GES 4700: Global Climate & Environmental Change

Spring 2021

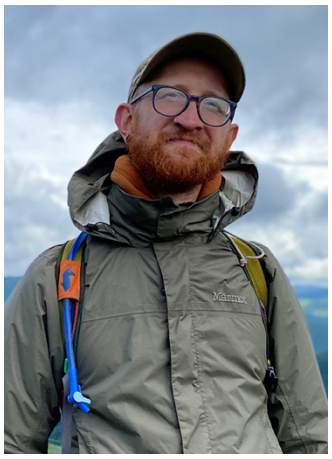
My Bloody Valentine's *Loveless* (1991) album cover | "... MBV's music is more truly ecological than representational 'nature' music, and more uncompromising than quiet ambient music." (Morton, *Hyperobjects* 2013: 30)

Course Description

Climate change comes up constantly in our day-to-day lives: in the news, in conversations with close friends and family, and in the back of our minds when we take a walk or bike ride and see changes in the landscape around us. It is immense, happening at temporal scales that stretch millions of years into the past and hundreds of years into the future and at spatial scales that span the entire globe. It is also intimate; it is in the air we breathe and is impacted by even some of our smallest decisions. There are global strikes for or against it, multitudes of competing and seemingly contradictory scientific and political claims, and still fires burning in our backyards. In short, it is one of the most pressing issues of our time, and, as such, can be incredibly overwhelming. In this course, we will take a step-by-step approach to understanding how, why, and where climate change is happening; examine specific facets of climate change that are affecting our daily lives; and look to the near-future for possible solutions and interventions. We will unpack climate change together in a seminar-style course, discussing how issues like melting permafrost in the Arctic are linked to water shortages in the American West.

This course will be offered as remote asynchronous, meeting entirely online throughout the semester. Though there will be no required weekly meetings, we will find alternative ways to share knowledge together throughout the semester. If you have any questions, thoughts, of ideas, please be in touch with me at dharri14@uccs.edu.

Professor: Dylan M. Harris



- **Email:** dharri14@uccs.edu (checked 9am-5pm M-F)
- **Office Hours:** Wednesdays, 12:00 – 2:00 pm (or by appointment)
- **Office Location:** Outlook Teams (for now)

Faculty Response Time

I try to respond to emails within 24 hours (except for weekends), and I try to return grades within 72 hours. I will let write to let you know if my schedule changes otherwise!

Teaching Philosophy

I think of the classroom as an experimental space in which I can learn alongside students, testing and pushing the limits of how knowledge is made, consumed, and carried forward outside of the university. With a background in organizing work, I also see the classroom as a site where knowledge production meets practical skills meant to encourage students in their research and writing, activism, and professional development. I focus on four main tenets in my teaching: critical thinking, deep listening, active engagement, and effective communication. I believe this four-part approach to teaching encourages students to slow down their thought processes, to sit with tension in their own ideologies and truly learn from others. Ultimately, I think this approach to teaching permits students to feel more comfortable expressing themselves in the classroom, which allows students–and myself–to learn just as much from one another as they do from me. Finally, and importantly, I draw from my personal and professional experiences as an educator (in both formal and informal spaces over the last decade), to center diversity and inclusion in the classroom. I am intentional about creating space for students to feel brave and confident in their own life experiences, bringing them to the fore in classroom conversations to help one another better understand how the ideas we discuss in class resonate in particular and significant ways in people's lives.

Course Objectives

This course serves as an introduction to geography through a tour of world regions. There is a lot to cover here, and it important that you all are prepared to **think critically**.
Critical thinking is bolded here because it will be our most useful tool throughout this course. Take a quick look at a definition of critical thinking from the *Foundation for Critical Thinking:*

"Critical thinking can be seen as having two components: 1) a set of information and belief generating and processing skills, and 2) the habit, based on intellectual commitment, of using those skills to guide behavior… It is thus to be contrasted with: 1) the mere acquisition and retention of information alone, because it involves a particular way in which information is sought and treated; 2) the mere possession of a set of skills, because it involves the continual use of them; and 3) the mere use of those skills ('as an exercise') without acceptance of their results."

