

Department of Physical and Environmental Sciences  
PSCD-11 Communicating Science: Film, Media, Journalism, and Society  
2018 Outline

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Lecture time: Thursday, 7 pm to 10 pm  
Location: Instructional Centre (IC120)

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#### Description:

When it comes to science, the media, both in its traditional, and emerging forms play a key role in the global transfer of information. Potentially it is a vital bridge, mediating the gap between scientists and non-scientists, and enhancing the understanding of pressing environmental, social, and ethical questions. We live in a world where vital issues increasingly require an understanding of complex scientific and technical issues. The perennial problems of communication between specialists, and the rest of us, are complicated in our times by a highly polarized climate of scepticism towards institutions, perceived elites, and “fake news”.

How, can an understanding of complex issues in science be successfully communicated to a wider audience? How can we recognize “bad science” even when it’s being communicated brilliantly? How can we help others to do the same? These are just a few of the related challenges, all of which have pressing implications for the well being of our society. Finding answers to these questions is both more vital, and more difficult than ever. This course will use traditional (print, radio, film, TV) and new media (including blogs, vlogs, and Twitter) to explore the role of science and scientists in society, and the role of media in conveying issues. Students will engage with filmmakers, TV and radio producers, journalists, bloggers, and academics in order to understand their approaches, choices, and the constraints within which they they work.

### Course Objectives:

In this course, students will explore practical and theoretical issues around the role the media plays in communicating an understanding of developments in the sciences, and their implications in our daily lives. We will turn to filmmakers, radio and TV producers, broadcast executives, and others working in this field to gain an understanding of the inner workings, and real-world forces that shape their decisions at each step of the process. Our interest is learning how to communicate science more effectively, but also how to recognize “bad science” no matter how enticing the packaging.

My specific objective in this course is to provide students with a look “back stage” at the challenges, and choices involved in the production of science journalism (in the most ample sense — whether documentary film or Tweets) for a general audience. This simple objective raises many questions. Not least among them: what are the influences at play in the making of a science, nature, medical or environmental documentary? What about a vlog or radio broadcast? How are complex situations distilled into hour-long, narratives for a visually driven medium like film, or into 280 characters for a tweet? What is lost, and what is gained, in the quest to both tell the truth, and tell a good story? How are decisions made in the contest between accuracy and simplifying — that slippery slope to “dumbing down”? Given limited broadcast hours, and the demand for ratings, how do broadcasters decide what subjects will actually get covered?

Each session of Communicating Science will focus on a particular theme (nature, medicine, mathematics, etc) and a particular medium (film, TV, print, Twitter, etc.). During that class we will deconstruct a specific documentary film, program, website, etc in order to illustrate and explore the general topic. In each session, the question asked will be how scientific information has been ‘pictured’ for that media. Specific clips, excerpts, or programs, will be screened during class to illustrate issues, and demonstrate editorial decisions.

Lecturer Daniel Zuckerbrot is a veteran director, producer, and writer of film, and television. He has been an independent producer for many years and is the founder, and partner in his company Reel Time Images. He also served stints as the senior producer of the CBC’s The Nature of Things, and headed the research department for Alliance/Atlantis Factual Production when it was the largest producer of documentaries in the country. He will joined by guest speakers involved in the making of the works being explored.

Learning Outcomes : Upon completion of this course, you will be better able to:

- understand the relationships between scientific and mass media communications
- explain the role of media in communicating science
- understand the differences in how science is communicated through various media, i.e., documentary films, news, peer reviewed publication, popular science magazines, science blogs, etc
- develop and articulate a scientific idea in documentary form
- develop a critical appreciation of the role of media, and particularly documentaries , in science communication

### Marking Scheme:

In addition to weekly preparation and class participation, students will be asked to complete two written assignments and write a final exam.

#### Assignment 1 (Due February 15 at the start of class)

- An analysis, and critique of a science documentary focusing on:
  - the variety of ways that science is incorporated into the film.
  - the elements of the storytelling that affect, enhance and hinder the strength of the science behind the subject matter.
  - the influence of the film's style, characters, and scenes as they impact the effectiveness of the science.

Your paper should be no longer than 10 pages, double-spaced - excluding title page, reference list, etc. (30%).

