ARTSSCI 4CF3

How Science Speaks to Power

2022-2023 (Term 1, Fall 2022)

**Professor:** Dr J. Roger Jacobs

**Office Address:** LSB 429

**Email:** jacobsr@mcmaster.ca

**Office hours:** Wednesday 2:30 pm-3:30 pm

**Lectures and Inquiry Meetings:** Tues., Wed., Fri., 12:30-1:20 pm. KTH B107

Materials:

* **Text**: There is no required text. Required readings will be linked through [Avenue](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*
* More detailed readings for the very serious: The Rightful Place of Science: Science on the Verge. A. Saltelli et al. *Q124.6.I85 2016*

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 in current events.

Course Description and Format:

* Your government defines the ethical uses of stem cells, changes the content of the food pyramid, imposes closures during epidemics 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- and how is this evolving today?
* 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 5, readings and class activities will explore the process of science. Some classes will consider a case study, or be dedicated to project work. Weeks 10-13 students will present their own case studies.

Weeks 1 and 2: (Sept 6, 7, 9, 13, 14, 16)

**Science vs. The Scientific Method**

**Hypothesis formulation, testing and falsifiability**

**Case Study: Trofim Lysenko**

**Readings**: Saint Rachel Builds a New Paradigm, What Scientists are…, Selective History of Western Science

Weeks 3 and 4: (Sept 20, 21, 23 27, 28) No class 30th

**Confidence and certainty: Error, variation**

**Vetting science: Peer review, retractions**

**Case Study: China One-Child (Modeling)**

**Case Study:** **Hwang Woo-suk**

**Reading:** Epistemic Community in Action, The Role of Uncertainty and Objectivity in Modern Science

Week 5 (Oct 4, 5, 7)

**Funding Science: pay the piper (Linear Model)**

**Case Study: Quotas and Whaling**

**Group Case Presentations (Oct 5, 7)**

**Reading:** Scientists as Stakeholders

Week 6– Midterm Recess

Weeks 7 and 8: (Oct 18, 19, 21, 25, 26, 28)

**Converting Science to policy**

**Post Normal Science**

**Case Study: IPCC,** **Montreal Protocol (Precautionary Principle)**

**Reading:** Emergence of Post-Normal Science

Weeks 9 and 10: (Nov 1, 2, 4, 8, 9, 11)

**Post Normal Futures**

**First Case Study Presentations** Nov 11

**Reading:** Where Science for Policy is Going

Weeks 11 to 14: (Nov 15, 16, 18, 22, 23, 25, 29, 30, Dec 2, 6, 7)

**Case Study Presentations**

**Course Reflection**

Marking Scheme:

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|  | **Late Penalties** |
| **15%** Assignments- 2 x 7.5%  *(dates TBA)* | 5% per weekday |
| **10%** Participation/Peer Evaluation |  |
| **15%**  Contrarian Science Presentation & Reflection – in class Oct 5 & 7 |  |
| **15%** Case Study- Presentation/Activity—in class November 11- Dec 6 |  |
| **25%** Case Study – Written Submission/Portfolio—Nov 30 | 5% per weekday |
| **20%** Final Exam- take home--- due noon Dec 15 | late exams not accepted |

SENATE-APPROVED ADVISORY STATEMENTS

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. **It is your responsibility to understand what constitutes academic dishonesty.**

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. For information on the various types of academic dishonesty please refer to the [*Academic Integrity Policy*](https://secretariat.mcmaster.ca/app/uploads/Academic-Integrity-Policy-1-1.pdf)*,* located at [https://secretariat.mcmaster.ca/university-policies-procedures- guidelines/](https://secretariat.mcmaster.ca/university-policies-procedures-%20guidelines/).

The following illustrates only three forms of academic dishonesty:

* plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
* improper collaboration in group work.
* copying or using unauthorized aids in tests and examinations.

AUTHENTICITY / PLAGIARISM DETECTION

**Some courses may** use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., online search, other software, etc.). For more details about McMaster’s use of Turnitin.com please go to [www.mcmaster.ca/academicintegrity](https://mcmasteru365-my.sharepoint.com/personal/rbishop_mcmaster_ca/Documents/www.mcmaster.ca/academicintegrity).

COURSES WITH AN ONLINE ELEMENT

**Some courses may** use online elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses online elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

ONLINE PROCTORING

**Some courses may** use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the [*Code of Student Rights & Responsibilities*](https://secretariat.mcmaster.ca/app/uploads/Code-of-Student-Rights-and-Responsibilities.pdf) (the “Code”). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact [Student Accessibility Services](https://sas.mcmaster.ca/) (SAS) at 905-525-9140 ext. 28652 or [sas@mcmaster.ca](mailto:sas@mcmaster.ca) to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [*Academic Accommodation of Students with Disabilities*](https://secretariat.mcmaster.ca/app/uploads/Academic-Accommodations-Policy.pdf) policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

In the event of an absence for medical or other reasons, students should review and follow the [*Policy on Requests for Relief for Missed Academic Term Work*](https://secretariat.mcmaster.ca/app/uploads/Requests-for-Relief-for-Missed-Academic-Term-Work-Policy-on.pdf).

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](https://secretariat.mcmaster.ca/app/uploads/2019/02/Academic-Accommodation-for-Religious-Indigenous-and-Spiritual-Observances-Policy-on.pdf) policy. Students should submit their request to their Faculty 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.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors. The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done either by the instructor for the purpose of authorized distribution or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

EXTREME CIRCUMSTANCES

The University reserves the right to 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.

NOTES FOR ALL ARTS & SCIENCE COURSES

1. Some of the statements above refer to a “Faculty Office”; please note that the Arts & Science Program Office serves in this capacity.
2. It is the responsibility of students to check their McMaster email regularly. Announcements will be made in class, via A2L, and/or via the course email distribution list.
3. For additional information regarding requests for accommodation, relief for missed term work (e.g. MSAF), deferred examinations, etc., students should read carefully the [Requests](https://artsci.mcmaster.ca/forms-requests/) and [Resources](https://artsci.mcmaster.ca/current-students/resources/) pages on the Arts & Science Program website.