Physical & Environmental Sciences
UNIVERSITY OF TORONTO
SCARBOROUGH

EES3001H, Winter 2022: Professional Scientific Literacy, Mon. 2-5, SW311

Zoom link:
https://utoronto.zoom.us/j/83592619581
Meeting ID: 835 9261 9581
Passcode: 120575

Instructor: Dr. Stuart Livingstone
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COURSE DESCRIPTION & OBJECTIVES

For decades, environmental scientists have been documenting anthropogenic impacts on the planet's ecosystems. Currently, the weight of scientific evidence showing the severity of the biodiversity and climate crises is immense, and many scientists are advocating for increased governmental engagement with environmental issues. As such, environmental science is closely tied to human valuation of the environment; a linkage that requires one to be able to identify sound science and also understand how science is communicated and used in public policy. This is scientific literacy.

It is increasingly recognized that environmental considerations need to be integrated into all aspects of our economies, a trend that is evidenced by the steady growth of the environmental sector as well as increasing public concern for environmental sustainability. In order to prepare for a career in environmental management or conservation science, it is vital that students develop science literacy skills. Environmental professionals employ a range of tools that fall under the umbrella of scientific literacy. It is the goal of this course that students develop 1) a clear understanding of the scientific process & scientific analysis, 2) the ability to communicate environmental science to different audiences, 3) the ability to think critically about environmental issues, how they are studied, and how they are discussed in public discourse, and 4) the ability to place individual environmental studies and issues in the larger context of environmental and conservation science. We will achieve these learning objectives through lectures, the completion of some small individual assignments, a large group term project involving a systematic review of an environmental science issue and engaging in discussion with leading environmental practitioners and science communicators.

LAND ACKNOWLEDGEMENT

Increasingly, the science and policy that is focused on biodiversity conservation is seeking to bridge Western/settler approaches with Indigenous knowledge and worldviews in a manner that embodies the objectives of Reconciliation with Indigenous peoples. This idea is very much at the forefront of conservation science and planning in Canada, where recent strides in protected area creation have largely been achieved through Indigenous-led initiatives. In this regard, it is essential that contemporary efforts to conduct the science and engage with the policies that seek to conserve Canada's biodiversity do so through the lens of Reconciliation with Indigenous Peoples in Canada.

I (we) wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

COURSE SCHEDULE

EES3001: Professional Scientific Literacy Winter 2022

Date		Subject	Assignment due	Guest speaker	Readings
Jan	10	Introduction	(Topic Brainstorm)		
	17	Term Project / Evidence-based conservation			Stevens & Norris 2021 Pita et al. 2011 (Suppl)
	24	Group work		Jay Fitzsimmons (MNRF)	
	31	Ecological Integrity / Group work	Open letter		Rohwer & Marris, 2021 Karr et al. 2021 Marris & Rohwer, 2021
Feb	7	SciComm 1		Cindy Bongard (UTSC)	TBD
	14	SciComm 2		Jode Roberts (DSF)	Oke et al. 2021 Saunders 2021 (blog)
	21	Reading week			
	28	Experimental design	Briefing note / Blog	Paula Julio & Katrina Wisniewski (MNRF)	Koen et al. 2021
Mar	7	Basic statistics		Farheen Kadwa (WWF)	Steel et al. 2013
	14	Topics in Sci Lit: Biological control / Group work	Experimental Design		Ferreira-Martins et al. 2021
	21	Topics in Sci Lit: Bridging Indigenous knowledge & western conservation science		Steven Alexander (DFO)	Alexander et al. 2021
	28	Topics in Sci Lit: Lessons from Covid-19 for biodiversity conservation / Group work			Gregg et al. 2021 Hanafiah et al. 2021
Apr	4	Presentations	Rapid Review doc & Presentation		

EVALUATION

- Open Letter (20%) – Due Feb. 4th
- Briefing Note/Blog (10%) – Due Feb. 28th
- Experimental Design (10%) – Due March 14th
- Group Review Paper & Presentation (30% & 10%) – Due Apr. 4th

- Discussion participation (20%)
    - Evaluation will consist of participation in class and/or on the Quercus discussion board. For discussion board activity to count towards your participation grade, you need to enter your comments/replies **2 days** before or after a given lecture. A rubric for the discussion component of your grade will be posted on the course Quercus page.

The evaluation will be carried out in accordance with the Graduate Grading and Evaluation Practices Policy (and how that policy is interpreted and applied in this Dept.)
http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/grading.pdf

READINGS
There is no assigned textbook for this course. Required Readings and Lecture Notes: Links to the required readings and lecture notes will be placed on the Quercus course website. Posting of the presentations of guest lectures will be at the discretion of the guest. **It is highly recommended that you take additional notes during lectures and guest presentations. ~~All assigned readings and material covered during lectures will form the subject matter for the examination.~~**

Week 1: Introduction – no readings

Week 2: Term project & Evidence-based conservation

- Stevens, M., & Norris, D. R. (2021). A mixed methodology for evaluating use of evidence in conservation planning. *Conservation Biology*.

- (Supplemental) Pita, C., Pierce, G. J., Theodossiou, I., & Macpherson, K. (2011). An overview of commercial fishers' attitudes towards marine protected areas. *Hydrobiologia*, *670*(1), 289-306.

