

Paper #2. Due Thurs Nov. 16.

General Instructions:

- (a) Respond to the following in an essay of no less than 5 pages and no more than 7 pages (not including title page and bibliography). Your essay should be typed, 10- or 12-point, double-spaced and spell-checked. Please submit a hardcopy of your paper in class on the due date, as well as an e-copy to Turnitin.
- (b) Your essay should conform to the guidelines for writing essays handed out in class. **Make Absolutely Certain that you have read and understood these guidelines before you attempt to begin writing your essay.** If you do not follow these guidelines, the grade for your essay will suffer!
- (c) Your essay must include a bibliography that minimally includes the relevant course readings. Your essay must use this bibliography as a source to cite for all claims and quotes you attribute to authors. If you do not include a bibliography that you cite for claims and quotes, the grade for your essay will suffer!
- (d) Please make use of Tandon's Writing Center if you have trouble with spelling and/or grammar. If your essay contains so many spelling/grammatical errors that a reader cannot comprehend what your claims are, then your grade will suffer as a result. Information about Tandon's Writing Center can be found at <http://engineering.nyu.edu/academics/support/polytechnic/writing>.
- (e) *Late paper policy:* Late papers will be given an initial penalty of 1/3 grade point, and a further penalty of 1/3 grade point for every period of 4 days after the due date. *Example:* An A paper turned in one day late will receive an A-; an A paper turned in 4 days late will receive a B+; an A paper turned in 8 days late will receive a B; etc. *Late papers will not be accepted after the date of the final.*

Specific Instructions:

The goal of this paper is to produce an STS analysis of a particular technological system. Choose one of the technological systems under (A), and then choose one of the STS approaches under (B) to analyze it. Make sure you address all the relevant points listed under the STS approach of your choice.

- Choose a *particular* technological system for your STS analysis, and not a general research topic. For instance, instead of writing on "wireless networks" in general, pick a particular network that is either already in existence, or is under development.
- You are encouraged to pick a technological system that you are familiar with, either from a class or a research project, or simply out of personal or professional interest. If you have an interest in a particular system that does not appear in the list below, please get my approval for it before beginning work.
- The section immediately following your introduction should be a *description* of the technological system. This description should provide the "technical specifications" of your system, and should be aimed at an educated audience (for instance your fellow engineering students) who understand basic engineering, science and math concepts, but may not have expert knowledge of your system. Your description should not take up more than a section of your paper. The remaining sections of your paper should be your STS analysis of your system.
- As much as possible, sources should be peer-reviewed publications, as opposed to popular media (newspaper articles, science journalism, trade magazines, etc.). For technologies currently under development, this may be difficult. If you do use popular media sources, make sure to do so in a *critically informed* way. If you do need to use online sources, be sure to follow the instructions on how to cite an online source in the guidelines for writing essays handed out in class.
- Finally, make sure to explicitly state which STS approach you are using in your introduction; address all the items under your approach; incorporate at least one (ideally all) of the relevant concepts into your analysis; and make use of at least one of the relevant course readings listed for your approach.

(A) Technological System (samples):

1. Network system (wireless, cyber security, etc.)
2. Robotic system
3. Material science system
4. Bioengineering system (protein stabilization, drug delivery, biochemical processes, etc.)
5. Nanotech system
6. Adaptive/assistive technological system
7. Modeling system (3d, mathematical, CGI, etc.)
8. Urban infrastructure system (subway, bicycle share, traffic regulation, hurricane protection infrastructure, etc.)

(B) STS Approach

1. Actor-Network Theory. Sismondo (2010, Chap 8); Callon (1986).

- (a) Identify a primary actor and two or more secondary actors, their goals, and the obstacles impeding these goals. At least one actor must be non-human.
- (b) Identify an obligatory passage point (OPP) associated with the primary actor.
- (c) Explain the negotiations in which the secondary actors are persuaded to identify with and then act out their roles, and that led (or potentially will lead) to the resolution of the OPP.
- (d) Evaluate the effectiveness of your ANT analysis.

Advise: It's important to identify the primary actor as the actor that sets up the OPP and convinces the other actors that they have to pass through it in order to achieve their goals. It's also important to identify goals and obstacles for every actor, *including* the non-human actor.

2. Social Constructivism. Sismondo (2010, Chaps 5-6); Casper & Clarke (1998).

- (a) Describe your technological system using an objectivist description (in which scientific facts are "absolute").
- (b) Identify those aspects of the objectivist description that are socially constructed.
- (c) Convince the reader that an adequate understanding of the technological system requires adopting the concept of heterogeneous engineering, in which both technological device and its social and cultural environments are simultaneously constructed.
- (d) Evaluate the effectiveness of your social constructivist analysis.

Advise: An important concept for this approach is *heterogeneous engineering*. Another important concept is *technological anti-essentialism*.

3. Ethnography. Sismondo (2010, Chap 10); Restivo & Zenzen (1982); Collins (1974).

- (a) Identify the relevant human communities associated with the technological system.
- (b) Identify the habitats and cultural norms associated with these communities.
- (c) Explain how the technological system arises from, and plays an essential part in, the interactions among these communities, their norms and their habitats.
- (d) Evaluate the effectiveness of your ethnographic analysis.

Advise: In this approach, you pretend to be an anthropologist and you study the relevant human communities associated with the technological system in terms of their value systems and norms. Important concepts are *technological anti-essentialism*, *inversion* and *tacit knowledge*.

4. Standpoint Epistemology. Sismondo (2010, Chap 7); Godfrey-Smith (2003, Chap 9); Martin (1991).

- (a) Identify the relevant set of values from a privileged viewpoint.
- (b) Identify the relevant set of values from a disenfranchized viewpoint.
- (c) Convince the reader that adopting the disenfranchized viewpoint accomplishes both normative *and* epistemological goals (i.e., it increases our understanding of the technological system, it empowers underrepresented groups, it furthers economic goals, etc.).
- (d) Evaluate the effectiveness of your standpoint analysis.

Advise: In this approach you take the viewpoint of a disenfranchized group, and you argue that it has a unique and desirable perspective on scientific knowledge that the dominant (privileged) group does not possess. Important notions include *technological anti-essentialism*, *tacit knowledge*, and *heterogeneous engineering*.

5. Cultural History. Sismondo (2010, Chap); Vincenti (1995).

- (a) Identify a typical "Whig" history account (one that subscribes to technological determinism and technological essentialism) of your technological system.
- (b) Explain in detail the sense in which the historical development of the technological system was not determined by objective technical facts, but rather by the social and cultural norms of the relevant communities.
- (c) Convince the reader, based on your historical analysis, that the technological system under consideration does not possess an "essence".
- (d) Evaluate the effectiveness of your cultural historical analysis.

Advise: Important concepts for this approach are *technological determinism*, and *technological essentialism*. You want to argue against both of these views, using your technological system as an example. Another important concept is *heterogeneous engineering*.