

INDEV 609 Course Outline (Fall 2021)

Sustainability Concepts, Applications and Key Debates

Instructor: Dr. Simron Jit Singh, Professor, SEED
Office: EV3, Room 4227 | Tel: 519.888.4567 (Ext. 33111)
Office hours: By appointment
Email: simron.singh@uwaterloo.ca

Times and location

This course is **remote synchronous** once a week: Fridays, 10am – 12.50 pm. We will use *WebEx* for our weekly meetings: <https://uwaterloo.webex.com/meet/simron.singh>

For group collaboration, a *Team* with the name INDEV 609 has already been created on *MS Teams*. You can also use *LEARN* for the same.

Course description

The course (INDEV 609) is designed to introduce the participants to a spectrum of sustainability concepts, approaches, and key debates, setting the stage for critical and practical engagement with development. The emphasis is on gaining clarity on the notion of sustainability and global environment change since its translation into practice will often imply confronting a number of challenges when taking decisions. In this course, we will go through key proposals for humanity's sustainable future. These are: a) economic de-growth / downscaling production and consumption, b) resilience and adaptation, and c) the (payments for) ecosystem service approach. Each of these proposals will be evaluated and discussed. The course emphasizes taking a "big picture" and a whole system perspective on sustainability. By the end of this course, students will be able to distinguish various schools of thoughts on sustainability and related terminologies, and critically reflect the strength and shortcomings of these approaches.

Note on readings

Most of the readings listed here are either open access (links provided) or available through UW library while on campus, but also remotely by logging onto the library system. As graduate students, you are expected to search and download these readings yourself. If some of the readings listed are not available online or through the UW library (book chapters, publication in press, etc.), these will be uploaded on *LEARN* prior to the class. You are also encouraged to look for additional literature and include them in your assignments. If you encounter problems in accessing the readings, please let me and/or our liaison librarian know. Her name is Agnes Zientarska-Kayko. (email: azientarskakayko@uwaterloo.ca)

Overview of graded assignments

Deliverable	Topic	Due Date	Where	Marks
Reflection 1	Is there a global environmental and social crisis? (Units 2-4)	6 Oct.	Dropbox	20
Reflection 2	Efficiency or Sufficiency? Comparing decoupling and de-growth. (Units 5-7)	3 Nov.	Dropbox	20
Reflection 3	Adapt or Die? A critical reflection on the concept of <i>resilience</i> (Units 8-9)	17 Nov.	Dropbox	20
Group presentations	Topics need to be approved by the instructor	3 Dec.	Virtual presentation to class Dropbox	25+5 = 30
Class participation	See page 10			10

What is a reflection paper? Reflection papers (submitted individually) should be close to 1,000 words, not counting in-text and end reference list. They must offer a critical reflection on the theme and insights gained in respective unit blocks (see above table). A reflection paper is **not a summary** of the readings, but a critical opinion piece. However, it is not enough to just offer your opinion, but why you think so, what is the evidence you gathered from the lecture and readings? What are your key takeaways based on the evidence?

Procedure for each week of class/unit

It is important that you come to the class having read/watched the materials for that week so you can follow the lecture better. The lecture complements, but not replaces the readings. Each unit will begin with a one-hour lecture, followed by 45 mins of break-out groups (created by the instructor) to discuss the delivered content, readings, and write down your key takeaways as a group. Sometimes a quiz will be posted on LEARN for the group to test themselves. After a 15 min break, at 12 noon EST, the class will reconvene to discuss and ask questions.

Weekly schedule of topics

Unit 1: September 10th

Introduction to the course content, structure, participants, standards, expectations, readings, deliverables, and addressing any concerns that may arise thereof; kick-off into the course theme.

Unit 2: September 17th

Sustainability: Is there reason for concern?

