University of Manitoba
Faculty of Environment, Earth and Resources
Department of Environment and Geography

COURSE DETAILS

Course Title & Number:	**GEOG 7010 Global Climate Change**
Number of Credit Hours:	**3**
Class Times & Days of Week:	**M/W/F 1030-1120**
Location for Classes:	**243 Wallace**
Pre-Requisites:	A grade of C or better in GEOG 3390 (or GEOG 3610 or 053.361), or permission of department head.

Instructor Contact Information

Instructor(s) Name:	**Dr. Ronald Stewart**
Office Location:	470 Wallace
Office Hours or Availability:	Make an appointment via in person during class or email during regular daytime hours (8am – 4pm)
Office Phone No.	204-480-1052
Email:	Ronald.stewart@umanitoba.ca All emails will be replied to within 48 hours
Contact:	Feel free to set up an after-class meeting in person in class or via email during regular daytime hours (8 am – 4 pm)

General Course Information & Goals

This course is concerned with the basics of climate and its change, particularly through anthropogenic factors. It will cover the physical factors associated with climate and will examine individual components including forcing mechanisms and feedbacks. It will examine anthropogenic factors and whether these do or do not significantly affect the climate system. It will also consider how climate projections are made, what is currently anticipated, and what are

some of the current scientific uncertainties. As well, it will explore suggestions for countering global warming through geo-engineering.

Reference to current literature will be made as appropriate. Familiarity with basic mathematical/physical concepts is assumed.

This course is important (but not necessarily required) for careers in many areas associated with the changing climate. Many sectors of society are very concerned with climate change and this course offers the opportunity to gain a solid background on this issue that can be applied to other topics or serve as a stepping stone towards more focused study of climate issues.

Using Copyrighted Material

Please respect copyright. We will use some copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at http://umanitoba.ca/copyright/ or contact um_copyright@umanitoba.ca.

Recording Class Lectures

The instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of the instructors. Course materials (both paper and digital) are for the participant's private study and research.

Textbook, Readings, Materials

There is **no required textbook**. There are a number of references that will be used. Two of these will be the following but current literature will also be used. These are available on-line.

IPCC 2007 Working Group I Report (Physical Science Basis).
IPCC 2014 Working Group I Report (Physical Science Basis)
IPCC 2021 Working Group I Report (Physical Science Basis)

Tools:

All students should ensure they have non-programmable scientific calculators.

Course Lectures/Materials:

All lecture PowerPoints and other digital content will be provided to students via UM Learn System. Be sure to familiarize yourself with the UM Learn System.

Course Technology

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by the instructor and/or the University of Manitoba Disability Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline "gaming" during scheduled class time. If the student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (©S Kondrashov. Used with permission)

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy (http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Expectations: Instructors Expect You To

The instructor will be in class for 5-10 minutes prior to and after the class time. We will treat you with respect and would appreciate the same courtesy in return. See Respectful Work and Learning Environment Policy.

Academic Integrity:

Please see the PDF file called "Schedule-A-ROASS.pdf" in the UM Learn course folder that contained Schedule "A" (Policies and Resources) that outlines academic integrity policies and student resources. Students should acquaint themselves with the University's policy on cheating and examination impersonation (see Section 7.0 of the University of Manitoba General Calendar). **Plagiarism and cheating in general, is a serious academic offence.**

All work/assignments submitted by each student are to be completed independently unless otherwise specified.

Students Accessibility Services

Student Accessibility Services
If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.
Student Accessibility Services http://umanitoba.ca/student/saa/accessibility/
520 University Centre
204 474 7423
Student_accessibility@umanitoba.ca

Expectations: You Can Expect Instructors To

We value each student's viewpoint and input to each class. Therefore, we encourage students to interact with us in class by asking questions and answering questions posed by the instructor and other students in the class. We expect students to respond the best they can, however, we do not expect perfection!

Class Schedule

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – ROASS-Procedure).

