

## **ESTC34H3S/EESC34H3 – Sustainability in Practice**

**Lecture: Wednesday, 9am-12pm**

First class is Wednesday, January 12, 2022, and the last class is Wednesday, April 6, 2022

**No classes during Reading week (February 21 - 25, 2022)**

**Course Instructor:** Professor Vidya Anderson/ **Email:** [vidya.anderson@utoronto.ca](mailto:vidya.anderson@utoronto.ca)

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**Office hours: By appointment**

### **COURSE DESCRIPTION**

As the climate rapidly changes and natural resources grow increasingly scarce, there is a strong need for individuals and organizations to design and implement effective sustainability and environmental management solutions.

This course provides a practical introduction to the very broad fields of sustainability and environmental management and is fundamentally transdisciplinary. Student will learn the scientific principles of sustainability and gain in-depth exposure to environmental management practices in real time. Foundational principles of sustainability are covered along with emerging topics of human health, air and water pollution, water resources, eco-system health, energy and climate change, social justice, biodiversity, and regulatory strategies for environmental management.

This course is intended for students who want to apply theoretical principles of environmental sustainability to real world problems. Students will learn to how to implement sustainability practices in their daily lives. Students will also identify a problem of local interest related either to campus or municipal sustainability and develop a practical solution. Students who choose campus issues will have the potential to implement their solutions.

### **COURSE OBJECTIVES**

Students will learn practical skills and gain exposure to sustainable management practices and emerging technologies. Readings and discussions will offer critical perspectives while highlighting challenges, limitations, and strengths. Lectures, writing assignments, and other evaluations will help you to:

- Gain insight into critical environmental factors affecting air, water, climate, and ecosystems
- Build practical vocabularies
- Identify greenwashing, misinformation, disinformation, and fake news
- Leverage your knowledge of focused subject areas—such as environmental economics, GHG emissions management, sustainable building design, sustainable supply chain management, environmental toxicology, etc.—to achieve a specific objective
- Implement sustainability management at the nexus of a community
- Develop transferable project management skills

## SCHEDULE

Week 1 – Jan. 12 – Lecture 1  
Week 2 – Jan. 19 – Lecture 2  
Week 3 – Jan. 26 – Lecture 3  
Week 4 – Feb. 2 – Lecture 4  
Week 5 – Feb. 9 – Lecture 5  
Week 6 – Feb. 16 – Lecture 6  
Week 7 – Feb. 23 – **No classes (Reading week)**  
Week 8 – Mar. 2 – Lecture 7  
Week 9 – Mar. 9 – Lecture 8  
Week 10 – Mar. 16 – Lecture 9  
Week 11 – Mar. 23 – Lecture 10  
Week 12 – Mar. 30 – Lecture 11  
Week 13 – Apr. 6 – Lecture 12

For the topics covered during individual lectures, please see the READINGS section at the end of this syllabus.

### A few notes on the lecture format:

The broad objective of the lectures is to create opportunities for active engagement with the course material, to generate discussions and debate, and to create a more interactive learning environment leading to a deeper understanding of the course material.

## EVALUATION

Assignment	Due date	Weight (%)
1. Class participation and attendance	Ongoing	5%
2. Discussion board postings	Weekly (before class)	10%
3. Personal sustainability action plan	March 4	15%
4. <b>A)</b> Project charter & <b>B)</b> Group presentation	March 23 & 30	20%
5. Creative solutions essay	April 6	20%
6. Final exam	TBD	30%

### A few notes on the assignments:

Please read the assigned readings in advance and attend class prepared to discuss your ideas, ask questions, suggest issues for discussion, and engage in the overall online classroom learning experience. **You are required to participate in the discussion board by posting at least one response to the weekly question(s).** One or more questions pertaining to the weekly readings will be posted and you will have one week to post your answer(s). Answers submitted after this time will not be counted toward your participation grade.

Details for specific assignments will be provided over the course of the term. Evaluation will be conducted in accordance with the University Assessment and Grading Practices Policy <http://www.governingcouncil.utoronto.ca/policies/uniaassgpp.htm>.

## COMMUNICATION

Quercus is the primary mode of communication for this course. Please check Quercus regularly for course announcements. If you have content-related questions, you must use the Quercus discussion board to ask these questions. Remember that if you have a question about a lecture or assignment, it is likely that another student has the same question. Posting questions on Quercus improves learning for everyone. Please make sure to use and check your University of Toronto email address for all communication with the Course Instructor and the Teaching Assistant. ***It is imperative for students to monitor Quercus for updates and for when assignments are due.***

## **A CLASSROOM BUILT ON RESPECT, DIVERSITY, AND INCLUSION**

The University's policies are important building blocks for advancing an intentionally inclusive environment. We strive to cultivate a teaching, learning, and working environment that is equitable, inclusive, and free from discrimination and harassment. Bullying, harassment, and racism will not be tolerated in the classroom. Such behaviour will result in disciplinary action, removal from the course, and a permanent mark on your academic record.

