

The lectures in the course will not strictly follow the layout of the book. For this reason, it is best if students read **chapters 1-3 and 6 and the two blog posts before the course has started**, read all three papers prior to the second day of the course, and read chapters 5 and 7 for the third day of the course.

The purpose of these readings is to get an idea of the content and to be prepared to discuss it. It is not to memorize specifics, and none of these readings should be taken as the final word, rather as a place to begin our discussions.

Textbook for the course

Philosophy of Science: A Very Short Introduction

Samir Okasha

Chapter one of this book asks “What is science”, and begins with a short history of science and the development of the scientific method, followed by an examination of the differences between science and pseudo science. This section introduces Popper and contrasts Popper to Marx and Freud.

Chapter two introduces scientific reasoning, where deduction and induction are explained and the problem with induction is explained, and Popper is reintroduced. This leads into the third chapter, “Explanation in science” which explores hypotheses, and explanation in science. This leads to discussions covering correlation and causality in science.

Chapter five deals mostly with Thomas Kuhn and paradigms in science. Kuhn suggested that science is done in what he called paradigms, where the inner paradigm was accepted by the scientists working the field until that point that it no longer agrees with the research being done. When scientists no longer accept their paradigm, there is a paradigm shift.

In chapter six the book addresses three case studies in philosophy of science; one in each physics, biology and psychology. These case studies provide additional re-world applications to the use of philosophy of science in on-going research programs. We will not directly address these case studies in the class, rather, they will provide a starting point for the application of these problems to active science.

Chapter seven discusses critics of science and the practice of science. If we have time, we will address the issues such as religion vs science directly in the class, but otherwise these examples will provide good overall criticism of how science is done, and should generally be kept in mind over the week.

Blogs for the course – to read before the course begins

Why ecologists might want to read more philosophy of science

Jeremy Fox

This post suggests why ecologists (and scientists more generally) *ought* to study more philosophy of science and outlines the practical benefits of understanding more philosophy of science. A great point is made about the practice of “cookbook science” where scientists might follow a specific protocol, i.e. the scientific method or hypothesis testing, without necessarily understanding the underpinnings.

What is philosophy of science (and should scientists care)?
Janet D. Stemwedel

This blog outlines what is meant by philosophy of science, specifically, what exactly philosophers of science do. Importantly, this post addresses whether scientists should actively study philosophy of science.

Papers for the course – to read before Tuesday

Platt, J.R. 1964, Strong Inference. *Science*. 146(3642):347 – 353

T.C. Chamberlin. 1965. The Method of Multiple Working Hypotheses. *Science* 148(3671):754-759

Quinn, J.F. and A.E. Dunham. 1983. On Hypothesis Testing in Ecology and Evolution. *The American Naturalist* 122(5):602-617