

# **GEOG 3204(3)-001**

## **Climate Change & Variability**

Fall Term 2021 (Sep-Dec)

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Office Hours: Mondays, 9:30-10:30 am; Wednesdays, 8:30-9:30 am  
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Lectures: Room 4M46  
Mon/Wed/Fri, 11:30 am – 12:20 pm

### **Readings**

There is no textbook for this course.

However, there are many excellent online and library resources that will be used. For example, the recently released 2021 IPCC report on climate change will be used extensively, as will many recent peer-reviewed articles and reports. Resources produced by the University of Winnipeg's Prairie Climate Centre will also be used. Links to these will be made available through Nexus as needed.

### **Course Description**

The causes and characteristics of regional and global climate change and variability will be examined, as will be the methods of reconstructing climate histories. Emphasis will be placed on the North American experience. Topics will include atmosphere teleconnections (e.g., El Niño and La Niña), global warming, and climate forecasting.

### **Learning Outcomes**

By the end of this course students should have a good understanding of:

- the general nature of climate variability vs climate change
- the causes of climate change in the past
- the main methods used to reconstruct distant and recent climates
- the evidence for anthropogenic climate change
- the methods used to produce climate projections
- the importance and inevitability of uncertainty
- the potential impacts of climate change, especially in Canada
- the challenges and opportunities regarding mitigation and adaptation
- the need for urgent action; what we must do.

### **Course Organization**

The topics that will be covered in this course, at least to some extent, are listed below.

The order and time spent on topics may change in response to current events and/or requests from the students.

*Please note that due to time constraints, or conditions beyond the instructor's control, all topics may not be covered; and additional topics may be added.*

Order	General Topics	Some of the Specific Topics
1	Introduction to the importance of climate change and the urgency of dealing with it	Where we've been, where we are, where we may be going
2	The difference between variability and change	Weather vs climate; ocean-atmospheric interactions; the important modes of variability
3	The carbon cycle	Sources and sinks of carbon; the Keeling Curve
4	Radiation and radiative forcing	Greenhouse gases, radiation balance, feedbacks
5	Paleoclimate change and more recent change	Ice ages, Milankovitch Cycles, feedbacks, the Holocene, hockey stick graph, methods of reconstruction
6	Recent warming and change	Observation system, trends, cryosphere, oceans, precipitation/water cycle, impacts already observed
7	Climate models	Modelling and uncertainty, scenarios, assessing risk, potential impacts on human and natural systems, urgency
8	Canada's situation	The Climate Atlas of Canada, health, agriculture, forests, cities and more
9	What to do?	Mitigation and adaptation strategies, solutions, social change, hope

### Student Evaluation

Midterm Test	15%
Shorter Writing Assignment	15%
Longer Writing Assignment	35%
Final Exam	35%

The Shorter Writing Assignment will be on a specific topic. The Longer Writing Assignment will be on a topic chosen by the student in consultation with the instructor. Detailed instructions and expectations regarding the writing assignments will be provided when they are assigned; they must be typed, and there will be a penalty for assignments handed in late. The final exam will be comprehensive.

### Grading

A+ = 90% and up	B+ = 75-79.9	C+ = 65-69.9	D = 50-54.9
A = 83-89.9	B = 70-74.9	C = 55-64.9	F= 49.9 and below
A- = 80-82.9			

The numeric boundaries separating letter grades may be altered at the demand of the Departmental Review Committee. Grades are not final until approved by the University Senate. **Tuesday November 16<sup>th</sup> is the FINAL DATE to withdraw without academic penalty. Withdrawing before the VW date does not necessarily result in a fee refund.**

### NEXUS

On a regular basis, the instructor will assign readings; all assigned readings are testable unless otherwise noted. The readings and the slide presentations used in class will be posted on NEXUS (<https://nexus.uwinnipeg.ca/>). If you are having difficulties with

NEXUS contact the help desk at (204) 786-9149 or connect to the Nexus supports listed on the Nexus page noted above.

### Email

Your University of Winnipeg email address will be used for course related correspondence (name@webmail.uwinnipeg.ca). Please do not use the Nexus email function. Please do not use your gmail or hotmail or other accounts to correspond with the instructor.

Students have the responsibility to regularly check their UWinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or their course instructors.