- Historical and current overview on global environment change science, and sustainable development

Readings:

1. Steffen, W., et al. (2020). The emergence and evolution of Earth System Science. *Nature Reviews Earth & Environment*, 1(1), 54–63.
<https://doi.org/10.1038/s43017-019-0005-6>
2. Hoekstra, A. & Wiedmann, T. (2014). Humanity's unsustainable environmental footprint. *Science* 344, pg. 1114.
<https://science.sciencemag.org/content/344/6188/1114>
3. Raworth, K. (2012). A Safe and Just Space for Humanity. Can we live within the Doughnut? Oxfam Discussion Paper.
<http://policy-practice.oxfam.org.uk/publications/a-safe-and-just-space-for-humanity-can-we-live-within-the-doughnut-210490>
4. Rockström, J., et. al. (2021). Identifying a Safe and Just Corridor for People and the Planet. *Earth's Future*, 9(4), e2020EF001866.
<https://doi.org/10.1029/2020EF001866>

For your curiosity:

- *Millennium Ecosystem Assessment (2005). Ecosystems and human well-being: Synthesis.* (2005). Island Press.
<https://www.millenniumassessment.org/documents/document.356.aspx.pdf>
- IPCC. (2021). *Climate Change 2021: The Physical Science Basis (AR6).* Intergovernmental Panel on Climate Change (IPCC).
<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>
- Intergovernmental Panel on Climate Change: <http://www.ipcc.ch/>

Interactive tools

- <http://www.carbonmap.org/>
- Global food demand scenarios
http://www.pik-potsdam.de/%7Ebodirsky/demand_scenarios/#page1

Unit 3: September 24th

Sustainability as a problem of society-nature interactions

- Society's metabolism
- Evidence from material flow accounting
- Socio-metabolic regimes and historical transitions

Readings:

1. Haberl, H., et. al. (2011). A socio-metabolic transition towards sustainability? Challenges for another Great Transformation. *Sustainable Development*, 19(1), 1–14. <https://doi.org/10.1002/sd.410>
2. Schandl, H., et al. (2017). Global Material Flows and Resource Productivity: Forty Years of Evidence. *Journal of Industrial Ecology*, 22(4), 827–838. <https://doi.org/10.1111/jiec.12626>
3. Haas, W., Krausmann, F., Wiedenhofer, D., Lauk, C., & Mayer, A. (2020). Spaceship earth's odyssey to a circular economy—A century long perspective. *Resources, Conservation and Recycling*, 163, 105076. <https://doi.org/10.1016/j.resconrec.2020.105076>

Watch

The Story of Stuff (20 mins) is one of the most watched environmental-themed online movies of all time. <https://www.storyofstuff.org/movies/story-of-stuff/>

Unit 4: October 1st

Does trade increase or reduce international material inequality?

(Guest: Dr. Anke Schaffartzik, Central European University, Vienna, Austria)

Readings:

1. Schaffartzik, A., Duro, J. A., & Krausmann, F. (2019). Global appropriation of resources causes high international material inequality – Growth is not the solution. *Ecological Economics*, 163, 9–19. <https://doi.org/10.1016/j.ecolecon.2019.05.008>
2. Mayer, A., Haas, W., & Wiedenhofer, D. (2017). How Countries' Resource Use History Matters for Human Well-being – An Investigation of Global Patterns in Cumulative Material Flows from 1950 to 2010. *Ecological Economics*, 134, 1–10. <https://doi.org/10.1016/j.ecolecon.2016.11.017>
3. UNEP, & IRP. (2020). *Sustainable Trade in Resources: Global Material Flows, Circularity and Trade*. (p. 80). United Nations Environment Programme. <https://wedocs.unep.org/bitstream/handle/20.500.11822/34344/STR.pdf?sequence=1&isAllowed=y>

Unit 5: October 8th

Decoupling, international trade, and social conflicts

- What is resource/material decoupling, and what is the evidence?
- How is it linked to international trade and social conflict?
- What gives rise to environmental justice movements?

