

## Philosophy 220 – Philosophy and the Sciences – Fall 2014

### Elliott Sober and Hayley Clatterbuck

This is a first course in philosophy of science, aimed at undergraduates who are interested in science. There are no prerequisites. The course helps fulfill Humanities and Social Science distribution requirements. The goal of the course is to understand what makes science tick. The course is divided into four sections. The first concerns the ABCs of deductive logic and probability reasoning. The second addresses the question “what is science?” as it pertains to the on-going conflict between evolutionary biology and creationism/intelligent design. The third involves a survey of some standard topics in philosophy of science – the justification of inductive reasoning, the nature of explanation, the question of whether scientific evidence ever supports claims about unobservable entities, and the difference between normal scientific change and scientific revolutions. The fourth topic concerns the role of ethical and political values in scientific practice.

#### Requirements:

Attendance at all lectures and at your scheduled weekly section, and participation in discussion, are required and will affect your grade. There will be two in-class exams and two essays. Each essay will be on an assigned topic and should be 4-5 double-spaced pages. Some brief writing projects will be assigned in sections. There may be unannounced quizzes. Completion of all assignments is a requirement for passing the course.

#### Office Hours:

ES’s office hours are W 1:15-3:15, or by appointment, in 5199 Helen C. White Hall.  
HC’s office hours are M 11-12 and Th 2:30-3:30, in 5172 Helen C. White Hall.

#### Books available at University Bookstore (and on reserve at College Library):

Ian Hacking, *An Introduction to Probability and Inductive Logic*, Cambridge University Press, 2001. (= H)  
Samir Okasha, *Philosophy of Science – A Very Short Introduction*, Oxford University Press, 2002. (= O)  
Heather Douglas, *Science, Policy, and the Value-Free Ideal*, University of Pittsburgh Press, 2009. (= D)

#### Schedule of Readings and Assignments

Week	Dates	Topics	Readings
1	9/2-9/4	Logic	H (ch 1-2)
2	9/9, 9/11	The ABCs of probability	H (ch 3-7)
3	9/16, 9/18,	Decision theory	H (ch 8-10)
4	9/23, 9/25	Probability as rational credence	H (ch 11-15)
5	9/30, 10/2	Probability as frequency	H (ch 16-19)
6	10/7	<b>First Exam</b>	
6	10/9	The Design Argument	Paley, excerpt from <i>Natural Theology</i> ; Sober, handout.
7	10/14,10/16	The Demarcation Problem	Hansson, “Science and Pseudo-Science,” Stanford Encyclopedia of Philosophy (on-line); Wikipedia article on “Demarcation Problem”; O (ch 1)
8	10/21	McLean v Arkansas	Michael Ruse, “Witness Testimony Sheet, McLean v Arkansas”; Larry Laudan, “The Demise of the Demarcation Criterion”; Michael Ruse, “Pro Judice.”
8	10/23	Irreducible complexity, ID, and Creationism	Wikipedia article on irreducible complexity; Sober, “What’s wrong with ID?” (on my web site); Judge Jones’s opinion in <i>Kitzmiller v Dover Area School District</i> .
9	10/28	<b>First Essay Assignment Due</b>	
9	10/28, 10/30	Problem of Induction	O (ch 2); H (ch 20-22)

10	11/4, 11/6	Explanation	O (ch 3); Woodward "Explanation" in <i>Stanford Encyclopedia of Philosophy</i>
11	11/11, 11/13	Scientific Realism	O (ch 4); Chakravartty, "Scientific Realism" in <i>Stanford Encyclopedia of Philosophy</i> (sections 1-3)
12	11/18, 11/20	Scientific Change and Revolutions	O (ch 5)
13	11/25	<b>Second Exam</b>	
14	12/2	Science Wars and Science Advisors	D (ch 1-2); O (ch 7)
14	12/4	The Value-Free Ideal and Moral Responsibilities of Scientists	D (ch 3-4)
15	12/9	Values in Science and Objectivity	D (5-6)
15	12/11	Integrity of Science, Values in Practices	D (7-8)
<b>Second essay due on day of scheduled final</b>			