## **USE OF ELECTRONIC EQUIPMENT IN THE CLASSROOM**

The use of electronic equipment for course-related tasks (taking notes, accessing readings etc.) is allowed and encouraged; the use of electronic equipment for personal communication or entertainment is strongly discouraged. For reasons of privacy as well as protection of copyright, unauthorized video or audio recording is prohibited.

Reproduction or distribution of lecture materials to a third party violates the University's copyright policy and could result in academic sanction. Please refer to the University's copyright policy for further information: <http://www.governingcouncil.utoronto.ca/policies/copyright.htm>.

## **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. We welcome students with diverse learning styles and needs in our course. If you require accommodations or have any accessibility concerns, please contact the UTSC AccessAbility Services as soon as possible at <http://www.utsc.utoronto.ca/~ability/>. AccessAbility Services staff (located in Rm SW302, Science Wing) are available via email and phone to schedule appointments to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca).

We also suggest you also refer to the following University of Toronto Scarborough Library link: <http://utsc.library.utoronto.ca/services-persons-disabilities>.

## **PLAGIARISM**

The University of Toronto treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters <http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf> outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. The University of Toronto Code of Behaviour on Academic Matters states that "it shall be an offense 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."

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness, and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. According to Section B of the University of Toronto's Code of Behaviour on Academic Matters (August 1995), which all students are expected to know and respect, it is an offence for students:

- To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e., to commit plagiarism;
- To include false, misleading or concocted citations in their work;
- To obtain unauthorized assistance on any assignment;

- To provide unauthorized assistance to another student. This includes showing another student completed work;
- To submit their own work for credit in more than one course without the permission of the instructor;
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes; and
- To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values which they protect. The full Code of Behaviour regulations can be found at <http://www.artsci.utoronto.ca/osai/The-rules/what-is-academic-misconduct>.

Normally, students will be required to submit their course essays through *Ouriginal* for a review of textual similarity and detection of possible plagiarism.

For accepted methods of standard documentation and formats, including electronic citation of internet sources please see the University of Toronto writing website at:

- *How Not to Plagiarize* <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize>
- *Citation Format* <http://www.writing.utoronto.ca/advice/using-sources/documentation>
- *APA style - Research & Citation Resources* <https://owl.english.purdue.edu/owl/section/2/10/>

## WRITING AND ENGLISH LANGUAGE

Please visit the English Language and writing support page at University of Toronto: <http://writing.utoronto.ca/support/english-language-support/>. The following resources are also useful:

- *General Writing Resources* <https://owl.english.purdue.edu/owl/section/1/>
- *Academic Writing* <https://owl.english.purdue.edu/owl/section/1/2/>
- **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)
- *Using Quotations* <http://www.writing.utoronto.ca/advice/using-sources/quotations>
- *Paraphrase and Summary* <http://www.writing.utoronto.ca/advice/using-sources/paraphrase>

## LATE WORK

### Extensions, accommodations, and late penalties

Extensions and accommodations are at the discretion of the course instructor, only for serious and verifiable reasons (illness etc.), when supported by appropriate documentation.

In the absence of an extension **approved prior to the due date**, a late penalty of **5%** per day of the total value of the assignment will be deducted for each day, including weekend days.

## READINGS

The required readings for each class are listed below. Most of the readings – all journal articles and some book chapters – are available in full text, online, through the University of Toronto library catalogue. For the readings available in print only, copies will be made available and/or circulated and/or available on reserve at the library.

**Note:** The reading list is provisional. You should not expect any major changes, but revisions and additions may be made (and communicated in a timely manner) if there is interest or demand for a certain topic. The order of topics in different weeks may be switched, for example in order to accommodate a guest lecturer.

Week 1 – Jan. 12 – Lecture 1

### **Introduction – What is Sustainability?**

- Butler, C.D. (2017). Limits to growth, planetary boundaries, and planetary health. *Environmental Sustainability*, ISSN 1877-3435, 04/2017, Vol. 25, pp. 59 – 65  
<https://www.sciencedirect.com/science/article/pii/S1877343516300549?via%3Dihub>
- Hardin, G. (1968). The Tragedy of the Commons. Source: *Science*, New Series, Vol. 162, No. 3859 (Dec. 13, 1968), pp. 1243-1248, Published by: American Association for the Advancement of Science, Stable URL: <http://www.jstor.org/stable/1724745>
- Tu, C., Suweis, S. & D’Odorico, P. (2019). Impact of globalization on the resilience and sustainability of natural resources. *Nature Sustainability*, 2, 283–289. <https://doi.org/10.1038/s41893-019-0260-z>
- United Nations. (2020). *The Sustainable Development Goals Report 2020*, available at: <https://sdgs.un.org/sites/default/files/2020-09/The-Sustainable-Development-Goals-Report-2020.pdf>