Building from a base of critical thinking, at the end of this course you will be able to:

- CO1 – explain how/why the global climate has changed in the past;
- CO2 – identify key drivers in the global climate system in the present;
- CO3 – articulate key biophysical, social, political, and economic factors influencing global climate change in the present and the future;
- CO4 – discuss the pros/cons of climate policy;
- CO5 – synthesize biophysical and social science scholarship on climate-related issues;
- CO5 – effectively communicate, though discussion and writing, about the changing global climate.

Course Requirements

- There are no prerequisites for this course.

Required Texts and Other Readings

- We will draw heavily from William F. Ruddiman's *Earth's Climate: Past and Future (3rd Edition)*, but chapters will be uploaded to Canvas. However, if you're interested in climate change more broadly, this is a great book to have around!
- This course will also use lots of supplementary materials – podcasts, music, interviews, popular articles, etc. – that will also be made available either as links or PDFs through Canvas.

Course Expectations

In short, you will get out of this course what you put into it. There will be multiple opportunities to engage with material in ways that are meaningful to you, and it is my hope that this information will not be passively absorbed. Rather, it is my hope that this material resonates with you all in ways that extend beyond the classroom.

Technology Requirements
This course will work best with the use of a personal computer system; either Mac or PC. It can potentially be completed with a mobile device or tablet, but it may prove to be more difficult in terms of technical capacity.

- Download and install Microsoft Office 365 on your personal computer
- To participate in a few discussions, you will need speakers or headphones/earbuds attached to your computer as well as a microphone. A webcam has a microphone built into it.
- Download and install the latest version of the Google Chrome.
- Download and install Acrobat Reader.

Technology Competencies

- You are expected to begin this course with basic computing skills that include using Canvas, Microsoft Word to write papers, accessing online research databases, and corresponding by campus e-mail. We will also use Microsoft Excel occasionally to process and analyze climate data. Knowledge of technology-supported multimedia, such as Microsoft PowerPoint and other audio/video resources is a plus; Communication outside of class will be by campus e-mail. An idea: if your UCCS address is not your primary one, have emails from it rerouted to the one you check most often. You can find information on how to do this on the UCCS IT website.

Course Structure

- This course will be delivered entirely online through Canvas. The course will be offered as 'remote asynchronous,' meaning that there will be no required weekly meetings.
- Information will be uploaded at least a month at a time, allowing you to work on course materials at your own pace.
- The units/weeks/modules start on Monday at midnight (12am) and end on Sundays at 11:59pm.
    - Most assignments will be due on Sundays at 11:59pm, after which it will be marked as late. However, there will be a couple assignments due on Fridays at 11:59pm.
- The weekly course material will consist of video lectures, readings, links to internet resources (e.g., podcasts and news articles), and discussion assignments.
- Interactivity among the class members is through discussions (both asking and answering questions).

Assignments & Grading Summary

1. *Participation* – 10% / 10 pts

2. *Initial Reflection* – 5% / 5 pts

3. *Module/Seminar Discussion Leadership* – 15% / 15 pts

4. *Discussion Question Responses* – 40%

- Reflective Discussions - 4 pts per week (2 pts per question answered; 2 pts per response to a peer) x 10 weeks = 40 pts

5. *Written Reflections* – 10% / 10 pts

- Short Paper #1 5% / 5 pts)
- Short Paper #2 (5% / 5 pts)

6. *"Lab" Assignments* – 10% / 10 pts

- Lab Assignment #1 (5% / 5 pts)
- Lab Assignment #2 (5% / 5 pts)

