

Brock University

Environmental Sustainability Research Centre (ESRC)

SSAS 5P01: Foundations of Sustainability Science and Society

Fall, 2018

Instructor: Dr. Ryan Plummer

Administrative Information

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Office Hours: By appointment

Website: See information posted on Isaak, Brock's Sakai-based Learning Management System

Lecture: Tuesdays, 1100-1400 (MC C300)

Course Goals & Objectives

This course introduces and explores the philosophical and conceptual underpinnings of the Sustainability Science and Society graduate program. It aims to engender critical thinking about foundational concepts central to sustainability science and the ways in which they are enacted.

Five objectives are established for individuals participating in SSAS 5P01. By the end of the course learners will be able to:

1. appreciate different ways of understanding Nature and demonstrate awareness of interactions between natural and social systems;
2. critically reflect upon the concepts of sustainable development, sustainability and sustainability science;
3. understand the structure, approach and themes of sustainability science;
4. articulate their research interest and position it in relation to sustainability science; and,
5. effectively communicate (writing and oral) major concepts in sustainability as well as engage in meaningful scholarly discourse.

Course Orientation & Format

The orientation and format of SSAS 5P01 is predicated on the assumption that learners are mature, self-motivated, and committed to the pursuit of knowledge. Learning in this context is considered a shared process. The instructor and students embark on this enriching process together. The instructor's roles in the course are of provocateur, facilitator, and mentor. Students are actively engaged agents that shape the learning process.

The course format is highly interactive. 'Big questions' are posed by the instructor and readings are identified as guides to inform active inquiry by learners. Fundamental philosophical and conceptual ideas are brought forward in student focused exercises, illuminated through small group discussions, and engaged with in assignments. Exploration of student research interest(s) within sustainability science is prioritized. Academic discourse is thus fostered which is lively, articulate, critical and meaningful.

Experiential education serves as a vehicle to enable exploration of the enactment of sustainability science. Introducing an experiential education module into the course is made possible by a grant from Teaching and Learning Innovation. Four experiential education opportunities will occur over the three-week module (see schedule). Logistical arrangements regarding the experiential education portion are being made at this time

as news of success with this grant application was received concomitant with completion of the course syllabus. Please routinely consult the course Sakai site, specifically the calendar feature, as details will be posted in due course. Please note that October 30, 2018 will be a full day field trip off campus. The experiential module will take place outside the classroom so please dress appropriately. Developing and implementing the experiential education module is undertaken in collaboration with Amanda Smits (ESRC Projects and Program Coordinator) and Carolyn Finlayson (Experiential Education, FOSS).

Important University Dates

The date for withdrawal from a D2 course without academic penalty is November 6, 2018. Students are encouraged to review other important university deadlines and dates as set out in the Brock University 2018-2019 Graduate Calendar (<https://brocku.ca/webcal/current/graduate/acad.html>).

Course Communications

Course communications (e.g., notifications in the event of class cancellations, inclement weather) will occur via Sakai. Students must always check SSAS 5P01 Calendar on Sakai to receive information on the class date, location, required readings and any additional instructions. Students must communicate through their Brock email and can expect responses within one week under normal circumstances.

Course Evaluation and Due Dates

Element	Key Aspects	Worth (%)	Description of Element
Engaging with Sustainability Science	Critical Participation and Leading a Small Group Discussion on Key Reading	30	<p>Students (in pairs) are responsible for leading a group discussion around a 'key reading'. The key reading for the class is indicated in the syllabus by a *. An excellent overview of leading discussion of a scientific journal article may be found at: http://tulane.edu/sse/eebio/academics/graduate/scientific-journal.cfm. The group discussion should be approximately 30 minutes, complement other aspects of the class, and inform consideration of the big question of the week. Evaluation will be of the group discussion and is 15% of the overall grade.</p> <p>Due date: see course timetable - revised after the first week of classes once enrollment is finalized.</p> <p>All students are required to critically participate in every class. Critical participation goes beyond preparing and understanding material for the class. It involves interpreting the meaning and implications of materials and actively engaging in scholarly discussion. Critical participation is determined by the by the instructor using the considerations set out above and is 15% of the overall grade.</p>

