physical sciences for students

	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.		who are preparing for a baccalaureate-granting program, and provide programs of study to students presently in the work force, allowing them the opportunity to continue their 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.	1. To increase the student's critical thinking and reasoning abilities. 2. To increase the student's understanding and appreciation of the physical world, and the ability to apply this understanding in his/her personal and professional life.	1a. Demonstrate a thorough knowledge and understanding of basic physical science principles and their applications (outcome meets in two different department purposes – 1a and 5a). 1b. Apply problem solving skills through critical thinking and scientific methods (meets in 1b and 2b). 2a. Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data (meets in 2a, 3b, and 4a). 2b. Apply problem solving skills through critical thinking and scientific methods (meets in 1a and 2b).

		3. To increase the student's ability to interpret and understand his/her world mathematically.	3a. Explain and predict quantitative, analytical and graphical situations 3b. Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data (meets in 2a, 3b, and 4a).
		4. To increase the student's awareness of the benefits of incorporation of technology into Science and Math studies.	4a. Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data (meets in 2a, 3b, and 4a).
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.	The School promotes a challenging, positive, and inquisitive Collegial environment of high ethical standards and of frequent interactions between faculty and students to foster independent thought and the collegial exchange of ideas.		
To provide a general liberal arts education that supports specialized academic programs and 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.	5. To prepare a student to matriculate into a four-year degree program in math or science-related fields.	5a. Demonstrate a thorough knowledge and understanding of basic physical science principles and their applications (meets in 1a and 5a).
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 reinforces and strengthens service. An emphasis of service encourages social awareness and responsibility among faculty and students.	6. To serve as a resource for the community, utilizing the expertise of the faculty.	

PART 2

Discussion of Instructional Changes Resulting from 2014-2015 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
No changes were planned or implemented.		

PART 3

Discussion About the University Assessment Committee's 2014-2015 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
Department Purposes are not aligned with their Student Learning Outcomes and Department purpose of "To increase the student's awareness of the benefits of incorporation of technology into Science and Math studies" is not included.	Y	Aligned Department Purposes and Student Learning Outcomes and included the missing Department Purpose.
Department purpose of "To increase the student's awareness of the benefits of incorporation of technology into Science and Math studies" lacks aligned Student Learning Outcome.	Y	Aligned this Department Purpose with corresponding Student Learning Outcome.
Department Purpose "To serve as a resource for the community, utilizing the expertise of the faculty" is not aligned with a Student Leaning Outcome.	N	Implementation planned for academic year 2016-2017.
All data, results, and conclusions need to be separated by on-ground, online, and blended.	Y	Separately reported.

The performance standard for the first assessment measure (ACS exam) states that students will score "in the 36^{th} percentile or higher". Why 36^{th}? Is this standard suggested by ACS?	Explanation Reworded for Clarity.	The 36^{th} percentile was chosen because roughly 10% of the material on the ACS exam is not taught in the course. So an approximation was made that the number of correct student responses on the exam will be lowered by about that same amount. As a result, average score would be at the 36^{th} percentile. It is understood that there are reliability issues when making this assumption but it is the opinion of the chemistry faculty that the ACS exam is a robust exam which still possesses a good reliability under these circumstances. Please see for more information: http://webs.anokaramsey.edu/lund/chem1061/Grades/ACSexam.htm
Assessment measure 4a. contains an unspecified number 'grade scores', and why combining two different courses?	Y/Explanation Provided.	Both labs measure the same assessment measure. Using two labs provides more data to assess the measure.
Assessment measures 3a, 4b contains an unspecified number 'unit laboratory reports', and why combining two different courses?	Y/Explanation Provided.	'Number' of reports is specified. Both are first semester introductory level physics courses with the same focus. Using both provide more data to assess the measure.
Performance standard 2d misses what percentage?	Y/Added.	Should be 70%.
Assessment measures 2c contains an unspecified number 'lecture exams' and why combining two different courses?	Y/Explanation Provided.	'Number' of exams is specified. Both are first semester introductory level physics courses with the same focus. Using both provide more data to assess the measure.
Assessment measures use terms 'majors' and 'students' inconsistently, why?	Y	Corrected to 'majors'.

