

ARTSSCI 4CF3
How Science Speaks to Power
2019-20 (Term 1)

Professor: Dr J. Roger Jacobs

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Office hours: LSB 429 *Mondays 10:00-11:00 and Thursday 9:00-10:00*

Lectures and Inquiry Meetings: Mon., Wed., Thu., 4:30-5:20pm, BSB B155

Materials:

- **Text:** There is no required text. Readings will be linked to the course Avenue site (<https://avenue.mcmaster.ca>). Lecture material related to experimental design can be explored further in this book available in Thode:
Experimental Design for Biologists DJ Glass, *QH 323.5 .G565 2007*
- This book reflects some of the concepts and models presented on science policy, and makes useful reading:
The Honest Broker RA Pielke, Jr. – *Q 180.55 .S62 P54 2007*

Course Objectives:

- This course will develop skills of critical analysis of scientific research- as interpreted or employed by the lay media, governments, NGOs and by scientists, in support of different interests. You will develop your ability to critique the interpretation or application of scientific knowledge as well as to isolate the social and political context of the science. You will learn how to interpret the effect different stakeholders have on the translation of knowledge into policy. After this course you should have greater skill in science literacy, and be better able to critique both science and science-based policy.

Course Description and Format:

- Your government defines the ethical uses of stem cells, changes the content of the food pyramid and declares carbon dioxide to be a pollutant. In all cases these policies are based upon scientific evidence- and in all cases there is dissent on these decisions within the public, government and scientific communities. What constitutes scientific proof? How do scientists agree- or change their mind on whether a conclusion is scientifically valid? How do policy makers decide how to implement scientific insights?
- In this course you will learn the rules by which scientists propose, validate and challenge scientific insights. You will also investigate the context of the research – how research is funded, disseminated, corrected, and how it reaches the public and policy makers. The major focus in the course will be a case study that you identify and analyse from the perspective of the scientist, lobbyist, layperson and the policy maker.

Schedule:

For weeks 1 to 6, two hours per week will explore the process of science. The third hour each week will consider a case study, or be dedicated to project work. Weeks 8-13 students will present their own case studies.

Weeks 1 and 2: (Sept 4,5,9,11,12)

Science vs. The Scientific Method

Hypothesis formulation, testing and falsifiability

Case Study: Trofim Lysenko
Weeks 3 and 4: (Sept 16,18,19,23,25,26)
Error, variation, confidence
Vetting science: Peer review, retractions
Case Study: Hwang Woo-suk
Weeks 5 and 6: (Sept 30, Oct 2,3,7,9)
Funding Science: pay the piper
Case Study: IPCC
Group Case Presentations (Oct 10)
Week 7 – Midterm Recess
Weeks 8 and 9: (Oct 21,23,24,28,30,31)
Converting Science to policy
Post Normal Science
Individual Case Study Presentations
Weeks 10 and 11: (Nov 4,6,7,11,13,14)
Case Study Presentations
Case Study Presentations
Weeks 12 to 14: (Nov 18,20,21,25,27,28, December 2,4)
Case Study Presentations

Marking Scheme:

Late Penalties

15%	Assignments- 3 x 5% (Provisionally Sept 26, Oct 21, Nov 11)	5% per school day
10%	Participation/Peer Evaluation	
10%	Group Case Presentations	
15%	Case Study- Presentation/Activity—in class November	5% per school day
30%	Case Study – Written Submission/Portfolio—Nov 30	late exams not accepted
20%	Final Exam- take home--- due noon December 18	

McMaster Policy on Academic Integrity:

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences—e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty, please refer to the [Academic Integrity Policy](http://www.mcmaster.ca/academicintegrity), located at:

<http://www.mcmaster.ca/academicintegrity>.

The following illustrates only three forms of academic dishonesty: 1) Plagiarism—e.g., the submission of work that is not one’s own or for which other credit has been obtained. 2) Improper collaboration in group work. 3) Copying or using unauthorized aids in tests and examinations.

McMaster Student Absence Form (MSAF):

In the event of an absence, students should review and follow the Academic Regulations in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work.” Please consult the

MSAF statement on our website (<https://artsci.mcmaster.ca/forms-requests/>) and direct any questions or concerns to Shelley Anderson or Madeline Van Impe in the Arts & Science Program Office.

Academic Accommodation of Students with Disabilities:

Students who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) to make arrangements with a Program Coordinator. SAS can be contacted by phone 905-525-9140 ext. 28652 or email sas@mcmaster.ca. For further information, consult McMaster University's [Academic Accommodation of Students with Disabilities](#) policy.

Academic Accommodation for Religious, Indigenous, or Spiritual Observances (RISO):

Students requiring academic accommodation based on religious, indigenous, or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation should submit their request to their Faculty Office (i.e. to Shelley Anderson or Madeline Van Impe in the Arts & Science Program Office) normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Please Note:

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L, and/or McMaster email. It is the responsibility of students to check their McMaster email and course websites regularly during the term and to note any changes. Announcements will be made in class and by using the course email distribution list.

Sustainable Written Work Submission:

The written work submission guidelines have been chosen to support the more sustainable use of paper, energy, and toner and meet the SILVER standard of the Office of Sustainability www.mcmaster.ca/sustainability. All written work should be submitted in the following format:

- Double-sided pages
- 1.5 line spacing
- Exclusion of title page
- Decreased margin