

University of Toronto Scarborough
Department of Physical and Environmental Sciences
ESTC35H3 Environmental Sciences and Technology in Society
Monday 9-11am, IC320, Winter 2019

Instructor: Dr. Nicole Klenk
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1. Course Details

Course Description

In this course students will engage critically, practically and creatively with environmental controversies and urgent environmental issues from the standpoint of the sociology of science and technology (STS). This course will contribute to a better understanding of the social and political dimensions of the production and applications of environmental science and technology in society.

The lectures and class discussions will cover the following topics: urbanization, climate change, nuclear energy, ecosystem engineering, biotechnology and genetically altered foods, and other environmental 'hot topics' issues that may arise during the course.

Course Objectives

By completing this course, students will:

- (1) Learn about different perspectives on the role of science and technology in addressing environmental problems;
- (2) Gain a better understanding of how science and technology is (or is not) used in environmental decision-making and the politics of knowledge production and technology use to solve environmental problems; and
- (3) Practice necessary critical thinking and writing skills.

Attendance and Participation Policy

Because of the nature of the material covered in class, class participation is essential.

Textbooks

Stewart Brand. 2009. Whole Earth Discipline. Penguin Books.
James Smith. 2009. Science and Technology for Development. ZED Books.
Sheila Jasanoff. 2016. The Ethics of Invention. Technology and the Human Future. Norton & Cie.

2. Coursework and Assignment Policies

Grading Scheme

In this course you will write three assignments and participate in a class debate. Full details for the assignments are provided at the end of the syllabus.

Course Component	Value	Due
Assignment 1: Media analysis	25 %	February 4 th
Assignment 2: Rhetorical analysis	25 %	March 4 th
Assignment 3: Knowledge integration essay	25 %	April 1 st
Class debate	25%	Various dates

Class debates: Teams of 4 students will debate an environmental issue of their choice. The debate exercise has two components: (1) the debate and (2) the written component.

Each team will select 8-10 news articles that exemplify two very different perspectives on the issue.

Each news article must:

- refer to some scientific understanding of the issue;
- demonstrate a political leaning and present some policy options.
- the articles selected *must be news articles, not academic journal articles.*

Debate guidelines: Each team will have 10 minutes to argue about their two perspectives on the issue (each side of the issue gets 5 minutes to present arguments for their perspective and proposed policy options), followed by a 2-minute rebuttal (1 minute for each perspective). This will be followed by 3 minutes of questions from the audience. The instructor will enforce strict time limits for the debate.

Debate format		
	Side 1	Side 2
Round 1	5 minutes of arguments	5 minutes of arguments
Round 2	Rebuttal of Side 2's arguments: 2 minutes	Rebuttal of Side 1's arguments: 2 minutes
Round 3	Answer audience questions: 3 minutes	Answer audience questions: 3 minutes

Written component guidelines: Each team will also write and submit a 2-page outline of the various arguments they made during the debate, linking each of the points they make to the news articles that informs this point. There must be a clear connection between the news articles and the arguments made by each side of the debate.

Grading: Teams will be graded on the quality of their arguments, their ability to communicate arguments in a clear, concise, and compelling manner, their written summary of the debate, and the integration of the news sources in the debate.

Handing in Your Assignments:

Written assignments for this course are to be submitted via Quercus. Paper copies of the assignments will not be accepted.

Extensions

Students MUST submit a request for extension in ADVANCE of the deadline in order to receive a decision. For extensions of time beyond the examination period you must submit a petition through the [Office of the Registrar](#).

Please follow the University of Toronto procedure to be completed in order to be considered for academic accommodation for any course work such as missed tests or late assignments. Verification of Student Illness or Injury forms can be found on the [Office of the Registrar's webpage](#).

Late penalties

Late assignments will be subject to a late penalty of 10% per day (including weekends) of the total marks for the assignment. All assignments are due in class.

3. Academic Integrity

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's [Code of Behaviour on Academic Matters](#) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Please be sure to review the Code of Behaviour.

Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

Please avoid academic dishonesty, have confidence in your own ability to learn, and grow academically by doing your own thinking and writing!