7. *Final Reflection* – 10% / 10 pts

Total – 100 points

Grading Breakdown –

- A+ = 97 + points
- A = 94-96 points
- A - = 90-93 points

- B+ = 87-89 point
- B = 84-86 points
- B- = 80-83 points

- C+ = 77-79 points
- C = 74-76 points
- C- = 70-73 point

- D+ =67-69 points
- D = 64-66 points
- D- = 60-63 points

- F = >60 points

Participation

This course is offered as a 'remote asynchronous,' meaning that this course is offered entirely online (due to COVID-19) and there will be no required weekly meetings. Instead, course material – lectures, readings, assignments, etc. – will be uploaded to Canvas. There will be a few

suggested online meetings throughout the semester, but you will have plenty of time to prepare, plan for, and schedule these meetings.

While traditional 'class participation' (e.g., attendance in class, responding to/asking questions in class, visiting office hours (in person), and group work) is not possible, there are other kinds of participation that will be taken into account in this course –

- Accessing and utilizing course materials on Canvas (required)
- Completing assignments (required)
- Engaging with other students' discussion questions/answers (required)
- Attending online office hours (suggested)

Initial Reflection – due by Sunday, January 24th at 11:59pm

In a paragraph (~150-250 words), answer the following question –

What does Timothy Morton mean when he calls global warming a 'hyperobject', and how does the album he discusses in his book – Loveless by My Bloody Valentine – help us to understand climate change better?

For this question, I will provide some more context from Morton's book, and I will make sure that you all have access to this album. There are certainly no right or wrong answers to this question, and I assure I am not looking for anything in particular! I like to start this course with a group reflection exercise to get us in a similar mindset when thinking about something as complex as climate change. This is just an interesting (I hope!) way of gauging what folks think about climate change from one perspective.

These responses will only be read by me and not shared with your peers. I will not be 'grading' this so much as I will be reading it to see how you think about these issues. Again, no right or wrong answers! You will receive full credit as long as you write a paragraph and attempt to answer the question.

Module / Seminar Leadership

This course is largely modeled after a graduate studies seminar, meaning that discussion is a key element of how we are going to learn about this material. Because of COVID-19, this will of course have to take place online through Canvas. However, I am confident that we can still find ways of creating and sustaining meaningful conversations on the topics discussed in the class.

Beginning Module/Week 4: Millennial Scale Climate Change (2/8 – 2/14) you all will be partly responsible for 'leading' our weekly discussions. I will do the first 2 Modules/Weeks to give you all a sense of ways to do this.

You will only need to complete one of these throughout the course. You will be able to volunteer for which Module/topic you would like to discuss in the first two weeks of the course via a poll.

There will be multiple people working on each week, so you may want to work together (though you do not have to).

For the assignment, you will need to read the Module's required materials and prepare a short presentation (~10-15 as a group) or (~3-5 minutes individually) – that provides an overview of the Module's materials and questions/ideas you had from the material. This will be uploaded to Canvas. Additionally, you will submit some questions via Canvas – 4 max. – that you would like to pose to the class. These questions will then be added to that week's discussion thread.

******Because other people will need to engage with your presentation and questions as a part of the week's materials, these will be due on Wednesday of each Module/Week.******

Point Breakdown –

- ~10-15-minute group presentation or ~3-5-minute individual presentation (10% / 10 pts)
- Submit discussions questions – 4 max. – via Canvas. (5 pts)
- **Total – 15% / 15 pts**

Discussion Question Responses – 9 in total due by Thursday, May 13th at 5pm*

****** I am giving you all an extra 4 points because of the schedule change!***

Each week, 3 or more discussion questions will be posted to Canvas. These questions will come from me and from your discussion leaders for that week. They will be based on the 'required materials,' and I expect your responses to also be based on these materials (though, feel free to include the additional materials in your responses if you feel inclined!).