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 a thorough knowledge and understanding of basic physical science principles and their applications.	1a. **Indirect Measures:** Majors' scores from CHEM 1415, General Chemistry II on the American Chemical Society (ACS) academic assessment exam.	1a. At least 50% of majors who take the American Chemical Society (ACS) standardized exam will score in the 36th percentile or higher.	1a. All Physical Science Major Students taking CHEM 1415.	1a. 5 (15-16) 2 (14-15) 1 (13-14) 3 (12-13) 3 (11-12) 5 (10-11) 2 (09-10) 21 Total	1a. 60% (3/5) of majors met the assessment performance standard in 2015-16; 50% (1/2) of majors met the assessment performance standard in 2014-15; 100% (1/1) of majors met the assessment performance standard in 2013-14; 0% (0/3) of majors met the assessment performance standard in 2012-13; 66.7% (2/3)	1a. A majority of majors in CHEM 1415 possess basic knowledge of chemistry, and have an understanding of its principles and their applications. With small N annual fluctuations are to be expected. Keeping a moving average of the data reveals any on-going trends.	1a. Y (2015-16) Y (2013-14) N (2012-13) Y (2011-12) Y (2010-11) Y (2010-09) Y: seven year avg.

					of majors met the assessment performance standard in 2011-12; 60% (3/5) of majors met the assessment performance standard in 2010-11; 100% (2/2) of majors met the assessment performance standard in 2009-10. A 7-year "moving average" showed that 12/21 (57%, N = 21) majors met the assessment performance standard.		
	1b. **Indirect Measures**: Majors' scores on hourly exams in MATH 1613, Trigonometry.	1b. At least 70% of majors earned a grade of 70% or better on the four hourly exams in Math 1613 Trigonometry	1b. All Physical Science Major Students taking Math 1613.	1b. 6 (14-15) 3 (13-14) 6 (12-13) 12 (11-12) 27 Total	1b. 4 of 6 (67%) of scored 70% or better on the hourly exams in 2014-15. 3 of 3 (100%) met the performance	1b. Results were above or very close to the performance target in the last two years.	1b. Expectations were met in every year except the current year, which was close.

					standard in 2013-14. 6 of 6 scored 70% or better on the hourly exams in 2012-13. 10 of 12 scored 70% or better on the hourly exams in 2011-12.		
	1c. **Indirect Measure**: Majors' scores on 4 lecture exams in PHYS 2015 and PHYS 1114. Note: Both are first semester introductory level physics courses with the same focus. PHYS 2015 is calculus based, intended for students majoring in physics, mathematics or engineering	1c. Majors must score 70% or greater on 4 lecture exams.	1c. All Physical Science Major Students taking PHYS 2015 and PHYS 1114.	1c. 2 (15-16) 2 (14-15) 9 (13–14) 15 (12-13) 4 (11-12) 32 Total	1c. 1/2 (50%) MPS majors score 70% or greater on lecture exams in 2015-16; 2/2 (100%) in 2014-15; 2/9 (22%) in 2013-14; 7/15 (47%) in 2012-13, and 3/4 (75%) in 2011-12.	1c. Expectations were met twice in five years. There are no indications of ongoing trends.	1c. N (2015-16) Y (2014-15) N (2013-14) N (2012-13) Y (2011-12)
	1d. **Indirect Measures:** GEOL 1124, Historical Geology. Majors' scores on a written paper of a field study of interpretation of geological	1d. 70% of all majors must score 70% or greater on the final field analysis paper.	1d. All Physical Science Major Students taking GEOL 1124.	1d. 5 (15-16) 6 (14-15)	1d. 100% of majors scored 70% or greater on their interpretation of the geologic processes in	1d. (15-16) Expectations were met. (14-15) Expectations were met.	1d. Y(2015-16) Y(2014-15)

