Sustainability Approaches
ERS 400 (Winter 2018)

Lecture: Tuesday (12:30 pm -2:20 pm)
Tutorial: Wednesday or Thursday (8:30 am – 9:20 am)

Instructor: Dr. Derek Armitage (derek.armitage@uwaterloo.ca)
Teaching Assistants: Emily Caddell and Richard Giles

School of Environment, Resources and Sustainability
Faculty of Environment
University of Waterloo

Office Hours:
Wed. 9:30-11:30am
or by appointment
Office: 2013

> "You have to act as if it were possible to radically transform the world. And you have to do it all the time." —Angela Davis

Overview: This course examines how individuals and societies deal with and respond to social-ecological system complexity, uncertainty and change, and emphasizes selected concepts, approaches and tools to foster environment and resource sustainability. The course will build on material covered in previous SERS courses, and it will further emphasize the application of systems thinking concepts in the context of real-world cases and your interests.

Course approach and objectives: We live in a human-dominated earth system. Sustainable responses to the local and global changes humanity has created will test our individual and collective capacities to cope, adapt and deliberatively transform our interactions with nature. This course will emphasize actionable concepts and encourage transdisciplinary thinking as a foundation to foster sustainability.

Our approach to the class will be: 1) systemic - thinking in terms of social and ecological connections and considering feedback across scales; 2) critical - not accepting the obvious explanation and challenging the relationships of power that influence sustainable outcomes (generally and in regards to your own focus); and 3) applied – developing and using concepts, tools and skills in the context of some real-world challenges, with an emphasis on your own interests and career aspirations.

At the end of this course, you should be able to:

- Reflect on your own training and experience as it relates to social-ecological uncertainty and change (local to global), and broader efforts to transition towards sustainability;
- Understand and assess various approaches as they are applied at local to global scales to deal with sustainability challenges;
- Critically assess the assumptions underlying sustainability ideas and applications and by extension your own interests and experiences; and
- Reflect and communicate your understanding of linked social and ecological system sustainability, and with reference to your own interests and future aspirations.

Course activities will involve a mix of lecture and discussion (e.g., through tutorial activities). We will draw on a range of examples and cases, both close to home and internationally. Guest speakers and multi-media (e.g., video) will be used to supplement course content. Assignments

are intended to encourage critical thinking and reflection, and should be tailored to your specific interests.

Readings: The required course text, "Sustainability Science", argues that sustainability is a transformative process. The full reference for the text is:

König, Ariane. 2017. *Sustainability Science: Key Issues in Environment and Sustainability.* Routledge: London and New York.

This text has just recently been published and so it is not available in the UW bookstore. However, it is easily purchased as an e-book at the publishers website at: https://www.routledge.com/Sustainability-Science-Key-Issues/Konig-Ravetz/p/book/9781138659285

The e-book is recommended. You may seek to obtain the paperback version (either via the publishers website or Amazon) but if you do, please confirm that it will be delivered quickly.

Supplementary readings are listed in the course schedule (below), and they are accessible through the course LEARN site or via the UW Library. Readings (course text and supplementary articles) will focus on selected approaches, concepts and tools that are conducive to transdisciplinary sustainability research and practice, and in relation to the themes and assignments we cover in the course.

Readings from past SERS courses are a valuable resource – please revisit and use them as appropriate.

Additional helpful resources can be found in: "Readings in Sustainability Science and Technology" by Kates (2010). It is available for free online: http://www.hks.harvard.edu/centers/cid/publications/faculty-working-papers/cid-working-paper-no.-213

Course requirements and evaluation: Evaluation in this course is based on: (i) tutorial/lab participation; (ii) a mid-term exam; and (iii) your 'theory of change' in which you situate your own specific interests in its broader social-ecological context. A summary of each requirement is provided below:

Tutorial/lab participation (20%): Participation marks will be assigned for (a) regular attendance in the tutorial/labs (10%) and (b) your substantive contribution to tutorial discussions and activities, including evidence you have come to the sessions prepared, and that you are willing to offer questions and contribute to discussions (10%). Please note that quantity of participation will not be equated with quality.

