

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site. As we learn about climate change and the other challenges to which it is linked, it is critical to acknowledge the importance Indigenous sovereignty, land stewardship, and knowledge in meaningful climate action. Together this term, we will explore ways to centre these relations in policy responses, here and globally.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Policy Responses to Global Climate Change/ Climate Change: Science, Technology & Sustainable Development	RES520/PPGA584	3

PREREQUISITES AND COREQUISITES

There are no formal pre- or co-requisites for this course, however, it is cross-listed between Resources, Environment & Sustainability (RES) and Public Policy and Global Affairs (PPGA).

The climate crisis (drivers, impacts, justice, responses) is inherently multi-faceted, and this course is very interdisciplinary. Each of you bring training, experience, and insights that can help us understand climate change. However, because the course is interdisciplinary, we also anticipate that there will be times when you encounter concepts and material that may be entirely new and unfamiliar. Do not be alarmed – this is part of the process!

If you find that there are concepts that are being alluded to that you feel you would benefit from additional review on, please contact the Instructors for suggested materials.

TEACHING TEAM CONTACTS

Course Instructors	Contact Details	Office Location	Office Hours
Milind Kandlikar (he/him) Professor Institute for Resources, Environment & Sustainability and School of Public Policy and Global Affairs	mkandlikar@ires.ubc.ca or via Canvas <i>You can expect me to respond to email inquiries within 48 hours.</i>	AERL 422	TBD first week of class
Course TA			

LEARNING OUTCOMES

This course will introduce climate change, its drivers, impacts, and policies to address these. Climate change will be contextualized within global change, and the interplay of socio-economic development and technical change with climate policies. This course is about understanding the complexity of these interactions and identifying policy responses that are more likely to succeed. Changes in global climate will have a range of impacts across different geographies, ecosystems, and societies. Some will benefit

while others will face devastation. The challenge lies in finding solutions that address this diversity of outcomes without thwarting the rights of different peoples to “develop”.

By the end of this course, you will be able to:

- Explain basic scientific and economic concepts related to climate policy
- Analyze and describe key policy debates and their technical, economic, political, social, and/or ethical underpinnings
- Critically evaluate the technical, economic, and socio-political opportunities and challenges associated with implementing different climate solutions
- Critically read papers and synthesize key contributions and remaining questions
- Appreciate the contribution of diverse disciplines, worldviews, and knowledge systems to understanding and acting on the climate crisis
- Collaborate in interdisciplinary teams to analyze and communicate about real-world climate policy debates to diverse audiences

COURSE STRUCTURE AND ACTIVITIES

This course meets for one three-hour seminar block (**W, 2:00 PM – 5:00 PM PT, AERL 107**) each week, with two 5-10 minute breaks. I will aim to record classes for asynchronous viewing (screen and audio). In general, classes will incorporate two or three of:

- Instructor-led lecture, reviewing and synthesizing core concepts for the week
 - Some weeks, this component will be done asynchronously, through pre-recorded lectures, and we will meet synchronously for a shorter time
- Active learning on the week’s topic (e.g., interactive discussion, serious games, and other activities)
- Guest speaker and discussion, or other opportunities to engage with other perspectives (e.g., film segments, podcast segments) and discussion
 - These may not happen every week

Class sessions are divided into four modules: Climate Basics; Unpacking Net-Zero Emissions; Impacts and Adaptation; Climate Policy and Justice. Each week will focus on a few key climate science and policy concepts, which we will explore through a specific case study or set of cases related to the module topic (see schedule below). The class is not meant to be a comprehensive survey of climate policy issues – rather, we will use specific examples as windows into larger debates, and models of how to think critically about climate issues. The class is designed to provide many opportunities for peer learning, including through discussion, sharing and commenting on reflections, and a group term project, that you will present during our end-of-term symposium.

Active engagement, debate, and critical appraisal are key components of the course work. There are weekly readings/viewings/listenings (some mandatory and some optional) that you are expected to complete before class, so you are prepared to engage with your peers interactively. Students who are less comfortable speaking in class should see the professors about ways to create more comfort or explore alternative modes of participation (e.g., online posts and interaction).

SCHEDULE OF TOPICS

Schedule updates will be reflected on Canvas. Please see the Detailed Schedule for readings.

