

A Philosophical Introduction to Science Studies

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1 Course Description

Is science a rational enterprise, and if so, why? How do the organization and institutions of science contribute to, or detract from, its success? This course explores these questions from a multidisciplinary perspective, considering not just philosophical perspectives, but also sociological, economic, and historical.

The first half of the course focuses on the issue of the rationality of science. We start with some classic works from the philosophy of science (classes 1–4). We then look at some more recent philosophical views (classes 5–7) before moving on to consider the strong program in the sociology of scientific knowledge (classes 8–11).

The second half of the course considers some issues in the reward structure of science and its institutional design. First we talk about the importance of priority (“being first”) in scientific discoveries (classes 12–15). Next we focus on the extreme inequalities in the reward structure of science (classes 16–17) and their disproportionate impact on women scientists and scientists belonging to a minority (classes 18–20). From there we move to scientists’ decisions to publish their work and editors’ decisions to accept or reject that work (classes 21–24). Finally, we look at Robert Merton’s institutional norms of science (“CUDOS”) and how they are maintained (classes 25–28).

2 Course Objectives

At the end of this course, students should have

- the ability to extract the central claims and arguments from a text;
- the ability to carefully distinguish descriptive from normative claims;
- a working understanding of the various approaches that fall under the umbrella term “science studies”;

- the ability to speak in front of the class.

3 Reading List

Is Science Rational?

- Class 1. Critical rationalism. Reading: Karl Popper, *The Logic of Scientific Discovery* (sections 1.1–1.3), *Conjectures and Refutations* (pp. 33–39).
- Class 2. Normal science and revolutions. Reading: Thomas Kuhn, “Logic of Discovery or Psychology of Research?”, *The Structure of Scientific Revolutions* (pp. 92–110).
- Class 3. Lakatos’ research programmes. Reading: Imre Lakatos, “Criticism and the Methodology of Scientific Research Programmes”.
- Class 4. Anything goes. Reading: Paul Feyerabend, “Against Method: Outline of an Anarchistic Theory of Knowledge” (sections 5–15).
- Class 5. New fuzziness, old problems. Reading: Clark Glymour, *Theory and Evidence* (chapter IV).
- Class 6. Values in science. Reading: Helen Longino, *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry* (pp. 62–82).
- Class 7. Individual and group rationality. Reading: Conor Mayo-Wilson et al., “The Independence Thesis”.

The Strong Programme in the Sociology of Knowledge

- Class 8. Studying scientists in the lab. Reading: Bruno Latour and Steven Woolgar, *Laboratory Life: The Construction of Scientific Facts* (chapter 3).
- Class 9. The strong programme in the sociology of knowledge. Reading: David Bloor, *Knowledge and Social Imagery* (chapter 1).
- Class 10. What is the scientific status of the strong programme? Reading: Larry Laudan, “The Pseudo-Science of Science?”
- Class 11. Bloor’s reply to Laudan. Reading: David Bloor, “The Strengths of the Strong Programme”.

The Reward Structure of Science: Priority

- Class 12. The priority rule. Reading: Robert Merton, “Priorities in Scientific Discovery”.
- Class 13. The priority rule and externalities. Reading: Partha Dasgupta and Paul David, “Toward a New Economics of Science”.
- Class 14. The priority rule and theory choice. Reading: Michael Strevens, “The Role of the Priority Rule in Science”.
- Class 15. Evaluating the credit economy. Reading: Kevin Zollman, “The Credit Economy and the Economic Rationality of Science”.

Inequalities in the Reward Structure of Science

- Class 16. Social stratification in science. Reading: Robert Merton, “The Matthew Effect in Science”, Jonathan Cole and Stephen Cole, *Social Stratification in Science* (chapter 3).
- Class 17. Mechanisms that produce stratification. Reading: Stephen Turner and Daryl Chubin, “Chance and Eminence in Science: Ecclesiastes II”, Albert-László Barabási and Réka Albert, “Emergence of Scaling in Random Networks”.
- Class 18. The productivity puzzle. Reading: Jonathan Cole and Harriet Zuckerman, “Marriage, Motherhood and Research Performance in Science”, Pleun van Arensbergen et al., “Gender Difference in Scientific Productivity: A Persisting Phenomenon?”.
- Class 19. The underrepresentation of women in science. Reading: Stephen Ceci and Wendy Williams, “Understanding Current Causes of Women’s Underrepresentation in Science”, Carole Lee, “Revisiting Current Causes of Women’s Underrepresentation in Science”.
- Class 20. Bargaining power as an explanation of inequalities. Reading: Justin Bruner and Cailin O’Connor, “Power, Bargaining, and Collaboration”.

The Role of Scientific Journals

- Class 21. Double-blind and single-blind reviewing. Reading: Rebecca Blank, “The Effects of Double-Blind vs. Single-Blind Reviewing”.

- Class 22. Why does it take so long to get a paper published? Reading: Glenn Ellison, “Evolving Standards for Academic Publishing: A q - r Theory”.
- Class 23. Game-theoretic models of the publication market. Reading: João Faria, “The Game Academics Play: Editors Versus Authors”, Damien Besancenot et al., “Search and Research: The Influence of Editorial Boards on Journals’ Quality”.
- Class 24. How can journals be improved? Reading: Martin Heintzelman and Diego Nocetti, “Where Should We Submit Our Manuscript?”, Kevin Zollman, “Optimal Publishing Strategies”.

The Institutional Norms of Science

- Class 25. Merton’s CUDOS norms. Reading: Robert Merton, “A Note on Science and Democracy”.
- Class 26. Verifying and extending CUDOS. Reading: Melissa Anderson et al., “Extending the Mertonian Norms”.
- Class 27. The incentive for organized skepticism. Reading: Justin Bruner, “Policing Epistemic Communities”.
- Class 28. The incentive to share in science. Reading: Michael Strevens, “Scientific Sharing: Communism and the Social Contract”.