



(Due: June 1, 2020)

Date report completed: 7/17/2020

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Assessment contributors (other faculty involved): \_\_\_\_\_

**Brief statement of Program mission and goals:**

**I. Assessment of Student Learning Outcomes (SLOs) in this cycle.** Including processes, results, and recommendations for improved student learning. Use Column H to describe improvements planned for 2019-2020 based on the assessment process.

A. Which of the program SLOs were assessed during this cycle? <b>Please include the outcome(s) verbatim from the assessment plan.</b>	B. When was this SLO <u>last</u> reported on prior to this cycle? <b>(semester and year)</b>	C. What method was used for assessing the SLO? <b>Please include a copy of any rubrics used in the assessment process.</b>	D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved (N).	E. What is the expected proficiency level and how many or what proportion of students should be at that level?	F. What were the results of the assessment? (Include the proportion of students meeting proficiency.)	G. What were the department's conclusions about student performance?	H. What changes/improvements to the <u>program</u> are planned based on this assessment?
SLO1 - Communication	Spring 2015	CAT Exam administered to Seniors (n=16 in May 2019) and (n=117 in December 2019) Specifically Q2,Q3,Q4,Q6,Q7,Q9,Q11,Q14, Q15 that assess Communication	Seniors (n=16 in May 2019) and (n=117 in December 2019)	Students as a group are expected to perform at or above the peer mean CAT in normed assessments.	Students scored well below the mean in all questions associated with Communication, in all but one case significantly so (p<0.0001). Overall, about 24% of our students obtained a score on individual	Our students are well below that national mean in Communication and have shown a performance slide on all CAT measured items for this SLO.	A General Education re-design is in process, including Faculty Development around focusing our teaching and learning culture on our Gen Ed SLOs in Gen Ed courses.

					problems that <b>may</b> have been above the national mean (individual questions not nationally normed)		
SLO2 – Critical Thinking	Spring 2015	CAT Exam administered to Seniors (n=16 in May 2019) and (n=117 in December 2019) Specifically Q3,Q4,Q6,Q7,Q9,Q15 that assess Critical Thinking	Seniors (n=16 in May 2019) and (n=117 in December 2019)	Students as a group are expected to perform at or above the peer mean CAT in normed assessments.	Students scored well below the mean in all questions associated with Critical Thinking, in all but one case significantly so (p<0.0001). Overall, about 24% of our students obtained a score on individual problems that <b>may</b> have been above the national mean (individual questions not nationally normed)	Our students are well below that national mean in Critical Thinking and have shown a performance slide on all CAT measured items for this SLO.	A General Education re-design is in process, including Faculty Development around focusing our teaching and learning culture on our Gen Ed SLOs in Gen Ed courses.

SLO5 – Quantitative Reasoning	Sprin 2015	Review of artifacts by two separate individuals from Gen Ed MATH courses using the CDHE gt Pathways Rubric based on the AAC&U VALUE rubric	Artifacts from N=82 students from four courses. Mat 120 (n=20), Math 156 (n=28), Math 109 (n=16), and Math 101 (n=20)	The rubric has 5 categories, each evaluated in 4 performance levels, were 4 is mastery an 1 is novice. Students as a group are expected to perform at or above 2 in this rubric	For Math 120, the only category that met expectations was Representing Information, all other categories were below expectations. For Math 156, 109, and 101, all categories were at or above 2 as an average. For students, 9 of 20 in Math 120 were meeting expectations. 22 of 28 in Math 156 were meeting expectations. 12 of 16 in Math 109 were meeting expectations. 17 of 20 in Math 101 were meeting expectations.	Overall, our Math students are doing well using this assessment tool. One area of concern may be MATH 120, where the artifacts produced lower than expected student outcomes.	Continue to work with the Math faculty to refine the Math curriculum. The Gen Ed Math courses are part of the Gen Ed re-design (see above)
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SLO6 – Scientific Reasoning	Spring 2015	Review of artifacts from Gen Ed ST courses using the CDHE gt Pathways Rubric based on the AAC&U VALUE rubric	Artifacts from N=115 students from two courses. BIOL 181L (n=42) and BIOL 182L (n=73)	The rubric has 5 categories, each evaluated in 4 performance levels, were 4 is mastery an 1 is novice. Students as a group are expected to perform at or above 2 in this rubric	For BIOL 182L, the average for all 5 categories was above 2, and 56 of the 73 students were above expectations. For BIOL 181L, the averages for all 5 categories were below 2, and only 8 of the 42 students met the expectations.	Overall, our ST students are doing well using this assessment tool. One area of concern may be BIOL 181L, where the artifacts produced lower than expected student outcomes.	Continue to work with the ST faculty to refine the ST curriculum. The Gen Ed ST courses are part of the Gen Ed re-design (see above)
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Comments on part I:

**II. Closing the Loop. Describe at least one data-informed change to your curriculum during the 2019-2020 cycle.** These are those that were based on, or implemented to address, the results of assessment from previous cycles.