Readings

1. Wiedmann, T., Schandl, H., Lenzen, M., Moran, D., Suh, S., West, J. & Kanemoto, K. (2013). The material footprint of nations. *PNAS Early Edition*: www.pnas.org/cgi/doi/10.1073/pnas.1220362110
2. Haberl, H., et. al. (2020). A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: Synthesizing the insights. *Environmental Research Letters*, 15(6), 065003. <https://doi.org/10.1088/1748-9326/ab842a>
3. Martinez-Alier, J., Temper, L., Bene, D. D., & Scheidel, A. (2016). Is there a global environmental justice movement? *The Journal of Peasant Studies*, 43(3), 731–755. <https://doi.org/10.1080/03066150.2016.1141198>
4. Scheidel, A., & Schaffartzik, A. (2019). A socio-metabolic perspective on environmental justice and degrowth movements. *Ecological Economics*, 161, 330–333. <https://doi.org/10.1016/j.ecolecon.2019.02.023>

Watch

Journey to the Commodity Frontiers (15 mins) “reveals the impacts of the modern economic system of resource extraction and profit seeking and who really pays for the material life style of the growth society” (Clive Spash). <https://vimeo.com/14182461>

Useful links:

- Project CEECEC (Civil Society Engagement with Ecological Economics): <http://www.ceecec.net>
- Project EJOLT (Environmental Justice Organisations, Liabilities and Trade): <http://ejolt.org>
- Interactive atlas of environmental justice: <http://ejatlas.org/>

READING WEEK 11 – 15 October – NO CLASS

Unit 6: October 22nd

Achieving net-zero: A simple path to climate success

Guest lecture: Prof. Katya Rhodes, University of Victoria, B.C. Canada

<https://www.uvic.ca/hsd/publicadmin/people/home/faculty/rhodeskatya.php>

Readings

1. Rhodes, E., Scott, W. A., & Jaccard, M. (2021). Designing flexible regulations to mitigate climate change: A cross-country comparative policy analysis. *Energy Policy*, 156, 112419. <https://doi.org/10.1016/j.enpol.2021.112419>

2. Brand-Correa, L. I., Martin-Ortega, J., & Steinberger, J. K. (2018). Human Scale Energy Services: Untangling a 'golden thread.' *Energy Research & Social Science*, 38, 178–187. <https://doi.org/10.1016/j.erss.2018.01.008>
3. Fanning & O'Neill (2019). The Wellbeing–Consumption paradox: Happiness, health, income, and carbon emissions in growing versus non-growing economies. *Journal of Cleaner Production*, Vol. 212. <https://doi.org/10.1016/j.jclepro.2018.11.223>

Simulation tool *The Wellbeing–Consumption Paradox*
<https://goodlife.leeds.ac.uk/paradox/>

Unit 7: October 29th

Sustainability, Consumption, Sufficiency and Degrowth

Guest lecture: Prof. Joachim Spangenberg (SERI, Germany)

<https://seri.academia.edu/JoachimSpangenberg>

Readings:

1. Kallis, G., Kerschner, C., Martinez-Alier, J. (2012) The economics of degrowth. *Ecological Economics* Vol. 84. Pg. 172-180. https://degrowth.org/wp-content/uploads/2012/11/Kallis_2012_The-economics-of-degrowth.pdf
2. Spangenberg, J. H., & Lorek, S. (2019). Sufficiency and consumer behaviour: From theory to policy. *Energy Policy*, 129, 1070–1079. <https://doi.org/10.1016/j.enpol.2019.03.013>
3. Wiedmann, T., Lenzen, M., Keyßer, L. T., & Steinberger, J. K. (2020). Scientists' warning on affluence. *Nature Communications*, 11(1), 3107. <https://doi.org/10.1038/s41467-020-16941-y>

For your curiosity:

This link contains more literature, case studies and debates on de-growth:

<https://degrowth.org/academic-writing/>

Watch/listen:

- Documentary “*Enough is Enough*” (18 min) - based on the book “*Enough is Enough*” by Rob Dietz and Dan O’Neill (2013). <https://www.youtube.com/watch?v=jgo-eTTmuLk>
- *Life after growth: Economics for everyone* (a 25 min film by Dr. Leah Temper) <https://vimeo.com/10871269>
- *Tim Jackson: An Economic Reality Check* (TED talk) http://www.ted.com/talks/lang/en/tim_jackson_s_economic_reality_check.html
- *Paul Kennedy* (CBC program): *The Degrowth Paradigm* <http://www.cbc.ca/radio/ideas/the-degrowth-paradigm-1.2914099>

Useful links:

- <http://degrowth.org>
- <http://degrowth.ca>
- <http://www.de-growth.com/vancouver/>
- <http://leipzig.degrowth.org/en/>

Unit 8: November 5th

What is socio-ecological Resilience?