#### Assignment 2 (Due March 15 at the start of class)

Students will be asked to produce a thoughtful and credible proposal for their own science film on a subject of their choosing. They will be asked to write up a formal treatment (no longer than 10 pages, double-spaced - excluding title page, reference list, etc) for a film that they might theoretically propose to a broadcaster, including subject matter, theme, thesis, scientific groundwork for the story, methods of illustrating the story, elements of filmmaking employed, scientific experts if any, scenes, characters, locations, graphics, and other didactic elements, with an eye to addressing the demand for both entertainment/engagement value, and scientific integrity. (30%)

Class participation: (20%)

Final Exam: Will be based on all term material. (20%)

Grade Distribution Summary (percentage of total)	
Assignments (2 @ 30% each)	60
Participation	20
Final Exam	20
Total Grade Possible	100

Overview: the course, expectations, and objectives. The making of science documentaries: goals and realities.

Lecture Schedule (tentative): Schedule may vary according to the availability of our guest speakers.

Week 1: Thursday January 11

Objectives: understanding the architecture of the course and its basic goal — the real world factors influencing how science is communicated to a wider audience. The spectrum of genres. What is a natural history/wildlife film. Why is special about that genre. Specific challenges.

Topic: Natural history and wildlife films. The Wild Canadian Year.

*Natural History, and wildlife films explore the life, and life cycles, of individual species interacting in a complex natural environment. They are among the most popular form of documentary film, and often the most expensive to make. They require not only specialized skills and equipment, but also involve unique dangers absent in many other genres. Besides the dangers to life and limb that can be inherent in filming in the wild, there are also editorial dangers. For example, the danger of reducing the natural world to nothing more than a collection of beautiful images. Or the parallel danger that lies in ignoring the environmental threats, that besiege the creatures and environments the films are exploring.*

Week 2: January 18<sup>th</sup>

Topic: The Making of a Year in Wild Canada. How we capture the natural world.

Objectives: To understand some of the specific factors that shape documentaries in general and wildlife films in particular.

Guest: Caroline Underwood, Executive Producer

*A film about film as we turn to the details of how we capture nature. Executive producer Caroline Underwood guides us through the steps in deciding what goes on the screen and the factors that make those choices possible or impossible. Caroline Underwood is almost certainly this country's most knowledgeable and experienced natural history filmmaker. A long, and illustrious career with CBC's The Nature of Things with David Suzuki, has taken her to every continent, including Antarctica. As a director, producer and executive producer she has been responsible on films that look at everything from Mosquitos to Elephants.*

*Suggested readings for next week. Take a look at the work of George Monbiot. His website has many interesting ones. For example: <http://www.monbiot.com/2017/07/13/the-lie-of-the-land/>*

Week 3: January 25<sup>th</sup>. \*Topic for Assignment 1

Topic: What do we mean by “wild” or by “nature”.

Objectives: To begin to look at our often deeply buried assumptions, which inform our thinking, editorial decisions and communication. For example, in the case of the natural history genre: what do we mean by wildlife? What do we mean by nature?

Filmmaker: Roberto Verdecchia

*For generations, we've tried to preserve wilderness, and the amazing creatures that live there. But what if we could make new wilderness? Even new wild creatures? What if we could bring back the wild of the ancient past? A radical new movement called Re-wilding aims to do just that. From a new Dutch “Serengeti” just thirty minutes outside Amsterdam, to the scientific recreation of a Stone Age wild bull.*

Suggested readings for next week. A short read, and a quick guide to Canada's insects.

<https://www.theguardian.com/environment/2012/may/19/insect-bug-pestival-bridget-nicholls>

<http://canadianbiodiversity.mcgill.ca/english/species/insects/index.htm>

Week 4: February 1<sup>st</sup>

Overview: Where is nature anyway?

Topic: Is my basement the natural world.

Objectives: To delve further in the assumptions that explicitly, or implicitly, shape the editorial and the artistic approach of the filmmaker.