### Important Dates

Date	Importance
Wed Sep 8	First lecture
Fri Sep 17	Shorter Paper Assigned
Thu Sep 30	National Day of Truth & Reconciliation; University Closed
Fri Oct 1	Shorter Paper Due (11:30 am; before class)
Fri Oct 1	Longer Paper Assigned
Mon Oct 11	Thanksgiving Day; University Closed
Oct 11 - 15	Mid-term Reading Week; No Classes
Wed Oct 20	Midterm Test
Thu Nov 11	Remembrance Day: University Closed
Tue Nov 16	Last Day to Withdraw Without Academic Penalty*
Mon Dec 6	Last Lecture in this course
Mon Dec 6	Longer Paper Due (11:30 am; before class)
<a href="https://www.uwinnipeg.ca/exam-schedules/">https://www.uwinnipeg.ca/exam-schedules/</a>	Final Exam (exam period is Dec 10-23)

\* **Voluntary Withdrawal:** You must formally withdraw from a course. If you simply stop going to classes, you may receive an “F” on your transcript and loss of tuition credit. Please refer to the 2021-22 Academic Calendar for Voluntary Withdrawal procedures. Please note that withdrawing before the Voluntary Withdrawal date does not result in fee refund.

Alternate test dates will be considered in very exceptional cases and for legitimate reasons only; vacation travel is not an acceptable reason. If you miss a test, you must contact your instructor in person immediately upon your return to the university. Documentation (i.e., proof of illness or circumstances beyond your control) is required before alternate arrangements can be made.

The Final Exam must be written as scheduled in the 2021-2022 Exam Timetable. If you have a Final Exam conflict (i.e., two final exams on the same date and time), or if circumstances beyond your control prevent you from writing the exam as scheduled, you must contact Academic Advising immediately; otherwise, you must write the final exam as scheduled.

Please refer to Section 9.d. under REGULATIONS & POLICIES in the 2021-2022 Undergraduate Academic Calendar.

## OTHER INFORMATION

Students are expected to conduct themselves according to the standards and regulations set out by the University of Winnipeg. The University Senate would like you to be particularly aware of the following regulations appearing in the 2021-2022 Undergraduate Academic Calendar under **REGULATIONS & POLICIES: Grading** (Section 4); **Grade Appeals** (Section 10), and; **Student Discipline** (Section 8), especially the definitions of **plagiarism** (Section 8.a.i) and **cheating** (Section 8.a.ii.).

### ACADEMIC CONDUCT:

It is your responsibility to be familiar with the information on Academic Regulations and Policies listed in the 2021-22 University of Winnipeg Undergraduate Academic Calendar [www.uwinnipeg.ca/index/calendar-calendar](http://www.uwinnipeg.ca/index/calendar-calendar). This section covers classroom regulations, grading, transcripts, challenge for credit, academic standing, student discipline (academic and non-academic misconduct), appeals including grade appeals, general university policies and codes, and graduation. You can find information on plagiarism by watching the University of Winnipeg library video tutorial “Avoiding Plagiarism”: <https://www.youtube.com/watch?v=UvFdxRU9a8g>

A summary of important information regarding Academic Misconduct follows. Where discrepancies exist between the text below and the Undergraduate Academic Calendar, the Undergraduate Academic Calendar will prevail.

### Forms of Academic Misconduct:

- Plagiarism: includes presenting other people’s published or unpublished work in part or as a whole as your own. This includes material from lab manuals, essays, journal articles, books, etc. Plagiarism also refers to submitting the same work in more than one course without both instructors’ permission and to the situation where two or more students submit identical (or nearly identical) work for evaluation when the work was to be completed individually.
- Cheating: includes copying another person’s answer on a test, communicating with another person during a test or exam, consulting unauthorized sources (including written and electronic sources), obtaining a copy (of all or part) of a test/exam/assignment before it is officially available, purchasing tests, essays or other assignments and submitting the work as your own.
- Improper Academic/Research practices include: fabricating or falsifying results, using other peoples’ research findings without permission, misrepresenting research results or methods, referring to non-existent sources or investigators, contravening the University’s Policy and Procedures on Research Integrity.
- Obstructing academic activities of another person; for example, interfering with another person’s access to pertinent resources or information to gain academic advantage.
- Impersonation: both impersonation of another individual or allowing someone to impersonate you.
- Falsification or Modification of an Academic Record: including tests, transcripts, letters of permission, etc.
- Aiding and Abetting Academic Misconduct.

**Penalties for Academic Misconduct:**

Penalties for academic misconduct include, but are not limited to:

- Written warning
- Lower or failing grade on an assignment or test
- Lower or failing grade in a course
- Denial of admission or readmission to the University
- Forfeiture of University awards or financial assistance
- Suspension from the University for a specified period of time
- Withholding or rescinding a U or W degree, certificate or diploma
- Expulsion from the University

**Procedures for Academic Misconduct:**

All allegations of academic misconduct must be reported initiating a process which involves several steps. These include procedures involving the instructor of the course in which the misconduct is alleged to have occurred, the Departmental Review Committee, and the Senate Academic Misconduct Committee. Students facing a charge of academic or non-academic misconduct may choose to contact the UWSA Student Advocacy Centre where Student advocates will be available to answer any questions about the process, help with building a case and ensuring students have access to representation. For more information or to schedule an appointment, visit <https://theuwsa.ca/academic-advocacy/> or call 204-786-9780.

