

RES 602—Interdisciplinary Research Design for Sustainability Impact

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Office Hours: Thursdays 15:00–16:00 (3–4pm) (on [Zoom](#))

Class Time and Location: Tuesdays, 09:00–11:00 and 11:30–12:30; on [Zoom](#)

Purpose in Brief

This is a course in which students deepen their understanding of the research process for interdisciplinary research on resources, the environment and sustainability. Students use their own research and research conducted by others to learn how sustainability questions are turned into meaningful answers through a staged process involving theories of change, researchable topics, related literatures, methods (qualitative and quantitative), rules of evidence and research ethics.

The goal of this course is to foster literacy in the research process and proposal development across the natural and social sciences and their integration.

Note to Students

This course is intended to most help you along your PhD journey, wherever you're at on that journey. Structures that appear rigid—e.g., assignments—are not that. Everything can be adapted for you personally, as we go.

Imagine that midway through the course, you aren't feeling excited about the direction you find yourself in (it might even be painful, as it was for one student), or if your thinking has been challenged in a way that unsettles the plan you had, **don't feel obliged to do any of the assignments as I envisioned them**. I really don't want any of you to be going through the motions for the sake of the course. If any of the assignments-as-envisioned aren't working for you at the time, simply explain that, and do something else that seems helpful to you at that time.

E.g., if you're questioning your direction in week 8, you might dig into 2-3 papers that represent different directions that might be of interest to you, and reflect somewhat on those. In the ideal, this week you'd reflect on research questions and theories of change that might accompany you if you somehow followed one of those different directions, but I don't want to be narrowly prescriptive if that doesn't feel right.

In general, feel free to adapt the assignments to suit you—just chat with me about it. If that's not possible, simply explain how you're changing the assignment for yourself, and why.

Course Description

In this course, students will learn how to turn ideas into researchable topics that are important, innovative, interesting, concrete, well-defined, and precise; how to identify appropriate research methods (qualitative and quantitative) and rules of evidence; how to map a project in relation to diverse literatures; and how to develop a research proposal. Topics include horizon scanning, methods review, research design, proactive ethics & participation, literature mapping, research questions and more.

The course will be managed adaptively towards a fundamental redesign for interdisciplinary sustainability problems (aren't they all?). Readings will include new pieces designed for purpose, with student input (in some cases on potentially coauthored blog posts). The remaining portions of the course involve an explicit focus on students' own research designs, which will develop in stages and be iteratively peer-assessed. Each week, we will engage in a conversation with an expert guest about their research. By the end of the class, students will complete a decent (annotated) draft of a proposal for their own thesis work.

Given the importance of understanding a wide range of research approaches, and the wide range of incoming academic and professional backgrounds among the students, much attention will be given to learning from peers and diverse faculty. This is an interactive seminar, where robust and consistent participation and attendance is expected of all students. Each week, the class may include lecture, discussions, and a range of mind-mapping, brainstorming and reflective exercises. Weekly readings will be available on Canvas.

Some of you may find the following textbook useful, although its scope is more limited than ours: Bhattacharjee, Anol. (2012). Social Science Research: Principles, Methods, and Practices, 2nd edition. http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks

Learning Objectives and Outcomes

In this course, students (you) will do the following:

- Learn how to navigate complex interdisciplinary landscapes to achieve key personal objectives and answer interesting research questions that might yield meaningful sustainability impacts.
- Communicate your research ideas creatively and compellingly for specialist and non-specialist audiences.
- Develop a working proposal (proto-proposal, or proposal-in-progress), for later refinement.
- Engage with peers to constructively assist in parallel journeys, as practice mentoring.

These overarching objectives have several components:

1. (a) Identify one or more theories of change that pertain to your own research, and (b) Distinguish between ingredients that are critical to your individual objectives for your PhD and future career, and which are ‘icing on the cake’.
2. Identify a diverse set of literatures that are somewhat relevant to your research.
3. Assess a range of possible methods for their appropriateness in a given context.
4. Identify key components of a research problem (dependent and independent variables, etc.) that would or might satisfy your own objectives, and answer an interesting and important research question.
5. (a) Adapt a research plan given outside input, and (b) Design research to contribute meaningfully to the objectives of relevant stakeholders and/or rightsholders.
6. Map a set of relevant literatures conceptually in relation to each other and in relation to a project, including in terms of literatures you will draw from and those you will contribute to.
7. Write a compelling introduction for your research, which demonstrates through a funnel-like argument how your specific research is importantly relevant to the broadest possible audience.
8. Identify, craft, and critique research questions that spark interest, are feasibly testable, and that could realistically contribute to meaningful change towards sustainability.
9. Devise, describe, and defend methods that can answer identified research questions, in relation to relevant disciplinary and field-specific norms.
10. Distinguish implications from relevance, and pinpoint plausible implications of proposed research for research, policy, and practice.