Guest: Prof. Prateep Nayak, University of Waterloo

<https://uwaterloo.ca/school-environment-enterprise-development/people-profiles/prateep-nayak>

- *Key resilience concepts*
- *Case Study: Chilika Lagoon - Resilience or Vulnerability*

Readings

1. Folke, C. (2006). Resilience: The emergence of perspective for social-ecological systems analyses. *Global Environmental Change*. Volume 16 (3). Pp. 253-267
2. Berkes, F. & Ross, H (2013) Community Resilience: Toward an Integrated Approach. *Society & Natural Resources: An International Journal*, 26:1, 5-20, DOI: [10.1080/08941920.2012.736605](https://doi.org/10.1080/08941920.2012.736605)
3. Nilufar Matin, John Forrester, Jonathan Ensor (2018). What is equitable resilience? *World Development*. Volume 109, Pages 197-205.
4. Nayak, P. K. (2017). Fisher communities in transition: Understanding change from a livelihood perspective in Chilika Lagoon, India. *Maritime Studies*, 16(1), 13. <https://doi.org/10.1186/s40152-017-0067-3>

Useful links:

- Resilience Alliance: <http://www.resalliance.org>
- *Ecology and Society* is an open access journal of the Resilience Alliance <http://www.ecologyandsociety.org>
- Stockholm Resilience Centre <http://www.stockholmresilience.org>

Unit 9: November 12th

A critique of Resilience

Readings

1. Brown, K. (2014). Global Environmental Change 1: A Social Turn for resilience? *Progress in Human Geography*, Vol. 38(1) 107–117. DOI: 10.1177/0309132513498837

2. MacKinnon, D. and Derickson, K.D. (2013). From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography*, Vol. 37, pp. 253-270.
3. O'Brien, Karen (2012). "Global Environmental Change II: From Adaptation to Deliberate Transformation." *Progress in Human Geography*. Vol. 36 (5).
4. Davidson, D. (2010). The applicability of the concept of resilience to social Systems: Some sources of optimism and nagging doubts. *Society & Natural Resources*, Vol. 23 (12).

Unit 10: November 19th

What can nature do for us? Perspectives from Environmental Economics

- Ecosystem services
- The Economics of Ecosystems and Biodiversity (TEEB)
- Payment for ecosystem services (e.g. CDM, REDD+)

Readings

1. Farley, J. (2012). Ecosystem Services: The Economics Debate. *Ecosystem Services* 1, p. 40-49.
2. Gomez-Baggethun, E. & Ruiz-Perez, M. (2011). Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography* 35 (5), p. 613-628.
3. Kinzig, A.P., Perrings, C. Chapin, F.S. III, Polasky, S., Smith, V.K., Tilman, D., and Turner, B.L. II (2011). Paying for Ecosystem Services - Promise and Peril. *Science*. Vol. 334 (6056). Pp. 603-604.
4. Muradian, R., et al. (2013). "Payments for ecosystem services and the fatal attraction of win-win solutions". *Conservation Letters*. Vol. 6 (4).
5. D'Alessandro, S., Cieplinski, A., Distefano, T., & Dittmer, K. (2020). Feasible alternatives to green growth. *Nature Sustainability*, 3(4), 329–335.
<https://doi.org/10.1038/s41893-020-0484-y>

For your curiosity

1. TEEB (2010). *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*.
http://www.teebweb.org/Portals/25/TEEB%20Synthesis/TEEB_SynthReport_09_2010_online.pdf
2. De Groot, R., Brander, L., van der Ploeg, S., Costanza, R., and others (2012). Global estimates of the value of ecosystem services and their services in monetary units. *Ecosystem Services* 1, p. 50-61.
3. Costanza, R., De Groot, R., Sutton, P. and others (2014). Changes in the global value of ecosystem services. *Global Environment Change* 26, p. 152-158.

Unit 11: November 26th

Preparing your final group projects

Unit 12: December 3^d

Final (group) presentations

The final presentations would focus on a case study, and analyze the same through the lens of one or more concepts learnt in the class. The case study and the question to be addressed must be agreed with the instructor ahead of time. Each group presentation is allowed a 10 minutes pitch, followed by a 5 min Q&A.

