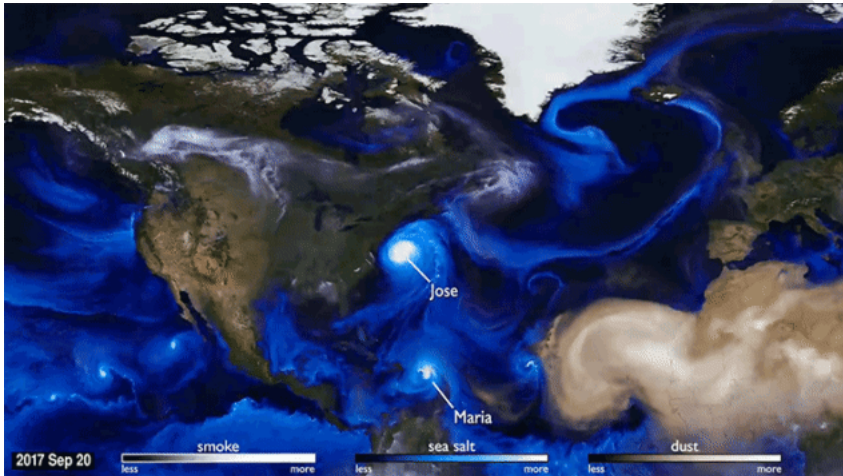


Division of Natural Science

<http://natsci.info.yorku.ca/>

Course Outline

**NATS 1765, Science, Experts, and Citizens**  
 Fall/Winter 2018-19  
 Mondays 13:00-14:30, Wednesdays 13:00-14:30 in Vari Hall A



**Forest fire and hurricane season, Sept 2017**

<https://www.nasa.gov/image-feature/how-to-see-the-atmosphere>

**Course Instructor(s) and Contact Information**

- Professor: James Elwick
  - Course Email: [nats1765@yorku.ca](mailto:nats1765@yorku.ca). Please email from your "yorku.ca" email account. Aimed-for response time is 48 hours *if your question has not already been answered in Moodle forum.*
- Office hours: 313 Bethune College, Mondays 11-12, Wednesdays 11-12, or by appointment

**Expanded Course Description**

NATS 1765, "**Science, experts and citizens,**" fulfills your general science (general education) credit. This course provides tools with which to better think about the relationship between science, scientific experts, citizens and what people think they know. We cover different cases in which claims about technical scientific facts interact, and often clash, with political and social arguments about those facts. Cases may include **vaccination, anthropogenic climate change** and what to do about it, and **genetic engineering.**

For each case we first cover a 'primer' on the technical issues - for instance learning how a gene codes for a protein - so that after this course when you come across such material you'll be better able to correctly grasp the relevant points. But we also study the enduring tension between expertise and democratic populism, the distinction between risk and uncertainty, and whether ignorance is a lack of knowledge...or the wrong knowledge confidently held. While no one can become an expert after taking 1 course, NATS 1765 will help you better think about some of the most important issues of our time.

**Course Learning Outcomes**

- Upon successful completion of this course you should be able to:
- Explain how a vaccine works, the causes of anthropogenic climate change, and some genetic engineering techniques.

- Describe topics like populism, Malthusianism and Cornucopianism, externalities, peer review, feedback mechanisms, and genetically engineered herbicide tolerant/resistant crops.
- Summarize passages in your own words to better learn, distil, and explain concepts like risk, uncertainty, false negatives and false positives, expertise, and the naturalistic fallacy.
- Illustrate these above concepts with examples from the readings or from your everyday lives.
- Actively read a text.

## Evaluation

- 14 in-class summaries worth 22%.
- iClicker in-class questions worth 8%, with some points given for wrong answers.
- Quiz 1, in-class, in early October, worth 10%.
- Midterm during winter exam period, worth 25%.
- Quiz 2, in-class, in early February, worth 10%.
- Final Exam during spring exam period worth 25%.
  - Quizzes and exams will consist of multiple choice questions and some short answer questions.
  - Dates & times for Midterm and Final Exams are set by the Registrar's Office.
- *In all quizzes and exams you are allowed to bring in and use a paper dictionary (ordinary or translation), provided you first show this dictionary to the instructor or teaching assistant.*