	processes and geological formations.				the field.		
2. Apply problem solving skills through critical thinking and the scientific method.	2a. **Direct Measures**: Majors' scores on Titration lab reports and Beers Law lab reports in CHEM 1415: General Chemistry II.	2a. At least 50% of majors will earn a grade of 70% or higher for lab reports.	2a. All Physical Science Major Students taking CHEM 1415, General Chemistry II.	2a. 5 (15-16) 2 (14-15) 1 (13-14) 3 (12-13) 3 (11-12) 5 (10-11) 2 (09-10) 21 Total	2a. 80% (4/5) of majors met the assessment performance standard in 2015-16;100% (2/2) of majors met the assessment performance standard in 2014-15; 0% (0/1) of majors met the assessment performance standard in 2013-14; 100% (3/3) of majors met the assessment performance standard in 2012-13; 100% (3/3) of majors met the assessment performance standard in 2011-12; 40% (2/5) of	2a. This measure was met in three of the past four years. With small N annual fluctuations are to be expected. Keeping a moving average of the data reveals any on-going trends.	2a. Y (2015-16) Y (2014-15) N (2013-14) Y (2012-13) Y (2011-12) N (2010-11) Y (2010-09) Y: seven year average

					majors met the assessment performance standard in 2010-11; 100% (2/2) of majors met the assessment performance standard in 2009-10. A 7-year "moving average" showed that 16/21 (76%, N = 21) majors met the assessment performance standard.		
	2b. **Direct Measures:** Majors' scores on three assignments worked through MyMathLab in MATH 1613, Trigonometry. These topics were trigonometric functions, inverse trigonometric functions, and complex numbers.	2b. At least 70% of majors will earn a grade of 70% or better on the three assignments in MATH 1613.	2b. All Physical Science Major Students taking MATH 1613, Trigonometry.	2b. 6 (14-15) 3 (13-14) 6 (12-13) 12 (11-12)	2b. In 2014-15, 5 of 6 (83%) of the majors scored 70% or better on the homework assignment "trigonometric functions". 5 of 6 (83%) of the majors scored 70% or better on the homework	2b. Performance standards were met.	2b. Y (all years)

					assignment "inverse trigonometric functions". 5 of 6 (83%) of the majors scored 70% or better on the homework assignment "complex numbers".		
	2c. **Indirect Measure**: Majors' scores on 4 lecture exams in PHYS 2015 and PHYS 1114. Note: Both are first semester introductory level physics courses with the same focus. PHYS 2015 is calculus based, intended for students majoring in physics, mathematics or engineering	2c. At least 70% of majors score 70% or better on 4 lecture exams in PHYS 2015 and PHYS 1114.	2c. All Physical Science Major Students taking PHYS 2015 and PHYS 1114.	2c. 2 (15-16) 2 (14-15) 9 (13–14) 15 (12-13) 4 (11-12) 32 Total	2c. 1/2 (50%) MPS majors score 70% or higher on 4 lecture exams in 2015-16. 2/2 (100%) in 2014-15; 2/9 (22%) in 2013-14; 7/15 (47%) in 2012-13 and 3/4 (75%) in 2011-12.	2c. Expectations were met twice in five years. There are no indications of ongoing trends.	2c. N (2015-16) Y (2014-15) N (2013-14) N (2012-13) Y (2011-12)
	2d. **Direct Measures**: GEOL 1124, Historical Geology. Majors' scores on a term project: Final % scores on majors' term	2d. 70% of majors must score 70% or greater on their comprehensive geologic model term project	2d. All Physical Science Major Students taking GEOL 1124, Historical Geology.	2d. 5 (2014-15) 5 (2015-16)	2d. 5/5 geology majors scored 70% or higher on their geologic time model in 2015-16.	2d. 2015-16 Expectations were met. 2014-15 expectations were met	2d. Y(2015-16) Y(2014-15)

