Fitchburg State University General Education Program: Procedural and Logical Thinking Rubric

Goal: Fitchburg State University students will use a rational, systematic procedure to arrive at conclusions, examine or build underlying patterns and structures, or deduce further information.

	Internalizing	**Refining**	**Developing**	**Emerging**
Defining the Problem: Construct a clear and insightful problem statement and/or other representation with evidence of relevant contextual factors. (from AAC&U problem solving)	Consistently Demonstrates the ability to articulate and/or visualize the problem by breaking it down logically, including when appropriate through elegant analogy to other problems, to identify all the relevant factors necessary to appropriately address the problem.	Mostly demonstrates the ability to articulate and/or visualize the problem by breaking it down logically and through analogy to other problems to identify almost all of the relevant factors necessary to address the problem	Shows some evidence of the ability to articulate and/or visualize the problem by breaking it down, identifying some relevant factors, often relying on incomplete analogy to other problems to partially address the problem.	Efforts to articulate and/or visualize the problem by breaking it down, rarely identifies any relevant factors, relying on inexact analogy to other problems, incompletely addressing the problem.
Identifying Processes: Identifies multiple processes and approaches for solving the problem that apply within a specific context. (modified from AAC&U problem solving)	Consistently identifies all of the appropriate processes that can be inferred from broadly relevant principles and skillfully selects those necessary to address the problem.	Mostly identifies the appropriate processes that can be inferred from broadly relevant principles and selects several that are necessary to address the problem.	Identifies some of the appropriate processes that can be inferred from broadly relevant principles, while sometimes selecting processes that don't address the problem	Identifies processes that rarely emerge from the relevant principles, often generating processes that don't directly address the problem.
Integrating Processes: Proposes one or more ways to sequentially and/or simultaneously combine processes for solving the problem within the specific context. (modified from proposed FSU QR rubric)	Consistently integrate multiple elements into a solution process in a logical sequence and/or in combinations that effectively address all aspects of the problem.	Integrates several elements into a solution process in a mostly logical sequence and/or in combinations that address most aspects of the problem.	Integrates some of the elements of of an effective solution process in a logical sequence and/or combinations to address some aspects of the problem	Integrates one or more elements of a solution that rarely represent a logical sequence or effective combinations to address the aspects of the problem.

Predicting Outcomes: Predict one or more solutions/outcomes that indicates their comprehension of the processes and problem. (modified from AAC&U problem solving)	Consistently demonstrates the ability to predict outcomes and/or generate a solution by logically applying the processes identified to a given set of conditions and/or inputs.	Demonstrates the ability to predict outcomes and/or generate a solution by applying the processes identified to a given set of conditions in a mostly logical manner.	Demonstrates the ability to predict some outcomes or generate a partial solution by applying the processes identified to a set of conditions or inputs with some logical consistency.	Predicts outcomes or generates solutions while applying the processes identified in a manner that rarely demonstrates logical consistency or procedural accuracy.
Evaluating and Revising: Evaluate predicted solutions/outcomes and adapt approaches for addressing the problem such as reviewing logic/reasoning, examining feasibility, considering alternative approaches and revising accordingly. (modified from AAC&U problem solving)	Consistently and effectively evaluates predicted solutions and/or outcomes in terms of their logic and reasoning as well as potential alternative approaches and offers appropriate revisions as needed.	Evaluates predicted solutions and/or outcomes in terms of most of the appropriate considerations with regard to their logic, reasoning, and potential alternatives, offering mostly appropriate revisions as needed.	Evaluates some predicted solutions and/or outcomes in terms of considerations with regard to some of their logic, reasoning, and potential alternatives, without consistent necessary revisions.	When evaluating predicted solutions and/or outcomes, the logic, reasoning and potential alternatives are rarely all addressed, with little to no consideration for revisions.
Reflection on Processes: Reviews processes and results relative to the problem defined with considerations of the applications and limitations of the processes and solutions/outcomes including any need for further work.	Consistently Reviews processes, predictions, solutions and outcomes relative to the problem defined with thorough, specific considerations of the applications and limitations of the processes and solutions/outcomes in other contexts and any need for further work.	Reviews processes, predictions, solutions and outcomes relative to the problem defined addressing most considerations of the applications and limitations of the processes and solutions/outcomes in other contexts and any need for further work.	Reviews processes, predictions, solutions and outcomes relative to the problem defined addressing some considerations of the applications and limitations of the processes and solutions/outcomes in other contexts and any need for further work.	Review of processes, predictions, solutions and outcomes rarely demonstrates consideration of any of the applications and limitations of the processes and solutions/outcomes in other contexts or any need for further work.
Personal Reflection: Discussion of personal confidence and attitude towards procedural and logical thinking including willingness to apply PRT skills in future work.	Consistently demonstrate broadly positive attitudes towards the processes involved in procedural and logical thinking demonstrating their understanding of the relevance of procedural and logical thinking to their studies and their life as informed citizens.	Demonstrate mostly positive (or improving) attitudes towards the processes involved in procedural and logical thinking, demonstrating their understanding of the relevance of procedural and logical thinking to their studies and their life as informed citizens.	Demonstrate some positive (or improving) attitudes towards the processes involved in procedural and logical thinking demonstrating an understanding of some of the relevance of procedural and logical thinking to their studies and their life as informed citizens.	Positive or improving attitudes are rarely demonstrated towards the processes involved in procedural and logical thinking with limited reference to the relevance of procedural and logical thinking to their studies and their life as informed citizens.

Procedural and Logical Thinking Rubric

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Understanding the Rubric

The rubric focuses on seven criteria:

1. Defining the Problem: Construct a clear and insightful problem statement and/or other representation with evidence of relevant contextual factors. (from AAC&U problem solving)
2. Identifying Processes: Identifies multiple processes and approaches for solving the problem that apply within a specific context. (modified from AAC&U problem solving)
3. Integrating Processes: Proposes one or more ways to sequentially and/or simultaneously combine processes for solving the problem within the specific context. (modified from proposed FSU QR rubric)
4. Predicting Outcomes: Predict one or more solutions/outcomes that indicates their comprehension of the processes and problem. (modified from AAC&U problem solving)
5. Evaluating and Revising: Evaluate predicted solutions/outcomes and adapt approaches for addressing the problem such as reviewing logic/reasoning, examining feasibility, considering alternative approaches and revising accordingly. (modified from AAC&U problem solving)
6. Reflection on Processes: Reviews processes and results relative to the problem defined with considerations of the applications and limitations of the processes and solutions/outcomes including any need for further work.
7. Personal Reflection: Discussion of personal confidence and attitude towards procedural and logical thinking including willingness to apply PRT skills in future work.

The rubric has four levels of performance with a consistent distinguishing term in each criterion.

Performance Level	**Distinguishing Term**	**Explanation: The student artifact is . . .**
Internalizing	Consistently	nearly perfect in meeting the criteria (~100%).
Refining	Mostly/Frequently	above average in meeting the criteria (~75%).
Developing	Partially/Sometimes	average in meeting the criteria (~50%).
Emerging	Minimally/Rarely	in the early stages of meeting the criteria (25% or less)