Enacting Sustainability Science	Communique Via Social Media	20	<p>Enacting sustainability science is a serious enterprise which is often underestimated. Experiential education in the course serves as a vehicle to enable exploration of how sustainability science is enacted. Each student is required to reflect upon the experiential component and produce a communique via a form of social media (e.g., Blog post, vlog, short video(s), series of tweets, Instagram or Facebook posts). Choose an area of focus related to one of the partnership agreements explored through the course field trips and translate what you learned via a social media message to the general public. Students are not required to post to their own social media accounts and can choose to create the content in a Word file. Ideally, the content from this assignment may be used on the ESRC account, with permission of the student.</p> <p>Accompanying the social media content will be a two page reflection paper outlining the following:</p> <ol style="list-style-type: none"> 1. How did you come to choose this particular partnership/area of focus? 2. What message are you trying to communicate? 3. Why did you select this particular medium of messaging? <p>Due date: November 13, 2018</p>
Sustainability Science and Your Research	Whiteboard Talk and Concept Discussion	20	<p>Effectively communicating complicated ideas in a succinct and understandable manner is essential. Individual(s) will prepare and deliver a whiteboard talk to the class on a major concept / idea associated with their research. Whiteboard talks are succinct (under 5 minutes) explanations of an idea or concept using a blank background and a marker. For an example see: http://www.stockholmresilience.org/news--events/whiteboard-seminars.html. The whiteboard talk will be the basis for a class discussion, led by the student, about the major concept/idea associated with their research (approximately 20 minutes). This is an opportunity for the student to gain input/feedback on his/her idea for MRP/Thesis research at an early stage. The Whiteboard Talk and Concept Discussion is 20% of the overall grade.</p> <p>Due date: see course timetable - revised after the first week of classes once enrollment is finalized.</p>
	Research Paper	30	<p>The research paper (approx. 10 pages) provides an opportunity to explore your research interest and considers the relationship to sustainability science. It is a formal research paper and consists of two main elements. The first element addresses the research interest you plan on pursuing in your Masters program. The research interest should be clearly identified and the main concept(s) unpacked in relation to the scholarly literature. The second element positions your research interest in relation to sustainability science and the themes engaged with during the course. The research paper is 30% of the overall grade.</p>

			Due date: Friday December 14, 2018
	Total	100%	

Assignment Formatting

All assignments must be submitted in electronic format (using .doc, .docx, or pdf) using the following formatting standards unless otherwise specified:

- Title page
- 12-point font
- 1-inch (2.54 cm) page margins
- Single spacing
- Page numbers in footer or header
- Full name of student in header
- APA-based format for in-text and end-of-text citations (see Brock's Guide: <http://researchguides.library.brocku.ca/c.php?g=99806&p=645973>)

Late Submission Policy

* Assignments must be submitted electronically by 11:55 PM on the due date. The penalty for late submission of assigned coursework is 10% per day, unless accompanied by medical documentation. See Medical Exemption Policy and the medical health certificate at <https://brocku.ca/registrar/toolkit/forms/>. The University may, at its discretion, request more detailed documentation in certain cases.

Relationship Between Attendance and Grades

Students are expected to attend all classes and must submit all assignments in order to pass this course.