	project of a geologic model of the Earth through time. Includes: evolutionary and extinction events, tectonic plate locations, atmospheric conditions, sea level changes, major orogenic locations, events, climatic changes, etc.				5/5 geology majors scored 70% or higher on their geologic time model in 2014-15.		
3. Explain and predict quantitative, analytical and graphical situations.	3a. **Direct measure**: Majors' scores on 10 Unit laboratory reports in PHYS 1114, General Physics and PHYS 2015, Engineering Physics I. Note: Both are first semester introductory level physics courses with the same focus. PHYS 2015 is calculus based, intended for students majoring in physics, mathematics or engineering.	3a. At least 70% of majors will average 70% or better on 10 unit laboratory reports in PHYS 1114 and PHYS 2015.	3a. All Physical Science Major Students taking PHYS 1114, General Physics and PHYS 2015, Engineering Physics I.	3a. 2 (15-16) 2 (14-15) 9 (13–14) 15 (12-13) 4 (11 -12) 32 Total	3a. 2/2 MPS majors met the performance standard in 2015-16; 2/2 in 2014-15. 9/9 in 2013-14; 13/15 in 2012-13, and 4/4 in 2011-12.	3a. A majority of majors in PHYS 1114 & PHYS 2015 were able to conduct the experiments and analyze and interpret the data using mathematical/graphical tools.	3a. Y (2015-16) Y (2014-15) Y (2013-14) Y (2012-13) Y (2011-12) Y: Five year avg.
4. Demonstrate an ability to	4a. **Indirect Measures** Majors' composite lab	4a. At least 50% of majors will earn a lab grade	4a. All Physical Science Major	4a. 5 (15-16) 2 (14-15)	4a. 80% (4/5) of majors met the	4a. A majority of majors in CHEM 1415 were able to design	4a. Y (2015-16) Y (2014-15)

design and conduct experiments, as well as to analyze and interpret data.	grade in CHEM 1415, General Chemistry II.	of 70% or higher.	Students taking CHEM 1415, General Chemistry II.	1 (13-14) 3 (12-13) 3 (11-12) 5 (10-11) 2 (09-10) 21 Total	assessment performance standard in 2015-16; 100% (2/2) of majors met the assessment performance standard in 2014-15; 100% (1/1) of majors met the assessment performance standard in 2013-14; 100% (3/3) of majors met the assessment performance standard in 2012-13; 100% (3/3) of majors met the assessment performance standard in 2011-12; 60% (3/5) of majors met the assessment performance standard in 2010-11; 100% (2/2) of	and conduct experiments, and successfully analyze and interpret the data gathered from them. With small N annual fluctuations are to be expected. Keeping a moving average of the data reveals any on-going trends.	Y (2013-14) Y (2012-13) Y (2011-12) Y (2010-11) Y (2010-09) Y: seven year avg

					majors met the assessment performance standard in 2009-10. A 7-year "moving average" showed that 18/21 (85%, N = 21) majors met the assessment performance standard.		
	4b. **Indirect measure:** Majors' scores on 10 Unit laboratory reports in PHYS 1114, and PHYS 2015 Note: Both are first semester introductory level physics courses with the same focus. PHYS 2015 is calculus based, intended for students majoring in physics, mathematics or engineering.	4b. At least 70% of majors will average 70% or better on 10 Unit laboratory reports in PHYS 1114 and PHYS 2015.	4b. All Physical Science Major Students taking PHYS 1114 and PHYS 2015.	4b. 2 (15-16) 2 (14-15) 9 (13–14) 15 (12-13) 4 (11 -12) 32 Total	4b. 2/2 MPS majors met the performance standard in 2015-16; 2/2 in 2014-15. 9/9 in 2013-14; 13/15 in 2012-13, and 4/4 in 2011-12.	4b. A majority of majors in PHYS 1114 and PHYS 2015 were able to show their ability to design and conduct experiments, as well as to analyze and interpret the data using mathematical/graphical tools.	4b. Y (2015-16) Y (2014-15) Y (2013-14) Y (2012-13) Y (2011-12) Y: Five year avg

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 planned.			