4. Accessibility and Communication Policies

Accessibility: Students with diverse learning styles and needs are welcome in this course! In particular, if you have a disability/health consideration that may require accommodations, please feel free to the Accessibility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca

Communicating With You

The best way to communicate with me is during office hours. However, I also respond to student emails within two business days (Monday-Friday) and within business hours (9am-5pm). Please note that emails sent to me Friday after 5pm and during the weekends will be responded to on Monday during business hours.

5. Course schedule

Date	Topic	Content/Practice
Jan 7	Introduction	Introduce you to the learning outcomes of the course
Jan 14	Science in society: opportunities, risks and responsibilities <i>Workshop on media analysis</i>	News articles on Iron Fertilization Jasanoff chapters 1-2 Film: Fifth Estate Documentary <i>Ironman</i> , https://www.cbc.ca/fifth/episodes/2012-2013/ironman
Jan 21	Anatomy of urgent environmental problems and disasters	Jasanoff chapter 3 Brand chapter 1 Film: <i>This Changes Everything</i>
Jan 28	Opening-up and closing-down policy options	Article: Stirling 2008, Stilgoe et al 2013, Castree et al 2014; Moser et al 2010
Feb 4	Urban hopes and dreams *Assignment 1 due <i>Workshop on rhetorical analysis</i>	Brand chapter 2 and 3 Articles: Smaje 2011, Rees and Wackernagel 1996
Feb 11	Nuclear Energy	Brand chapter 4 Munster and Sylvest 2015, Vainio et al 2016, Wynne 1996 Ted Talk: https://www.ted.com/talks/debate_does_the_world_need_nuclear_energy
Feb 18	Family Day/Reading week	
Feb 25	Genetic engineering <i>Class debate</i>	Brand chapters 5 and 6 Jasanoff chapter 4 Skogstad 2011, Shiva 1991 Ted Talk: https://www.ted.com/talks/pamela_ronald_the_case_for_engineering_our_food#t-151674

Date	Topic	Content/Practice
March 4	Geoengineering *Assignment 2 due <i>Class debate</i>	Brand chapters 7, 8, 9 Burger and Gunlach 2016,
March 11	Big Science <i>Class debate</i>	Smith chapters 1, 2 Jasanoff chapter 5
March 18	Mundane science <i>Class debate</i>	Smith chapter 3 Kammen and Dove 1997 Film: <i>Kitchen Stories</i>
March 25	Science and technology for whom and for what? <i>Class debate</i>	Smith chapter 4 Jasanoff chapters 6 and 7 Anadon et al 2015
April 1	Feral futures *Assignment 3 due <i>Class debate</i>	Smith chapter 5 Jasanoff chapter 8 and 9 Ramirez and Ravetz 2011 Ted Talk: https://www.ted.com/talks/charles_c_mann_how_will_we_survive_when_the_population_hits_10_billion

Assignment 1: Media analysis

Worth 25% of overall mark

Due February 4, 2019

Length: 8-10 pages including references to news articles

Formatting requirements: (double spaced, 12 point font, 1 inch margins)

In this assignment I would like you to write a research report on media coverage of genetic engineering.

You may choose to focus your assignment on Canadian media, or on another country's media, or international media. You are given a set of 5 articles that you need to incorporate in your report. In addition, you must find 10 other new articles that primarily seek to communicate science to the general public. In other words, please provide a reference list of 15 total news articles, but report on the 5 already given to you and at 10 additional ones.

Please look at the following research guide for media analysis:

<https://guides.library.utoronto.ca/ESTC35>

Learning objectives

This assignment is meant to teach you skills in critical thinking, knowledge integration, research and writing.

Report structure:

Introduction: describe what is at issue with genetic engineering.

Methods: describe how you searched for relevant media coverage on this issue: explain the scope of your search; keyword strings; criteria you used to select the articles in your review.

Results: report what emerging themes and trends you found within the media coverage with respect to the thematic/substantive content of the articles; the tone of the article; the position(s) taken on the issue; the use of science to inform the article; the objective(s) of the article.

Discussion: discuss how the issue of genetic engineering is being communicated in the media; what message(s) is the general public getting about the risks and benefits of the technology; what environmental issue is genetic engineering meant to address; the governance of this technology (who is responsible for regulating it and how well or poorly is it being governed); who may benefit from this technology and who is at risk from this technology; the extent to which the media coverage on this issue based on science and how can you tell if the scientific sources are credible and legitimate?