Course Timetable

Week (Date)	Module	Overview of Topics	Elements
Week One (Sept 11)	Setting the stage	<ul style="list-style-type: none"> • Course introduction and organization • The landscape of sustainability science (what do we study?) • Framing, caricatures of nature, and understandings of the contemporary environmental situation 	<ul style="list-style-type: none"> • Lecture and discussion • Group exercises and dialogue
Week Two (Sept 18)		<ul style="list-style-type: none"> • The state of the environment 	<ul style="list-style-type: none"> • Round table • Deliberation on key question / reading
Week Three (Sept 25)		<ul style="list-style-type: none"> • The concept of sustainable development • Transition between sustainable development and sustainability 	<ul style="list-style-type: none"> • Lecture and discussion • Debate • Deliberation on key question / reading (Meredith and Jocelyn)

Week Four (Oct 02)		<ul style="list-style-type: none"> • Sustainability science: origin and overview 	<ul style="list-style-type: none"> • Lecture and discussion • Deliberation on key question / reading (Shelby and Samantha)
Week Five (Oct 16)	Experiencing Sustainability science	<ul style="list-style-type: none"> • UNESCO Biosphere Reserves 	<ul style="list-style-type: none"> • Lecture and discussion • Field trip (at Brock University)
Week Six (Oct 23)		<ul style="list-style-type: none"> • Institutions of higher education 	<ul style="list-style-type: none"> • Field trip (at Brock University)
Week Seven (Oct 30)		<ul style="list-style-type: none"> • Innovative partnerships <ul style="list-style-type: none"> ○ Brock-Lincoln Living Laboratory ○ Excellence in Environmental Stewardship Initiative 	<ul style="list-style-type: none"> • Field trip (please note this is a full day off campus)
Week Eight (Nov 6)	Unpacking sustainability science research	<ul style="list-style-type: none"> • No class 	<ul style="list-style-type: none"> • No class
Week Nine (Nov 13)		<ul style="list-style-type: none"> • The landscape of sustainability science research • Adaptation, transformations, and transitions 	<ul style="list-style-type: none"> • Deliberation on key question / reading (Alicia and Jessica) • Whiteboard talks and concept discussions (Lukas; Connor; Emma)
Week Ten (Nov 20)		<ul style="list-style-type: none"> • Governance (decision-making) 	<ul style="list-style-type: none"> • Deliberation on key question / reading (Connor and Seyi) • Whiteboard talks and concept discussions (Jocelyn; Meredith; Alicia)
Week Eleven (Nov 27)		<ul style="list-style-type: none"> • Resilience 	<ul style="list-style-type: none"> • Deliberation on key question / reading (Emma and Lukas) • Whiteboard talks and concept discussions (Seyi; Shelby; Samantha; Jessica)
Week Twelve (Dec 4)	<p>Pushing boundaries and considering future challenges</p> <p>Pushing boundaries and considering future challenges</p>	<ul style="list-style-type: none"> • Sustainability science: challenges, evaluation and emerging frontiers 	<ul style="list-style-type: none"> • Deliberation on key question / reading • Summative discussion • Course evaluations

Required Course Readings (*big question for the week*; * please bring to class)

NB. All required course readings are available on the SSAS 5P01 Isaak Site under course readings (Ares Tool).

Myths of Nature and how Nature is understood (Sept 11, 2018)

Q. Why is the way in which we understand nature important when considering the contemporary environmental situation?

Holling, C.S., L.H. Gunderson, and D. Ludwig. 2002. Quest of a theory of adaptive change. In L. H. Gunderson and C. S. Holling (Eds.). *Panarchy*, 3-25. Island Press, Washington.

The contemporary environmental situation (Sept 18, 2018)

Q. What is the present 'state of the environment'?

Lomborg, B. 2001. Things are getting better. In B. Lomborg. *The Skeptical Environmentalist*, 3-33. Cambridge University Press, Cambridge.

Sustainable development and sustainability (Sept 25, 2018)

Q. Do we need to move beyond the concept of sustainable development?

Pezzoli, K. 1997. Sustainable development: A transdisciplinary overview of the literature. *Journal of Environmental Planning and Management* 40(5): 549-574.