Week 2 – Jan. 19 – Lecture 2

### **Personal Sustainability**

- Benton, M.C., Radziwill, N.M. (2018) Designing Personal Sustainability into Organizational Culture: The Case of Burning Man. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_17](https://doi.org/10.1007/978-3-319-71389-2_17)
- Phillips, D.M., Phillips, J.K. (2018) We’d Like Our Clothes Back Please! Partnering with Consumers to Achieve Sustainability Goals. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_32](https://doi.org/10.1007/978-3-319-71389-2_32)
- United Nations. *170 Daily Actions to transform our world*, <https://drive.google.com/file/d/1iMdE6DLLuCqwq3K9U-DaTUWB6KyMa8QG/view>

Week 3 – Jan. 26 – Lecture 3

### **Sustainability in the Anthropocene Epoch**

- Everard, M., Johnston, P., Santillo, D. & Staddon, C. (2020). The role of ecosystems in mitigation and management of Covid-19 and other zoonoses, *Environmental Science & Policy*, 111: 7-17, ISSN 1462-9011, <https://doi.org/10.1016/j.envsci.2020.05.017>.
- Lancet. (2020) Climate and COVID-19: converging crises. [https://doi.org/10.1016/S0140-6736\(20\)32579-4](https://doi.org/10.1016/S0140-6736(20)32579-4)
- Watts, N. *et al.* (2020). The 2020 report of The Lancet countdown on health and climate change: responding to converging crises. *Lancet*, [https://doi.org/10.1016/S0140-6736\(20\)32290-X](https://doi.org/10.1016/S0140-6736(20)32290-X)
- Whitmee, S. *et al.* (2015). Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *The Lancet* 2015, Volume 386, Issue 10007, 1973 – 2028 <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2815%2960901-1>

Week 4 – Feb. 2 – Lecture 4

### **Sustainability in Practice - Agriculture**

Guest Speaker: B. Gilvesy

- Cole, M. B., Augustin, M. A., Robertson, M. J., & Manners, J. M. (2018). The science of food security. *Npj Science of Food*, 2(1), 1-8. <https://www-nature-com.myaccess.library.utoronto.ca/articles/s41538-018-0021-9>
- EAT Lancet Commission. (2018). Food, Planet, Health – Summary Report. [https://eatforum.org/content/uploads/2019/07/EAT-Lancet\\_Commission\\_Summary\\_Report.pdf](https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf)
- McCarthy, U., Uysal, I., Badia-Melis, R., Mercier, S., O’Donnell, C., & Ktenioudaki, A. (2018). Global food security – Issues, challenges and technological solutions. *Trends in Food Science & Technology*, 77, 11-20. <https://www.sciencedirect-com.myaccess.library.utoronto.ca/science/article/pii/S0924224417305125?via%3Dihub>
- UNEP. (2021). Food Waste Index 2021. <https://www.unep.org/resources/report/unep-food-waste-index-report-2021>

Week 5 – Feb. 9 – Lecture 5

### **Urban Sustainability**

- Anderson, V. & Gough, W.A. (2021). Harnessing the Four Horsemen of Climate Change: A Framework for Deep Resilience, Decarbonization, and Planetary Health in Ontario, Canada. *Sustainability*, 13, 379. <https://doi.org/10.3390/su13010379>
- Anderson, V. & Gough, W.A. (2020). Evaluating the potential of nature-based solutions to reduce ozone, nitrogen dioxide, and carbon dioxide through a multi-type green infrastructure study in Ontario, Canada. *City and Environment Interactions*. <https://doi.org/10.1016/j.cacint.2020.100043>
- O'Neill K., Gibbs D. (2018) Green Building and Sustainability: Diffusing Green Building Approaches in the UK and Germany. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_29](https://doi.org/10.1007/978-3-319-71389-2_29)
- Strom E. (2018) Brownfield Redevelopment: Recycling the Urban Environment. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_20](https://doi.org/10.1007/978-3-319-71389-2_20)

Week 6 – Feb. 16 – Lecture 6

### **Sustainability in Practice - Artificial Intelligence**

Guest Speaker: *H. Mehdipoor*

- Khakurel, J.; Penzenstadler, B.; Porras, J.; Knutas, A.; Zhang, W. (2018). The Rise of Artificial Intelligence under the Lens of Sustainability. *Technologies*, 6, 100. <https://doi.org/10.3390/technologies6040100>
- Nishant, R., Kennedy, M., and Corbett, J. (2020). Artificial intelligence for sustainability: Challenges, opportunities, and a research agenda, *International Journal of Information Management*, Vol. 53, 102104, ISSN 0268-4012, <https://doi.org/10.1016/j.ijinfomgt.2020.102104>.
- van Wynsberghe, A. (2021). Sustainable AI: AI for sustainability and the sustainability of AI. *AI Ethics* 1, 213–218 <https://doi.org/10.1007/s43681-021-00043-6>