## Course Materials

- Reading material:
  - A textbook, Harry Collins, *Are we all scientific experts now?* (Polity, 2014).
    - Available at the York University Bookstore and [Amazon](#) (paperback \$16, Kindle \$8). There should be lots of used copies; also on reserve at Steacie library.
  - All remaining reading material is available on the course Moodle site as PDFs; there are also online games and other material.
- Smartphone / laptop material:
- iClicker/REEF classroom response system, no cost (paid through your tuition fees).
  - <https://www.iclicker.com/students/apps-and-remotes/apps>
- "Forest" app, available for iOS, Android, and Chrome. Digital distraction fighter, with which we're also going to plant trees both virtual and real.
  - <https://www.forestapp.cc/en/>

## Laboratory/Tutorial

- This course does not have a laboratory or tutorial component.

## Course Content and Format

(SUBJECT TO CHANGE)

<u>FALL TERM</u>	<u>WINTER TERM</u>
<p><a href="#">Wed 9/5/2018</a> Introduction</p> <p><a href="#">Mon 9/10/2018</a> Are we really in a "post-truth" era? of "fake news"?</p> <p style="text-align: center;"><a href="#">MODULE 1: ANTI-VACCINATIONISTS</a></p> <p><a href="#">Wed 9/12/2018</a> Antivaccinationism</p>	<p style="text-align: center;"><a href="#">MODULE 4: RISK, UNCERTAINTY AND IGNORANCE</a></p> <p><a href="#">Mon 1/7/2019</a> A new 'shadow kingdom': thinking about risk</p> <p><a href="#">Wed 1/9/2019</a> Beck and risk continued</p> <p><a href="#">Mon 1/14/2019</a> Ignorance and uncertainty</p>

<p><a href="#">Mon 9/17/2018</a> Correlation, storytelling and apparent causation</p> <p><a href="#">Wed 9/19/2018</a> Apparent causation continued</p> <p><a href="#">Mon 9/24/2018</a> Apparent causation continued</p> <p><a href="#">MODULE 2: DEMOCRACY VS EXPERTISE</a></p> <p><a href="#">Wed 9/26/2018</a> When can non-scientists contribute to science?</p> <p><a href="#">Mon 10/1/2018</a> When should non-scientists stay out of science (if ever)?</p> <p><a href="#">Wed 10/3/2018</a> Democracy vs expertise continued</p> <p><a href="#">Mon 10/15/2018</a> Don't talk about scientists - talk about scientific experts</p> <p><a href="#">Wed 10/17/2018</a> Scientific expertise continued</p> <p><a href="#">Mon 10/22/2018</a> Scientific expertise continued</p> <p><a href="#">Wed 10/24/2018</a> Scientific expertise continued</p> <p><a href="#">Mon 10/29/2018</a> Don't just talk about expertise... talk about trustworthiness too</p> <p><a href="#">Wed 10/31/2018</a> Review of material</p> <p><a href="#">Mon 11/5/2018</a> <i>FIRST QUIZ</i></p> <p><a href="#">MODULE 3: ANTHROPOGENIC CLIMATE CHANGE 1 (THE PROBLEM)</a></p> <p><a href="#">Wed 11/7/2018</a> Anthropogenic climate change was discovered in 1938: the long history of climate science</p> <p><a href="#">Mon 11/12/2018</a> Understanding climate a bit more</p> <p><a href="#">Wed 11/14/2018</a> If climate change has been a political issue since 1988, why so little action?</p> <p><a href="#">Mon 11/19/2018</a></p>	<p><a href="#">Wed 1/16/2019</a> What if experts aren't always good at assessing risk?</p> <p><a href="#">MODULE 5: ANTHROPOGENIC CLIMATE CHANGE PART 2 (WHAT TO DO ABOUT IT?)</a></p> <p><a href="#">Mon 1/21/2019</a> Thought Communities and Possible Responses to Climate Change</p> <p><a href="#">Wed 1/23/2019</a> Thought Communities and Possible Responses to Climate Change continued</p> <p><a href="#">Mon 1/28/2019</a> Geoengineering</p> <p><a href="#">Wed 1/30/2019</a> Geoengineering continued</p> <p><a href="#">Mon 2/4/2019</a> Geoengineering: terraforming or global gardening?</p> <p><a href="#">Wed 2/6/2019</a> Review for quiz</p> <p><a href="#">Mon 2/11/2019</a> <i>SECOND QUIZ</i></p> <p><a href="#">MODULE 6: GENETIC ENGINEERING</a></p> <p><a href="#">Wed 2/13/2019</a> Basics of Genetics/Genomics and genetic engineering</p> <p><a href="#">Mon 2/25/2019</a> Basics of genetics and genetic engineering continued</p> <p><a href="#">Wed 2/27/2019</a> Transgenic Organisms (ie "GMOs") and Naturalistic Fallacies</p> <p><a href="#">Mon 3/4/2019</a> Transgenic organisms, naturalistic fallacies continued</p> <p><a href="#">Wed 3/6/2019</a> Transgenic organisms, naturalistic fallacies continued</p> <p><a href="#">Mon 3/11/2019</a> Transgenic Organisms, Corporate Agriculture, and Monocultures</p> <p><a href="#">Wed 3/13/2019</a> Transgenic agriculture and monocultures continued</p> <p><a href="#">Mon 3/18/2019</a> Transgenic agriculture and monocultures continued</p> <p><a href="#">Wed 3/20/2019</a></p>
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<p>'Wicked problems'</p> <p><a href="#">Wed 11/21/2018</a> 'Wicked problems' continued</p> <p><a href="#">Mon 11/26/2018</a> The collapse of western civilization?</p> <p><a href="#">Wed 11/28/2018</a> Climate denialism</p> <p><a href="#">Mon 12/3/2018</a> Review for midterm</p> <p><a href="#">DATE TBD - Exam Period</a> MIDTERM EXAM</p>	<p>Transgenic Organisms, the Public, Risk, and Uncertainty</p> <p><a href="#">Mon 3/25/2019</a> Transgenic organisms and the public continued</p> <p><a href="#">Wed 3/27/2019</a> Transgenic organisms and the public continued</p> <p><a href="#">Mon 4/1/2019</a> Drawing links between climate change and genetic engineering</p> <p><a href="#">Wed 4/3/2019</a> Course Review</p> <p><a href="#">DATE TBD - Exam Period</a> FINAL EXAM</p>
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## Math Content

