

GEOG 3210/5210; ENVST 3210: Global Climate Change*General Education SF*

Spring 2021

Professor: Andrea Brunelle, GC 4748, 585-5729, andrea.brunelle@geog.utah.edu & Canvas
 Office Hours: Tues 3:00-4:00 (see zoom links on Canvas) and by appointment.
 TA: Kripa Thapa, kripa.thapa@utah.edu
 Office Hours: by appointment.
 Prerequisite: Basic knowledge about Earth Systems and a keen interest in learning more
Required Texts: Earth's Climate: Past and Future, William Ruddiman **3rd Edition** (you must have the 3rd edition!)

Course Web Page: <https://utah.instructure.com>

Grading 3210:	Weekly quizzes	20%
	Reading and Viewing Guides, other assignments	20%
	Current Topics Discussion post and comments	10%
	4 course objective assessments (12.5% each)	50%
Grading 5210:	Weekly quizzes	20%
	Reading and Viewing Guides, other assignments	15%
	Current Topics Discussion post and comments	10%
	4 course objective assessments (10% each)	40%
	CO ₂ monitoring exercise and report	10%

We are doing written course objective assessments (did we, and how did we, meet each course objective) in lieu of traditional exams this year. Objective 1 & 2 assessments will be during the semester and serve as mid-terms, and objectives 3 & 4 come at the end of the semester and serve as the final exam. Guidelines for writing these will be provided and discussed before they are assigned!

Course Description: Climate change has been occurring throughout Earth's history. Inherent processes such as the planet's tectonic activity, the Earth's relationship to the Sun and other extraterrestrial bodies, as well as atmospheric and hydrological processes have dictated an ever-changing climate pattern over a variety of time scales. Speciation, adaptation, migration, and extinction of living organisms have frequently resulted from climate changes, but the relatively recent evolution and expansion of humans around the globe have cast climate change in a new light. Humans are altering the atmosphere in an unprecedented manner and stand to suffer greatly from even relatively minor alterations in climate. Yet, the complexity of the issue, the inertia of industry and energy use, and the reluctance of policymakers to risk economic backlash have created a politically charged atmosphere surrounding the study of global climate change. In this class, students will be introduced to the methods and review the evidence used to study climate changes of the past and will examine the data being used to forecast climate change into the future.

Learning Objectives:

1. Be able to explain the role of CO₂ in regulating the Earth's climate.
2. Be able to talk about other things that affect climate and give examples from the past.
3. Be able to describe the current concern about climate change using the past as a foundation.
4. Feel comfortable explaining "the three facts" about climate change to others.

Class Policies

Participation – Participation is expected and will be reflected in your grade. In this online environment, participation means having done the reading and being prepared for a lecture so you can contribute in the break-out sessions and take the weekly quiz(zes) on time. Quizzes assigned one week will be due by the following Monday before midnight. Chapter quizzes will include the material presented for that chapter but may also include review questions from previous chapters. **There are NO make-up quizzes**; however, the two lowest scores will be dropped.

The university has also asked instructors to provide 3 mental health days over the course of the semester. Since all the lectures are recorded you can choose to not attend at your discretion and watch the video later. The material is cumulative however, so I do recommend staying caught up. All assignments will be due as scheduled, but to allow for issues that come up, quizzes and assignments (except the last two assessments) will be accepted up to a week late with no penalty. No work more than a week late will be accepted unless the professor is notified ahead of time and the situation approved.

Zoom – I will record all lectures in case you cannot attend on a given day. They will be posted under the Zoom → Cloud Recordings tab on our Canvas page. I encourage you to "attend" as many live zoom lectures as you can, so you have an opportunity to ask questions or get clarification. We will also be doing "in-class" breakout sessions to discuss topics with your fellow students and polls to assess understanding. While in the zoom, you can always post questions in the chat box. Also, I would love to see your faces if you are comfortable. It is very weird lecturing to a panel of blank boxes!

