STS-UY.3254 Philosophy of Science

Department of Technology, Culture and Society, NYU-Tandon

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T/Th 2:00-3:50pm
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I. Instructional Format: Instruction will be conducted in-class, unless circumstances require otherwise. Please be aware of the NYU policy on face masks at nyu.edu/life/safety-health-wellness/coronavirus-information/covid-related-guidance/protective-equipment.html. Masks are not required but are welcome. As a reminder, if you are ill or are exhibiting symptoms of illness (coughing, sneezing, runny nose, etc.), you should stay home until you feel better and your symptoms are gone. It's ok to miss one or two lectures in this class. These can be easily made up by discussing any missed content with me. On the other hand, if you find yourself in a situation in which you will have to miss more than a week of lectures, please see Section VII.3.ii below. I will periodically remind the class of these policies over the course of the semester.

II. Description: Philosophy of science is broadly divided into two subfields. The task of the first is to study the nature and methodology of science in general. The task of the second is to study the conceptual and philosophical foundations of particular fields within science. In this course, we will consider topics in the first subfield, including philosophical attempts to describe scientific explanations, laws of nature, and the process whereby theories in science are confirmed by evidence. We will also consider the nature of scientific theories: what they are, how they change, and how they can be interpreted. The objectives of the course are to be introduced to the major fields of study in contemporary philosophy of science and how it relates in particular to other approaches to the study of science and technology.

This is a 4-credit course that meets over a 15 week semester. You should thus expect to devote 6.6 hours per week of supplemental time for this course. Supplemental time is time outside of classroom instruction that involves reading assignments, writing, exam preparation, homework assignments, and study time. For additional information on NYU policies related to this, please see: https://www.nyu.edu/academics/accreditation-authorization-assessment/resources-faqs/required-weekly-minutes.html

III. Objectives

HuSS (Humanities and Social Sciences) General Education Objectives

Think critically, creatively and independently; demonstrate information literacy; demonstrate skills in inquiry and analysis; demonstrate effective oral communication skills; demonstrate effective writing skills; bring the perspectives of HuSS to bear on technical discourse; demonstrate ethical reasoning.

STS (Science, Technology and Society) Cluster Objectives

- Demonstrate a basic understanding of the following:
  - How sci & tech shape society (in historical, philosophical, sociological, cultural, and technical ways).
  - How social processes frame sci and tech enterprises, including theory construction, invention, and innovation.
  - The relation between the content of sci/tech knowledge, and the social context in which it is created.
- Demonstrate technical proficiency in a field in the natural sciences or engineering.
- Demonstrate ability to critically analyze and communicate issues involving interactions among sci, tech, & society.

IV. Required Reading: These are available in the Contents section in Brightspace. We will read [GS] and [K] in their entirety. We will read excerpts from [B] and [S].

1. [B] Bird, A. (1998) *Philosophy of Science*, Routledge.
2. [GS] Godfrey-Smith, P. (2003) *Theory and Reality*, Univ. of Chicago Press.
3. [K] Kuhn, T. (1996) *The Structure of Scientific Revolutions, 3rd Ed.*, Univ. of Chicago Press.
4. [S] Sismondo, S. (2010) *An Introduction to Science and Technology Studies*, Wiley-Blackwell.

V. Requirements: This course has two websites: A Brightspace website, brightspace.nyu.edu, accessible only to enrolled students, and a public website, https://research.engineering.nyu.edu/~jbain/philsci/index.html.

1. **One paper** of 5–7 pages. Suggested topics are posted in the Contents section in Brightspace.
   (a) The paper must conform to writing guidelines posted in the Contents section of Brightspace.
   (b) The paper should be submitted to the relevant link in the Assignments folder in Brightspace.
   (c) *Late paper policy*: There are no extensions on the due date. Late papers will be accepted but will be given a penalty of a third of a grade point for every period of 7 days after the due date. *Example*: An A paper turned in 1-7 days late will receive an A-; an A paper turned in 8-14 days late will receive a B+; an A paper turned in 15-21 days late will receive a B; *etc*. *Late papers cannot be accepted after the due date of the final.*
2. **Eight homework assignments**. These are posted in the Contents section in Brightspace. Please submit them by their due dates to links in the Brightspace Assignments folder. One optional extra credit assignment may also be submitted and will count towards your final homework grade.
   Submission format: The preferred file type is .pdf. Please label the file you submit using the following format:
   <assignment number>.<last name>_<first initial>.<file type>
   Example: Jon Bain's .pdf submission for homework #7 should be labeled:
   07.Bain_J.pdf
3. **One midterm** and **one final**. Each exam will consist of 8 short answer questions, of which you will be asked to pick 6 to respond to; and 3 short essay questions, of which you will be asked to pick 2 to respond to. A response to a short answer question should be no more than 1 paragraph in length (~3-4 sentences), and a response to a short essay question should be no more than 1 page in length (~3-4 paragraphs). Both the midterm and the final are take-home exams and should be submitted to the relevant link in the Assignments folder in Brightspace on their due dates. For the policy on makeup exams, please see Section VII.3.ii below.

VI. Grade Distribution: Homework: 25% total Midterm: 25% Paper: 25% Final: 25%

VII. Reminders on University Policies

1. **Inclusion Statement.** NYU values an inclusive and equitable environment for all students. I hope to foster a sense of community in this class and consider it a place where individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. It is my intent that all learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. If this standard is not being upheld, please feel free to speak with me.