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

PART 7 (A & B)

Assessment Measures and Faculty Participation

A. Assessment Measures:

1) How many different assessment measures were used?
   Chemistry: 3
   MATH 1613: 2
   PHYS 1114: 4
   PHYS 2015: 4
   GEOL 1124 2
2) List the direct measures (see rubric):
   Chemistry: 1 – 2a
   MATH 1613: 1 – 2b
   PHYS 1114: 1 – 3a
   PHYS 2015: 1 – 3a
   GEOL 1124 1 – 2d
3) List the indirect measures (see rubric):
   Chemistry: 2 – 1a, 4a
   MATH 1613: 1 – 1b
   PHYS 1114: 3 – 1c, 2c, 4b
   PHYS 2015: 3 – 1c, 2c, 4b
   GEOL 1124 1 – 1d.

B. Assessment Measures:

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. Kirk Voska	Collected and analyzed Chemistry data; Reviewed Report.	Kirk Voska
Dr. Kasia Roberts	Collected Chemistry data; Reviewed Report.	Kasia Roberts
Dr. Doug Grenier	Collected and analyzed Math data; Reviewed Report.	[signature]
Dr. Min Soe	Collected and analyzed Physics data; Reviewed Report.	Min Soe
Dr. Suhkitha Vidurupola	Prepared and Reviewed report.	Sukhitha Vidurupola
Dr. Jamie M.Graham	Collected and analyzed GEOL data; Prepared and Reviewed report.	Jamie M. Graham

2) Reviewed by:

Titles	Names	Signatures	Date
Department Head	Dr. Jamie Graham	Jamie M. Graham	10/17/16
Dean	Dr. Keith Martin	Keith W. Martin	10/19/16

RUBRIC FOR STUDENT LEARNING STUDENT LEARNING REPORT

1) A. Are the school, department and program missions clearly stated?

Exemplary	Established	Developing	Undeveloped
The program, department, and school missions are clearly stated.	The program, department, and school missions are stated, yet exhibit some deficiency (e.g., are partial or brief).	The program, department, and school missions are incomplete and exhibit some deficiency (e.g., are partial or brief).	The program, department, and school missions are not stated.

B. Are student learning outcomes and department purposes aligned with university commitments and school purposes?

Exemplary	Established	Developing	Undeveloped
Student learning outcomes and department purposes are aligned with university commitments and school purposes.	Student learning outcomes and department purposes demonstrate some alignment with university commitments and school purposes.	Student learning outcomes and department purposes demonstrate limited alignment with university commitment and school purposes.	Student learning outcomes and department purposes do not demonstrate alignment with university commitment and school purposes.

2) How well did the department incorporate instructional or assessment changes from last year's report or from other assessment activities?

Exemplary	Established	Developing	Undeveloped
All planned changes were listed, whether they were implemented or not, and their impact on curriculum or program budget was discussed thoroughly.	Most planned changes were listed, and their status or impact on curriculum or program budget was discussed.	Some planned changes were listed, and their status or impact on curriculum or program budget was not clearly discussed.	No planned changes were listed, and their status or impact on curriculum or program budget was not discussed.

3) Did the department include peer review feedback and provide rationale for implementing or not implementing suggestions?

Exemplary	Established	Developing	Undeveloped
All reviewer feedback was listed, and for each suggestion a clear rationale was given for its being implemented or not.	Most reviewer feedback was listed, and for most suggestions a rationale was given for their being implemented or not.	Some reviewer feedback was listed, and for some suggestions a rationale was given for their being implemented or not.	Feedback from reviewers was not included.

4) A. **Are the student learning outcomes listed and measurable?**

Exemplary	Established	Developing	Undeveloped
All student learning outcomes are listed and measurable in student behavioral action verbs (e.g., Bloom's Taxonomy).	Most student learning outcomes are listed and measurable in student behavioral action verbs (e.g., Bloom's Taxonomy).	Some student learning outcomes are listed and measurable in student behavioral action verbs (e.g., Bloom's Taxonomy).	Student learning outcomes are either not listed or not measurable.