Conclusion: summarize your results and discussion, and provide some thoughts on how the media might be affecting how the general public perceives genetic engineering—whether it is deemed appropriate or not as a technology to address environmental problems?

Assignment 2: Rhetorical Analysis

Worth 25% of overall mark

Due March 4, 2019

Length: 8-10 pages

Formatting requirements: double spaced, 12 point font, 1 inch margins

Learning objectives

In this assignment you will demonstrate your ability to notice, explain and assess rhetorical features of a text, which will help you build your critical reading and thinking skills.

General directive

In this assignment, you are required to read, understand and conduct a rhetorical analysis of The Dark Mountain Project Manifesto. A rhetorical analysis examines how and why an author chose to write a text the way he/she has. A rhetorical analysis explains the target audience of and the potential motivations for writing the text, and describes the persuasive qualities of the structure of a text and its compositional techniques and figures of speech. In your rhetorical analysis you should critically assess the means by which the authors of each manifesto has tried to influence or persuade readers.

Steps

1. To begin your rhetorical analysis, construct a table of rhetorical features you will analyze and divide the table into two columns to help you distinguish between what the author wrote and why he/she wrote it in this way. For example, you may consider all or some of the questions in the worksheet below.
2. Develop your own thesis statement for your rhetorical analysis.
3. In your essay compare the rhetorical features of each text in a logical way. For example, you could start by identifying the author's main thesis, his/her purpose in writing this piece and his/her intended audience. Next, you could explain the rhetorical features of the text, the reason for their use and the extent to which they are effective writing strategies. Make sure not to simply summarize the rhetorical strategies the author uses often, but assess the extent to which they are compelling and effective.
4. Each paragraph should contain a strong topic sentence declaring the purpose of the rhetorical strategy you will discuss. The order of the paragraphs should be logical and support your thesis statement.

A rhetorical analysis is not a summary. In a rhetorical analysis you have to analyze and assess not only what an author wrote, but why he/she wrote it in a certain way.

Rhetorical Analysis Worksheet

What the author wrote	Why the author wrote this, and wrote it in this way.
What is the author's main thesis?	Why did the author choose this thesis to study?
What is the author's purpose? To inform, criticize, persuade? Some other purpose?	What seems to have prompted the writer to present this argument?
Who is the author's target audience? What academic discipline are they likely to come from?	Why did the author choose to write for this particular audience?
What is the author's background? What, if any, is the writer's history of work on this topic?	How does the author build his credibility with the target audience? In what ways does the author appeal to authority, emotion or logic? Does the author connect with the reader and if so, does this level of connection help the essay? Why?
Does the author consider opposing points of views? How does he present them?	What purpose does the presentation of opposing views serve?
What is the author's mode of writing? Description, definition, dialogue, cause/effect, compare/contrast, formal/informal?	Why did the author use this mode of writing? What features of the text make it a more persuasive argument? What parts are most appealing? Why?
Rhetorical devices	Does the author use rhetorical devices such as metaphor, simile, symbolism, humour, irony, parody? Why?

(Adapted from:

<http://writing.colostate.edu/guides/teaching/co301aman/pop7b13.cfm>; <http://tutorial.ncsu.edu/sites/tutorial.ncsu.edu/files/RhetoricalAnalysis.pdf>;

http://www.english.lsu.edu/English_UWriting/English1001Teachers/Assignments/item34042.html

Assignment 3: Essay

Worth 25% of overall mark

Due April 1, 2019

Length: 8-10 pages including references

Formatting requirements: double spaced, 12 point font, 1 inch margins

Choose one of the following essay questions:

A. What are the benefits and limitations of markets in promoting research aimed at solving social-ecological problems that are most prevalent in developing countries?

In your answer refer to the example of sleeping sickness in sub-Saharan Africa and integrate the perspective of Brand, Jasanoff and Smith (if they have one, either implicitly or explicitly articulated) on the essay question and following concepts in relation to the essay question:

- progress
- technological determinism
- justice
- responsibility
- gender
- local knowledge

or

B. What makes geoengineering more complicated to govern than GMOs or nuclear energy?

Refer to Brand, Jasanoff and Smith's perspectives on technocracy, sociotechnical risks and the governance of science and technology in addressing social-environmental issues in your answer.