Date(s)	Class Content	Required Readings or Pre-class Preparation	Evaluation
Sept 6-11	Introduction and fundamentals	Material on UM Learn	
Approx. Sept 13-20	Basics of climate science	Material on UM Learn	
Approx.	Climate forcing focusing on anthropogenic factors	Material on UM Learn	

Sept 22-Oct 6			
Sept 27	First test	Expect marks back within 1 week	15% of final grade
Oct 16, 18 and/or 20	First student presentations	Expect marks back within 1 week	27.5% of final grade
Approx. Oct 13-Nov 10	Climate modelling	Material on UM Learn	
Nov 6	Second test	Expect marks back within 1 week	15% of final grade
Approx. Nov 20-Dec 1	Climate projections and uncertainties	Material on UM Learn	
Nov 24, 27 and/or 29	Second student presentations	Expect marks back within 1 week	27.5% of final grade
Approx. Dec 4-6	Geo-engineering	Material on UM Learn	
Dec 8	Third test		15% of final grade

Course Evaluation Methods

Evaluations will use a combination of presentations and tests. **No final exam is used.**

Refer to the Presentation Description on the following page of the syllabus for details of what is expected for the presentations.

Date:	Assessment Tool	Value of Final Grade
Sept 27	First test (expect marks back within 1 week)	15% of final grade
Oct 16, 18 and/or 20	First student presentations (expect marks back within 1 week)	27.5% of final grade
Nov 6	Second test (expect marks back within 1 week)	15% of final grade
Nov 24, 27 and/or 29	Second student presentations (expect marks back within 1 week)	27.5% of final grade
Dec 8	Third test	15% of final grade

Grading

It will be important to attend the lectures and interact with the instructors and other students. Students will not be permitted to write make-up tests or hand in late assignments except for documented medical or compassionate reasons. A grade of zero will be recorded for missed assignments, tests and presentations. Late assignments will be penalized 25% per day (including weekends and holidays). Students may have access to their marks prior to the voluntary withdrawal date (November 21, 2023) and are encouraged to talk with instructors before a decision to withdraw is made.

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	90-100	4.25-4.5	4.5
A	80-89	3.75-4.24	4.0
B+	75-79	3.25-3.74	3.5
B	70-74	2.75-3.24	3.0
C+	65-69	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

Assignment/Presentation/Test Descriptions

There will be two reports/presentations (each with a written abstract) and three in-class tests that students will have to complete. There will be no Final Exam in the Examination Period. The report/presentation topics will be shown in class and the specific ones for each student will be agreed to with the instructor. Actual requirements are provided below and reports should be on the same topics as the presentations.

Written Paper Guidelines:
You will collect and read research papers (e.g., journal articles) on a subject below selected by yourself, and write a review on the subject in as much detail as you can. Guidelines follow below:

- The paper should be approximately 5-7 pages of text long with 1.5 line spacing and using 4-6 references. <u>These requirements may be changed later</u>.

- There needs to be a short (200 word) abstract. According to the American Geophysical Union: A good abstract sets the general question or topic that you are studying for the general reader, provides background on the specific question or problem, briefly describes key data or analyses, and describes the key results and uncertainties. Please avoid acronyms or if used, define them.
- Figures/Tables should be embedded within the text, close to where they are cited within the text (i.e. on the same page or immediately after the page in which they are discussed/cited in the text).
- All figures/tables should be numbered in sequential order and ***should be explicitly referred to in your paper***!
- You are encouraged to include your own critical views of the subject in your paper/review.
- The paper should include an introduction (why the topic is important scientifically and to people and society) followed by the main body of the paper (the main body should be well organized and include sub-sections where appropriate).
- All references should be at the end of the report in alphabetical order according to the lead author name.
- You should use RECENT publications for your project! 1-2 older references (prior to 2005) are fine to cite older work, but make sure you use the most up-to-date research articles possible for the primary discussion. Failure to do so will impact your mark.

The paper/review should demonstrate a good understanding on your part of the chosen subject. **The paper will be graded on overall organization, abstract quality, clarity, understanding of the subject, grammar, completeness, neatness and the use of up-to-date references.**

The following aspects should be considered when writing your paper (We encourage you to have others proofread your report):

- Is the material well organized and is the flow logical?
- Does the introduction clearly state the purpose and/or motivation of the paper/review?
- Is the paper and presentation clear and easily understandable?
- Write and organize it in such a way that other students can learn from your paper.
- Are figures appropriate and effective in supporting the text in the paper?
- Do the figures have adequate captions and are they clearly discussed and referred to in your paper?