Week	Date	Seminar Topic	Key questions, themes
Module 1: Climate Basics			
<i>Developing a shared vocabulary to discuss the scientific, technical, economic, and socio-political dimensions of the climate crisis.</i>			
1	Sept. 7	Course Intro and Climate Science Overview	What is the course about? What causes a changing climate? How do we know? What does a changing climate mean? What don't we know?
2	Sept. 14	Integrated and systems perspectives: linking social, economic, and technology dimensions of climate change	How do we assess different approaches to reducing GHG emissions? How do we model and understand climate change impacts and policies in the context of everything else that is going in the economy and society?
3	Sept. 21	Introduction to climate policy: Carbon pricing & technology choices	What are the different policy approaches to reducing GHG emissions? What complementary approaches to pricing carbon are needed? What are the socio-economic implications of pricing carbon?
4	Sept. 28	Institutions and governance	How do we govern the global climate? What is the history of climate governance? What have been core debates and turning points? Current challenges and opportunities.
Module 2: Unpacking Net-Zero Emissions			
<i>What does “net-zero” actually mean, why does it matter, how will we get there, how do we evaluate proposals critically</i>			
5	Oct. 5	Electrify everything, and what's left	What does net-zero mean and why does it matter? What is the role of electrification in getting there? How far does electrification get us and what is left? What are the techno-economic and institutional challenges?
6	Oct 12	Deep dive on decarbonizing transportation + QUIZ 1	What are the challenges and opportunities around decarbonizing passenger road transport? What can we learn from jurisdictions around the world about policies for innovation, infrastructure, equity, and integrated planning? What about harder to decarbonize transport segments?

7	Oct 19	Negative emissions – nature based and technology based	What are key concerns and debates around negative emissions? How do we distinguish between hype and reality wrt different negative emissions (nature-based and technology-based solutions)?
Module 3: Impacts and Adaptation			
<i>What are the impacts of a changing climate, and who is on the frontlines of these impacts? What are strategies for adapting to these changes?</i>			
8	Oct 26	Climate Impacts and Adaptation Wildfires, floods, extreme heat	What are the impacts of climate change How are these impacts distributed -- who is on the frontline of climate change (vulnerability)? What are options for adapting to these impacts, in particular given distributional patterns?
9	Nov 2	Climate, agriculture and development	Developing countries will face the brunt of climate impacts – from Sea Level Rise to Impacts on Agriculture. What might the scale of these impacts be? How might nations, institutions and individuals adapt to these changes?
10	Nov 9	Sea level Rise	Developing countries will face the brunt of climate impacts – from Sea Level Rise to Impacts on Agriculture. What might the scale of these impacts be? How might nations, institutions and individuals adapt to these changes?
Module 4: Climate Impacts and Justice			
<i>How do different dimensions of justice intersect with the climate crisis – who is responsible, who is impacted, who is involved in making decisions about it? What would it mean to centre justice in how we approach the climate crisis?</i>			
11	Nov 16	Energy and development (global + local) and just transitions Quiz 2	Energy is key to development, and central to reducing poverty. How might the world transition to a low carbon economy? and avoid the negative consequences of air pollution inherent to solid fuel use? What are the implications of these transitions for workers?
12	Nov 23	Climate Justice	Climate change is caused by those who contribute to high CO ₂ emissions, but its effects will be felt more intensely by those who have contributed the least. What might we be able to do about this?
13	Nov 30	SYMPOSIUM	Project presentations/demos

LEARNING MATERIALS

There is no mandatory text book for this course. All course readings will be posted online on **Canvas**, and will range from excerpts from books, scholarly articles, news articles, grey literature (e.g., government and civil society reports), blog posts, podcasts, and other multimedia content. Copyrighted materials will be made available through the UBC library, but will be **CWL protected**. Each week will include readings that are mandatory and optional. Optional readings offer an opportunity to go deeper into that particular week's topics, and are given as starting points for students to explore further if they are interested. Though not required, some may be useful as you work on your Term Project.

ASSESSMENTS OF LEARNING

Evaluation is based on a combination of participation (individual), reflection papers (individual), quizzes (individual), and a term project which has several scaffolded sub-components (small groups of ~4). Further details on all assignments will be provided during the first sessions.

Class Project (40% of total)

The overall goal of the project is to improve understanding on how we collectively transition to a low carbon system. The projects can focus on climate solutions (mitigation, adaptation, transformation) in terms of their techno-economics, policy and institutions, societal concerns, or all of the above in an integrated manner. During the first few weeks of the course, we will provide multiple suggestions for projects. The project will consist of:

- A 1-page proposal and project statement – 2.5%
- Final Presentation of the paper – 2.5%
- Group project paper 5000-7000 words – 25%. Each paper will include your individual component, i.e., you will take responsibility for a specific part of the paper. However, we expect the paper to be a single fully integrated document.
- A public communications piece about the project (e.g., blog, podcast, art work, graphic) – 10%

A guideline for project components is below. These are only guidelines. Your own project might deviate from the guidelines depending on what you choose to focus on.