Evaluation / grading criteria

Group process marks / Making invisible work visible: The final assignment is a group project (presented on 3 December). Group efforts and process remains largely invisible to the instructor but must be compensated for. The group members themselves therefore determine these marks in a consensus based on the contributions of each member (see example below). Please consider tasks such as literature search, analyzing the literature, preparing slides for presentation, maintaining group coordination, presentation, contribution to writing in terms of quantity and quality, or work that goes into editing parts written by others to ensure the overall quality, proof reading, referencing, etc. In any case, group members should document work done individually. Assessing sub-tasks will only be done in case of a situation of no-consensus on the distribution of pool of marks – a situation not desired since assessing the writing alone can be biased, and overshadows other forms of contributions.

Example for distribution of a pool of marks

- Total mark for a group process: 5
- Number of group members: 4
- Total pool of marks to the group: 20 (5 x 4)
- Group members divide marks by consensus as follows:

<i>Student</i>	<i>Ann</i>	<i>Stacy</i>	<i>Bob</i>	<i>Chris</i>	<i>Total</i>
<i>Mark</i>	6	5	4	5	= 20

The instructor can either take the mark as they have been divided up to add to the individual total, or use them as a ratio to calculate the mark out of 20, depending on how the totals look like. After the final presentation, please communicate to the instructor the group decision on the sharing of this pool of marks, with copy to all group members. In case I do not receive an email to this effect, the instructor will assume that all group members receive equal marks.

Class participation includes being present in the class, actively engaging in activities in the break-out groups, attempting the quizzes, asking questions, responding to ideas, discussion - contributions that demonstrate your engagement and connection with the course materials and prior experience, demonstrating improvement and initiative, and openness in challenging your own assumptions and knowledge (critical thinking). Class participation also includes interacting with your classmates in a constructive and respectful manner, as well as maintaining general discipline.

Expectations

- | | |
|---------|---|
| 8+ | <ul style="list-style-type: none">- able to initiate and facilitate the development of ideas- comments are consistently insightful and raise questions or ideas that stimulate the learning of others- demonstrates critical reflection on readings- brings relevant and interesting resources (media, cases, articles) to the attention of others |
| 6-7 | <ul style="list-style-type: none">- comments and questions demonstrate some critical analysis- consistently shares ideas- effort made to build on ideas of others |
| 4-5 | <ul style="list-style-type: none">- raises occasional clarifying questions and comments- comments often not of a critical nature and do not demonstrate integration of material |
| Below 4 | <ul style="list-style-type: none">- no consistent contribution- little evidence of integrated learning- absent from class |

Course policies

LEARN: For this course, we will use LEARN - a web-based teaching and interacting tool that has a number of features. All course materials will be posted on LEARN, and assignments will be submitted to LEARN.

Electronic communication policy: I will only be using your UW email account to communicate to you, especially when sending group mails via LEARN. So please remember to check your UW account frequently, or set up a forwarding system to an account you use most. You will not be automatically notified for new announcements. If you wish to be notified, you will need to activate this function on LEARN – [see instructions here](#). However, in case of individual queries, I will respond (within 3 working days) by using the reply function to the email id you are writing from. I will not respond to any requests or messages sent via Facebook, SMS, or other social media.

Unclaimed assignments will be retained for two months after term grades become official in quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures.

University Policies and Support

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the [Office of Academic Integrity](#) for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check the [Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

Appeals: A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](#) (other than a petition) or [Policy 71, Student Discipline](#) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72, Student Appeals](#).

Note for students with disabilities: [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) will be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. This tool is used only for self-learning, as an opportunity for students to revise their submissions based on the results. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or

annotated bibliography), if they are concerned about their privacy and/or security. Those students who do not wish to use Turnitin should report to the instructor within one week of the start of the course, so alternate arrangements could be discussed.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.

Intellectual Property. Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

Coronavirus Information

[Coronavirus Information for Students](#)

This resource provides updated information on COVID-19 and guidance for accommodations due to COVID-19.

Mental Health Support

All of us need a support system. We encourage you to seek out mental health supports and resources when they are needed. You can reach out to [Campus Wellness](#) and learn about the variety of services available to promote your mental health and wellbeing.