The following aspects should be considered when preparing/delivering your presentation:

- The talk should not be longer than 8 minutes and be based on the report. Be sure to practise it beforehand! Note that the duration of talks may be changed later.
- Title page should reflect the main focus topic of the presentation.
- 1-2 slides should be used for an Introduction to your topic – including why the topic is important to society. The Introduction should also include relevant background to the topic.
- The introduction should also clearly state the purpose and/or motivation of the paper(s) you used for your talk.

- Organize your talk so the flow is logical.
- Discuss the topic in such a way so that other students can learn from your presentation – i.e. be sure to take more time when discussing more detailed or complex ideas.
- Are figures appropriate and effective in supporting your discussions?
- Figures should have citations - from where it was used.
- Speak clearly and loud enough when delivering your talk.
- Be sure to include a slide giving conclusions
- Include a slide with your own thoughts on this issue
- Last slide should include all references.

You will be graded according to the points above, as well as, **overall organization, clarity, understanding of the subject, and using up-to-date more recent references.**

Some common journals in the library system (online or hardcopy) include:

American Meteorological Society (many journals)
Atmosphere-Ocean (Canadian Meteorological and Oceanographic Society)
Electronic Journal of Severe Storms Meteorology (EJSSM)
Atmospheric Research
Quarterly Journal of the Royal Meteorological Society (QJRMS)
Tellus
Journal of Geophysical Research - atmospheres
Earth Interactions
Boundary Layer Meteorology
Agricultural and Forest Meteorology
Arctic

Books (do not use books older than 2004)

Assignment Grading Times

See the Class Schedule Tables.

Assignment Extension and Late Submission Policy

Students will not be permitted to write make-up tests or hand in late assignments except for documented medical or compassionate reasons. A grade of zero will be recorded for missed assignments, tests and quizzes. Late assignments will be penalized 10% per day (including weekends and holidays). Students may have access to their marks prior to the voluntary withdrawal date (November 21, 2023) and are encouraged to talk with the instructor before a decision to withdraw is made.

Schedule "A"

Section (a): A list of academic supports available to Students, such as the Academic Learning Centre, Libraries, and other supports as may be appropriate:

Writing and Learning Support

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more

information, please visit the Academic Learning Centre website at: http://umanitoba.ca/student/academiclearning/

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 201 Tier Building.

University of Manitoba Libraries (UML)

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by subject: http://bit.ly/WcEbA1 or name: http://bit.ly/1tJ0bB4. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: http://bit.ly/1sXe6RA. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage:www.umanitoba.ca/libraries.

Section (b): A statement regarding mental health that includes referral information:

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* http://umanitoba.ca/student/counselling/index.html

474 University Centre or S207 Medical Services

(204) 474-8592

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

Student Support Intake Assistant

http://umanitoba.ca/student/case-manager/index.html

520 University Centre

(204) 474-7423

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service http://umanitoba.ca/student/health/

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are interested in information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator

http://umanitoba.ca/student/health-wellness/welcome.html

Katie.Kutryk@umanitoba.ca

469 University Centre

(204) 295-9032

Live Well @ UofM

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

http://umanitoba.ca/student/livewell/index.html

Section (c): A notice with respect to copyright:

All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community.

Visit http://umanitoba.ca/copyright for more information.

Section (d): A statement directing the student to University and Unit policies, procedures, and supplemental information available on-line:

Your rights and responsibilities

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The Academic Calendar http://umanitoba.ca/student/records/academiccalendar.html is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form http://umanitoba.ca/registrar/

- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support http://umanitoba.ca/academicintegrity/ View the **Student Academic Misconduct** procedure for more information.

- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected conduct yourself in an appropriate respectful manner. Policies governing behavior

include the:

Respectful Work and Learning Environment

http://umanitoba.ca/admin/governance/governing_documents/community/230.html

Student Discipline

http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html and,

Violent or Threatening Behaviour

http://umanitoba.ca/admin/governance/governing_documents/community/669.html

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html More information and resources can be found by reviewing the Sexual Assault site http://umanitoba.ca/student/sexual-assault/

- For information about rights and responsibilities regarding **Intellectual Property** view the policy http://umanitoba.ca/admin/governance/media/Intellectual_Property_Policy_-_2013_10_01.pdf

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site http://umanitoba.ca/faculties/

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations http://umanitoba.ca/academic-advisors/

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

http://umanitoba.ca/student/advocacy/

520 University Centre

204 474 7423

student_advocacy@umanitoba.ca