SS211 – ~~Environment, Science, and Technology~~
Understanding Technoscientific Controversies
Spring 2020
Weir 203
TR 9:30-10:45

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Course Description:
As widespread worries about the arrival of a post-truth era attest, many people have come to believe that our time is characterized by the demise of expertise. Such worries imply that if citizens could just learn to see and respect the facts, many of our most contentious political disputes would disappear and "common sense" policy solutions could be straightforwardly implemented. The point of this class is critically evaluate that sentiment and, ultimately, replace it with a far more nuanced and intelligent understanding of disagreement.

This science and technology studies course challenges students to think more carefully and critically about technoscientific environmental problems and controversies, such as climate change, vaccine hesitancy, genetic engineering, pharmaceutical drugs, and nuclear energy. Students will examine the cognitive, cultural, economic, ethical, political, and communicative roots of disagreement, learning to recognize that these issues are not solved by presenting a "balanced view" of both sides or by simply informing "ignorant" opponents. Students will apply these thinking skills in order to develop more productive and empathic solutions to tenacious and highly polarized public conflicts.

Pre-requisites/Co-requisites: None

Place in Curriculum: General Education Core requirement, Area 4 – Social Sciences

Course Learning Outcomes:
This course explores the political, economic, cultural, and technoscientific dimensions of contention. By the end of the course, it is anticipated that students will be able to: (1) Discern and describe how subjective judgements influence the outcome of scientific decisions about what to study, how to study it, and how to deal with uncertainty, (2) Recognize and articulate the moral, personal, and political commitments that shape ordinary citizens' seeming "rejection" of "mainstream" scientific positions, (3) Uncover the values underlying rhetoric that is purported to be just about "the facts", (3) Apply these skills in envisioning productive and democratic pathways toward solutions to wicked political problems

Program Learning Outcomes:
Students will: (1) Identify and communicate orally and in written language while attending to audience, purpose and context. (2) Apply strategies such as reading for main points; seeking key arguments, counterarguments, rebuttals; locating supportive documentation for arguments; reading from the perspective of different stakeholder lens; and rhetorically evaluate texts (3) Evaluate how well supported one's own arguments and those of others by quality sources and evidence; integrate support for their own claims with information from sources that are used and cited ethically and appropriately (4) Delineate a research problem or question. (5) Identify and gather information to address problem, and evaluate evidence and data for credibility (6) Develop

conclusions, solutions, and outcomes that reflect an informed, well-reasoned evaluation (7) Draw on historical and cultural perspectives to evaluate contemporary issues, modes of thought, and or modes of expression; Recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives (8) Discern the ethical and civic consequences of decisions and civilly engage with others when taking a position on those decisions

Course Requirements:

Required Texts:

For most weeks there will not be a specific assigned reading. Rather, students will be assigned a set of questions about a case and tasked to locate sources to that will enable them to answer those questions. Often PDFs of or URLs for suggested readings will be posted to Canvas.

Assignments

The structure of this course requires careful reading in preparation for engaged class discussion. Students will be expected to have explored and thought carefully about assigned cases or readings prior to that day's class. Students are strongly encouraged to do and discuss their homework with each other, which will both ease the workload and enhance their learning.

Students may miss no more than two classes without incurring a significant penalty to their attendance grade (full letter grade per day). Moreover, any absence will negatively affect the student's participation grade. Penalties can only be avoided by completing an additional reading and writing assignment.

This course consists of homework, class discussions, two papers, presentations, and a final group research project.

Participation: Students will be graded on their appearing prepared to discuss and respond to questions regarding that day's topic, which entails having spent time researching and, most importantly, thinking. Students who are shy or socially anxious are encouraged to contact the instructor if they are uncomfortable speaking in class; such students can electronically submit questions and comments for that day's discussion.

Students on their laptops or otherwise preoccupied with a digital device will receive a zero for that day's participation grade. Students are encouraged to take handwritten notes so as to avoid the alluring pull of email and other computerized distractions. Listening attentively but otherwise not participating will earn students a non-zero (but also non-passing: e.g., <50%) participation grade. Finally, students should put their phones on vibrate and keep them in their book bags or pockets.