**Academic Misconduct Policy and Procedures:**

<https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>

**Non-Academic Misconduct Policy and Procedures:**

<https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>

**Misuse of Filesharing Sites:**

Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves “aiding and abetting” plagiarism. Students who do this can be charged with Academic Misconduct.

**Avoiding Copyright Violation:**

Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, videos, and presentation slides. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of [copyright law and University policy](#). Students must also seek prior permission of the instructor /presenter before photographing or recording slides, presentations, lectures, and notes on the board.

**RESEARCH ETHICS:**

Students conducting research interviews, focus groups, surveys, or any other method of collecting data from any person, including a family member, must obtain research ethics approval before commencing data collection. Exceptions are research activities done in class as a learning exercise. For submission requirements and deadlines, see <http://www.uwinnipeg.ca/research/human-ethics.html>

**ACCESIBILITY SERVICES:**

Students with documented disabilities, temporary or chronic conditions requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., access to volunteer note-takers), are encouraged to contact Accessibility Services (AS) at 204-786-9771, or [accessibilityservices@uwinnipeg.ca](mailto:accessibilityservices@uwinnipeg.ca) to discuss appropriate options. All information about a student's disability or medical condition remains confidential.

**INDIGENOUS STUDENT SERVICES:**

Indigenous students seeking additional supports, academic or other, are encouraged to contact the Aboriginal Student Services Centre (ASSC). The ASSC offers a variety of support services, and was created to maintain a safe, educational and culturally sensitive environment for all Aboriginal students (First Nation, Metis and Inuit) as they pursue their academic studies at The University of Winnipeg. More information can be found at: <http://www.uwinnipeg.ca/assc/>.

**SCENT-FREE ENVIRONMENT:**

The University of Winnipeg promotes a scent-free environment. Please be respectful of the needs of fellow classmates and the instructors by avoiding the use of scented products while attending lectures and labs. Exposure to perfumes and other scented products (such as lotion) can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities.

**ACADEMIC ACCOMODATION FOR RELIGIOUS REASONS:**

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide an opportunity for students to make up work or examinations without penalty. A list of religious holidays can be found at <http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf>

**STUDENT WELLNESS:**

The University of Winnipeg provides comprehensive general and specialized counselling and health services to all students for free at the Wellness Centre, located on the first floor of the Duckworth Centre (1D25). For more information see <https://www.uwinnipeg.ca/student-wellness/>

**UW SAFE:**

In the event of an emergency, please dial police at 911 or campus security at 204-786-6666 for help. Everyone is urged to download [UW Safe, our new campus safety app](#) for mobile devices (through the [Apple](#) or [Google Play app store](#)). It has emergency contact

numbers ready to go with one click. It also contains a “friend walk” option that allows you to be visible in real time as you walk to a destination. SafeRide and SafeWalk programs are also available to everyone on campus including evening hours. The University of Winnipeg has, in addition to the Respectful Working Environment Policy described below, policies and practices related to sexual violence. These are accessible here: <https://www.uwinnipeg.ca/respect/sexual-violence/index.html>. If you have experienced sexual violence, here are some important support telephone numbers:

- University Sexual Violence Response Line: 204-230-6660
- Klinik Sexual Assault Crisis Program 204-786-8631 or 204-784-4049 (also available after business hours)
- At Health Science Centre: 204-HSC 787-2071, ask for the sexual assault Nurse examiner (also available after business hours)

### **RESPECTFUL WORKING ENVIRONMENT:**

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at [www.uwinnipeg.ca/respect](http://www.uwinnipeg.ca/respect)

### **PRIVACY:**

Students should be reminded of their rights in relation to the collecting of personal data by the University (<https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html>), especially if Zoom is being used for remote teaching (<https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html>) and testing/proctoring (<https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html>).

### **CLASS CANCELLATIONS:**

When it is necessary to cancel a class due to exceptional circumstances, I will make every effort to inform students via UWinnipeg email (and/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.

### **CHANGE TO FORMAT OF COURSE?**

One final note: Although unlikely, it is possible that health and safety concerns related to COVID-19 may necessitate the course going online (Zoom). Should this happen, every effort will be made to minimize the disruption to the content and quality of the course and to accommodate the needs of the students.