

History and Philosophy of Science

Professor Matthew J. Brown

Spring 2016

Course Information

Course Number: HIST 3328.001 / PHIL 3328.001

Official Course Title: History and Philosophy of Science and Medicine

Meeting Time and Location: Monday & Wednesday, 4:00pm-5:15pm, SLC 2.303

Professor Contact Information

Email Address: mattbrown@utdallas.edu

Office Phone: 972-883-2536 (unlikely to answer outside office hours)

Office Location: JO 4.120

Office Hours: Monday 5:30-6:30pm and Thursday afternoon TBD

Appointments: Sign up for appointments via <http://doodle.com/mattbrown>

Course Description

Science plays an enormously influential role in our society. As a social institution, it commands enormous respect and social influence, as well as vast sums of funding. It produces results that are greatly sought after, for both good and ill. At the same time, science generates great controversy when it collides with various religious, economic, and educational agendas. The adjective “scientific” garners almost immediate respectability to whatever it is applied, and, in some circles, it is a prerequisite for being taken seriously. Yet to many it also bespeaks alienation, abstraction, and a void of meaning, useless in our attempt to understand values. Some even deride science as mere ideology and power-mongering, as sexist, racist, or elitist.

Science is open to interpretation and critique; as a result, it stands in need of explanation, elaboration, justification, limitation, or change. History and philosophy of science attempt to understand how and why science works, to explain its successes and occasionally uncover its failures, to interpret its results, and to discover, what, if any, are its limits. Historians and philosophers of science also try to situate science in the broader scheme of human activities and social institutions, and to understand the way in which our particular cognitive, social, political, and moral situation impacts its development.

In this course, we will focus on six key texts in the history and philosophy of science, some classics in the field, others more recent but nonetheless landmark work. Through these texts, we will try to better understand what counts as science and explore whether we can demarcate science from non-science or pseudo-science. We will ask what the aim of science is, what it is trying to produce. We will explore a variety of challenges to our common ways of understand how and why science works. We will explore the too-often ignored connections between the scientific process and our ethical and political values, attempting to determine whether and to what extent such human values play a role in science, and to what extent such a role is legitimate and compatible with the objectivity or reliability of scientific knowledge.

For the purposes of this course, we will construe science broadly to include natural and social sciences, engineering, technological development, mathematics, and medicine.

Student Learning Objectives

- Students will become familiar with the basics of how science works, both contemporary and historical, and the philosophic issues science raises.
- Students will demonstrate a knowledge of some major works in history and philosophy of science from 1962 to present.
- Students will be able to describe basic methodologies of historical and philosophical research on the sciences.
- Students will demonstrate effective written and oral communication skills.

Required Books

Books will be available at Off Campus Books, **not** the UT Dallas Campus Bookstore. Please purchase the editions ordered there or linked below.

- Thomas Kuhn, *The Structure of Scientific Revolutions*
- Paul K. Feyerabend, *Against Method*
- Nancy Cartwright, *The Dappled World: A Study of the Boundaries of Science*
- Hasok Chang, *Is Water H₂O? Evidence, Realism and Pluralism* (You can download a PDF through the UT Dallas library)
- Helen Longino, *The Fate of Knowledge*
- Heather Douglas, *Science, Policy, and the Value-Free Ideal*

Please do **not** get an alternative edition or eBook version. It is essential that you have the same page numbers as everyone else in the class, so we can read and refer to the texts together. I will check periodically to ensure you have the text. (For the Chang book, you may download and print the PDF version.)

Other Required Materials

- 3" × 5" index cards (for Discussion questions)
- Paper and writing implements (bring to every class)

Academic Calendar

1. 1/11 - Introduction
2. 1/13 - Kuhn 1 [Intro, Ch I-IV]
3. 1/18 - Martin Luther King Day - No Class
4. 1/20 - Kuhn 2 [Ch V-VIII]
 - Special Lecture: *Fire in the Blood*
5. 1/25 - Kuhn 3 [Ch IX-XI]
6. 1/27 - Kuhn 4 [Ch XII-XIII, Postscript]
 - Special Lecture: *Epidemics, Public Health and Race in Historical Perspective*
7. 2/1 - Against Method 1 [Frontmatter, Intro, Ch 1-4]
8. 2/3 - Against Method 2 [Ch 4-5]
9. 2/8 - Against Method 3 [Ch 6-8]
10. 2/10 - Against Method 4 [Ch 9-11]
 - Special Lecture: Adia Benton
11. 2/15 - Against Method 5 [Ch 12-15]
12. 2/17 - Against Method 6 [Ch 16-18]
 - Box Project: Report 1 Due
13. 2/22 - Cartwright 1 [Intro, Ch 1]
 - Midterm Exam (All Week)
14. 2/24 - Cartwright 2 [Ch 2-3]
15. 2/29 (Leap Day) - Cartwright 3 [Ch 4-5]
16. 3/2 - Cartwright 4 [Ch 7]
17. 3/7 - Chang 1 [Intro, §1.1]
18. 3/9 - Chang 2 [§1.2]
19. 3/14 - Spring Break - No Class
20. 3/16 - Spring Break - No Class
21. 3/21 - Chang 3 [§2.1-2.2]
22. 3/23 - Chang 4 [§3.1-3.2]
 - Special Lecture: Joan Slonczewski
23. 3/28 - Chang 5 [§4.1-4.2]
24. 3/30 - Chang 6 [§5.1-5.2]
 - Box Project: Report 2 Due
25. 4/4 - Longino 1 [Preface, Ch 1-2]
26. 4/6 - Longino 2 [Ch 3-4]
27. 4/11 - Longino 3 [Ch 5-7]
28. 4/13 - Longino 4 [Ch 8-9]