Homework: Students will be graded on having conducted brief Internet searches, reading, and thinking about an assigned example or case of a technoscientific controversy. This will be evaluated via short Canvas submissions. These will sometimes be individual and other times as group discussions. These will be due one hour prior to the beginning of class.

Presentations: The first major assignment will ask students to each watch a different episode of the Netflix series *Exhibit A* (or a similar documentary). They will research the methods discussed in that episode and present their findings to the class as a group, completing individual pre- and post-reflections.

Students will also present as a pair for either the controversy review or the exploring disagreement assignment.

Controversy Review: Pairs of students will read a small number of sources (2-4) on a contentious scientific issue (approved by the professor), producing a 1500+ word written review. Each review will entail characterizing the controversy with respect to relevant complexities, methodological choices, uncertainties and underlying values without taking sides or presuming to know who is "right."

Exploring Disagreement: Pairs of students will read articles and/or explore online forums and social media in order to better understand why people come to divergent views about the same "facts" or even come to distrust the experts. They will record their findings in a 1500+ word written essay, characterizing the disagreement in terms of differences of worldview, moral foundation, personal experience, etc. without dismissing any one group as insufficiently knowledgeable.

Course Schedule:

VALUE IN SCIENCE - CONTROVERSIES

Tue Jan 14 – Review of Course & Syllabus – Introduction to Values in Science

Thu Jan 16 –What Should We Study? Who Decides?

Tue Jan 21 – How Should We Study It?

Thu Jan 23 – Biasing Assumptions and Questions.

Tue Jan 28 – Tradeoffs in Models -> Natural stream design Do human studies vs. animal models vs. epidemiology (Uncertain Hazards + Schrader-Frechette's chapter) + Climate change models

Thu Jan 30 – Standards of Evidence. Error and Inductive Risk. Homework *Exhibit A Episodes.*

Tue Feb 4 – Forensic Science: The Breathalyzer. Begin Research for Presentations. **[Turn in 1st Reflection]**

Thu Feb 6 – **Workshop Day – Gathering and Interpreting Evidence on Forensic Method**

Tue Feb 11 – Group Presentation Day I

Thu Feb 13 – Group Presentation Day II

[2nd Reflection Due Friday Feb 14th by 5pm]

Tue Feb 18 – (How) Should Scientists do Politics? [Have them research Tyrone Hayes and controversy over Atrazine. In-class: James Hansen. Discussion:]

Thu Feb 20 – How Should We Talk About Science? [What example for homework? Global warming, climate change, climate disruption? In class: Bacon and Choline; Admitting Uncertainty, "carbon free" "Carbon neutral"? Sustainability]

Tue Feb 25 – Involving the Public in Science. Who is an Expert: ACTUP **[Choose Paper I Topics]**

Thu Feb 27 – **[Film Day][Goodbye Mrs Ant][Homework: Research]**

Tue Mar 3 – Workshop Day I – Gathering Evidence & Interpretation

Thu Mar 5 – Workshop Day II – Writing

Tue Mar 10 – Presentation Day I

Thu Mar 12 – Presentation Day II

Turn in Controversy Review by Fri March 13th 5pm

Tue Mar 17 – [Spring Break]

Thu Mar 19 – [Spring Break]

UNDERSTANDING AND NAVIGATING DISAGREEMENT

Tue Mar 24 – What Matters in Life? Comparing Solutions to Climate Change: Abundance v. Austerity. Ex: https://www.earthisland.org/journal/index.php/magazine/entry/ecology-fast-and-slow/ Compare Ecomodernism and Degrowth as solutions to the perceived climate crisis

Thu Mar 26 - What is Nature? Fear and Dread. https://slate.com/technology/2017/07/how-fear-motivated-and-harmed-the-anti-nuclear-movement.html OR https://nymag.com/intelligencer/2017/07/climate-change-earth-too-hot-for-humans.html

What use is fear? Why do people fear some things rather than others?

