

## Scientific Methods II: Grand Challenges of Science Distribution List

### Description

The Grand Challenges in Science course will introduce students to a major global challenge in science from a multi-disciplinary approach. The “Grand Challenges” addressed in these courses should be topics that are compelling for both intellectual and practical reasons, that deal with roadblocks for progress in a field, and that will deliver significant payoff when progress is made. Using primary sources, discussion, and critical reasoning, students will examine the history and evidence of a particular challenge and examine solutions to the problem.

### Core Curriculum Objectives

Each course in the distribution list must meet the following criteria:

1. Explicit instruction on critical thinking and evaluation of evidence.
2. Real-world examples of problems and how they are addressed by science.
3. Student engagement with primary source materials.
4. Explicit instructions on how to determine the validity of a scientific claim.
5. Multi-disciplinary scientific approaches to issues (even if taught by one department).
6. Exploration of the role that the virtues of humility, patience, fortitude, etc. play in scientific inquiry and discovery.

### Criteria

- Students may take one 3-hour Grand Challenges of Science lecture course to meet the 7-hour science requirement.
- The course may be offered at the 1000, 2000, 3000, or 4000-level.
- Department Requirement: Only departments offering the BS degree are eligible to offer a course in the Grand Challenges of Sciences Distribution List. If the course is taught by two or more departments, at least one department must offer the BS degree.
- Each course in this distribution list must incorporate science-informed decision making and address issues related to at least one of the areas listed below:
  - History and philosophy of science.
  - Origins of universe/solar system, atmosphere, hydrosphere, biosphere, or geosphere.
  - Evolution/extinction.

### 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.”