Current Topics in Global Change- Everyone must find a current topic related to climate change and post it on the Discussion Board. Once a topic has been reported on, you cannot use that item. The source must be cited (e.g., NPR, All Things Considered, 1/11/21) so we know where you got your info, and others do not duplicate it. They need to fully explain the topic (6-8 complete sentences). You also need to provide a thoughtful reply to at least 4 postings by the due date. You will be graded on the quality of your post and your responses to others.

Extra Credit- I give extra credit for attending and reporting on out-of-class lectures on climate change. I will keep my eye out for them, but if you see something you think might fit, let me know (ahead of time so we can make it available to everyone), and I will review it.

**** Students taking 5210 will be held to a higher standard on all assessments. ****

Essential Learning Outcomes: ELO's are skills that should be gained in general education coursework that prepare students to be "effective 21st-century global citizens" (U of U General Education Guidelines). Through the discussions over the course of the semester and with assignments described above, we will specifically work on several of these outcomes, and they will be incorporated and assessed as follows:

- *Critical Thinking and Reasoning*- Critical thinking and reasoning skills will be developed and employed on a daily basis through the presentation, discussion, and consideration of scientific data on climate change. These skills will be assessed during the in-class and online quizzes and on objective assessments.
- *Written Communication* – Student written communication skills will be assessed, and constructive feedback provided during the course objective analyses and their current topics postings.

***Incompletes will only be given at my discretion and only if the student is passing at the time.**

***You are responsible for all information presented in the lecture and over the course website (Canvas).**

Incomplete & Preliminary Lecture, Reading & Assignment Schedule (WATCH Canvas FOR UPDATES!):

[Type here]

Spring 2021 – lecture schedule subject to change

[Type here]

WEEK OF:	Topic	Reading (<i>"looking deeper"</i> boxes not required)	Assignments (due Monday the following week)
Jan 18	Introductions & Syllabus Greenhouse Effect		<i>Syllabus quiz</i> <i>Greenhouse quiz</i>
Jan 25	Overview of Climate Science Earth's Climate System Today Climate Archives, Data, and Models	Chapter 1 Chapter 2 Chapter 3	<i>Chapters 1, 2, & 3 quizzes</i> <i>Getting to know you discussion</i>
Feb 1	CO ₂ and Long term Climate	Chapter 4	<i>Chapter 4 quiz</i>
Feb 8	Plate Tectonics and CO ₂	Chapter 5	<i>Chapter 5 quiz</i>
Feb 15	Greenhouse Earth	Chapter 6 (6.1-6.3 & Asteroid to the end)	<i>Chapter 6 quiz</i>
Feb 22	From Greenhouse to Icehouse	Chapter 7 Watch "Cracking the Ice Age"	<i>Chapter 7 quiz</i> <i>Cracking the Ice Viewing Guide Quiz</i>
Mar 1	Astronomical Control of Insolation Insolation Control of Monsoons	Chapter 8 Chapter 9	<i>Chapter 8 & 9 quizzes due March 15th</i> <i>Objective 1 assessment due March 15th</i>
Mar 8	No Lectures (office hours by appointment)	No readings	No assignments
We will assess our progress and adjust the schedule as necessary for the second half of the term- updated quiz and lecture schedule will be provided.			
Mar 15	Insolation Control of Ice Sheets Orbital Scale Changes in CO ₂ and CH ₄	Chapter 10 Chapter 11	
Mar 22	Orbital Scale Interactions The Last Glacial Maximum	Chapter 12 Chapter 13	<i>Objective 2 assessment assigned after chapter 12</i>
Mar 29	Climate Since the Last Glacial Max Humans and Preindustrial Climate	Chapter 14 Chapter 16	
Apr 5	Climate Changes in the last 1000 yrs Climate Change since 1850	Chapter 17 Chapter 18	
Apr 12	Warming in the last 125 years	Chapter 19 Watch Dimming the Sun	<i>Dimming the Sun Viewing Guide Quiz</i>
Apr 19	Current & Future Climate Change	Chapter 20 Watch Chasing Ice	<i>Chasing Ice Viewing Guide Quiz</i> <i>Objective 3 & 4 due April 27</i>
Apr 26	Climate Change Implications What we can do	Chapter 20 4 Degrees (on Canvas)	
Objective 3 & 4 assessments will be accepted until the end of our final exam period which is Monday, May 3, 2021, 3:00 pm			