Tue Mar 31 - Who Do We Trust? - Dow Breast Implants case

Discuss in Class: Why do some people turn to homeopathy rather than "standard" medicine? https://qz.com/1006387/women-are-flocking-to-wellness-because-traditional-medicine-still-doesnt-take-them-seriously/ https://www.nytimes.com/2006/02/03/health/when-trust-in-doctors-erodes-other-treatments-fill-the-void.html https://www.theatlantic.com/magazine/archive/2019/08/measles-as-metaphor/592756/

Thu Apr 2 - Our Moral Foundations. Haidt talk, have them think about a few issues?

Moral foundation vignettes downloaded.

Tue Apr 7 - How to Talk to Political Opponents https://www.politico.com/magazine/story/2019/01/27/climate-change-politics-224295

https://www.eurekalert.org/pub_releases/2019-06/eiac-mca061019.php

[Choose Topics for Paper II]

Thu Apr 9 - [Film Day]["The Vaccine War"]

Tue Apr 14 - Workshop Day I – Finding and Feeling Through Partisan Spaces

Thu Apr 16 - Workshop Day II – Interpretation of Evidence/Observations

Tue Apr 21 – Workshop Day III - Writing [Presentations, if Needed]

Thu Apr 23 – Presentation Day I

Tue Apr 28 – Presentation Day II

Papers due April 30th by 6pm.

[Finals Week]

Grading:
A = 100-93%; A- = 92-90%: B+ = 89-87%; B = 86-83%; B- = 82-80%; C+ = 79-77%; C = 76-73%; C- = 72-70%; D = 69-60%; F=<60%

Breakdown:
Attendance and Participation 20%
Homework 15%
Exhibit A Group Presentation & Two (2) Individual Reflections 15%
Controversy Review 20%
Exploring Disagreement Assignment 20%
Second Presentation 10%

Counseling and Disability Services:

Reasonable Accommodations
New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. To schedule an appointment, please call 835-6619.

Counseling Services
New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 835-6619.

Academic Honesty: New Mexico Tech's Academic Honesty Policy for undergraduate students is found starting on page 60 of the NMT Undergraduate Catalog, http://www.nmt.edu/images/stories/registrar/2014-2015_UNDERGRADUATE_Catalog_FINAL.pdf

New Mexico Tech's Academic Honesty Policy for graduate students is found starting on page 59 of the NMT Graduate Catalog, http://www.nmt.edu/images/stories/registrar/2014-2015_GRADUATE_Catalog_FINAL.pdf.

You are responsible for knowing, understanding, and following this policy.

Respect Statement: New Mexico Tech supports freedom of expression within the parameters of a respectful learning environment. As stated in the New Mexico Tech Guide to Conduct and Citizenship: "New Mexico Tech's primary purpose is education, which includes teaching, research, discussion, learning, and service. An atmosphere of free and open inquiry is essential to the pursuit of education. Tech seeks to protect academic freedom and build on individual responsibility to create and maintain an academic atmosphere that is a purposeful, just, open, disciplined, and caring community."

Potential Controversies to Review
Leaded Gasoline
BPA
Love Canal
Woburn, MA
Mercury
PCBs
Geoengineering (Iron Dumping)
rBGH
Ozone Hole
Acid Rain
Bt Corn
Climate Change
Cancer Alley
Atrazine
NFL and Concussions

Potential Disagreement Topics
GMO Crops/Pesticides/Organic Food
Vaccines
SIDs and "Safe Sleep"
Health Effects of EMFs/Wi-Fi
Minimalist Shoes (i.e., Five Finger)
Gun Control/Second Amendment

Driverless Cars/Automation
Minimum Wage Laws
Natural Gas Fracking
Keystone or Transmountain Pipeline
Biological roots of IQ/test score differences (i.e., race and gender)
Diets (Paleo, etc. Whether sugar or fat is the thing to avoid)
Negative effects of digital tech/video games on young people
Teaching evolution vs. creationism in schools
Nuclear power
Human Enhancement