Course Declaration and Philosophy

Deliverables: Unlike pre-2020, this course is not organized around producing a proposal as a product. The course is oriented towards helping you on the journey, making explicit what is often implicit, demystifying steps that you might otherwise feel like you should already know, and developing a familiarity with a broad landscape of interdisciplinary sustainability science and studies through collective learning.

Adaptive Management: This course is decidedly a work in progress. I really want it to contribute substantially to your program and career in this space, and since I’ve never taught the course before, that requires nimbleness and flexibility. I appreciate your patience and understanding!

Grades: As I understand it, grades have two purposes. 1, to evaluate you relative to your peers. This doesn’t apply well in this context, because you’re doing such entirely different things, in such different fields, with different standards of evaluation. 2, to motivate you when other motivations aren’t sufficient. This also doesn’t apply here, because if I’m not giving you assignments that are clearly meaningful to your program and later career, or if those things aren’t sufficiently motivating (I’m sure they are), then we’ve got bigger problems.

Readings: I have only a limited set of readings that are specifically relevant to this course's learning objectives, and somewhat equally so for *all* of you (and some of these are blog posts I created for this class). I won't assign readings just for the sake of it. Accordingly, you'll do readings, but they will mostly be those that you identify as specifically relevant for your own project. Please help identify other readings that are broadly applicable. Heck, maybe we'll even create some together.

Course Policies

As per university requirements:

Attendance

Following university regulation, regular attendance is expected of students. Students who neglect their academic work and assignments may be excluded from the final examinations (note: there are no exams in this course). Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

The University accommodates students with disabilities who have registered with the Disability Resource Centre. The University accommodates students whose religious obligations conflict with attendance, submitting assignments, or completing scheduled assignments. Please let the instructor know in advance, preferably in the first week of class, if you will require any accommodation on these grounds. Students who plan to be absent for varsity athletics, family obligations, or other similar commitments, cannot assume they will be accommodated, and should discuss their commitments with the instructor before the drop date.

Late Assignments

This course is not intended to run or ruin your life. So when exceptional circumstances will prevent you from completing an assignment on time, you may request an extension and it will be granted where possible and appropriate. In the absence of a granted extension, a 5% reduction of grade will be assigned for each day an assignment is late beyond the required due date.

Academic Dishonesty

Please review the UBC Calendar "Academic regulations" for the university policy on cheating, plagiarism, and other forms of academic dishonesty.

Students should retain a copy of all submitted assignments (in case of loss) and should also retain all their marked assignments in case they wish to apply for a Review of Assigned Standing. Students have the right to view their marked examinations with their instructor, providing they apply to do so within a month of receiving their final grades. This review is for pedagogic purposes. The examination remains the property of the university.

Classes by Week

1. Jan 12—Problem Identification

What is an important and interesting problem, what is your theory of change, and what are your fundamental needs with respect to your research project?

Assignment: Critical Ingredients document. Note Learning Journal: start entries (see 11 below).

Readings: **Chan, K.** (2020) "[How to Write a Winning Proposal—in 10 Hard Steps \(a new series\).](#)" *CHANS Lab Views* (Read up to "Why You Need A Theory of Change").

Armitage, D., J. Arends, N.L. Barlow, A. Closs, G.A. Cloutis, M. Cowley, C. Davis, S.D. Dunlop, S. Ganowski, C. Hings, L. Chepkemot Rotich, K. Schang, S. Tsuji and C. Wiens (2019). "Applying a "theory of change" process to facilitate transdisciplinary sustainability education." *Ecology and Society* **24**(3). <https://www.ecologyandsociety.org/vol24/iss3/art20/> (skim)

And/or: **Oberlack, C., T. Brey, M. Giger, N. Harari, K. Herweg, S.-L. Mathez-Stiefel, P. Messerli, S. Moser, C. Ott and I. Providoli** (2019). "Theories of change in sustainability science: Understanding how change happens." *GAIA-Ecological Perspectives for Science and Society* **28**(2): 106-111. <https://doi.org/10.14512/gaia.28.2.8>

2. Jan 19—Horizon Scan

What literatures—both disciplines and fields—pertain to this problem?

Assignment: List of 6+ Literatures (with notes about each, including associated theories of change)

Reading: **Echeverri, A., D.S. Karp, R. Naidoo, J. Zhao and K.M.A. Chan** (2018). "Approaching human-animal relationships from multiple angles: A synthetic perspective." *Biological Conservation* **224**: 50-62. <https://www.sciencedirect.com/science/article/pii/S0006320718303434>

3. Jan 26—Methods Review

What kinds of methods are relevant to the problem at hand, both generally (e.g., qualitative vs. quantitative; observational vs. experimental vs. modeling) and specifically?