Berkes, F., J. Colding and C. Folke. 2003. Introduction. In F. Berkes, J. Colding and C. Folke (Eds.). *Navigating Social-Ecological Systems*, 1-31. Cambridge University Press, Cambridge

*Transforming Our World: The 2030 Agenda for Sustainable Development, A/Res/70/1, United Nations. Available online: <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication>.

Sustainability science: origin and overview (Oct 02, 2018)

Q. What is sustainability science?

Clark, W.C. and N.M. Dickson. 2003. Sustainability Science: The Emerging Research Program. *Proceedings of the National Academy of Science*, 100(14), 8059-8061.

Kates, R.W., W.C. Clark, R. Corell, J.M. Hall, C.C. Jager, I. Lowe, J.J. McCarthy, H.J. Schellnhuber, B. Bolin, N.M. Dickson, S. Facheux, G.C. Gallopin, A. Grubler, B. Huntley, J. Jager, N.S. Jodha, R.E. Kaspersen, A. Mabogunje, P. Matson, H. Mooney, B.III Moore, R. O'Riordan and U. Svedin. (2001). Sustainability Science. *Science*, 292(55177): 641-642. [online] URL: http://www.jstor.org/stable/3083523?origin=JSTOR-pdf&_redirected

Experiencing sustainability science - UNESCO Biosphere Reserves (Oct 16, 2018)

Q. Are UNESCO Biosphere Reserves a heuristic example of operationalizing sustainability science?

Ishwaran, N., A. Persic and N.H. Tri. 2008. Concept and practice: the case of UNESCO Biosphere Reserves. *International Journal of Environment and Sustainable Development* 7: 118-131.

Reed, M. G. 2016. Conservation (in)action: Renewing the relevance of UNESCO Biosphere Reserves. *Conservation Letters* 9(6): 448-456.

Experiencing sustainability science - institutions of higher education (Oct 23, 2018)

Q. What should we expect of universities in terms of sustainability science?

Baker-Shelley, A., A. van Zeijl-Rozema and P. Martens. 2017. A conceptual synthesis of organisational transformation: How to diagnose, and navigate, pathways for sustainability at universities? *Journal of Cleaner Production*, 145: 262-276.

Bieler, A. and M. McKenzie. 2017. Strategic planning for sustainability in Canadian higher education. *Sustainability*, 9(2): 161.

Experiencing sustainability science - innovative partnerships (Oct 30, 2018)

Q. Are you daunted by the mandate conferred by sustainability science to go beyond the university and meaningfully engage with other actors in pursuing sustainability?

Evans, J., R. Jones, A. Karvonen, L. Millard and Wendler, J., 2015. Living labs and co-production: University campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability*, 16: 1-6.

Mosier, S. and M. Ruxton. 2018. Sustainability university-community partnerships: Lessons for practitioners and scholars from highly sustainable communities. *Environment and Planning C: Politics and Space*, 36(3): 479-495.

The landscape of sustainability science research - adaptation, transformations, and transitions (Nov 13, 2018)

Q. Does society need to adapt, transform or transition in relation to contemporary environmental challenges?

Smit, B. and J. Wandel. 2006. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change* 16(3): 282-292.

Feola, G. 2015. Societal Transformation in Response to Global Environmental Change: A Review of Emerging Concepts. *AMBIO*, 44, 376-390.

The landscape of sustainability science research - governance (Nov 20, 2018)

Q. Who should steer society and how should intervention occur in relation to the environment?

Bäckstrand, K. 2003. Civic science for sustainability: reframing the role of experts, policy-makers and citizens in environmental governance. *Global Environmental Politics* 3(4): 24-41.

Lemos, M.C. and A. Agrawal. 2006. Environmental governance. *Annual Review of Environment and Resources* 31: 297-325.

The landscape of sustainability science research - resilience (Nov 27, 2018)

Q. Is resilience a useful unifying concept?

Folke, C. 2006. Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16: 253-267.

