Scientific Reasoning

PHI 152 (Spring 2020)

Professor:	Dr. Christopher Eliot, Associate Professor of Philosophy
Office:	104F Heger Hall (516-463-4516)
Office hours:	Mon 10:40–12:40, Wed 2:30–3:30 and by appointment
Email:	Christopher.Eliot@hofstra.edu (Christopher.H.Eliot@hofstra.edu also works)
Texts:	Hacking, *Introduction to Probability and Inductive Logic*, and see below
Course site:	https://chreliot.github.io/phi152/
Course time & place:	Mon & Wed 9:05–10:30 in CV Starr Hall 0304

Important dates:

First test/midterm exam:	March 11 in class
Second test/final exam:	May 13 8:00–10:00 in our classroom

What we're doing here:

How can we, or anyone, get from questions to data to knowledge? Behind scientific knowledge are patterns of reasoning, some of which are native to science and some of which we can find elsewhere. It's common to refer to these patterns of reasoning as "the scientific method." But scientists use many patterns of reasoning, some of them quite different from others, and it's not clear that they are usefully described as a single "method." This course takes a broad view of scientific methods and patterns of reasoning, while examining in some specific cases how they go well when they go well, and also how they can go poorly. Taking an approach that is both conceptual and practical, we will examine the history of ideas about scientific reasoning, deductive and inductive logic, the use of probability ideas, the goals of statistics, some ways of recognizing causation, and interesting cases of actual scientific reasoning (both successful and not so much).

Course goals:

My goals for this course, as the instructor, are that you:

1. become familiar with some significant questions, concepts, and positions in philosophical discussions of scientific reasoning;
2. develop practical skills at analyzing reports about science in a nuanced way;
3. develop understanding of concepts involved in accounts of how scientific reasoning and scientific method work;
4. develop your skills at and comfort with formulating productive questions, especially about science and scientific reasoning;
5. develop your skills at participating comfortably and productively in academic discussion;
6. develop your skills at explaining ideas clearly.

Course requirements:

1. You will need to **access the texts** (see below) and figure out your strategy for reading them. Reading assignments will be listed on the course site (https://chreliot.github.io/phi152/) under associated "Topics." The topic pages will tell you which of these four places you can find them:
    a. Hacking's book *Introduction ot Probability and Inductive Logic*;
    b. linked directly from the course site;
    c. posted to Blackboard under the Course Documents button;

   d. posted to Ares Electronic Reserve, accessible through Blackboard.

2. You are expected to **read**, and **be prepared to discuss**, the assigned texts. You will receive a participation grade which figures in both your contributions to class and the apparent preparedness reflected in them. Participation is not mere attendance; it involves volunteering contributions. I may even call on you and expect you to have something relevant to say. Though presentations will help explain the readings, you cannot expect to understand our discussion without reading yourself. Much of the point of our meeting in person is that you bring you be able to engage *your independent scholarship* with that of other scholars—your peers and me. Obviously, that requires having both read and digested the text. Do it.

3. You are expected to **attend** the class sessions. I will be taking attendance regularly, at or after each session. Arriving late counts as half an absence. Absences beyond 2 will reduce your grade by .2/4 More than 2 sessions of missed attendance will be factored into your participation grade. You *do not* need to contact me about being absent! However, if you have doctors' notes or excuses from Hofstra officials, keep them on file until the end of the semester, in case you need to show why you had more than 2 absences.

   Also, since you will be responsible on tests for knowing what happened in class even if you did not attend, it may be helpful to figure out someone in the class you can ask. I can tell you what topic we discussed in class, but I can't repeat the lecture or discussion or email notes. I don't have notes that would make sense to you. Others might.

4. You will need to figure out a strategy for **taking useful notes**.

5. **Electronic devices** may be used in class only to take notes, to access course materials, and occasionally to look up other information. Using them demands extra attention; see the participation rubric.

6. You will need to complete about eight short **assignments**. These will consist of problems or brief analyses. Assignments will need to be uploaded through Blackboard, through a link under the Assignments button, unless the instructions say otherwise.