Guest: Hadi Dowlatabadi

Assignment: Methods Review (of three papers of your choosing)

Reading: **Dudovskiy, John.** "[Constructivism Research Philosophy](#)". *Business Research Methodology*.

Potentially useful also: **Tobi, H. and J.K. Kampen** (2018). "Research design: the methodology for interdisciplinary research framework." *Quality & Quantity* **52**(3): 1209-1225.

<https://doi.org/10.1007/s1135-017-0513-8>

4. Feb 2—Research Design

What methods might you apply within a PhD timeline, given your fundamental objectives, your theory of change, and your strengths and resources?

Guest: Milind Kandlikar

Assignment: Research Design presentation (3 minutes)

Reading: **Hamby**, Sherry. "[Know Thyself: How to Write a Reflexivity Statement](#)". *Psychology Today*.

And/or: **Milner**, H.R. (2007). "Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen." *Educational Researcher* **36**(7): 388-400.

<https://journals.sagepub.com/doi/abs/10.3102/0013189X07309471>

5. Feb 9—Research Co-Design

What might possible research partners have to say about or want to see in your prospective research? How might you adapt your plan to address that and proactive ethics considerations, including a possible decolonization perspective?

Guest: Hannah Wittman

Assignment: Statement of Co-Design

Reading: **Norström**, A.V., et al. (2020). "Principles for knowledge co-production in sustainability research." *Nature Sustainability* **3**:182-190. <https://doi.org/10.1038/s41893-019-0448-2>

And (get to know, if you haven't yet): **Smith**, L.T. (2005). *Decolonizing Methodologies: Research and Indigenous Peoples*, Zed. <http://books.google.com/books?id=Nad7afStd8C>

Feb 16—NO CLASS (Reading Week)

6. Feb 23—Literature Mapping

(Circling back to 2 and 3, given 4 and 5) How do various disciplines and fields pertain to your prospective project? Which ones do you hope to draw from, which do you hope to contribute to, and how?

Guest: Ed Gregr

Assignment: Mind Map (relating 10+ literatures) + Wikipedia entry

Readings: Wikipedia entries in your area.

7. Mar 2—A Compelling Funnel

Here's where we characterise our work as important and specifically relevant to the broadest possible audience.

Guest: Amanda Giang

Assignment: Draft Introduction (including references)

Readings: (optional) **Gustafsson**, K. and L. Hagström (2018). "What is the point? Teaching graduate students how to construct political science research puzzles." *European Political Science* **17**(4): 634-648. <https://doi.org/10.1057/s41304-017-0130-y>

8. Mar 9—Research Questions

Specific, interesting, important, and achievable hypotheses or guiding research questions (following a grounded-theory approach).

Guest: Leila Harris

Assignment: Research Questions (including a justification of each, and theory of change)

Readings: (Also for additional resources) **Pacheco**, Raul. "[Developing research questions](#)". *Raul Pacheco-Vega, PhD*.

9. Mar 16—Methods (+ Timelines, Budget)

What you will do (to specifically answer your research questions), when you will do it, and with what resources.

Guest: Stephanie Chang

Assignment: Methods Statement (including references)

Readings: (Thinking forward, toward interdisciplinarity) **Chan**, Kai and John **Robinson**. "[Interdisciplinary Culture Clash, Part 1: Sustainability in an Imaginary World](#)". *CHANS Lab Views*. (And five following parts, if interested)

10. Mar 23—Implications

Who can do what (that matters), once your results and analysis are available.

Guest: Claire Kremen

Assignment: Implications (for research, policy and practice; including references as appropriate) + Paragraph Statement on Interdisciplinarity

Reading: (optional) **Robinson, J.** (2008). "Being undisciplined: Transgressions and intersections in academia and beyond." *Futures* **40**(1): 70-86. <http://dx.doi.org/10.1016/j.futures.2007.06.007>

11. Mar 30—Presentations

Your proposal in a nutshell (6 min)

Assignment: Learning journal (**with entries for each week**)

Assignments

Critical Ingredients Document

Fill out the document found [here](#), replacing my example text with your own. Use your own words, and adapt as much as you like. Remember, this is a document for you to express yourself, so don't let yourself be impeded in that by perceived structures imposed by me. Just make sure to explain yourself—that will be the primary criteria for grading (I will be generous).