Filmmaker: Roberto Verdecchia

*In our previous class we discovered that the idea of nature and wilderness are more complicated and elusive than we might have thought. This week we probe a different aspect of that question. A film about a tiger in the jungle is a natural history/wildlife film. Is one about the bugs in my basement?*

Suggested readings for next week. A blog entry on a film series that while not science is one of the most acclaimed examinations of children and the adults they became

<http://www.pbs.org/pov/blog/pressroom/2013/07/56-up-premiere-pov-pbs-indies-showcase/>

LA Times article on "Soft Sciences"

<http://articles.latimes.com/2012/jul/12/opinion/la-oe-wilson-social-sciences-20120712>

Nature Article "In Praise of Soft Sciences" <https://www.nature.com/articles/4351003a>

Week 5: February 8<sup>th</sup>

Topic: The human dimension

Filmmaker: Eileen Thalenberg

Objectives: To see how those notions examined in the last weeks can be applied (or not) when the film is about human beings and explores what some would deride as a "soft-science". In this case developmental psychology.

*Making films about nature is not a straightforward activity, neither in technical nor editorial terms. What about films on human nature. How reliable are psychological findings? What does it take to report them responsibly. Today's film, "Born to Be Good?" looks at the moral trajectory of children from the first months of life onward. This film asks the questions: "where does our moral compass come from? Where do our notions of good and bad, our sense of justice and fairness originate? How do we decide who to trust, who to help? Blending scientific research and scenes of children in their own environments, the documentary reveals that children seem to have a moral sense from the very the get-go. There's an old show biz expression about the difficulties of working with children and animals. In the next weeks we'll learn something about both. Filmmaker Eileen Thalenberg, address some of the difficulties she faced in making this film and the reasons for some of her choices.*

Week 6 : February 15<sup>th</sup> \*Assignment 1 due at the start of class

Topic: The gatekeepers. How do broadcasters decide what documentaries get made or make

it to air.

Guest: The Nature of Things, Executive Producer Sue Dando.

Objectives: *CBC's much celebrated science series, The Nature of Things with David Suzuki, is one of the longest running programs on television. For many Science films can be an expensive proposition. TV broadcast is one of the keys to the funding of documentaries in Canada. Of the many films proposed what factors determine what gets made (and seen)? Who decides and how they do it.*

Suggested readings for next week. Two different points of view on global warming's impacts on archeology: <https://tinyurl.com/gqms0qd> and <https://tinyurl.com/y92uu4hb> Also <https://tinyurl.com/y9qfm5bf> On archeology and First Nations

Week 7: February 22<sup>nd</sup> \*Topic of Assignment 2

Topic: What happens when the interests of science and another community collide.

Filmmaker: Andrew Gregg

Objectives: To explore conflict and balance in science journalism.

*On one hand this film should be a relatively straightforward story about climate change and archeology. It tells the story of how melting glacial ice is revealing never-before-seen human artifacts, some of them thousands of years old. But for the indigenous people of the area these aren't just historical objects, they are their heritage and even the bodies of their ancestors. How does the filmmaker, or science journalist, do justice to all parties and to the story itself.*

Supplementary readings for next week. Points of view on nuclear power:

<https://tinyurl.com/yb6jxy6s>

<https://tinyurl.com/yaekl8zk>

Week 8: March 1<sup>st</sup>

Topic: Sorting out the Facts

Filmmaker: Donna Zuckerbrot

Objectives: Extending our look at conflict and balance. From communicating complex moral issues to including complex technical ones. What makes environmental films different than other genres?

*Every science program, book or article, requires understanding, and simplifying complex information. Every story you tell requires editorial judgment: that is, deciding what to include, and what to leave out. How to tell a technically demanding story? How to find your footing in a highly polarized debate? These are a few of the challenges illustrated in the making of My Nuclear Neighbour. It is a story told from the perspective of a farm family that literally, wakes up one day to discover that their nearest neighbour is going to be a nuclear plant.*

Preparation for next week:

<http://www.siohhanroberts.com/category/articles/>

Read an article from Ms Roberts archive and be prepared to question her.

Week 9: March 8<sup>th</sup>

Topic: Making the abstract Concrete part

Writer: Siobhon Roberts

Objectives: Understanding ways of approaching and communicating very abstract or technical material . Understanding the differences in the limits and possibilities of different media.