B. **Are the assessment measures appropriate for the student learning outcomes?**

Exemplary	Established	Developing	Undeveloped
All assessment measures are appropriate to the student learning outcomes.	Most assessment measures are appropriate to the student learning outcomes.	Some assessment measures are appropriate to the student learning outcomes.	None of the assessment measures are appropriate to the student learning outcomes.

C. **Do the performance standards provide a clearly defined threshold at an acceptable level of student performance?**

Exemplary	Established	Developing	Undeveloped
All performance standards provide a clearly defined threshold at an acceptable level of student performance.	Most performance standards provide a clearly defined threshold at an acceptable level of student performance.	Some of the performance standards provide a clearly defined threshold at an acceptable level of student performance.	No performance standards provide a clearly defined threshold at an acceptable level of student performance.

D. **Is the sampling method appropriate for all assessment measures?**

Exemplary	Established	Developing	Undeveloped
The sampling methodology is appropriate for all assessment measures.	The sampling methodology is appropriate for most assessment measures.	The sampling methodology is appropriate for some assessment measures.	The sampling methodology is appropriate for none of the assessment measures.

E. **Is the sample size listed for each assessment measure?**

Exemplary	Established	Developing	Undeveloped
Sample size was listed for all assessment measures.	Sample size was listed for most assessment measures.	Sample size was listed for some assessment measures.	Sample size was not listed for any assessment measures.

F. **How well do the data provide clear and meaningful overview of the results?**

Exemplary	Established	Developing	Undeveloped
For all student learning outcomes the results were clear, more than a single year's results were included, and meaningful information was given that reveals an overview of student performance.	For most student learning outcomes the results were clear, more than a single year's results were included, and meaningful information was given that reveals an overview of student performance.	For some student learning outcomes the results were clear, more than a single year's results were included, and meaningful information was given that reveals an overview of student performance.	For none of the student learning outcomes were the results clear, more than a single year's results were included, and meaningful information was given that reveals an overview of student performance.

G. **Are the conclusions reasonably drawn and significantly related to student learning outcomes?**

Exemplary	Established	Developing	Undeveloped
All conclusions are reasonably drawn and significantly based on the results and related to the strengths and weaknesses in student performance.	Most conclusions are reasonably drawn and significantly based on the results and related to the strengths and weaknesses in student performance.	Some conclusions are reasonably drawn and significantly based on the results and related to the strengths and weaknesses in student performance.	No conclusions are reasonably drawn and significantly based on the results or related to the strengths and weaknesses in student performance.

H. **Does the report indicate whether the performance standards were met?**

Exemplary	Established	Developing	Undeveloped
Stated for all performance standards.	Stated for most performance standards.	Stated for some performance standards.	Not stated for any performance standard.

5) **How well supported is the rationale for making assessment or instructional changes? The justification can be based on conclusions reported in Part 4 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.**

Exemplary	Established	Developing	Undeveloped
All planned changes are specifically focused on student learning and based on the conclusions. The rationale for	Most planned changes are specifically focused on student learning and based on the conclusions. The rationale for	Some planned changes are specifically focused on student learning and based on the conclusions. The rationale for	No planned changes are specifically focused on student learning and based on the conclusions. There is no rationale.

planned changes is well grounded and convincingly explained.	planned changes is mostly well grounded and convincingly explained.	planned changes is lacking or is not convincingly explained.	

6) **Did the faculty include at least one teaching technique they believe improves student learning or student engagement in the classroom?**

Yes	No		
The faculty has included at least one teaching technique they believe improves student learning or student engagement in the classroom.	The faculty has not included any teaching techniques they believe improve student learning or student engagement in the classroom.		

7) **A. How well did the faculty vary the assessment measures?**

Exemplary	Established	Developing	Undeveloped
Assessment measures vary and include multiple direct measures and at least one indirect measure. The number of measures is consistent with those listed.	Assessment measures vary, but they are all direct. The number of measures is consistent with those listed.	Assessment measures do not vary or are all indirect. There is some inconsistency in the number of measures recorded and the total listed.	Assessment measures are not all listed or are listed in the wrong category. The total number of measures is not consistent with those listed.