Responses to the questions can range in style and length. If you feel compelled to write a personal story, or if you want to write a mini-manifesto or research-based response, feel free to do so. I only ask that you answer the question fully and thoughtfully (e.g., engaging with each part of the question). **Your responses only need to be a few sentences, but feel free to write as much as you like. Again, I only ask that you answer the question fully, addressing each part of the question**. These responses will be public so that your peers can read and engage with them as well. In addition to answering **2 questions** (1 point each), you are expected to engage with at least **one** of your peers' answers (2 points) My intention is twofold –

> i) to create as much of a 'discussion' as I can outside of a formal classroom, and
> ii) to make sure that you are engaging with the course material throughout the class (rather than all at once at the end).

There are 15 weeks of material, but I am only asking you to answer questions for 10 of them. This means that you can pick and choose which weeks to engage with more deeply. However, you should be reading/engaging with each week. **Your discussion question responses will be due by the Sunday, at 11:59 pm, of the week about which you are writing.** *Keep in mind that some weeks can have multiple things due, so plan accordingly!*

Point Breakdown –

- 1 point per question answered x 2 (2 points)
- 2 points per engagement with peers' answer (2 points)
- 10 weeks x 4 points = **40 points total**

2 Short Papers

- ***#1 due by Sunday, March 7th at 11:59pm (5pts)***
- ***#2 due by Sunday, April 4th at 11:59 (5pts)***

Writing is a critical piece of how we communicate about the climate. Further, writing helps to bring ideas into focus and to synthesize new understanding and knowledge. Each of these short papers will ask you to engage with a topic we've covered in class in more depth. These short papers provide a way for you to engage more deeply with the topics raised in this course and – ideally – will be a compass for how you think about the climate after this course.

Each paper should be no less than 1000 words (and not more than 1500 words – learning to write short papers is a virtue!). All normal formatting (1-inch margins, 12 pt. font, relatively normal font style) apply for these and the final projects.

2 Lab Assignments

- ***#1 due by Sunday, February 7th at 11:59pm (5pts)***
- ***#2 due by Sunday, April 18th at 11:59pm (5pts)***

Like writing, it is important to understand where climate data comes from and how to analyze it to better understand and address climate change. These two short lab assignments will be opportunities for you all to engage with biophysical climate data and apply your knowledge of class concepts.

Each lab will be posted with detailed instructions and tutorials.

Final Reflection – due by Thursday, May 13th at 5pm

The final reflection for this course is an opportunity for you to further explore some element of climate change that you found compelling, interesting, and/or important. By this stage of the course, it is not a matter of you 'proving' any knowledge to me. Rather, it is meant to give you a parting thought/idea to carry with you outside of the course.

This assignment is NOT meant to be stressful or take too much of your time. Because there are multiple ways to approach it, there is no right or wrong project topic or format for this assignment. More information about this will be posted well ahead of any due dates.

Grading Policy

- Grades will be posted in Canvas within 4 days after the assignment due date.
- Assignments should be uploaded using the assignment link in Canvas; please do not email them to the instructor.

Late Assignments Policy

Discussion Responses – **Because you have the option to choose which weeks you respond to discussion questions, there will be no late days**. These discussion board will close at midnight on the Friday of each week to help me keep track of who responds and when.

Initial Discussion, Module Presentations, Written Reflections (x2), and Labs (x2) – **You each are allowed to use 3 late days throughout the semester however you choose.** If you are three days late on one assignment, your grade will not be affected. If you miss one day on each assignment, your grade will not be affected. However, if you use all of your late days and submit an assignment late, I will not be able to accept the late assignment, and you will receive 0 pts. I will keep up with these, but I encourage you to keep up with them yourself as well.

Final Reflections – Because these are due at the very end of class, there will be no room for late days.

Assignment / Grading Review

Assignments and points	Points total	Final Weighted Percentage
Participation	10 pts	10%
Initial Discussion	5 pts	5%
Module / Seminar Leadership	15 pts	15%
Discussion Question Responses	4 pts x 10 weeks = 40 pts	40%
2 Short Papers	2 x 5 pts = 10 pts	10%
2 Lab Assignments	2 x 5 pts = 10 pts	10%
Final Reflection	10 pts	10%
Total	100	100%

Communication and Interaction Policies

- Participate in all online activities in the course as listed in the syllabus unless they make prior arrangements.