- Mathematics to Ontario grade 10 is required.

## Course Policies

### Classroom etiquette

- Some things to remember:
  - What you think is quiet whispering can often be heard at the front of the room, distracting other students and even the instructor.
  - Laptop and 'screen' use is fine if used to take notes or look up material, but alternative uses don't just distract you – they also tend to distract your neighbours.
  - Elwick wanders around the room during class.

### REEF (clicker) use and etiquette

- In many cases you will be allowed to talk over the questions with neighbours before answering.
- BUT: having a friend click your device while you're not in class is *cheating*. Evidence of this is forwarded to the Dean and may result in serious academic penalties for both people involved.

### Email Policies and Etiquette

- When writing an email, please
  - ... use correct grammar and capital letters
  - ...address it to [nats1765@yorku.ca](mailto:nats1765@yorku.ca)
  - ...include a summary of the subject in the email's subject line (e.g. "Question about Nov. 7<sup>th</sup> assignment").
  - ...sign off with your name and student number.
  - ...(if it's a question), first check to see if it's been answered already in the Moodle discussion group.

### Accommodations

- Course conflicts, work conflicts, or vacations are not acceptable reasons for accommodation.
- **If you still wish accommodation for a missed/to be missed assignment...**
  - **If you will miss a summary or REEF question,**
    - Please email [nats1765@yorku.ca](mailto:nats1765@yorku.ca) in advance explaining the reasons why.
  - **If you have missed a summary or REEF question,**

- You must email [nats1765@yorku.ca](mailto:nats1765@yorku.ca) within 24 hours explaining the reasons why.
- **If you will miss a Quiz,**
  - Please email [nats1765@yorku.ca](mailto:nats1765@yorku.ca) in advance explaining the reasons why.
- **If you have missed a Quiz,**
  - You must email [nats1765@yorku.ca](mailto:nats1765@yorku.ca) within 24 hours explaining the reasons why, and provide documentary evidence for this absence.
    - If medical this must be an attending physician's statement (<http://www.registrar.yorku.ca/pdf/attending-physicians-statement.pdf>)
    - If another cause, must provide letter (e.g. from funeral director, etc) or other acceptable form of evidence.
- **If you will miss an Exam,**
  - You must email [nats1765@yorku.ca](mailto:nats1765@yorku.ca) in advance explaining the reasons why.
- **If you have missed an Exam,**
  - You must petition: (<http://registrar.yorku.ca/pdf/Undergraduate%20Academic%20Petition%20Form.pdf>)

## Copyright and Intellectual Property

### Some notes on copyright:

- Notes from class slides are provided after each class. Uploading them or distributing them to others is prohibited under Canadian copyright law.
- You may record classes on audio, as long as you don't upload these recordings to the internet.

