MINOR IN
PHILOSOPHY
OF SCIENCE

WHAT IS THE “PHILOSOPHY OF SCIENCE”? 

The sciences do an excellent job at conveying the present state of scientific knowledge. BUT ... research suggests that undergraduate science education alone is ineffective at increasing students’ capacities to think critically, to solve empirical problems by using scientific method, or to identify pseudo-science.

The Minor in Philosophy of Science is explicitly designed to address these issues. The Minor is structured to build up analytical reasoning skills, to train critical evaluation of evidence-based inquiry, to develop empirical problem-solving through scientific methodology, as well as to increase their capacities to identify, avoid, and control for error in empirical inquiry.

Minor in Philosophy of Science Objectives

• Develop analytical reasoning skills

• Broaden ability to apply scientific reasoning to empirical problems

• Sharpen ability to assess critically the quality of scientific work

• Heighten understanding of the ethical and socio-political responsibilities of scientific inquiry

The Minor allows students as well the opportunity to engage with their own major fields of study in ways often not available in the normal course of studies.

• Students have the chance to explore their fields background assumptions, the interdisciplin ary relations between the sciences, as well as what makes scientific inquiry a distinctively powerful tool to understand the natural world.

• Most of the courses are small seminars with intense and lively discussions, providing students the opportunity to engage with a cross-disciplinary community of fellow science majors and plausibly increasing student retention and resilience.
A progressive sequence of three required core courses: 1) Logic, Language, and Scientific Reasoning (PHIL 2441), 2) Investigating Nature (PHIL 3340), and 3) Philosophy of Science (PHIL 4350). These first build up students’ general analytical and reasoning skills and then proceed to developing their understanding of the theoretical underpinnings of contemporary scientific inquiry. Two further elective courses are required as well.

**PHIL 2441: Logic, Language, and Scientific Reasoning**
Students learn the basic principles of argumentation, how to apply those principles in the analysis of natural language arguments, how to recognize and avoid human cognitive traps, as well as how to use formal techniques to counter human cognitive deficiencies in, for example, conditionalized reasoning. In addition, this course is used to introduce students to the logic of experimental inference as well as to what differentiates scientific reasoning from non-scientific reasoning.

**PHIL 3340: Investigating Nature**
Introduces a broad range of topics relevant to scientific inquiry, e.g., hypothetical assessment, the relation between experiment and hypothesis, error exclusion in experimental design, the diversity of explanatory strategies as well as complimentary explanatory forms, model-based explanations, the effects of classificatory assumptions and conceptual paradigms on theory formulation, as well as the influence of psycho-social biases.

**PHIL 4350: Philosophy of Science**
Moves beyond the introductory character of the prior course and aims to engage students directly in issues that remain a source of dispute in the logic of the sciences, e.g., the inter-justificatory relations of the sciences, the autonomy of the “special sciences”, the role of truth in scientific inquiry, whether “laws” have any distinctive or special status within explanation, etc. Given the seminar setting, students have the opportunity to reason through, argue about, and come to better understand the theoretical assumptions of science inquiry.

**Elective Courses**
- PHIL 3032: Twentieth Century Analytic Philosophy
- PHIL 3350: Metaphysics
- PHIL 3360: Epistemology
- PHIL 3440: Introduction to Symbolic Logic
- PHIL 4101: Pragmatism: Classical American Philosophy
- PHIL 4242: Bioethics
- PHIL 4300: Philosophy of Mind
- PHIL 4740: Empiricism
- PHIL 4920: Philosophy of Media and Technology
- PHIL 4812/4980: Special Topics in Philosophy (e.g., Philosophy of Biology or Philosophy of Language)