- Commit to spending a minimum of 2-4 hours per week to complete the requirements for the course.
- Check UCCS email daily for updated messages sent via Canvas by the professor, and reply to these messages when appropriate
- Practice “Netiquette" and civility for online discussions, written work, email, and all forms of communication (see below)
- Submit all assignments through Canvas by the stated deadline.
- Know the policies and procedures for late work or missed assignments.
- ***Ask for help if you need it!***

Student Services and Support

Accommodations

“If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to register with Disability Services and provide them with documentation of your disability. They will work with you to determine what accommodations are appropriate for your situation. To avoid any delay, you should contact Disability Services as soon as possible. Please note that accommodations are not retroactive and disability accommodations cannot be provided until a Faculty Accommodation Letter has been given to me. Please contact Disability Services for more information at Main Hall room 105, 719-255-3354 or dservice@uccs.edu.

Military and Veteran Students

Office of Veteran and Military Student Affairs provides the following syllabus statement: "Military students who have the potential to participate in military activities including training and deployment should consult with faculty prior to registration for any course, but no later than the end of the first week of classes."

At this time, the student should provide the instructor with a schedule of planned absences, preferably signed by the student's commander, in order to allow the instructor to evaluate and advise the student on the possible impact of the absences. In this course, the instructor will consider absences due to participation in verified military activities to be excused absences, on par with those due to other unavoidable circumstances such as illness. If, however, it appears that military obligations will prevent adequate attendance or performance in the course, the instructor may advise the student to register for the course at another time, when she/he is more likely to be successful.

Technology Support

There is a pre-course setup that can be added to your course shell with instructions for students for setting up your computer and student tutorial videos for Canvas. More help is available through the Help link at the bottom of the global navigation in the Canvas course (black nav bar at the far left of the window).

- For 24/7 Canvas Student Support, 844-802-9230
- For issues with logging in or your UCCS e-mail account or campus wireless, contact the UCCS Help Desk 719-255-3536 or Contact the Help Desk online.
- Canvas Support Live Chat - you do not have to be logged in to Canvas to access the hotline or chat.

UCCS Academic Support Services

Access to a range of University academic support services is available via the Canvas user interface (UCCS Resources > Resources, Policies, Etc.

UCCS Student Services & Resources

Access to a range of University student support services is available via the Canvas user interface (UCCS Resources > SU18-FA18 > Resources, Policies, Etc.). If you need access to these services, please contact the Student Success Center.

The Excel Centers

The UCCS Excel Centers include the Language and Social Sciences Center, the Mathematics Center, the Communication Center, the Science Center, and the Writing Center. These five academic centers are designed to provide critical academic and individual support to all students in the University in all major academic areas, both within and beyond the classroom. All Excel Centers offer online services by appointment.

Kraemer Family Library

Library skills are essential to your success as a college student. Librarians are available to help students select and locate appropriate books, articles, and other resources needed to complete course assignments. Research help is available in person at the Reference Desk, by phone at 719.255.3295, and through email or chat via the Library's website, www.uccs.edu/library.

Course and Institutional Policies

In addition to the course policies, all UCCS students are also expected to know and comply with policies set by the campus and the Regents of the University of Colorado. The most important include:

Attendance, Preparation, and Participation

Students are expected to maintain high standards of ethical and professional conduct. This includes being adequately prepared, contributing to class discussions, submitting high caliber work, and representing your own work fairly and honestly. You must actively engage in class and group work to maximize your learning in this course.

Professional Behavior

Professional behavior is necessary for you to be a successful member of a learning community. Please monitor your participation in class discussions and group work and find ways to contribute intelligently to the discussion without silencing others. All written assignments must be computer generated unless otherwise indicated by the professor. Professional behavior will be expected in your future teaching/counseling career and is often the hallmark of career success.