7. You will need to attend and take a **first/midterm test** and a **second test/final exam** at the end of the term. The final will be comprehensive, but will emphasize the second half of the course. For each test, I will post a list of questions in advance, from which the actual test will be drawn. There will therefore be no questions on the tests which you have not seen in advance. The second test will cover the entire course but will strongly emphasize the second half. (At the test, bathroom breaks will not be permitted. Make-up final tests will not be permitted except under limited circumstances and arranged well in advance. Please make any travel plans accordingly.)

8. Finally, I always hope this goes without saying and am occasionally disheartened to find that it doesn't: I ask you to **be respectful** of the business of the class during class sessions. In this course it is acceptable drink or eat quietly during class, but please do not distract yourself and others by messing around, loudly chomping Doritos, etc. Especially as this will be a small discussion course, I expect focused engagement from you. That involves not only not nodding off and not engaging in distracting side-conversations, but also being sensitive to the need to make room for as many students' contributions as possible.

Evaluation:

I would prefer to teach entirely without grades, but their existence has various kinds of value for you. So we have them. Here is where yours come from:

To the degree it is practically feasible, I evaluate your work anonymously, to eliminate unconscious biases and approach objectivity. (Obviously, under certain circumstances, it is not practically feasible.) Your grades will be calculated according to the University's standards, relative to course expectations, and relative to other members of the class. This does *not* mean your grade will be "curved" to a mean score, but it may be adjusted upwards depending

on overall class performance. That is, you will earn at least the score you deserve according to University standards, but also one related to how other students performed. Assignments and tests/exams will be graded using a 4-point scale. "Incomplete" status will also not be given automatically, nor in the absence of a compelling, written request.

Your grade will be calculated as follows:

Participation	15%
Assignments	30%
First Test	25%
Second Test	30%

I will circulate partial/preview grades for participation at the one third and two thirds marks, so you have a sense of how I think it's going. Grades for writing assignments and tests will be converted to Hofstra's 4-point scale before calculation.

4 = **A** represents exceptional work.
3 = **B** represents superior work.
2 = **C** represents satisfactory work.
1 = **D** represents below-satisfactory work.

Instructor's own academic honesty policy:

Representing someone else's work as your own, or any other form of scholastic dishonesty (as defined by the University), will automatically earn you an F for the course, beyond the required dishonesty form. So this is the key point you should internalize now: If you ever find yourself in circumstances where it seems reasonable to be dishonest, please come discuss what we can do about the circumstances instead. You will find that while *after* I've detected scholastic dishonesty, the outcome is severe and automatic, *beforehand* I try to be as helpful as possible.

Syllabus adjustments:

Unexpected events can lead to changes in the schedule and syllabus. However, it's important to me that you not feel that the rules have changed on you mid-stream, so, if any changes are necessary, I will make them as fair as possible.

Contacting me:

The best way to contact me is by email; I check it regularly. If you have a quick question, often we can take care of it by email. But if you need more help, don't hesitate to visit my office hours, listed above, or ask (in person or by email) to set up another mutually-convenient time. Phoning is not a reliable way to reach me.

General university policies:

The page at this URL describes university policies about academic honesty, student access services, university-wide deadlines, incomplete grades, discriminatory harassment, relationship violence, sexual misconduct, and absences for religious observances: http://www.hofstra.edu/about/administration/provost/provost-hofstra-policies.html

Final thought:

Inevitably, grades are a function of performance, not of effort in itself. I can't reasonably assess effort. What's challenging varies from student to student. You will need to figure out what *you* need to do to perform well. I will try to help you with what's hard for you, if I know you need help. In the end, you are responsible for your education, however, and if you are confused, you should ask a question, or I will assume you understand. Unless you discuss them with me in person or by email, I will also likely not be aware of any dissatisfactions you have with any aspect of the course. I hope you will not be dissatisfied. I think this material is fun and useful, and believe an important part of my job is trying to show you why it is.