- Special Lecture: Maya Goldenberg
29. 4/18 - Douglas 1 [Preface, Ch 1]
 30. 4/20 - Douglas 2 [Ch 3-4]
 31. 4/25 - Douglas 3 [Ch 5-6]
 32. 4/27 - Douglas 4 [Ch 7-8]
 33. [5/9??] - Final Exam Period - Box Project Final Presentations

Assignments

1. The Box Project - Group project (84 points)
2. Midterm Exam (84 points)
3. Final Exam (84 points)
4. Attendance and participation (84 points)
5. Discussion Questions & Quizzes - Short, unannounced quizzes on previous week's ideas or this week's readings. (3 points each, 84 points max)
6. Reading presentation (optional) (20 points)
7. Special guest lectures (optional) (10 points each, 30 max)

Grading Scale

Total points divided by 100, converted to a 4.0 scale. I.e., 3.0 = B, 3.33+ = B+, etc. 4.2+ = A+
See <http://catalog.utdallas.edu/2015/undergraduate/policies/academic#gpa>.

Exams

Midterm and Final Exam will be administered outside of class, at the Testing Center. You will have one week to start the exam, though you will only have limited time to complete the exam once started. These will be closed-book, closed notes exams.

Attendance and Participation

While reading and writing are crucial parts of the course, a central part of intellectual activity is in-person discussion. There are things learned by engaging in face-to-face discussion that cannot be learned any other way. (Hence the continuing importance of talks and conferences in every academic field.) While class will occasionally involve bits of lecture, this is merely an instrument to a more well-informed discussion and other structured activities. **Attendance is thus considered mandatory**, as is participation in class discussions. Both the quality and frequency of your contributions to class discussions and activities will be assessed.

Absences and tardies will count against this grade. You are permitted 3 “free” absences. After that, each absence will subtract 10 points from this grade. There are no “excused” or “unexcused” absences – the free absences apply to everyone, and there are also extra points built into the syllabus. A failing grade in this area will result in a failing grade in the course. (See “Completion” policy below.)

Every day you are expected to come to class with the assigned text for the day, in the correct edition. You are also expected to have paper and writing implement in case of a pop quiz or in-class activity. Failure to bring the appropriate materials to class can be counted as an absence.

Discussion Questions & Pop Quizzes

You should bring a discussion question on a 3" × 5" index card, based on the reading. Make sure your name is on the card as well. Discussion questions should be detailed, specific, and engage in depth with the readings by asking an analytical, synthetic, or evaluative question. ("How?" or "Why?" rather than "What?" "When?" "Where?" or Yes/No questions.)

Each week, this grade will be determined by how many students bring in discussion questions:

- If greater than half the students attending brings a discussion question, everyone who brings a question gets full credit
- If less than half the students brings a question, I will give a pop quiz.

Quizzes are unannounced and cannot be made up. They are short and will be given at the very beginning of class; if you are late or miss it, the time will not be extended for you. There are extra points built into the syllabus that you can use to make up for missed quizzes.

Reading presentations

You may volunteer to do a brief (15 minutes or less) presentation on the day's readings. Such presentations will focus on the one idea you find most interesting in that day's readings. You should not only summarize the idea, but engage with it by providing an original argument about it, raising an objection to it, or posing a serious and specific interpretive difficulty about it.

Special Guest Lectures

Dates listed on the Calendar above. Usual lectures will be at 7:30pm on Wednesday. Limited opportunities to meet with lecturers on Thursday afternoons may also be possible. You must check in with me before AND after the meeting to receive credit. (You cannot arrive late or depart early.) Some alternatives may be suggested if your attendance can be verified.

Course and Instructor Policies

Safe Space

Sometimes, in humanities courses, we have to discuss difficult, sensitive, or controversial topics. Our conversations will be governed by two rules aimed to ensure everyone feels comfortable contributing to the discussion:

1. Do your best to speak respectfully, tactfully, and not to attack persons in or out of the class. Criticism should target texts and ideas, not persons or groups, and especially not people in the room. Be sensitive to how what you say can be heard.

2. Assume that everyone else is doing their best. Be generous with others' honest mistakes. We all make them occasionally. Assume that all contributions are made in good faith, and do your best to gently suggest ways of improvement.