UCCS Student Code of Conduct

The purpose of the Student Code of Conduct is to maintain the general welfare of the university community. The university strives to make the campus community a place of study, work, and residence where people are treated, and treat one another, with respect and courtesy.

Plagiarism and Cheating

If you are unsure of what plagiarism and cheating consists of, please contact me before submitting an assignment that may include plagiarism and cheating. You may also want to read the *UCCS Policies on Academic Honesty and Civility* if you are uncertain as to what plagiarism and cheating are. University regulations will be followed to the letter.

UCCS Student Rights & Responsibilities

The Colorado General Assembly implemented the Student Bill of Rights (C.R.S. 23-1-125) to assure that students enrolled in public institutions of higher education have rights.

UCCS Academic Honor Code

UCCS has an ongoing commitment to maintain and encourage academic integrity. Therefore, the university has created a set of standards of academic honesty and procedures governing violations of these principles.

Confidentiality

Under no circumstances will students disclose individual student or teachers' names during whole class discussions. Please remember to respect the confidentiality of all participants, schools, and/or organizations.

Recording of classroom lectures and/or re-distribution of classroom materials

The materials, classroom lectures, discussions, and assignments for this course have been developed for educational purposes at UCCS and constitute intellectual property. Any student who wants to record or videotape classroom lectures and discussions or re-distribute classroom materials must discuss this issue with the professor and obtain written permission.

Recording a class with student participation to be used within the same class

Making recordings available to students enrolled in the class in which the recording was made is allowed because enrolled students would have: (1) been in the class and the recording would not disclose anything to the student that they didn't already know, or (2) missed the class, but the information in the recording is something that the student had a right to access had the student been in attendance. Instructors should consider the following when making classroom recordings to be shared with students enrolled in the same class:

- Provide notice to students of the recording in the syllabus and through a verbal announcement at the beginning of each recorded session.
- Ensure storage and access to the recording is secure and limited to students enrolled in the same class, for example by utilizing Canvas.
- Instructors should delete the recording within a reasonable time after the class ends to prevent inadvertent disclosure or use.
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Recording a class with student participation to be used outside of the class
The portion of these recordings containing student participation are education records protected by FERPA. Instructors should consider the following when sharing these recordings to anyone that is not a student enrolled in the class:

- Provide notice to students of the recording in the syllabus and through a verbal announcement at the beginning of each recorded session.
- Avoid recording students, if the recording includes only the instructor, it is not a student education record and not subject to FERPA.
- Edit the recording to remove any portion in which a student appears or blur the student's image and distort the student's voice.
- Plan class participation sessions so that it is easy to edit student participation out.
- For recordings where de-identification is not possible, obtain individual written FERPA consents from each student that can be identified in the recording.
- If students participating are not de-identified, or participating students do not provide a FERPA consent, then the recording cannot be shared outside of the class.

Withdrawal from Course

You may choose to withdraw from your class. Please note the last date for withdrawal without instructor/dean's approval is April 2nd, 2021. Please email prior to your withdrawal as I am concerned about your progress in this course.

Course Schedule (subject to change)

Module 1: 1/19 – 1/24
Course Introduction –

- Syllabus Review, Class Overview – FAQs
- Required Materials
  - Video Lecture
  - Read Syllabus
  - Read Timothy Morton (2013) *Hyperobjects* excerpt
  - Listen to My Bloody Valentine's (1991) *Loveless*
- Additional Materials
  - Ruddiman Textbook – Chapter 2: Earth's Climate System Today (pp. 19-54)
- Module Activity
  - Discussion Board – Introductions (upload yours + respond to one other)
  - **Initial Discussion Assignment (~150-250 words) – Due Sunday, 1/24 by 11:59pm**
    - *What does Timothy Morton mean when he calls global warming a 'hyperobject', and how does the album he discusses in his book – Loveless by My Bloody Valentine – help us to understand climate change better?*