Week 7 – Feb. 23 – **No classes (Reading week)**

Week 8 – Mar. 2 – Lecture 7

### **Workshop: How to Identify Greenwashing, Fake News, Misinformation & Disinformation**

Guest Speaker: *K. Barrett*

- Lazer, D. M., Baum, M. A., Benkler, Y., Berinsky, A. J., Greenhill, K. M., Menczer, F. ... & Zittrain, J. L. (2018). The science of fake news. *Science*, 359(6380), 1094-1096. <https://science-sciencemag.org.myaccess.library.utoronto.ca/content/sci/359/6380/1094.full.pdf>
- Scheufele, D. A., & Krause, N. M. (2019). Science audiences, misinformation, and fake news. *Proceedings of the National Academy of Sciences*, 116(16), 7662-7669. <https://www-pnas.org.myaccess.library.utoronto.ca/content/116/16/7662>
- Eysenbach, G. (2020). How to fight an infodemic: The four pillars of infodemic management. *Journal of Medical Internet Research*, 22(6), e21820. <https://www.jmir.org/2020/6/e21820>
- Farrell, J., McConnell, K., & Brulle, R. (2019). Evidence-based strategies to combat scientific misinformation. *Nature Climate Change*, 9(3), 191-195. <https://www-nature-com.myaccess.library.utoronto.ca/articles/s41558-018-0368-6.pdf>
- Wardle, C. (2018). Information disorder: The essential glossary. Shorenstein Center on Media, Politics, and Public Policy, Harvard Kennedy School. [https://firstdraftnews.org/wp-content/uploads/2018/07/infoDisorder\\_glossary.pdf](https://firstdraftnews.org/wp-content/uploads/2018/07/infoDisorder_glossary.pdf)

Week 9 – Mar. 9 – Lecture 8

### **Sustainability, Waste Management & Circular Cities**

- Das, S., Lee, S.-H., Kumar, K., Kim, K-H., Lee, S.S. & S.S. Bhattacharya. (2019). Solid waste management: Scope and the challenge of sustainability, *Journal of Cleaner Production*, 228, 658-678. <https://doi.org/10.1016/j.jclepro.2019.04.323>
- Patwa, N., Sivarajah, U., Seetharaman, A., Sarkar, S., Maiti, K. and Hingorani, K. (2021). Towards a circular economy: An emerging economies context, *Journal of Business Research*, Vol. 122, pp. 725-735, ISSN 0148-2963, <https://doi.org/10.1016/j.jbusres.2020.05.015>.
- Sung K., Cooper T., Kettley S. (2018) Emerging Social Movements for Sustainability: Understanding and Scaling Up Upcycling in the UK. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_15](https://doi.org/10.1007/978-3-319-71389-2_15)
- Velenturf, A. and Purnell, P. (2021). Principles for a sustainable circular economy, *Sustainable Production and Consumption*, Vol. 27, pp. 1437-1457, ISSN 2352-5509, <https://doi.org/10.1016/j.spc.2021.02.018>.

Week 10 – Mar. 16 – Lecture 9

### **Sustainability in Practice - Healthcare**

Guest Speaker: *B. Agic*

- Eckelman, M.J., Sherman J. (2016). Environmental Impacts of the U.S. Health Care System and Effects on Public Health. *PLoS One*. 11(6):e0157014. doi: 10.1371/journal.pone.0157014. <https://pubmed.ncbi.nlm.nih.gov/27280706/>
- Eckelman, M.J., Huang, K., Lagasse, R., Senay, E., Dubrow, R. and Sherman, J.D. (2020) Health Care Pollution And Public Health Damage In The United States: An Update. *Health Affairs* 39, 12: 2071–2079. doi: 10.1377/hlthaff.2020.01247 <https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2020.01247>
- Karliner, J., Slotterback, S., Boyd, R., Ashby, B. and Steele, K. (2019). Health Care's Climate Footprint: How the Health Sector Contributes to the Global Climate Crisis and Opportunities for Action. [https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint\\_092319.pdf](https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf)

Week 11 – Mar. 23 – Lecture 10

### **Class Presentations**

Week 12 – Mar. 30 – Lecture 11

### **Class Presentations**

Week 13 – Apr. 6 – Lecture 12

### **Reflections on Wicked Problems**

- Roseland M., Spiliotopoulou M. (2018) Sustainability in North America: The Canadian Experience. In: Brinkmann R., Garren S. (eds) *The Palgrave Handbook of Sustainability*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-71389-2\\_34](https://doi.org/10.1007/978-3-319-71389-2_34)