

University of Guelph - Department of Geography, Environment and Geomatics
PROVISIONAL Course Description – Winter 2027

GEOG * 2110 – CLIMATE & THE BIOPHYSICAL ENVIRONMENT (0.5 Credits)

Instructor: Ze'ev Gedalof (zgedalof@uoguelph.ca)

Class Meetings: M/W/F 4:30 PM - 5:20 PM, ROZH 103

Office Hours: MWF 1:30-2:30, Hutt 356

Graduate Teaching Assistants: TBA

GTA Office / Office Hours: TBA

STATEMENT ON ELECTRONIC AIDS

You are responsible for all content submitted for evaluation. Remember that Generative AIs, such as ChatGPT, use existing information. This means that their use may result in misappropriation of others' work as your own should you use it and submit it. This is academic misconduct (see Section VIII in the calendar). If you have used Generative AI you must identify how and appropriately cite it as you should any third party. Be warned that generative AIs can be confidently wrong. Also, I ran a few of my third year assignments through ChatGPT and it got a solid C+, but was also flagged for plagiarism by the University system. Secondly, there are versions of old assignments that are similar to this year's that have been uploaded to various cheater websites. If you use them you will get caught (I salt the data) and you will face the maximum consequences I can muster. Do not do it!

PREREQUISITE

GEOG*1300 or GEOG*1350

REQUIRED TEXT

Ruddiman, W. (2013). *Earth's Climate: Past and Future*. 3rd Edition. Freeman.

Per the ministry of waste-professors'-time directive: This textbook costs \$70 from the publisher. It is honestly the best textbook I have ever used, plus I really like Bill. You will need it to complete the lab assignments, and to cover any classes you miss.

Earlier editions are acceptable, and may be available at greatly reduced prices - but page, figure and chapter numbers are slightly different.

There is also an eBook available from the publisher for a discounted price; [see here for details](#). I will put one copy on reserve at the library (two if I can find another). This is one of the text books I kept from my own studies (it was the first edition, and still very relevant!)

OVERVIEW

This course is the second in a sequence of four related courses in Physical Geography. The first course (GEOG*1300/1350) laid the foundations with an introduction to the processes and resulting patterns in the physical environment. This course (GEOG*2110) will examine the history of the Earth's climate, the important patterns of climatic variability, the role that people have played in modulating the Earth's climate, and the challenges and opportunities that ongoing climatic change will pose. The remaining courses in the sequence include GEOG*3110, *Biogeography*, which provides a detailed overview of biogeography – the study of the distribution of plants and animals across the Earth's surface, and

GEOG*4110, *Environmental Systems Analysis*, – which synthesizes ideas from biogeography, hydrology, geomorphology, and climatology.

OBJECTIVES

- To learn and critically evaluate the basic principles and tools of paleoclimatology.
- To develop literacy in climatological concepts as they apply to current environmental issues.
- To learn basic quantitative techniques for the analysis of climatic data.

APPROACH

Each topic will be covered through a combination of readings, lectures, discussions, in-class exercises, and laboratory assignments.

EXPECTATIONS

Because class discussions and written assignments will be based on the assigned readings, students are encouraged to have done the appropriate readings prior to the start of each topic. Discussions may involve students being called on to read prepared answers to questions on the readings. All assignments and exam questions will be based on text readings, lectures, labs, and class discussions.

I do not make my PowerPoint files available on CourseLink. There are many reasons for this, but it boils down to two main considerations: You learn more if I don't provide them; and much of the material I present is copyrighted and I am not allowed to distribute it outside of the classroom.

POLICY ON ELECTRONIC DEVICES

The use of digital devices (phones, tablets, laptops, etc.) for any purpose other than note-taking is not permitted during class time unless you are sitting where no other students can see your screen. This is because the science shows that you distract the people around you more than you distract yourself and that's just not fair to them. [See here for details.](#)

COURSE EVALUATION

| | |
|--------------------------|-----|
| In-class tests (2) | 30% |
| Laboratory Exercises (7) | 35% |
| Final Exam | 35% |

LABORATORY SESSIONS

Attendance at your scheduled laboratory session is expected. All assignments must be submitted as **pdf files** via CourseLink *by midnight the day before* the next scheduled laboratory session in which you are registered (usually one week following when it was assigned). Also, the TAs have been instructed *not* to reteach material that they covered in the lab during their office hours – though they and I are available to clarify details that you may have missed. All labs are held in Hutt 240B.

Late assignments will be penalized at a rate of 10% of the value of the lab per day. Extensions must be requested in advance, and will be evaluated by the TAs (your first line of inquiry!) or myself on a case-by-case basis. Additional detailed information on assignments, midterms, final exam is available in the Undergraduate Calendar

MIDTERMS AND FINAL EXAM

There are in-class quizzes on Feb 10th and March 17th. There is a final exam on **TBD**. The final exam is cumulative, but will emphasize material after Test #2.

COMMUNICATION

This course uses CourseLink as the primary tool for communication and distribution of course material.