I. Past Climate

Module 2: 1/25 – 1/31
Tectonic Scale Climate Change –

- Required Materials
  - Ruddiman Textbook – Chapter 4: CO2 and Long-Term Climate (pp. 81-96)
- Additional Materials
  - Watch Short Video - Richard Alley - 4.6 Billion Years of Earth's Climate History: The Role of CO2
  - Article – Doe (1983) The past is the key to the future
  - Article – Hay et al. (1997) Climate: Is the past the key to the future?
- Module Activity:
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer

Module 3: 2/1 – 2/7
Orbital Scale Climate Change –

- Required Materials
  - Ruddiman Textbook – Chapter 8: Astronomical Control of Solar Radiation (pp. 159-176)
- Additional Materials
  - Watch Short Video – How Volcanoes Froze the Earth (Twice)
  - Read Article – Milankovitch (Orbital) Cycles and Their Role in Earth's Climate
- Module Activity:

- Discussion Board – Answer 2 Questions, Respond to 1 Answer
- **Lab 1 – Earth's Radiation Balance due Sunday, February 7th at 11:59pm**
  - ***Assignment will be posted via Canvas***

Module 4: 2/8 – 2/14
Millennial Scale Climate Change –

- Required Materials
  - Ruddiman Textbook – Chapter 13: The Last Glacial Maximum (pp. 253-272)
- Additional Materials
  - Watch film – Secrets Beneath the Ice (2010)
  - Read article – Alley et al (2003) Abrupt Climate Change
  - Listen to podcast – ArchPod: The Younger Dryas – Episode 142
- Module Activity:
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer
  - Seminar / Discussion Leader Posts

II. Present Climate

Spring Break I: 2/15 – 2/21

Module 5: 2/22 – 2/28
Historical Scale Climate Change –

- Required Materials
  - Ruddiman Textbook – Chapter 16: Humans and Preindustrial Climate (pp. 317-333)
- Additional Materials
  - Watch Film – Anthropocene: The Human Epoch
  - Read short article – Scientific American: The Human Experiment
  - Listen to podcast – Burning Futures: On Ecologies of Existence
- Module Activity:
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer
  - Seminar / Discussion Leader Posts

Module 6: 3/1 – 3/7
Sea-level Rise –

- Required Materials
  - Tahmina Anam (2020) The Unfortunate Place
  - Hauer et al. (2016) Millions projected to be at risk from sea-level rise in the continental United States
- Additional Materials
  - Read article – Nicholls & Cazenave (2010) Sea-Level Rise and Its Impact on Coastal Zones
  - Watch film – Shored Up
  - Read article / listen to (short) podcast - NASA Satellite To Measure Global Sea Level Rise

- Module Activity:
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

Module 7: 3/8 – 3/14
Extreme Weather Events & Hazards –

- Required Materials
    - Stott (2016) How climate change affects extreme weather events
    - Smith (2006) There's No Such Thing as a Natural Disaster
- Additional Materials
    - Coumou & Rahmstorf (2012) A decade of weather extremes
    - Watch Movie Trailer – Rebuilding Paradise
    - Watch Documentary – Blackout in Puerto Rico
    - Read article - The top 10 weather and climate events of a record-setting year
- Module Activity:
    - **Short Paper # 1 due Sunday, March 14th at 11:59pm (1000 words)**
        - ***Topic will be announced via Canvas***
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

Module 8: 3/15 – 3/21
Permafrost Thaw –

- Required Materials
    - DeConto et al (2012) Past extreme warming events linked to massive carbon release from thawing permafrost
    - Schuur et al (2015) Climate change and permafrost carbon feedback
- Additional Materials
    - Read Article - Are There Zombie Viruses — Like The 1918 Flu — Thawing In The Permafrost?
    - Watch Video – Hunting for Methane with Katey Walter Anthony
    - Explore Pleistocene Park Project:
        - Kickstarter (watch the video)
        - Website
- Module Activity:
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