Mid-term exam (30%): The mid-term exam is scheduled for March 13th. The mid-term will focus on key concepts and information covered in class, and as supplemented by readings and related resources.

Theory of change (50%): Regardless of our intellectual footing (e.g., ecology, policy, restoration, governance, etc.) or applied aspirations (e.g., resource manager, researcher, outreach, education, etc.), we need a theory of change to guide our sustainability efforts, and ideally, a 'systems-informed' theory of change. You will develop your theory of change in the context of an issue that is of particular interest to you. Further details on this assignment will be made available. To facilitate your efforts, we will approach the theory of change through a series of phases:

- Theory of Change Phase I (focal point, goals and aspirations) (10%)
- Theory of Change Phase II (conditions for change and key assumptions) (10%)
- Theory of Change Phase III (interventions and measuring success) (10%)
- Final Theory of Change Phase IV (bringing it all together) (20%) ***due April 6th @ 4pm***

SERS 400 (2018)

Week	Dates and Lecture Themes	Tutorial / Lab Activity	Readings/Resources
1	January 9: Course introduction (protect, restore, reform and transform)	No tutorials/labs	Chapter 1, 3 (course text) Ripple et al. 2017; Bull et al. 2017
2	January 16: Building your 'social-ecological theory of change'	Tutorial/lab meet and greet	Chapter 3, 18 (course text) James 2011; Taplan and Clark 2012;
3	January 23: Theory of change - a view from the trenches	*Discussion*: Do we need a Theory of Change?	Guest Speaker: Dr. Jessica Blythe Revisit James 2011; Taplan and Clark 2012;
4	January 30: Sustainability as a 'wicked problem'	*Discussion*: Framing 'wicked problems'	Chapter 8, 5 (course text) Rittel and Weber, 1973; Filbee-Dexter et al. 2017
5	February 6: The changing face of environmentalism?	*Mini-Workshop*: Theory of Change Phase I (focal point, goals and aspirations)	Chapter 4 (course text) Chan et al. 2016; Washington et al. 2017
6	February 13: Visions and scenarios of our social-ecological future(s)	*Discussion*: The environmentalist continuum	Chapter 6 (course text) Merrie et al. 2017; IPBES 2016
7	February 20 – Reading week		
8	February 27: Measuring progress on the path to sustainability	*Mini-Workshop*: Theory of Change Phase II (conditions for change and key assumptions)	Chapter 15, 16 (course text) IISD 2017; Becker et al. 2005
9	March 6: Linking science, policy and communities	*Discussion*: Measuring what matters	Chapter 2, 14 (course text) Citanovic et al. 2017; Clark et al. 2016

10	March 13: *Mid-term exam*	*Mini-Workshop*: Theory of Change Phase III (interventions and measuring success)	
11	March 20: Power and political ecology	*Discussion*: What is power?	Chapter 17 (course text) Raik et al. 2006; Brisbois et al. 2015; Patterson et al. 2018
12	March 27: 'Seeds of a good anthropocene' and lessons for your theory of change?	*Workshop*: Theory of Change Phase IV (bringing it all together)	Chapter 19 (course text) Bennett et al. 2015
13	April 3: Wrap-up	No tutorials/labs	

Supplementary Readings (*required)

Week 1: Introduction

Ripple et al. 2017. World Scientists' Warning to Humanity: A Second Notice. BioScience. 67(12): 1026-1028.

Bull et al. 2017. Available at https://www.iccs.org.uk/blog/when-ripple-becomes-flood-why-we-didnt-sign-ripple-et-als-world-scientists-warning-humanity

Week 2: Theory of change

Taplin, D. and H. Clark. 2012. Theory of Change Basics: A Primer on Theory of Change. ActKnowledge, New York.

James, C. 2012. Theory of Change Review. Report commissioned for Comic Reflief. 31 pp.

Rockstrom et al. 2017. A roadmap for rapid decarbonization. 355 (6331): 1269-1271.

Week 3: Theory of change

Revisit readings from week two

Week 4: Sustainability as a wicked problem

Rittel, H. and M. Weber. 1973. Dilemmas in a General Theory of Planning. Policy Science. 4: 155-169.

