Quantitative Reasoning[1]

Catalog Copy: In today's world, arguments and claims often rely for support on scientific studies and statistical evidence. Students should possess the mathematical and quantitative skills to evaluate such evidence. Furthermore, students should possess the skills both to recognize the quantitative dimension of problems and to use mathematical and logical reasoning to formulate and solve the problem. Finally, students need strong quantitative and logical skills because they are indispensable in managing everyday-life situations.

1. *Students will demonstrate the ability to evaluate quantitative evidence.*
2. *Students will demonstrate the ability to use quantitative or mathematical reasoning to formulate and solve problems.*

QR Rubric for Student Learning Outcome 1—Used for Statistics

1	2	3	4
Missing or incomplete or completely unsupported answer (Missing or incomplete solution)	Conclusion and support are given, but there is no precision in the language or statement of the conclusion, no quantitative elements in the support, or the conclusion does not logically follow from the support. (Solution given, but major errors with respect to the solution key.)	Conclusion and support are given and correct, but there are misuses of terminology or data, or there are some missing elements in the support. (Correct and matches most but not all of the solution key; differences are not significant.)	Conclusion is stated precisely using quantitative and appropriate notation and terminology, and is supported correctly using specific data references from the project. (Match the wording and elements of the solution key.)

QR Rubrics/Scales for Student Learning Outcome 2—Used with exam data

Computer Science 102: Exam responses tallied using a scale of 0-6. A score of 4 (effective) or higher means the student's work satisfies the general education student learning objective, with a score of 5 or 6 considered Outstanding. A score of 3 or below means the student's work does not meet the general education student learning objective, with a score of 3 considered Nearly Adequate and 1 or 2 for Ineffective. 0 is primarily reserved for missing work.

[1] Note: the numbered student learning outcomes (in italics) and the rubrics are not yet official in the *Catalog*; however, these were developed and approved by the General Education Committee in 2013-14 to assess student work.

Mathematics 113, 115, 123, 141, and 152: Exam questions were divided into 2 categories:

Type 1 = problems that require a student to provide work or justification for his or her answer.

Type 2 = problems that are a collection of 3-5 short answer questions that do not require any additional work. Each response was scored on a scale of 0-4 according to the rubric below, based on the problem type.

Score	Exam Problems=Type 1	Exam Problems=Type 2
0	Missing document	Missing Document or All Wrong
1-Ineffective	No Answer	Missed 3
2-Nearly Adequate	Incorrect Answer	Missed 2
3-Effective	Correct Answer with Little or no Support	Missed 1
4-Outstanding	Correct Answer with Work Shown	All correct

A score of 3 (Effective) or higher means the student's work satisfies the General Education student learning outcome, with a score of 4 considered Outstanding. A score of 2 or below means the student's work does not meet the general education student learning objective, with a score of 2 considered Nearly Adequate and 1 for Ineffective. 0 was primarily reserved for missing work.

Computer Science 102 (Student Learning Outcome 2, with particular respect to the evaluation of logical statements.)

Exam results were totaled for number of correct answers to selected test items and converted to a score of 0-6. A score of 4 or higher meant the student's work met the general education student learning objective, with a score of 5 or 6 considered Outstanding, 4 for Effective. A score of 3 or below meant the student's work did not meet the general education student learning objective, with a score of 3 considered Nearly Adequate and 1 or 2 for Ineffective. 0 was primarily reserved for missing work.