Additional readings may also be assigned as appropriate for the discussion topic

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and I to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

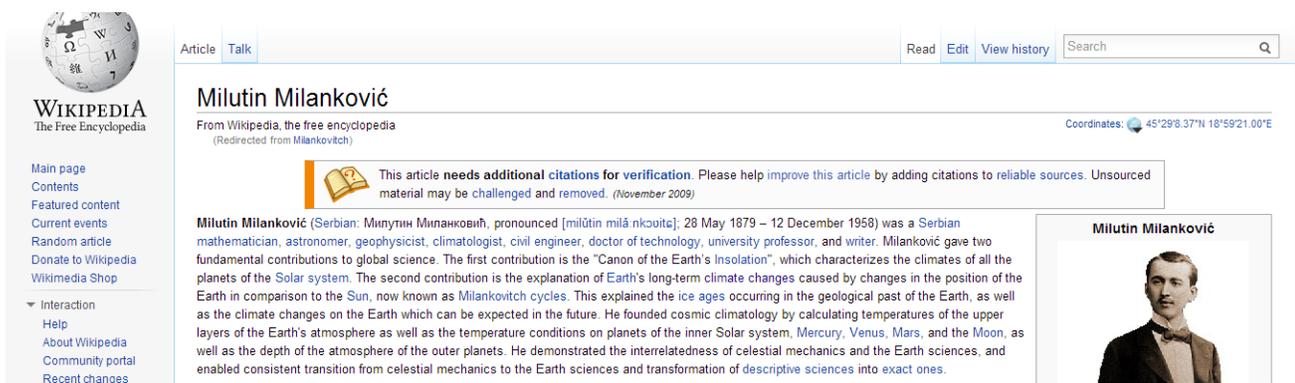
"Some of the writings, lectures, films, or presentations in this course may include material that conflicts with the core beliefs of some students. Please review the syllabus carefully to see if the course is one that you are committed to taking. If you have a concern, please discuss it with me at your earliest convenience." - *Per Accommodations Policy, Office of Academic Affairs*

Geography Department Academic Misconduct Policy

Academic misconduct will not be tolerated. Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities. Academic misconduct includes, but is not limited to, cheating, misrepresenting one's work, and plagiarism:

- Cheating involves the unauthorized possession or use of information in an academic exercise, including unauthorized communication with another person during an exercise such as an examination.
- Misrepresenting one's work includes, but is not limited to, representing material prepared by another as one's own work or submitting the same work in more than one course without prior permission of all instructors.
- Plagiarism means the intentional unacknowledged use or incorporation of any other person's work in one's own work offered for academic consideration or public presentation.

- When you gather information from any source (internet, book, newspaper, journal article, etc), you need to paraphrase. This means changing the words from the original source into your own. Even though the words are yours, the content is still from somewhere else, so it still needs a citation.
- The way that I do this is I'll read something and make notes on what I read. Then I put the original source away and explain it using my words and notes.
- You can take text directly from a source if you put the material in quotation marks, cite the source and the page number from the excerpt. However, I don't want to see any direct quotations in any of your work. I want paraphrasing with appropriate citations.
- Here is a good and bad example of paraphrasing from the Wikipedia entry on Milutin Milankovitch.



BAD:

Milutin Milankovic was a Serbian mathematician who gave two fundamental contributions to global science. These include the "Canon of the Earth's Insolation" which characterizes the climates of all the planets in the solar system. The other contribution is the explanation of the Earth's long-term climate changes caused by the position of the Earth and Sun.

GOOD:

Milutin Milankovitch made many contributions to our understanding of the Earth's climate. He was widely trained in the Earth, Geological and Astronomical sciences but is best known as a Serbian mathematician and astronomer. His most important contribution was his explanation for the ice ages, which is based on changes in the Earth's relationship with the Sun, known as Milankovitch Cycles (Wikipedia, 2012).

References Cited

Wikipedia. Accessed Dec. 30, 2012. Milutin Milanković, <http://en.wikipedia.org/wiki/Milankovitch>