1. *Problem definition and evaluative criteria*: Concisely characterize the need for policy, and define what a policy success would mean in your specific context.
2. *Formulate and evaluate alternative paths*: Identify the range of options, considering the category (or type) of policies suggested in terms of those we covered in class. e.g. regulation, voluntary action, subsidies, incentives, R&D, informational etc. Evaluate the costs and benefits of each policy to possible stakeholder (remembering that these extend beyond economic impacts alone)
3. *Evaluate strengths, weaknesses for policies*: Consider environmental effectiveness, economic efficiency, administrative efficiency, political feasibility, and other criteria you have defined.
4. *Unintended consequences*: What undesirable feedback mechanisms might a policy trigger? Are there implications for rebound effect, free ridership etc.?
5. *Communicate outcomes*: Summarizing a set of recommendations with consequences, evaluation techniques. Detail how a policy outcome will be measured and verified, returning to evaluation criteria.

Further details on all assignments will be provided in separate, follow-up documents.

Reflection Papers (20% of total, 5% x 4): Once per module, you will submit a reflection paper (no more than 1000 words) that **advances an argument** of your design about the module theme, **synthesizing across the readings/lectures/class discussion**. These papers are an opportunity for you to: connect class content to your own areas of interest; practice explaining and defending your thoughts concisely in a written format; have space to explore implications of an argument, question, challenge, or other thread raised in the readings and other materials. Your paper need not incorporate all materials for a given module (indeed, it can be advantageous to be more focused but thorough), and you can submit your reflection paper at any point during a module. You will post your reflection papers on Canvas Discussions. To encourage engagement with your peers' ideas, papers will be shared with the class on the Discussion Board, however, you will not be able to view others' papers until you have submitted your own. Students are encouraged to comment and engage constructively with each other's ideas in subsequent replies. If you are not comfortable with this structure, please consult with the Instructors at the beginning of term.

There will be 4 responses in total, of which you are required to complete 3. We understand that everyone has busy periods of time during the semester, and that these may differ across students. As a result, you can choose to use your “skip” at your discretion. You are welcome to complete more than 3 responses, and your grade will be based on your top 3 (i.e., your lowest grade will be dropped if you complete all 4).

Quizzes (30% total, 15% x 2): There will be two quizzes throughout the course (each worth 10%), based on material from the readings and class. Quizzes will be **open-book but time-limited** and focused on demonstrating understanding of core concepts through short answer responses.

Participation (10% of total): Participation is a **cornerstone of this course**. There are several ways to actively participate in class—these include **in-class engagement and online contributions**. Forms of online participation include responding to other students' reflection papers, and contributing to other discussion boards (e.g., Climate in the News). More details will be provided in class on expectations for **respectful, inclusive, and balanced** methods of participation. Remember that engagement means not only sharing your ideas but also listening and responding to what others have to say.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on [the UBC Senate website](#).

OTHER COURSE POLICIES

COVID Safety: Learning together, in the midst of an ongoing global pandemic is an unprecedented experience for everyone. We recognize that COVID-19 may impact your ability to engage with this course in ways that are not always easy to predict. I hope that we can all navigate this semester with flexibility and compassion. We are partners in this learning process, and we welcome suggestions for new ways to engage with course content. Please do not hesitate to reach out to us to inform us about any needs and constraints for learning this term (e.g., childcare availability), and we will work with you to develop a plan.

We will be sharing several videos as learning materials, including video lectures and recordings of classroom sessions. To protect the privacy of your classmates please **do not share** video content with those outside of our classroom community.

A higher the rate of vaccination in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so.

If you're sick, it's important that you stay home – no matter what you think you may be sick with (e.g., cold, flu, other). If you think you might have COVID symptoms and/or have tested positive for COVID and/or are required to quarantine: You can do a self-assessment for COVID symptoms here: <https://bc.thrive.health/covid19/en>

Do not come to class if you are sick, have COVID symptoms, have recently tested positive for COVID, or are required to quarantine. This precaution will help reduce risk and keep everyone safer. In this class, the course delivery and marking scheme is intended to provide flexibility so that you can prioritize your health and still be able to succeed:

- Recordings of class will be posted online, if you are not able to participate in class because you are sick.
- Participation grades take into account the full range of participation options, including asynchronous participation.
- We automatically drop one reflection paper score, so it is okay to take a week off.
- We can work with you and your groups to adjust deadlines as necessary.

If you do miss class because of illness:

- Make a connection early in the term to another student or a group of students in the class. You can help each other by sharing notes. If you don't yet know anyone in the class, post on the discussion forum to connect with other students.
- Consult the class resources on Canvas. We will post all the slides, readings, recordings for each class day.
- Use the discussion forum for help
- Come to office hours (they're online, so you can join from anywhere).
- See the marking scheme for reassurance about what flexibility you have.
- If you are concerned that you will need to miss a particular key activity due to illness, contact us to discuss, and we can formulate alternative arrangements.