Following university regulations, all email correspondence will be sent to your University of Guelph email address. I normally respond to student inquiries during my office hours. I do not normally reply to messages from off-campus email addresses (indeed, the University forbids it). Only messages and postings that are appropriately professional will be responded to. For example, I do not normally answer to emails that begin “Hey,” or that include texting lingo. I’m too old for that.

PROVISIONAL COURSE SCHEDULE

Dates for labs, tests, and exams are firm. Otherwise, the following schedule should be assumed to be provisional depending on how long it takes to get through the course material. This is a rapidly changing field, despite the fact that most of the course is looking at climate of thousands to millions of years ago. Also the University has flip-flopped on whether it is a TTh or a MWF offering.

| Date | Week# | Topic | Text Ch. | Lab |
|-----------|-------|------------------------------|------------|---------------------------------|
| 11-Jan-27 | 1 | Course Intro, Overview | None | None |
| 13-Jan-27 | | Climate Science | Ch. 1 | |
| 15-Jan-27 | | Earth's Climate System Today | Ch. 2 | |
| 18-Jan-27 | 2 | Sources of Climate Data | 3.1-3.4 | 1. Measuring Climate |
| 20-Jan-27 | | Climate Models | 3.5-3.7 | |
| 22-Jan-27 | | CO2 and climate | Ch. 4 | |
| 25-Jan-27 | 3 | Plate Tectonics | Ch. 5 | 2. The Carbon Cycle |
| 27-Jan-27 | | Greenhouse Climate | Ch. 6 | |
| 29-Jan-27 | | Greenhouse to Icehouse | 7.1-7.3 | |
| 1-Feb-27 | 4 | Hypotheses and Evidence | 7.4-7.6 | None |
| 3-Feb-27 | | Earth's Orbital Properties | 8.1-8.5 | |
| 5-Feb-27 | | Orbital-Scale Climate | 8.6-8.10 | |
| 8-Feb-27 | 5 | Monsoons and Insolation | 9.1-9.4 | 3. Orbital Climatic Variability |
| 10-Feb-27 | | Quiz #1 | 9.5-9.7 | |
| 12-Feb-27 | | Hypotheses and Evidence | 10.1-10.4 | |
| 15-Feb-27 | 6 | Insolation & Ice Sheets | 10.5-10.8 | None |
| 17-Feb-27 | | Ice Cores | Ch. 11 | |
| 19-Feb-27 | | Changes in CO2 & CH4 | 12.1-12.5 | |
| 22-Feb-27 | 7 | Reading Week | | |
| 24-Feb-27 | | Reading Week | | |
| 26-Feb-27 | | Reading Week | | |
| 1-Mar-27 | 8 | Interactions & Feedbacks | 12.6-12.10 | 4. Milankovich Theory |
| 3-Mar-27 | | Unsolved Problems | 13.1-13.6 | |
| 5-Mar-27 | | Last Glacial Maximum | 13.4-13.12 | |
| 8-Mar-27 | 9 | Data-Model Comparisons | 14.1-14.3 | 5. Deglacial Climate |
| 10-Mar-27 | | “Fire and Ice” | | |

| Date | Week# | Topic | Text Ch. | Lab |
|-----------|-------|-------------------------------------|------------|--------------------------|
| 12-Mar-27 | | Deglaciation and 14C | 14.1-14.3 | |
| 15-Mar-27 | 10 | Interactions & Feedbacks | 14.4-14.8 | None |
| 17-Mar-27 | | Quiz #2 | | |
| 19-Mar-27 | | Millennial Oscillations | 15.1-15.5 | |
| 22-Mar-27 | 11 | Causes | 15.6-15.11 | None |
| 24-Mar-27 | | Humans and Preindustrial Climate | Ch. 16 | |
| 26-Mar-27 | | Climate of the last millennium | 17.1-17.4 | |
| 29-Mar-27 | 12 | ENSO, PDO, NAM, EIEIO | * | 6. Preindustrial Climate |
| 31-Mar-27 | | Proposed Causes of Change | 17.5-17.9 | |
| 2-Apr-27 | | Climate Change since 1850 | Ch. 18 | |
| 5-Apr-27 | 13 | Causes of recent warming | Ch. 19 | None |
| 7-Apr-27 | | Future Climatic Change | 20.1-20.6 | |
| 9-Apr-27 | | "Holiday" (aka Good Friday) | | |
| 12-Apr-27 | 14 | Interactions, Feedbacks & Surprises | 20.7-20.11 | None |

Final Exam: Date TBA, Room TBA

* This content is *not* covered in your text. I will probably cover it in more detail and there may be supplemental readings assigned, which will be available through CourseLink.

The Fine Print (This Stuff Matters!):

University of Guelph Policy Statements:

E-mail Communication

As per university regulations, all students are required to check their @uoguelph.ca e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date

The last date to drop one-semester courses, without academic penalty, is the last day of classes. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

Copies of out-of-class assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email accessibility@uoguelph.ca or see the [SAS website](#).

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The [Academic Misconduct Policy](#) is detailed in the *Undergraduate Calendar*.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.