These principles are not meant to preclude criticism, or convey the idea that everyone is equally right about such topics. Rather, they are meant to redirect discussion in order to foster a maximally inclusive, appropriately focused, critically rigorous investigation of our ideas about these topics, which is the best way we know to make progress in such areas.

Contacting the Instructor

Before you contact me, I suggest checking the syllabus, course website, and all handouts to see if the answer to your question is there. For more complex questions, you should see me in office hours or make an appointment. You can send me an email, but this is not a good way to get in touch with me about either trivial matters (which are almost certainly on the syllabus or best discussed in class) or difficult issues (which should be discussed in person). I will not accept work or provide feedback via email. Email has generated many unreasonable expectations in our lives that we should all think more critically about, and I encourage you to do so. Of course, you should feel free to email me to remind me about something, or if you need to contact me urgently (if, for instance, you will miss an assignment due to a dire medical issue). If I do not reply to your email within 48 hours, please send me a reminder.

Late Work, Make-Up, and Completion

No late work or make-up exams will be allowed without consent of the professor *prior to* the due/exam date, except in situations where University policy requires it, or in case of truly dire circumstances. *All non-optional assignments must be completed in satisfactory manner in order to receive a passing grade in the course.*

Cheating and Plagiarism

Don't do it! If you incorporate any work that is not your own into any project that you do, and you do not cite the source properly, this counts as plagiarism. This includes somewhat doing the work for you, taking work done by another student, verbatim copying of published sources, and *paraphrasing* published work without citation. Re-using work created for another course also counts as plagiarism in most contexts. Unless group work is *explicitly* permitted or required, it is expected that all of the work that you turn in is original and your own, and that any sources that you make use of are correctly cited.

If you are caught cheating or plagiarizing, it is absolutely mandatory for the instructor to turn you in to the Dean of Students Office of Community Standards and Conduct.

Class Attendance

Missed classes, beyond your initial allowance, will count heavily against your participation grade, and egregious absenteeism will be grounds for an **F** in the course at the professor's discretion. In-class assignments and activities likewise cannot be made up. Each tardy arrival or early departure will

count as half an absence, unless they are disruptive or extreme, in which case they will be considered absences.

Laptops and Other Devices

You should not use a laptop or tablet computer in this course during lecture or discussion, including for note-taking or reading purposes, unless you can demonstrate a compelling need for it. Likewise, you may not use a music player or headphones, unless they are attached to a hearing-assistive device approved by the instructor or the Office of Student AccessAbility. If you are given such an exception, it will be immediately and permanently revoked if you abuse the technology for off-topic purposes.

The use of such devices can be a distraction to your classmates and instructor and a detriment to your own learning. Readings should be brought to class in the print version or printed out. Notes should be taken on paper and scanned or transcribed after class (transcribing handwritten notes has been shown to be a fairly effective study method). Given the nature of the course, you should not have to take such copious notes as to require any extra speed afforded by typing them. This strict and paternalistic policy is a result of both personal experience and a close look at the psychological and pedagogical research on the pros and cons of electronic devices in the classroom. Across every measure, the evidence speaks against indiscriminate use of laptops in class.

Failure to abide by this policy the first time will result in a warning. The second time, it will result in being marked “absent” for the day. For certain activities in-class, the instructor may request you to bring a laptop or to take it out and use it for that specific purpose. These will be specified by the instructor.

Classroom expectations

You are expected to have **read the assignments before class**, and it would be to your benefit to also read them again after class. You are expected to **bring a copy of assigned readings** for each day’s class, and have them available to refer to. I will occasionally ask to see your copy of the text, to see that you are so prepared. You are expected to **listen respectfully** to the professor and your fellow students, and **participate** in class discussions and activities.

Clear failure to abide by these expectations will result in you being asked to leave the classroom and being counted absent for the day.

Tips on Forms of Address

It is appropriate and courteous to refer to your professors by the title of “Professor” or “Doctor” as in “Professor Brown” or “Dr. Brown,” though in some circles the latter connotes someone with an MD rather than a PhD. Unless you write for the New York Times, it is generally inappropriate to refer to your professor as “Mr.” or “Ms./Mrs./Miss.” (And unless they have specifically stated a preference for it, it is never appropriate to call an adult woman “Miss or Mrs.”) Having been educated in part in the informal academic climate of California, it would also be fine if you call me “Matt.” (Please don’t call me “Matthew,” only my mother does that.) Having also been educated in the South, I am fine being referred to in a formal fashion as well (and would be happy to refer to you formally if you prefer).

Guns on Campus

There has been some confusion about the new guns on campus law that was passed last year. The new law does not go into effect until August 1, 2016. Prior to that time, no weapons, including concealed handguns, may be brought into any university buildings, including classrooms and office spaces. Even after August 1, open carry is not permitted on campus.

University Policies

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus: <http://go.utdallas.edu/syllabus-policies>

A syllabus is not a suicide pact. This descriptions, timelines, and policies contained in this syllabus are subject to change in the interest of improving the quality of the course, at the discretion of the professor. Adequate notice will be provided for any changes.