B. Does the list of faculty participants clearly describe their role in the assessment process?

Exemplary	Established	Developing	Undeveloped
The faculty role is clearly identified and it is apparent that the majority of the faculty participated in the process. The roles are varied.	The faculty role is identified and it is apparent that the majority of the faculty participated in the process. The roles are not varied.	The faculty roles are not identified. Few faculty participated.	The faculty roles are not identified. Faculty participation is not sufficiently described to make a determination about who participated.

EXPLANATION & EXAMPLES OF DIRECT AND INDIRECT EVIDENCE

DIRECT EVIDENCE of student learning is tangible, visible, self-explanatory evidence of exactly what students have and haven't learned. Examples include:

1) Ratings of student skills by their field experience supervisors.
2) Scores and pass rates on licensure/certification exams or other published tests (e.g. Major Field Tests) that assess key learning outcomes.
3) Capstone experiences such as research projects, presentations, oral defenses, exhibitions, or performances that are scored using a rubric.
4) Written work or performances scored using a rubric.
5) Portfolios of student work.
6) Scores on locally-designed tests such as final examinations in key courses, qualifying examinations, and comprehensive examinations that are accompanied by test blueprints describing what the tests assess.
7) Score gains between entry and exit on published or local tests or writing samples.
8) Employer ratings of the skills of recent graduates.
9) Summaries and analyses of electronic class discussion threads.
10) Student reflections on their values, attitudes, and beliefs, if developing those are intended outcomes of the program.

INDIRECT EVIDENCE provides signs that students are probably learning, but the evidence of exactly what they are leaning is less clear and less convincing. Examples include:

1) Course grades.
2) Assignment grades, if not accompanied by a rubric or scoring guide.
3) For four year programs, admission rates into graduate programs and graduation rates from those programs.
4) For two year programs, admission rates into four-year institutions and graduation rates from those programs.
5) Placement rates of graduates into appropriate career positions and starting salaries.
6) Alumni perceptions of their career responsibilities and satisfaction.
7) Student ratings of their knowledge and skills and reflections on what they have learning over the course of the program.
8) Those questions on end-of-course student evaluations forms that ask about the course rather than the instructor.
9) Student/alumni satisfaction with their learning, collected through surveys, exit interviews, or focus groups
10) Honors, awards, and scholarships earned by students and alumni.

Suskie, L. (2004). *Assessing Student Learning: A Common Sense Guide.* Anker Publishing Company: Bolton, MA

Checklist for Degree Program SLR

Complete one of these for each of your department's degree programs for 2014-2015.

Department: Mathematics and Physical Sciences

Degree Program: Physical Science, A.S.

Academic Year: 2015 - 2016

UAC Member: Sukhitha Vidurupola

[X] **PART 1 (A).** The Degree Program Mission is virtually the same as the one that appears in the 2014-2015 Bulletin.

[X] **PART 2.** All instructional or assessment changes (if any) from the following sources are included here: Part 5 and Column G of Part 4 of the 2014-2015 Student Learning Report.

[X] **PART 3.** All comments from the Peer Review Report of the 2014-2015 Student Learning Report are included here. The department's responses to all comments, providing a response is necessary, are also included here.

[X] **PART 4.** The student learning outcomes listed in Column A are exactly the same as the student learning outcomes listed in Part 1 (B).

[X] **PART 5.** Any proposed changes based on conclusions described in Column G of Part 4 of the 2014-2015 Student Learning Report are included here.

[X] **PART 6.** Any pedagogical insight related to promising teaching methods or more effective assessment measures. Completing this part of the Student Learning Report is optional.

[X] **PART 7 (A).** The number of different assessment measurers, direct measures and indirect measures are included here.

[X] **PART 7 (B).** The names and signatures of all faculty members who participated in the assessment process and their role in its development are included here.

Sukhitha Vidurupola

Signature of UAC representative