Spring Break II: 3/22 – 3/28

Module 9: 3/29 – 4/4
Climate Adaptation / Mitigation –

- Required Materials
    - IPCC AR5 (2014) – Impacts, Adaptation, Vulnerability: Summary for Policymakers
- Additional Materials

    - Read book chapter – Watts (2015) Now and Then: The origins of political ecology and the rebirth of adaptation as a form of thought
    - Read article – Droulet (2016) Cheap oil slows climate mitigation
    - Listen to podcast – America Adapts: Episode 1 – National Parks and Climate Change
- Module Activity:
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

Module 10: 4/5 – 4/11
Climate Migration –

- Required Materials
    - Ober (2014) How the IPCC views migration
    - Paprocki (2018) Threatening Dystopias: Development and Adaptation Regimes in Bangladesh
- Additional Materials
    - Read article / watch video: Kivalina on the Coast: how an Arctic community is responding to climate change
    - Read article: Resettling the First American 'Climate Refugees'
- Module Activity:
    - **Short Paper # 2 due Sunday, April 11th at 11:59pm (1000 words)**
        - ***Topic will be announced via Canvas***
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

III. Future Climate

Module 11: 4/12 – 4/18
Climate Justice –

- Required Materials
    - Simmons (2020) What is 'climate justice'?
    - Podcast - Climate Justice - Can the courts solve the climate crisis?
    - First Chapter of Kim Stanley Robinson's (2020) book *The Ministry of the Future*
- Additional Materials
    - Listen to Video / Read Speech – (2019) "This Is Our Time. This Is Our Future." Voices from the Historic Youth Climate Strike in NYC
    - Read short article - Black Lives Matter: the link between climate change and racial justice
    - Read article – Wilder et al (2016) Southwest climate gap: poverty and environmental justice in the US Southwest
- Module Activity:
    - Discussion Board – Answer 2 Questions, Respond to 1 Answer
    - Seminar / Discussion Leader Posts

Module 12: 4/19 – 4/25
Climate Modeling –

- Required Materials
  - Wayne (2013) The Beginner's Guide to Representative Concentration Pathways
  - Flato et al (2013) Evaluation of Climate Models pgs. 743-752
- Additional Materials
  - Article – Demeritt (2001) The Construction of Global Warming and the Politics of Science
  - Listen to podcast – Warm Regards: The Past and Future of Climate Models
- Module Activity:
  - **Lab 2 – Observed and Modeled Temperature in Colorado due Sunday, April 25th at 11:59 pm**
    - ***Assignment will be posted via Canvas***
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer
  - Seminar / Discussion Leader Posts

Module 13: 4/26 – 5/2
Geoengineering –

- Required Materials
  - Keith et. al. (2017) Solar geoengineering reduces atmospheric carbon burden
  - Buck (2019) Introduction. Desperation Point.
    - **OR** – Video: Buck (2019) After Geoengineering
  - Explore Website – Virgin Earth Challenge
- Additional Materials
  - Listen to podcast - Climate geoengineering – Experimenting with the global thermostat
  - Listen to interview - There's No Sheriff on This Planet: A Conversation with Kim Stanley Robinson
- Module Activity:
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer
  - Seminar / Discussion Leader Posts

IV. Synthesizing & Wrapping-up

Module 14: 5/3 – 5/9
Course Summary – Futures Ideas & Directions

- Required Materials
  - Bill McKibben's (2011) Introduction to *I'm With the Bears*
  - Ruddiman Textbook – Chapter 20: Future Climatic Change (pp. 393-411)
- Additional Materials
  - John Freeman's (2020) Introduction to *Tales of Two Planets*
- Module Activity:
  - Discussion Board – Answer 2 Questions, Respond to 1 Answer

Module 15: 5/10 – 5/13

Final Reflections due Thursday, May 13th by 5pm