*Can you translate things like Einsteins theories to a general TV audience in a meaningful way? What about complex statistical or technical issues? What do you do when these issues are so complex that even experts can't agree on what a study means, or on the risk of a particular activity? How do we decide where to spend health dollars, whether fears of nuclear power are realistic, and even where to invest our life savings? What do Einstein's theories have to do with your daily life? How do these problems vary in different media. Every film, book, program or article has to deal with reducing a large amount of, often very complex, information into a manageable size of understandable content. Those issues are no where more daunting than when the science in question is mathematics or physics. How we can we make the abstract concrete? How can we turn the most rarified thinking into something accessible to any interested viewer/reader. Toronto journalist Siobhan Roberts knows these problems better than most. A writer and documentary film maker, she specializes in science and particularly mathematics. She guides us through some of the difficulties in this specialized area and the differences between working in film and print. We'll also look at some other examples of very abstract sciences made accessible.*

Preparation for next week:

<http://www.cbc.ca/radio/quirks>

Listen to one of the audio stories available there and consider specific ways in which the same story might have to be presented differently in a book, or film.

Week 10: March 15<sup>th</sup> \*Assignment 2 due at the start of class

Topic: The audio world: radio, and podcasts

Producer: Tina Verma

Objectives: Extending the discussion to include the differences between primarily visual and auditory media.

*For forty years the award-winning science program Quirks & Quark has brought science to the public by radio and podcasts. What are the challenges and possibilities of communicating science through an audio rather than a visual medium? Tina Verma has produced science subjects for both radio and television. She talks with us about how ideas are generated and turned into stories suitable for each medium. Interviews and research are part of the process in both cases but the specifics vary: a story that might be a great radio item might not recommend itself as appropriate for a visual medium, and vice versa.*

Suggested reading for next week, or watching really. Look at a few news item on Discovery's Daily Planet:

<http://www.discovery.ca/Shows/Daily-Planet> These average 2-5 minutes. Do you find them interesting? Satisfying? Consider what makes a story suitable for a short news item?

Week 11: March 22<sup>nd</sup>

Topic: Science News

Guest: TBA

Objectives: the particular demands of the short form whether the daily news or tweets.



*One might criticize the quality of TV news but there's no getting around the fact there's a lot of it. And not just general news. There's no lack of specialized daily news programs reporting on sports, business, politics, and entertainment. Discovery Channels' Daily Planet is on the other hand, perhaps the only broadcast daily science news show in the world. Our guests today will walk us through how the program is made and some of the unique challenges that face this kind of programming. What about that shortest of short forms: Twitter? What is possible with those very short-form formats.*

Suggested reading for next week:

<https://tinyurl.com/ycavxqwo> Take a look at Professor Goldenberg's article. You might also be interested in attending her talk for the 6<sup>th</sup> Annual Upshur Lecture on Public Health Ethics. She will be speaking on low public trust in public institutions as primary source of vaccine hesitancy. It will be held at the U of T downtown campus on Wed Mar 28.

Time and location to be confirmed

Week 12: March 29<sup>th</sup>

Topic: Fake News? Reporting on medicine.

Guest:

Objectives: What happen when the personal stakes are high? What is the moral and ethical responsibility of the storyteller in whatever medium. What kind of journalism can survive in a world of "fake news"?

*Perhaps no aspect of communicating scientific advances to the public is more fraught than reporting on medical issues. Misleading reporting can bring false hope to those in desperate situations as easily as, or more easily than, it can bring useful information. Sloppy, inaccurate, or weak reporting can lead to serious, wide spread and potentially life threatening behaviours. All this is made much more complicated in a context of conspiracy theories, untrustworthy institutions, and fears (whether valid or not) of fake news. Maya Goldenberg is an associate Professor whose research is focused on medicine, and the question: "How do we know what to believe when it comes to health care". Her rigorous but compassionate approach to the question of why people don't believe vaccines are safe deserves attention. For those in the media it holds important lessons. We will be looking at a range of medical questions including what happens when health care makes us sick.*

Assignments :

General Information about Assignments

Your papers should be no longer than 10 pages, double - spaced, single sided excluding title page, reference list, and any figures or tables you wish to include.

Use the APA reference format.

The use of section headings is strongly suggested.