Filbee-Dexter et al. 2017. Ecological surprise: concept, synthesis and social dimensions. Ecosphere. 8(12).

Week 5: Environmentalism

Chan, K et al. 2016. Why protect nature? Rethinking values and the environment. Proceedings of the National Academy of Sciences. 113(6): 1462–1465.

Washington et al. 2017. Why ecocentrism is the key pathway to sustainability, The Ecological Citizen. 1(1): 35-41.

Week 6: Visions and scenarios

Merrie et al. 2017. Radical ocean futures-scenario development using science fiction prototyping. Futures.

IPBES. 2016. The methodological assessment report on scenarios and models of biodiversity and ecosystem services: Summary for policy makers. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 32pp.

Week 7: Measuring progress

Pinter, L. 2013. *Measuring Progress Towards Sustainable Development Goals.* International Institute for Sustainable Development Working paper.

Becker, J. 2005. Measuring progress towards sustainable development: an ecological framework for selecting indicators. Local Environment. 10(1): 87-101.

Week 8: Science, policy and communities

Citanovic, C., McDonald, J .and A. Hobday. 2016. From Science to Action: Principles for undertaking environmental research that enables knowledge exchange and evidence-based decision-making. Journal of Environmental Management. 183: 864-874.

Clark, B. et al. 2016. Crafting useable knowledge for sustainable development. PNAS. 113: 17

Week 9: Power and political ecology

Raik, D., A. Wilson and D. Decker. 2008. Power in Natural Resources Management: An Application of Theory. Society and Natural Resources. 21(8): 729-739.

Brisbois, M.C. and R.C. de Loë. 2015. Power in collaborative approaches to governance for water: A systematic review. Society and Natural Resources. 29(7):775-790.

Patterson et al. 2018. Political feasibility of 1.5 C societal transformations: the role of social justice. Current Opinion in Environmental Sustainability. 31:1–9

Week 10: Seeds of a Good Anthropocene

Bennett, E. et al. 2016. Bright spots: seeds of a good Anthropocene. Frontiers in Ecology and the Environment. 14(8): 441–448.

Course policies and important information: Please note the following: 1) All assignments must be completed to receive a mark for the course; 2) Requests for extensions of any assignment must be done so in writing in advance of the assignment due date; 3) In the event of an illness, a supporting medical certificate completed by a physician must be provided; and 4) Extensions may be granted for significant emergencies at the discretion of the Instructor.

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. The University's guiding principles on academic integrity can be found here: http://uwaterloo.ca/academicintegrity. ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office specifically for students: http://uwaterloo.ca/academicintegrity/Students/index.html

Students are also expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. Students may also complete the following tutorial: https://uwaterloo.ca/library/get-assignment-and-research-help/academic- integrity/academic-integrity-tutorial

When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. Within ENV, those committing academic offences (e.g. cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties which may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline: https://uwaterloo.ca/secretariat-general-counsel/policies- procedures-guidelines/policy-71. Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance: https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70

Intellectual property

Students should be aware that this course contains the intellectual property of their instructor(s), 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(s), 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).

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.

Mental health and wellbeing

The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' wellbeing to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. Please note that help is available. Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services http://www.uwaterloo.ca/counselling-services is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more. Additional information is posted on the LEARN site (under 'course syllabus and administration')

Religious Observances

Students need to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

Unclaimed assignments

Unclaimed assignments will be retained until one month after term grades become official in Quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures.

Communications with instructor(s)

All communication with students must be through either the student's University of Waterloo email account or via Learn. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

Co-op interviews and class attendance

Co-op students are encouraged to try and choose interview time slots that result in the least amount of disruption to class schedules. When this is challenging, or not possible, a student may miss a portion of a class meeting for an interview. Instructors are asked for leniency in these situations; but, a co-op interview does not relieve the student of any requirements associated with that class meeting.

When a co-op interview conflicts with an in-class evaluation mechanism (e.g., test, quiz, presentation, critique), class attendance takes precedence and the onus is on the student to reschedule the interview. CECA provides an interview conflict procedure to manage these situations. Students will be required to provide copies of their interview schedules (they may be printed from WaterlooWorks) should there be a need to verify class absence due to co-op interviews.