If you are sick on a presentation day, please email the instructor as soon as you are confident you should not come to the scheduled presentation. We would strongly prefer that you contact us to make an alternate arrangement than for you to come to class while you are ill. If you do show up for class and you are clearly ill, we will make alternate arrangements with you. It is much better for you to email ahead of time and not attend.

If we (the instructors) are sick: We will do our best to stay well, but if we are ill, develop COVID symptoms, or test positive for COVID, then we will not come to class. If that happens, here's what you can expect:

- If we are well enough to teach, but are taking precautions to avoid infecting others, we may have an online session or two. If this happens, you will receive an announcement in Canvas telling you how to join the class. You can anticipate that this would very likely be a last minute announcement. As a result, we recommend checking your Canvas settings to confirm that you get announcements sent to your email. Our classroom will still be available for you to sit and attend an online session, in this (hopefully rare) instance.
- One of our faculty colleagues in the Institute for Resources, Environment & Sustainability, or a senior graduate student or postdoctoral fellow with the appropriate expertise will substitute
- If the above are not possible, we will cancel class, and provide online content at a later time.

Expectations: If you cannot attend the synchronous sessions, it is your responsibility to be informed of the content discussed in class by watching the recordings, and to participate in class discussions online (via Discussion Boards). You are expected to treat your classmates, the teaching team, and yourself with respect at all times, both in and out of the classroom, and in writing (over email, on discussion boards). Your success in this course will be enhanced if you: are prepared for active participation, having read the assigned readings; ask questions about any material you don't understand (in-class or on the course Discussion Board); contribute your ideas to discussions.

You can expect that we, the teaching team, will facilitate a respectful and inclusive learning environment, both in and out of the classroom. You can expect that we will post course materials in a timely fashion (at least one week before each session), and be available for consultation during office hours and over email (we will respond within 48 hours, not including weekends). You can expect that we will provide opportunities for you to give us (anonymous) feedback during and at the end of term.

Finally, the classroom functions best as a space of learning when it is diverse, equitable, and inclusive. I echo the statements from UBC's strategic plan that:

Cultural and social differences of learners enrich and enhance the university.

Excellence cannot be achieved without inclusion.

The climate crisis intersects with issues of justice, equity, diversity, and inclusion in many ways (that we will unpack in this course). Learning about and discussing the climate crisis can also bring up strong beliefs, values, and emotions. On the first day of class, we will collaboratively develop a community agreement for our classroom space so that we can engage in these discussions respectfully and inclusively, together.

Late Policy: Due dates are set to help you manage your time. If not otherwise noted, all assignments are due at 11:59 PM on their due date. Following the suggested timeline will help you get the most out of the course. If you, or your team, need extra time to complete your assignments, please consult with the teaching team in advance. **When in doubt, reach out!**

Re-grading Policy: If you feel very strongly that any reading response or assignment was graded unfairly, please submit a request to the teaching team in writing (over email) indicating what you believe the issue is. Please be as specific as possible. You must submit the request within 2 weeks of the date grades were made available. We will consider your request carefully and will respond via email in approximately two weeks of receiving it. Re-grading may result in an increase or decrease. That regrade is final.

Academic Integrity: The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also

means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at <http://calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0>. Additional resources on academic integrity, including what plagiarism is and how to avoid it, are available at the UBC learning commons: <https://learningcommons.ubc.ca/resource-guides/avoid-plagiarism/>.

Accommodations: If you need any accommodations for course work or to participate in course activities (for instance, due to a disability, or religious obligations), please bring these to the teaching team's attention during the first week of the term. We will make every effort to accommodate your requirements in the classroom. For additional support to enhance your educational experience, UBC Access and Diversity (<http://students.ubc.ca/about/access>) works with students, faculty and staff to ensure a safe and secure learning environment for students living with long-term disabilities.

Learning Resources: The UBC Learning Commons (<http://learningcommons.ubc.ca/>) is an online portal available to all students to help you achieve academic success. You can access peer tutoring and academic coaching, interactive workshops, study groups, tech tools, student-directed seminars, and many other academic resources at the website. Through this portal, you can also access the UBC Writing Centre, which offers free academic writing tutor services from September to April.

Resources to support student mental health and wellbeing are available at the Wellness Centre (<https://students.ubc.ca/health/wellness-centre>), including resources for managing stress, study tips, and navigating the university. **For 24/7 support, you can call the UBC Student Assistance Program for counselling support at 1 833 590 1328 (toll-free from within North America) or at 1 604 757 9734 (outside of North America).**

Learning Analytics: Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, iPeer, Zoom. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums
- Assess your participation in the course

THANKS

We're grateful to Prof. Navin Ramankutty and Prof. Hadi Dowlatabadi, past instructors of this course, for generously sharing their course materials.