

PHI 322.001 Inductive Logic and Probability

Fall 2007

Classroom: BEH 224
Class Time: MW 11:30-12:45
Instructor: Dr. Alan Rhoda
Office: CDC 422
Office Hours: By appointment. I'm pretty easy to reach except on Fridays and weekends.
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Course Description

Inductive reasoning is essential to any systematic endeavor to learn about the world we live in. Unlike deductive reasoning, by which we trace out the consequences of what we *already* understand, inductive reasoning allows us to *extend* our knowledge and understanding. As a result, however, inductive reasoning is inherently *risky*. At best it can give us probable theories, not absolute certainties. That's why probability theory is such a vital tool for analyzing and modeling inductive reasoning. Inductive logic is simply the application of probability theory to inductive reasoning.

Understanding how to work with the mathematics of probability theory is an important skill for philosophers generally, and especially those who are interested in philosophy of science, epistemology, and philosophical logic. As this is a philosophy class, we will only spend a part of the semester (about half) learning the mathematics of probability theory. During the balance of the semester we will focus on philosophical issues concerning the nature of probability, decision theory, the justification of inductive reasoning, and (time permitting) the role that explanatory considerations play in inductive reasoning. In particular, we will spend several weeks looking at Hume's skeptical challenge to induction and explore various lines of response.

There will be two in-class midterms on the mathematics of probability theory and an in-class essay final on the justification of inductive reasoning and possibly on inference to the best explanation. I will regularly assign practice exercises. These will not be graded. During the second half of the semester, you will be asked to submit three précis (short summaries) of articles dealing with the justification of inductive reasoning.

Course Texts

Ian Hacking, *An Introduction to Probability and Inductive Logic* (required)
Wesley C. Salmon, *The Foundations of Scientific Inference* (required)
Peter Lipton, *Inference to the Best Explanation* (recommended)

Summary of Course Requirements

Exams (3 @ 20% each)	60%
Précis (3 @ 10% each).....	30%
Participation	10%

Borderline grades will be decided at the discretion of the instructor on the basis of attendance, participation, general comportment, and progress throughout the course of the semester.

Participation

The success of this class depends to a great extent on your attendance, preparation, and involvement in class. I'll take role at the beginning of each class to track attendance. Every *unexcused* absence after the second will result in a 1% reduction of your final grade. Showing up late or leaving early will lower your participation grade and may be counted as an unexcused absence. As for preparation, you should do the assigned readings and work through the exercises *before* class and be prepared to discuss them.

Excuses and Late Work

Excused absences and time extensions for exams and papers will be given only in the case of serious illness or other extenuating circumstances (death in the family, religious holiday, etc.). In *all* cases, appropriate documentary evidence (note from a doctor on official stationary, a funeral program or bulletin, etc.) must be produced by the student. The maximum extension *for any reason* will be one week from the original due date.

Students with Disabilities

If you have a documented disability that may require assistance, you should contact the Disability Resource Center (DRC) located in the Student Services Complex, room 137. You can contact the DRC at 895-0866 (Voice), 895-0652 (TDD), 895-0651 (Fax), or via the Internet at <http://www.unlv.edu/studentlife/drc>.

Schedule

Note: This is a *guideline only*. I reserve the right to revise this schedule as we go. If you miss a class for any reason, you should check my website (<http://www.alanrhoda.net>), where I keep a running log of readings and assignments and links to supplementary materials.

Week	Topics / Readings	
	Monday	Wednesday
8/27 – 8/31	Course Introduction; What is “Inductive” Logic? (Hacking, ch. 2)	The “Possibility Space”; Randomness and Independence; Counting Possibilities (Hacking, ch. 3)
9/3 – 9/7	No class (Labor Day)	Elementary Probability Ideas (Hacking, ch. 4)
9/10 – 9/14	Conditional Probability (Hacking, ch. 5)	The Basic Rules of Probability (Hacking, ch. 6)
9/17 – 9/21	Bayes’ Rule (Hacking, ch. 7)	Expected Value (Hacking, ch. 8)
9/24 – 9/28	Exam #1 (on Hacking, chs. 2-7)	Maximizing Expected Value (Hacking, ch. 9)
10/1 – 10/5	Decision Under Uncertainty (Hacking, ch. 10)	Theories of Probability (Hacking, chs. 11 & 12)
10/8 – 10/12	Theories of Probability (Salmon, pp. 63-96)	Personal Probabilities and Coherence (Hacking, chs. 13 & 14)
10/15 – 10/19	Learning from Experience (Hacking, ch. 15)	Exam #2 (on Hacking, chs. 2-14)
10/22 – 10/26	Stability and Normal Approximations (Hacking, chs. 16 & 17)	Significance Testing and Confidence Intervals (Hacking, chs. 18 & 19)
10/29 – 11/2	The Skeptical Problem of Induction (Hume, <i>Enquiry</i> , sec. IV; Salmon, pp. 1-11)	Responses to Hume: (A) Deductivism (<u>Popper</u> , “ <u>Conjectural Knowledge</u> ”; Salmon, pp. 21-27)
11/5 – 11/9	Responses to Hume: (B) Reliabilism (<u>Van Cleve</u> “ <u>Reliability, Justification, and Induction</u> ”; Howson, “Reliabilism”)	Responses to Hume: (C) Inductivism (<u>Max Black</u> , “ <u>Inductive Support of Inductive Rules</u> ”; Salmon, pp. 11-21)
11/12 – 11/16	No class – Veterans’ Day	Responses to Hume: (D) Categorical and Synthetic A Priorism (Salmon, pp. 27-40; other readings TBA)
11/19 – 11/23	Responses to Hume: (E) Uniformitarianism / Postulationism (<u>Russell readings</u> ; Salmon, pp. 40-48)	Responses to Hume: (F) Conditional A Priorism and Probabilism (<u>Reichenbach</u> , “ <u>The Pragmatic Justification of Induction</u> ”; Salmon, pp. 48-56)
11/26 – 11/30	Responses to Hume: (G) Methodological Justification (Rhoda, “Inference in Perspective”)	Responses to Hume: (G, cont.) Methodological Justification (readings from Peirce and possibly others; details TBA)
12/3 – 12/7	Inference to the Best Explanation (Lipton, ch. 4)	Inference to the Best Explanation (Lipton, chs. 9 & 10)
12/10 – 12/14	Final exam: Wednesday, December 12, from 10:10–12:10	