



Cognitive Skills and Processes –

QQ, QR: Quantitative and Formal Reasoning (6 credits) - Students must take two courses and meet both of these goals (w, x).

If using specific objective questions identified for each goal, the instructor may set the benchmarks for each rating as appropriate to the course and the discipline. For example, a typical benchmarking is laid out here:

90% or more correct	80%-89% correct	70%-79% correct	69% or less correct
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QQ

GOAL w – Student is able to... Formulate, evaluate, and communicate conclusions and inferences from quantitative information.

OUTSTANDING	GOOD	SATISFACTORY	UNSATISFACTORY
<p>Effective and insightful selection and presentation of a range of quantitative information.</p> <p>Formulates well-justified conclusions/inferences from the data at a high level of specificity and sophistication. Engages in extensively critical analysis of the conclusions/inferences including discussion of tests of validity and scope.</p> <p>Presentation is analytically precise, persuasive, and thorough.</p>	<p>Appropriate selection and presentation of relevant quantitative information.</p> <p>Draws a reasonably-justified conclusion/inference from the data.</p> <p>Identifies basic strengths and weaknesses of the conclusions/inferences noting concerns about validity and scope.</p> <p>Clearly and correctly presents conclusions and inferences.</p>	<p>Satisfactory selection and presentation of relevant quantitative information in adherence with standards conveyed in the course.</p> <p>Draws conclusions/inferences from the data, noting appropriate concerns about validity and scope.</p> <p>Satisfactorily presents conclusions and inferences.</p>	<p>Fails to select and present relevant quantitative information in adherence with standards conveyed in the course.</p> <p>Fails to draw, or critically assess, logical conclusions/inferences from the quantitative information.</p>



QR

GOAL x – Student is able to... Apply effective and efficient mathematical or other formal processes to reason and to solve problems.				
	OUTSTANDING	GOOD	SATISFACTORY	UNSATISFACTORY
Symbolization : The ability to convert a problem into a setting using symbolic terminology	Describes the relevant quantities or variables in the problem. Labels all the relevant quantities in the problem; uses the area’s mathematical/symbolic terminology correctly.	Labels all the relevant quantities in the problem; uses the area’s mathematical/symbolic terminology correctly.	Satisfactorily labels all the relevant quantities in the problem; uses the area’s mathematical/symbolic terminology correctly.	Fails to label all the relevant quantities in the problem or uses the area’s mathematical/symbolic terminology incorrectly.
Relationships : The ability to connect quantities and find relationships among symbolic quantities	Verbally connects quantities and finds relationships among symbolic quantities. Provides complete and accurate visual representations of relationships among symbolic quantities that reveal key relationships.	Provides complete and accurate visual representations of relationships among symbolic quantities that reveal key relationships.	Provides satisfactory visual representations of relationships among symbolic quantities that reveal key relationships in accord with specific course directives.	Uses irrelevant information in trying to set up the problem; relies on visual representations that are misleading; neglects fundamental connections and relationships.
Formulation: The ability to construct an appropriate symbolic framework	Structures the problem in a novel way or selection shows a sophisticated understanding of relevant conventional frameworks.	Identifies a relevant conventional framework for the problem.	Satisfactorily adopts a relevant conventional framework for the problem from the course materials.	Fails to employ a symbolic framework for the problem.
Analysis: The ability to carry out algorithmic and logical procedures to resolution	Elegantly carries out a logical sequence of algorithms and procedures; uses symbolic operational rules and performs computational steps correctly.	Carries out a logical sequence of algorithms and procedures; uses symbolic operational rules and performs computational steps correctly.	Satisfactorily carries out a logical sequence of algorithms and procedures; uses symbolic operational rules.	Fails to follow an appropriate algorithm or mathematical procedure to completion; makes serious computational errors.
Interpretation : The ability to draw valid conclusions from numeric/symbolic evidence	Draws insightful, valid, well-stated, and well-justified conclusions from the symbolic/numeric solution.	Draws valid clear and reasonably-justified conclusions from the symbolic/numeric solution.	Satisfactorily draws valid conclusions from the symbolic/numeric solution.	Fails to draw conclusions from the symbolic/numeric solution.