Phil 494-001, MWF 9:00: 9:50
Fall 2012
Montana State University
Wilson 2: 115
Email:psb@montana.edu

Instructor: Prasanta S. Bandyopadhyay
Office: 2-148 Wilson Hall
OH: MFW 10-11:50 or by appointment
Phone: 994-5212(O), 522-0269(H)

Epistemology of Science: A Bayesian Approach

Testing of a theory or what is often called the "confirmation of a theory" arises when a piece of data confirms a theory relative to some background information and auxiliaries. This is a descriptive issue concerning theory testing different from its normative issue in which philosophers are typically interested. Consequently, we, as students of philosophy, often ask, "When *should* a theory be declared confirmed by data?" Another allied question could be, "what are the conditions a theory of testing should obey so that it can be regarded as the correct account of testing? Strictly speaking, these questions belong to the domain of the "meta-theory" of theory testing. Various meta-theories have already been proposed. Some of them are Bayesians, while the rest of them are non-Bayesians which include, among other accounts, error-statistical account, and the Akaikean Information Criterion-based account. The presence of different schools of theory testing shows strong disagreements among philosophers about the correct methodology of the practice of science. I am myself interested in developing a specific version of a Bayesian theory of confirmation that addresses the relationship between competing theories, data, background information, and auxiliaries. To understand in depth the issues confronting an account of theory testing, we need to familiarize ourselves with some "logic" of theory testing as it offers tools and guidance regarding how to appreciate the connection between competing "theories", "data" "background information" and "auxiliaries". So we will begin with some elementary deductive logic and probability theory. There is no text book for this course as the entire course will be devoted to assessing critically different articles in this area. My website (prasantabandyopadhyay.com) will contain some of my papers. Details of the papers we will be reading for the seminar are provided below:

Week(s)	Readings	Availability
	Introduction to the course	
Aug: 27-31	Rosenberg:	Renee Library
	(i) "The Epistemology of Scientific	(E-reserve)
	Theorizing"& (ii) Godfrey-Smith	Same as above
	"Induction & Confirmation"	
Sept: 5-7	Deductive Sentential Logic	Same as above.
Sept: 10-14	Logic & Probability Theory	Same as above
Sept: 17-21	Basic ideas of Bayesian Epistemology	Handouts
Sept: 24-28	Belief & Beyond: Our Bayesian Type	My website
	Bandyopadhyay & Taper	
Oct: 1-5	Epistemology of Science:	
	A classic non-Bayesian approach	
	Popper: "Conjectures and Refutations"	Renee Library
		(E-reserve)\
Oct: 8-19	Epistemology of Science: Logical Empiricism and its Defects	
	(i)Godfrey-Smith: "Logic plus Empiricism"	Renee Library
	(ii) Quine: "Two Dogmas"	(E-reserve)

	(iii) Laudan: "Demystifying Underdetermination"	Same as above.
	(iv) Bandyo-Bennett & Higgs "How to undermine Underdetermination?'	My website (To be posted)
Oct: 22-Nov2	Shifting Paradigm: Is there a Logic of Epistemology of Science?	
	(i)Kuhn: "The nature & necessity of scientific revolutions"	Renee Library (E-reserve)
	(ii) "Logic of discovery or psychology of research?"	Same as above
	(iii) "Objectivity, value judgments & theory-choice."	------
Nov: 5- 14	Epistemology of Science:Non-Bayesian objections to Kuhn & Quine	
	(i) Mayo: "Ducks, Rabbits, & Normal Science"	Renee Library
	(ii) Mayo: "Severe Tests & Methodological Underdeterminations"	Renee Library
	(iii) Sober: "What is the problem of simplicity?"	Elliott Sober's Home page
	(iv) Sober: "Parsimony"	Same as above
Nov: 16-19	Epistemology of Severe Test: A Bayesian Account	
	Bandyo-Brittan: "Acceptance, Evidence, & Severity"	My website
Nov: 26-30	Epistemology of Science in a Holistic Way	
	(i) Quine: "Two Dogmas"	Renee Library
	(ii) Bandyo & Brittan: "The Duhem-Quine Thesis"	My website
Dec: 3-7	Epistemology of Science: A Recap	
	(i) What lessons have we learned?	
	(ii) Final paper due on 5th December	

Required Work for Students

Three short papers (about 3 pages each) & a final paper (about eight to ten pages due on 5 December). 10 x 3 = 30 points + 30 points = 60 points. (2) At the end of each week (except for those who are presenting that week), each student is supposed to submit a one page summary of that week's reading. There is no grade for it. If you don't turn them in then you will receive -3 for each non-submission. (3) You need to have one presentation during the semester. It will carry 20 points and (4) a lively interest in the problems discussed in the class is required. Your class participation is worth 20 points of the course.

Three Paper Topics:

(i) Is there anything distinctive about Bayesian School of testing/epistemology? What do you think about it? (Due at the end of Sept) (ii) What is the Popper-Kuhn controversy about scientific methodology? What is your stance toward it? (Due at the end of Oct) (iii) What is or are the debates over simplicity being a criterion of theory-choice? What is your stance toward the debate? (Due before 20 Nov) Your final paper could be a revised version of any of your three papers or it could be a *new* topic about which you are excited. Please check with me about your favorite final paper topic.