



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

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COURSE DETAILS

Course Title & Number:	GEOG 4390 Global Climate Change
Number of Credit Hours:	3
Class Times & Days of Week:	T/Th 1430 – 1545
Location for Classes:	Duff Roblin N302
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)

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 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 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](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](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 instructors 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 is 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 instructors 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
Jan 19-26	Introduction and fundamentals	Material on UM Learn	
Approx. Jan 26-Feb 7	Basics of climate science	Material on UM Learn	
Feb 9	First test	Expect marks back within 1 week	20% of final grade
Approx. Feb 14-March 9	Climate forcing focusing on anthropogenic factors	Material on UM Learn	
Feb 16	First student presentations	Expect marks back	20% of final grade

		within 1 week	
Approx. Feb 28- March 21	Climate modelling	Material on UM Learn	
March 23	Second test	Expect marks back within 1 week	20% of final grade
Approx. March 28 – April 11	Climate projections and uncertainties	Material on UM Learn	
April 6	Second student presentations	Expect marks back within 1 week	20% of final grade
Approx. April 13- 18	Geo-engineering	Material on UM Learn	
April 20	Third test		20% of final grade

Course Evaluation Methods

We will be using a combination of assignments, a presentation and a final test for evaluation purposes. **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
Feb 9	First test (expect marks back within 1 week)	20% of final grade
Feb 16	First student presentations (expect marks back within 1 week)	20% of final grade
March 23	Second test (expect marks back within 1 week)	20% of final grade
April 6	Second student presentations (expect marks back within 1 week)	20% of final grade
April 20	Third test	20% 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 10% per day (including weekends and holidays). Students may have access to their marks prior to the voluntary withdrawal date (March 31, 2017) 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 assignments, two presentations and two in-class tests that students will have to complete for the course (one assignment, one presentation and one test per instructor). No Final Exam will be done. The assignment questions and details will be provided in each assignment but will focus on the topics covered in class. The final tests will cover class material as well as major points within student presentations – questions will involve short-answer type questions. Details of the presentation requirements are provided below.

You may select a topic from the list below to be the focus of your presentation. Other topics may be acceptable, however, be sure to verify this with the instructor first.

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

- The talk should not be longer than 15 minutes. Be sure to practise it beforehand!
- Title page should reflect the main focus topic of the presentation.
- 1-2 slides should be used for an Introduction to your topic – this includes “motherhood stuff” such as why the topic is important to society. The Intro 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
- 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 18, 2016) and are encouraged to talk with instructors before a decision to withdraw is made.