## University Policies

### Important Sessional Dates

Includes sessional start and end dates, drop deadlines, and withdrawal dates.

See the Office of the Registrar website at <http://www.registrar.yorku.ca/enrol/dates/>

### Academic Honesty and Integrity

Academic honesty requires that persons do not falsely claim credit for the ideas, writing or other intellectual property of others, either by presenting such works as their own or through impersonation. Similarly, academic honesty requires that persons do not cheat (attempt to gain an improper advantage in an academic evaluation), nor attempt or actually alter, suppress, falsify or fabricate any research data or results, official academic record, application or document. Finally, academic honesty requires that persons do not aid or abet others to commit an offence of academic dishonesty, including intentional acts to disrupt academic activities.

Suspected breaches of academic honesty will be investigated and charges shall be laid if reasonable and probable grounds exist.

#### Academic Honesty and electronic devices during assessments (e.g. exams)

- Internet capable and personal storage devices of all kinds must be turned off, including vibrate. These and any other unauthorized material must be placed under the student's chair and should not be accessed at any point during the exam. Failure to comply with directive may be considered a break of academic honesty.
- See <http://registrar.yorku.ca/exams/tipsheet>

Please familiarize yourself with the full Senate Policy on Academic Honesty, found at <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>

Please also familiarize yourself with the SPARK Academic Honesty tutorial found at <https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>

### Academic Accommodation for Students with Disabilities

York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs.

The nature and extent of accommodations shall be consistent with and supportive of the integrity of the

curriculum and of the academic standards of programs or courses.

Please familiarize yourself with the full [Senate Policy on Academic Accommodations for Students with Disabilities](#), found at <http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/>

**Note: Students should submit accommodation letters from Counselling and Disability Services (CDS) to the course instructor within the first two weeks of the course or as soon as issued.**

Counselling and Disability Services - <http://cds.info.yorku.ca/>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

**Note: A student registered with CDS, and choosing to write with Alternate Exams, is responsible for making the appropriate writing arrangements within the timeframes outlined by Alternate Exams.** Alternate Exams - <http://altexams.students.yorku.ca/>

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents.

<https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/15/wo/kmHGekTpzKLX6XYKBXYc8M/0.3.4.62.0>

**Note: Students who will have an academic conflict as a result of a religious observance, at any point in the term, should make the instructor aware of such at least three weeks prior to the conflict.**

For conflicts occurring during an official examination period, please complete the Examination Accommodation Form available at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) and submit to your instructor at least three weeks prior to the final exam.

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. A statement of the policy and procedures regarding disruptive and/or harassing behaviour by students in academic situations is available on the website of the University Secretariat (<http://secretariat.info.yorku.ca/>).

## **Division of Natural Science Resources**

### **NATS-AID**

Free peer tutoring for students enrolled in Natural Science Courses. See <http://natsci.info.yorku.ca/nats-aid/>

### **M-AID in NATS (Math Aid)**

Free math help for students enrolled in Natural Science Courses (TA tutors). See <http://natsci.info.yorku.ca/m-aid-in-nats/>

## **Other Resources**

### **Learning Commons**

The Learning Commons brings together key supports for your learning: writing, research, learning skills and career services. <http://www.library.yorku.ca/cms/learning-commons/>

### **goSAFE**

goSAFE is a complimentary service provided to the York Community. At the Keele campus, goSAFE has two routes: North Route & South Route which will safely transport community members by vehicle from one specified hub to another on campus. goSAFE operates seven days a week, all year round, including University closures (with the exception at Glendon during the Christmas holiday closure).

Call the goSAFE office at 416-736-5454 or extension 55454 during hours of operation. Please give your name, location and destination. <http://www.yorku.ca/goSAFE/>



**Mental Health and Wellness at York University**

Outlines a variety of resources available to support mental health and wellness

<http://mhw.info.yorku.ca/resources/resources-at-york/students/>

**Good2Talk**

Post-Secondary Student 24 hour Helpline

<http://www.good2talk.ca/> 1-866-925-5454

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