Week 3: Group work – no readings
Guest lecture – Jay Fitzsimmons (MNRF)

Week 4: Ecological Integrity / Group work

- Rohwer, Y., & Marris, E. (2021). Ecosystem integrity is neither real nor valuable. *Conservation Science and Practice*, *3*(4), e411.

- Karr, J. R., Larson, E. R., & Chu, E. W. (2021). Ecological integrity is both real and valuable. *Conservation Science and Practice*, e583.

- Marris, E., & Rohwer, Y. The concept of ecological integrity may have been useful, but that does not make it real or morally valuable. *Conservation Science and Practice*, e586.

Week 5: Science Communication 2
Guest lecture – Cindy Bongard (UTSC)
TBD

Week 6: Science communication 2
Guest lecture – Jode Roberts (David Suzuki Foundation)

- Oke, C., Bekessy, S. A., Frantzeskaki, N., Bush, J., Fitzsimons, J. A., Garrard, G. E., ... & Gawler, S. (2021). Cities should respond to the biodiversity extinction crisis. *npj Urban Sustainability*, *1*(1), 1-4.

- Saunders, M. (2021) What the windscreen anecdote tells us about science, Ecology is not a dirty word, blog

Week 7: Reading week

Week 8: Experimental design
Guest lecture – Paula Julio & Katrina Wisniewski (MNRF)

- Koen, E. L., Newton, E. J., & Ellington, E. H. (2021). Evaluating potential sources of invasive wild pigs in Ontario. *Ecology and evolution*, *11*(21), 14744-14757.

Week 9: Basic statistics
Guest lecture – Farheen Kadwa (WWF)

- Steel, E. A., Kennedy, M. C., Cunningham, P. G., & Stanovick, J. S. (2013). Applied statistics in ecology: common pitfalls and simple solutions. *Ecosphere*, *4*(9), 1-13.

Week 10: Biological control / Group work

- Ferreira-Martins, D., Champer, J., McCauley, D. W., Zhang, Z., & Docker, M. F. (2021). Genetic control of invasive sea lamprey in the Great Lakes. *Journal of Great Lakes Research*, *47*, S764-S775.

Week 11: Bridging Indigenous Knowledge & Western conservation science

- Alexander, S. M., Provencher, J. F., Henri, D. A., Nanayakkara, L., Taylor, J. J., Berberi, A., ... & Cooke, S. J. (2021). Bridging Indigenous and Western sciences in freshwater research, monitoring, and management in Canada. *Ecological Solutions and Evidence*, *2*(3), e12085.

Week 12: Lessons from Covid-19 for biodiversity conservation / Group Work

- Gregg, E. A., Kusmanoff, A. M., Garrard, G. E., Kidd, L. R., & Bekessy, S. A. (2021). Biodiversity conservation cannot afford COVID-19 communication bungles. *Trends in Ecology & Evolution*, *36*(10), 879-882.

- Mohd Hanafiah, K., Ng, C., & Wan, A. M. (2021). Effective Communication at Different Phases of COVID-19 Prevention: Roles, Enablers and Barriers. *Viruses*, *13*(6), 1058.

Week 13: Presentations

VERIFICATION OF ILLNESS

A ***Verification of Illness*** **(also known as a "doctor's note") is temporarily not required.** Students who are absent from academic participation for **any reason** (e.g., COVID, cold, flu and other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online absence declaration. The declaration is available on **ACORN under the Profile and Settings menu.** Students should also advise their instructor *of* their absence. Visit COVID-19 Information for University of Toronto Students page on the Vice-Provost, Students website for information on this and other frequently asked questions.

EMERGENCY PLANNING

Students are advised to consult the university's preparedness site (http://www.preparedness.utoronto.ca) for information and regular updates regarding procedures relating to emergency planning.

ACCESSIBILITY NEEDS

The University of Toronto is committed to accessibility. If you require accommodations for a disability or have any accessibility concerns about the course, the classroom or course materials, please contact the UTSC Accessibility Services as soon as possible: http://www.utsc.utoronto.ca/~ability/

We also suggest you also refer to the following University of Toronto Scarborough Library link:

http://utsc.library.utoronto.ca/services-persons-disabilities

PLAGIARISM

University of Toronto Code of Behaviour on Academic Matters states that "it shall be an offence for a student knowingly: to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism."

For accepted methods of standard documentation formats, including electronic citation of internet sources please see the UofT writing website at http://advice.writing.utoronto.ca/using-sources/documentation.

The full Code of Behaviour regulations could be found from consulting

https://www.sgs.utoronto.ca/policies-guidelines/academic-integrity-resources/

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (*https://uoft.me/pdt-faq*).

WRITING AND ENGLISH LANGUAGE

As well as the faculty writing support, please see English Language and writing support at University of Toronto or the Centre for Teaching and Learning at UTSC.

The following is also useful:

Sylvan Barnett, *A Short Guide to Writing About Art*. 5-7th edition (New York: Harper-Collins, 1997)

William Strunk Jr., E.B. White. The Elements of Style (New York: MacMillan Publishing)

LATE WORK

Assignments must be handed in by 11:59 PM on the due date. A penalty of 10% per day, including weekend days, will be incurred for late assignments.