PHIL 5350/6350 Topics in Philosophy of Science: Models and Modeling
Spring Semester 2020
Weds 2.00 – 5.00pm; CTIH5 459
Instructor: Stephen M. Downes
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Course Description
Catalog Description: The course content may vary and will deal either with general issues in the philosophy of science such as explanation, laws and theories, realism/anti-realism; or it will focus on philosophical issues in such fields as physics, biology, and social science.

Detailed Description: This is an advanced topics in philosophy of science class. Our topic for this semester will be Philosophical Issues in Scientific Modeling. We begin by looking at some examples of the various approaches to modeling in science and look at some examples of the wide variety of models produced by scientists. There is a wide range of philosophical issues about modeling in science and we will only be able to cover a selection of these issues in this class. We will discuss what models are and whether they can be classified into types; scientific representation; the relations between models and theories; criteria for good vs. bad models; issues of demarcation between science and non-science; social science vs. natural science; and idealization. Philosophers discussed in this class will include: Nancy Cartwright, Melinda Fagan, Ron Giere, Peter Godfrey-Smith, Lisa Lloyd, Angela Potochnik, Elliott Sober, Katie Steele, Bas Van Fraassen, Michael Weisberg, Bill Wimsatt and Eric Winsberg.

Required Materials

All reading materials are available either via Canvas or Marriott Reserve. There is a list of recommended books on reserve at Marriott Library. Some of our required readings will be taken from books on this list. Other books on the reserve list are recommended supplementary reading.
I recommend that graduate students buy a few books from this list. Consider buying:
Michael Weisberg Simulation and Similarity, which is one of the latest thorough treatments of models in science and Angela Potochnik Idealization and the Aims of Science.

Course Outcomes
By the end of this course, you will be able to:
Identify positions in recent philosophical discussion of scientific models.
Apply various philosophical methods to cases of modeling in science.
Use elementary versions of some technical methods in philosophy including probability theory, decision theory and game theory.

These outcomes will be assessed via essay assignments, at least one in class presentation and contributions to in-class discussion.