Grading: Evaluation of assignments takes into account correctness, organization and structure, as well as research and content. You will be graded on the quality of your work and your ability to meet the desired learning targets . The marking scheme will consider:



- \_ how well the student is able to address the issue (20%)
- \_ critique of the science (i.e., how well does the student analyze the media and its message, what was missing or poorly communicated) (40%)
- \_ originality of observation (20%)
- \_ grammar and style (20%)

Your assignments must have the title of your assignment, your name, course number, the date and , your student number. Staple your assignment in the upper left corner; do not use folders, cover slips, or binders.

**Due Dates:** The assignments have specifically defined due dates as noted in the Course Schedule. It is your responsibility to consult the Lecture Schedule for all the Assignment and mid term due dates. The instructor will not assume the responsibility of reminding you that an assignment is due or that an exam will be given.

**Grade Posting :** All grades will be posted on Blackboard. You have 7 days after a grade has been posted to dispute an entry. Your grade may be revised up or down based on the review. After the 7 - day period, the grade stands as entered.

**Late assignments:** The late penalty is as follows:

1 day 10%, 2 day 20%, 3 day 30%, 4 day 40%, 5 day 50%, 6 day and after 100%

Please make sure to submit your assignments by the due time to avoid late penalty.

**Handing In Assignments:** You are responsible for making sure that your TA/instructor receive your work. Students who mail assignments in, place work on the floor outside an office, or slip assignments under a door, do so at their own risk.

**Lost or misplaced assignments:** It is your responsibility to keep a photocopy of your work, and to make more than one digital copy of your work. Excuses are not accepted in the case of lost or misplaced work.

**Class Attendance and Participation:** Students are required to attend class .

**Absences:** If you need to miss a practical or term test for any legitimate reason, you must submit appropriate documentation within three business days of your absence. If the reason for your absence is medical, an official UTSC medical note must be completed by a doctor who examined you while you were ill/injured (i.e. not after the fact). The medical note can be downloaded at:

[http://www.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf)  
Note that conditions ranked as mild or negligible will not be considered a valid excuse.

**Missed term work:** If a legitimate reason prevents you from submitting a piece of term work by its posted deadline, you must submit appropriate documentation within three business days of your absence. If the reason is medical, an official UTSC medical note must be completed by a doctor who examined you while you were ill/injured (i.e. not after the fact). The

medical note can be downloaded at:

[http://www.uts.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.uts.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf)

Note that conditions ranked as mild or negligible will not be considered a valid excuse.

**Extensions:** Requests for an extension on an assignment must be tendered in writing in advance of the due date. In instances of illness, an official UTSC medical note must be completed by a physician (see above) . Other notes are not acceptable. Extensions are granted at the discretion of the Professor (and the TAs), and may be granted for other significant emergencies.

**Academic Misconduct and Academic Dishonesty** will not be tolerated. Students engaging in misconduct or dishonest practices on exams, quizzes, or other assignments will be dealt with according to the guidelines established by the university.

**Plagiarism:** Please consult the University Calendar for a discussion and outline of the policy on plagiarism and academic integrity (also see proceeding section below). The sanctions can be severe. If, after reviewing the University policy, you are uncertain about what constitutes plagiarism, talk to your course instructor.

**Academic Integrity:** Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (

<http://www.governingcouncilutoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences include, but are not limited to:

In papers and assignments:

- \_ 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:

- \_ Using or possessing unauthorized aids.
- \_ Looking at someone else's answers during an exam or test.
- \_ Misrepresenting your identity.

In academic work:

- \_ Falsifying institutional documents or grades.
- \_ Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see

<http://www.utoronto.ca/academicintegrity/> ).

Please consult the University Calendar for information about grade distribution and academic conduct.

For reasons of privacy, as well as protection of copyright, unauthorized video or audio recording in classrooms is prohibited. This is outlined in the Provost's guidelines on Appropriate Use of Information and Communication Technology. Note, however, that these guidelines include the provision that students may obtain consent to record lectures and, "in the case of private use by students with disabilities, the instructor's consent must not be unreasonably withheld".

**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 accommodation, please feel free to approach me and/or the Access Ability Services Office as soon as possible. I will work with you and Access Ability Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC Access Ability Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287 - 7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca)

Students are encouraged to review the Calendar for information regarding all services available on campus.