2. **Moses Statement.** If you would like to request accommodations, please contact the Moses Center for Students with Disabilities (CSD) at 212-998-4980, mosescsd@nyu.edu, nyu.edu/csd, 726 Broadway, 2nd Flr. You must be registered with CSD to receive accommodations.

3. **Standards and Procedures**. The NYU-Tandon Office of Student Advocacy maintains a Community Standards and Procedures website at https://engineering.nyu.edu/life-tandon/student-life/student-advocacy. It contains information relevant to:
   (i) ***Incompletes***. It is NYU-Tandon policy that incompletes can be given only in extenuating circumstances (medical emergencies, accidents, *etc*.). An incomplete cannot be given because of a heavy course load, job commitments, or because you've simply fallen behind.

For this reason, you should attend every lecture and make sure you're aware of assignment deadlines and exam dates. If you find yourself falling behind during the semester, do not hesitate to contact me. If you think you qualify for an incomplete grade at the end of the semester, see the procedure in (ii) below.

(ii) ***Excuses due to illness or circumstances***. If you are experiencing an illness or any other situation, emotional or physical, that might affect your academic performance in a class (for instance, if you have to miss more than a week of lectures, or you think you qualify for an incomplete grade at the end of the semester), please email or schedule a visit with Deanna Rayment, Director of Student Advocacy and Compliance, Dibner Hall Room LC240, advocacy.tandonstudentlife@nyu.edu. Deanna is your official advocate at NYU-Tandon. (No other NYU school offers a similar service to its students!) She can reach out to your professor on your behalf when warranted. She can also advise you on all issues related to Health and Wellness. For legal and privacy reasons, you should not directly contact your professor with requests and concerns of this nature.

(iii) ***University Honor System***. Please be aware of the university policy on cheating and plagiarism in the Student Code of Conduct. Cheating on an exam, or plagiarizing on an essay assignment, are sufficient reasons for receiving an F in the course. The Code of Conduct can be downloaded from the Office of Student Affairs website listed above.

4. **Grading Policy.** The following is NYU-Tandon's grading policy for undergrad classes:

A	Excellent (4.000)	S	Satisfactory
A-	Excellent (3.667)	U	Unsatisfactory Progress
B+	Good (3.333)	W	Withdrew Officially
B	Good (3.000)	I	Incomplete (converts to F after 180 days)
B-	Good (2.667)	AUD	Auditor Status
C+	Satisfactory (2.333)	NR	No record
C	Satisfactory (2.000)	P	Passing
C-	Satisfactory (1.667)		
D+	Minimum Passing Grade (1.333)		
D	Minimum Passing Grade (1.000)		
F	Failure (0.000)		

VIII. Class Schedule

The following schedule may be subject to revision over the course of the semester. Reading assignments should be completed by the date on which they appear.

1	**Tues 9/3.** *Introduction* [GS] Introduction	**Thurs 9/5.** *Intro, cont.* **hw1 due**
2	**9/10.** *Logic Plus Empiricism* [GS] Ch 2.	**9/12.** *Logic Plus Empiricism, cont.* [S] Ch 1
3	**9/17.** *Induction and Confirmation* [GS] Ch 3	**9/19.** *Induction and Confirmation, cont.* **hw2 due**
4	**9/24.** *Popper: Conjecture & Refutation* [GS] Ch 4**.**	**9/26.** *Kuhn: Immature Science* [GS] Ch 5; [K] Chs 1, 2.
5	**10/1.** *Kuhn: Normal Science* [K] Chs 3–5.	**10/3.** *Normal Science, cont.* [K] Postscript Secs 2 & 3. **hw3 due**
6	**10/8.** *Kuhn: Anomalies & Crises* [K] Chs 6–8.	**10/10.** *Kuhn: Revolutions.* [K] Chs 9–13; Postscript Secs 4–7; [GS] Ch 6
7	**10/15. No Class**	**10/17.** *Lakatos, Laudan, Feyerabend* [GS] Ch 7. **hw4 due**
8	**10/22.** *Sociology of Science: Merton* [GS] Ch 8; [S] Chap 3.	**10/24.** *Soc of Science: Strong Program* [S] Chs 5 & 6. **Midterm handed out**
9	**10/29.** *Actor–Network–Theory.* [S] Ch 8. **Midterm due**	**10/31.** *Actor–Network–Theory, cont.* **hw5 due.**
10	**11/5.** *Feminism, Science, & Technology* [GS] Ch 9; [S] Ch 7.	**11/7.** *Feminism, Sci, & Tech, cont.*
11	**11/12.** *Naturalism and Social Structure* [GS] Chs 10 & 11.	**11/14.** *Naturalism & Social Structure, cont.* **hw6 due**
12	**11/19.** *Scientific Realism* [GS] Ch 12, [B] Chap 4.	**11/21.** *Scientific Realism, cont.*
13	**11/26.** *Laws of Nature* [B] Ch 1. **Paper due; hw7 due**	**11/28.** **Thanksgiving Break**
14	**12/3.** *Laws, cont.*	**12/5.** *Explanation: Covering Law Account* [GS] Ch 13.
15	**12/10.** *Covering Law Account, cont.*	**12/12.** *Unifying and Causal Accounts* [B] Ch 2. **hw8; Final handed out (due Tues Dec 17)**