

**Formal Reasoning**  
**Distribution List****Description**

Courses on this list will teach students how to reason formally either via mathematics, statistics, or logic and critical thinking.

**Core Curriculum Objectives**

The following criteria must be met for each course in the distribution list: the course will teach students how to reason formally either via mathematics, statistics, or logic and critical thinking.

- Course in mathematics and statistics teach the
  1. conceptual and theoretical tools for quantitative reasoning and problem solving.
  2. language of mathematics or statistics by writing expressing using mathematical or statistical symbols and equations.
  3. skills to describe complex problems in a mathematical or probabilistic framework.
  4. assumptions involved in mathematical or statistical modeling and the limitations of such models.
  5. skills to avoid common mathematical and statistical fallacies.
  6. skills to use quantitative information to make, understand, and evaluate the validity of quantitative arguments.
  
- Courses in logic and critical thinking teach the
  1. skills to think and ask questions critically, cogently, and creatively.
  2. kinds of reasoning or arguments that constitute critical thinking.
  3. practices and techniques of good reasoning and what constitutes bad reasoning (e.g. informal fallacies) within contemporary social, moral, religious, and political contexts. Such exploration will include discernment of the difference between normative and descriptive ethical analysis.
  4. vocabulary and techniques of critical thinking, especially those that are fundamental to good reasoning across a wide range of human practice and social roles.
  5. how to identify and construct arguments from a wide range of venues (textbooks, op editorials, letters to the editor, etc.).
  6. how to analyze and evaluate arguments.
  7. how to appreciate and evaluate alternative, competing or conflicting intellectual perspectives.
  8. how to write good argumentative essays.
  9. limits of reasoning.

**Criteria**

- Students will take one three-hour course from this distribution list.
- Courses in this distribution list may be offered at the 1000-level.
- Department requirement: Departments with faculty specializing in teaching the skill of formal reasoning are eligible to offer courses in this distribution list.

Justification

- “As rational beings, students require the intellectual rigor, integrity, and acumen necessary for the pursuit of truth. Critical reasoning stands at the core of the liberal arts tradition and is common to all disciplines. Students will learn how great thinkers have struggled with – and continue to struggle with – challenging and sometimes divisive philosophical and scientific problems in the pursuit of wisdom. Students will develop the skill of critical reasoning in many ways, including problem-solving, composing essays, and writing lab reports. In doing so, the core curriculum will encourage students to cultivate patience and intellectual humility in the search for truth.”