Learning Journal

Evidence shows that reflection about learning consolidates that learning. This assignment is to reflect on your learning in this course, which should also be of use to you as a record. **Each week**, please write a reflection of 150-500 words about your learning associated with the course (not just notes of key points, although feel free to keep such a record as well). Include the reflections that will be of most utility to you later. Connecting learning to intentions can be helpful (e.g., based on learning X, I now intend to do Y at time T). To be submitted once, at the end of the semester.

List of Literatures

This is a list of 6+ literatures (with notes about each, including associated theories of change). You could define this by field, or sub-field—whatever seems most appropriate. You can use this rough [template](#).

Methods Review

This assignment is straightforward. Provide the following **for each** of 3 or more papers that use methods that are likely to be relevant to your dissertation:

1. The bibliographic info, including the full-text url.
2. How the paper is relevant to your dissertation, appealing to your Critical Ingredients document (in a sentence or so).
3. 100-500 words that address each of the following (after having read the paper):
 - a. Insights about how the authors used the methods, what kinds of insights they permitted, how robustly, etc.
 - b. Your current thoughts about how the methods seem to contribute to the kinds of questions you're interested in, and the processes relevant to your theory of change.
 - c. Any complications or considerations that you foresee arising if you were to adapt those methods for your own use.

* Prioritize primary research methods. If you are planning for a systematic review paper, you may include up to one review paper among your three.

Research Design Presentation

Upload slides for a 3-minute presentation that outlines the following components/attributes of a research design for a part of your dissertation research:

- Your Positionality
- Research Question
- Dependent Variable(s)
- Independent Variable(s)
- Control Variables
- Unit of Analysis
- Scope of Analysis
- Scope of Potential Application/Relevance
- Possible Findings

Statement of Co-Design

300-700 words (or more as needed) outlining the following elements of how your research will involve decision-makers and/or affected communities:

1. Which model(s) does your research fit (contracted, collaborative, consultative, blue-sky)? Why?
2. What is your plan for design collaboration/consultation? Who will you meet with, how, when, and why?
3. What do you anticipate that you might hear? Do you anticipate any requests that might be tough to fulfil? (N/A for blue-sky)
4. What is your plan for engagement post-findings? Who are the key audiences? How will you ensure that your findings reach them?

Mind Map of Literatures (and Chapters)

In this Mind Map, please depict the following:

- Your dissertation's central question
- Potential chapters (aim for 2-8)
- A bunch of literatures from which you'll draw, and ...
- ... to which you'll contribute (>10 total)

Clearly this will require that you pin down some potential chapters, which may be hard. Don't worry about whether they will actually happen as imagined. Just get used to thinking about possibilities, and what they entail for the literatures that you should get to know via the comprehensive exams process.

If you like, you can supplement this Mind Map with a research design table (a brief version of what you presented in class) for each chapter.

Use whatever program you like to create this. Or draw it by hand, and snap a picture.

Wikipedia Entry

One of the primary tools by which knowledge reaches beyond academic experts to broader audiences is via Wikipedia. But Wikipedia in its current form is a product of dominant systems and institutions. Thus, entries are biased toward already privileged groups (white, English-speaking, male). They also better reflect disciplinary understandings, and generally post-positivist approaches over others. Let's do our bit to help others find important insights from emerging voices in the interdisciplinary study of sustainability.

The assignment: Following your mind map, pick a scholar, subfield or term that is either missing on Wikipedia or whose treatment is lacking. Create a page, or revise what's there. Then send me the link, with a little commentary about what you did and why.

Introduction

Submit a 4-5 paragraph introduction (max 800 words):

- A series of linked paragraphs, each linking to the next
- Start with the big-picture context—the broadest possible net—and narrow from there
- For each narrowing, show how the piece in question is central to that above
- Culminate in your Research Question

If you like, also include a few notes following [SCQA \(Links to an external site.\)](#) (Situation Complication Question Answer, up to 100 words for each).

Research Questions

Submit the following:

1. Your Introduction, with tracked edits as needed (this is just for context; it's not a central part of the assignment)
2. Research questions, overall (1) and chapter-specific (4 or more).

Make sure each question is specifically motivated (add an extra sentence of context just before the chapter-specific questions if needed).

Include a theory of change for each (fine if they overlap). That is, state how answering the research question should help change practice or policy. In most cases, this 'how' would include a few steps, each of which often includes assumptions. Please make these assumptions explicit.

Methods Section

300-500 words (aim for this).

- Write it as best you can, where you're at. Don't sweat it. If you don't know some details, simply note what you don't know and why, in square brackets. Some contingency is normal!

- No need to include a timeline and budget, but feel free to do so if you like.

Presentation (Proposal)

Please drop your slides for a 6-minute presentation of your Proposal, including Introduction, Research Questions, Methods, and Implications.