Olsson, L., A. Jerneck, H. Thoren, J. Persson and D. O'Byrne. 2015. Why Resilience is Unappealing to Social Science: Theoretical and Empirical Investigations of the Scientific Use of Resilience. *Science Advances*, 1.4 e1400217.

Sustainability science: challenges, evaluation and emerging frontiers (Dec 4, 2018)

Q. What are the next frontiers for sustainability science?

Miller, T.R., A. Wiek, D. Sarewitz, J. Robinson, L. Olsson, D. Kriebel. and D. Loorbach. 2014. The future of sustainability science: a solutions-oriented research agenda. *Sustainability Science* 9: 239-246

Lang, D.J., A. Wiek, M. Bergmann, M. Stauffacher, P. Martens, P. Moll, M. Swilling. and C.J. Thomas. 2012. Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science* 7 (Supplement 1): 25-43.

Academic Policies

Academic Integrity Statement

Academic misconduct is a serious offence. The principle of academic integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should consult Section XVIII, "Academic Misconduct," in the "Academic Regulations and University Policies" entry in the Graduate Calendar, available at <http://www.brocku.ca/webcal> to view a fuller description of prohibited actions, and the procedures and penalties. Information on what constitutes academic integrity is available at <https://brocku.ca/academic-integrity/>

Plagiarism Software:

Computerized plagiarism detection software (e.g., Turnitin.com) will be used in this course. Students who choose not to submit their assignments to Turnitin.com must contact the instructor well in advance. As per the Faculty Handbook, students objecting to the use of Turnitin.com will be offered a reasonable alternative. Assignments will be submitted to Turnitin.com via Isaak/Sakai.

Intellectual Property Notice

All slides, presentations, handouts, tests, exams, and other course materials created by the instructor in this course are the intellectual property of the instructor. A student who publicly posts or sells an instructor's work, without the instructor's express consent, may be charged with misconduct under Brock's Academic Integrity Policy and/or Code of Conduct, and may also face adverse legal consequences for infringement of intellectual property rights.

Special Accommodation

The University is committed to fostering an inclusive and supportive environment for all students and will adhere to the Human Rights principles that ensure respect for dignity, individualized accommodation, inclusion and full participation. The University provides a wide range of resources to assist students, as follows:

- a) If you require academic accommodation because of a disability or an ongoing health or mental health condition, please contact Student Accessibility Services at askSAS@brocku.ca or 905 688 5550 ext. 3240.
- b) If you require academic accommodation because of an incapacitating medical condition, you must, as soon as practicable, inform your instructor(s) of your inability to complete your academic work. You must also submit a Brock University Student Medical Certificate (found at <https://brocku.ca/registrar/toolkit/forms>). The University may, at its discretion, request more detailed documentation in certain cases. If you are unable to write a scheduled examination due to an incapacitating medical condition, you must follow the process set out in the Faculty Handbook III:9.4.1.
- c) If you are experiencing mental health concerns, contact the Student Wellness and Accessibility Centre. Good2Talk is a service specifically for post-secondary students, available 24/7, 365 days a year, and provides anonymous assistance: <http://www.good2talk.ca/> or call 1-866-925-5454. For information on wellness, coping and resiliency, visit: <http://brockmentalhealth.ca/mental-well-being/> .
- d) If you require academic accommodation on religious grounds, you should make a formal, written request to your instructor(s) for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term, or as soon as possible after a need for accommodation is known to exist.
- e) If you have been affected by sexual violence, the Human Rights & Equity Office offers support, information, reasonable accommodations, and resources through the Sexual Violence Support & Education Coordinator. For information on sexual violence, visit [Brock's Sexual Assault and Harassment Policy](#) or contact the Sexual Violence Support & Response Coordinator at humanrights@brocku.ca or 905 688 5550 ext. 4387.
- f) If you feel you have experienced discrimination or harassment on any of the above grounds, including racial, gender or other forms of discrimination, contact the Human Rights and Equity Office at humanrights@brocku.ca.