A. What SLO(s) or other issues did you address in this cycle? <b>Please include the outcome(s) verbatim from the assessment plan.</b>	B. When was this SLO last assessed to generate the data which informed the change? Please indicate the semester and year.	C. What were the recommendations for change from the previous assessment column H and/or feedback?	D. How were the recommendations for change acted upon?	E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations?
ALL SLOs	2018	We are currently redesigning the SLOs for Gen Ed, moving to a set of skills aligned with both the state of Colorado and AAC&U	Round Tables during 2019 led to a set of new SLOs approved by Faculty Senate in April 2020 that will go into effect Fall 2021. The academic year of 2020-2021 will be used for Faculty Development around our new SLOs	New SLOs approved in April

Comments on part II:



## GT PATHWAYS COMPETENCY: QUANTITATIVE LITERACY

Required in GT Pathways Categories:

[GT-MA1](#) (SLOs 1-5; and SLO 6 for Statistics courses only)

[GT-SC1](#) (SLOs 1 & 2)

[GT-SC2](#) (SLOs 1 & 2)

### *Quantitative Literacy*

Competency in quantitative literacy represents a student's ability to use quantifiable information and mathematical analysis to make connections and draw conclusions. Students with strong quantitative literacy skills understand and can create sophisticated arguments supported by quantitative evidence and can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc.).

### *Student Learning Outcomes (SLOs)*

*Students should be able to:*

#### **1. Interpret Information (required for GT-MA1, GT-SC1 & GT-SC2)**

a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).

#### **2. Represent Information (required for GT-MA1, GT-SC1 & GT-SC2)**

a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

#### **3. Perform Calculations (required for GT-MA1)**

a. Solve problems or equations at the appropriate course level.

b. Use appropriate mathematical notation.

c. Solve a variety of different problem types that involve a multi-step solution and address the validity of the results.





**4. Apply and Analyze Information (required for GT-MA1)**

- a. Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level.
- b. Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.
- c. Make judgments based on mathematical analysis appropriate to the course level.

**5. Communicate Using Mathematical Forms (required for GT-MA1)**

- a. Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication).

**6. Address Assumptions (required of Statistics courses only)**

- a. Describe and support assumptions in estimation, modeling, and data analysis, used as appropriate for the course.



**QUANTITATIVE LITERACY RUBRIC**

*This rubric is meant to be an **optional** course design and assessment tool. Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet level one performance criteria minimum.*

	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Interpret Information</b>	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information.	Provides accurate explanations of information presented in mathematical forms.	Provides explanations of information presented in mathematical forms, but makes errors within the explanation or inappropriate inferences based on the information.	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.
<b>Represent Information</b>	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate <i>or</i> accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate <i>or</i> inaccurate.
<b>Perform Calculations</b>	Calculations attempted are all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.) and address the validity of the results.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented cohesively and address the validity of the results.	Calculations attempted are successful but only represent a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are unsuccessful and may not be comprehensive.





	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Apply and Analyze Information</b>	Uses quantitative analysis as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses quantitative analysis as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses quantitative analysis as the basis for tentative, basic judgments, drawing plausible conclusions from this work.	Uses quantitative analysis as the basis for unskilled judgments, is hesitant or uncertain about drawing conclusions from this work.
<b>Communicate Using Mathematical Forms</b>	Uses quantifiable information in connection with a written argument or description of purpose of the work, presents it in an effective format, and explains with consistently high quality (may also include an oral argument).	Uses quantifiable information in connection with a written argument or description of purpose of the work, though data may be presented in a less than complete format or some parts of the explanation may be disjointed.	Presents a written argument but does not provide adequate quantifiable information to support or connect the argument and purpose of work.	Uses quantifiable information, but does not articulate a written argument that connects to the purpose of the work and the information.
<b>Address Assumptions</b> <b>(Required of statistics courses only)</b>	Specifically describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Specifically describes assumptions and provides compelling rationale for why assumptions are appropriate.	Specifically describes assumptions but attempts made to address rationale are inappropriate or ineffective.	Specifically describes assumptions but lacks rationale.

This rubric was adapted from the Association of American Colleges and Universities (AAC&U) VALUE rubrics and is also aligned with the Interstate Passport Initiative Learning Outcomes. The original VALUE rubrics may be accessed at <http://www.aacu.org/value-rubrics>. The Interstate Passport Initiative Learning Outcomes can be accessed at <http://www.wiche.edu/passport/learningOutcomesCriteria>.

## Inquiry and Analysis Edited Rubric for Gen Ed 2020

	4	3	2	1
<b>Incorporate Information and Existing Research</b>	Synthesizes in-depth information from appropriate and relevant sources.	Examines information from appropriate and relevant sources.	Incorporates foundational information from relevant sources.	Presents foundational information but from limited and/or irrelevant sources.
<b>Integrate Various Points of View</b>	Thoroughly and deeply integrates appropriate and relevant sources representing multiple points of view/approaches.	Integrates appropriate and relevant sources representing various points of view/approaches.	Integrates relevant sources representing limited points of view/approaches.	Integrates relevant sources representing a singular point of view/approach.
<b>Select or Develop a Design Process</b>	All elements of the methodology or theoretical framework are skillfully developed and/or synthesized.	Critical elements of the methodology or theoretical framework are appropriately developed; however, more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused.	Approach demonstrates a misunderstanding of the methodology or theoretical framework.
<b>Analyze and Interpret Evidence</b>	Organizes and synthesizes evidence to reveal insightful patterns, differences, similarities, limitations, and/or implications related to focus.	Organizes evidence to reveal important patterns, differences, similarities, limitations, and/or implications related to focus.	Organizes evidence, but the organization is not effective in revealing important patterns, differences, similarities, limitations, and/or implications.	Lists evidence but is unrelated to focus. Fails to reveal important patterns, differences, similarities, limitations, and/or implications.
<b>Draw Conclusions</b>	States a conclusion that is a logical extrapolation to support a broader context as a direct result of the findings.	States a conclusion focused solely on the findings. The conclusion arises specifically from and responds specifically to the findings.	States a conclusion that is over-generalized and is beyond the scope of the findings	States an ambiguous, illogical, or unsupported conclusion from findings.