

Microclimatology GEOG 4104A [0.5 credit]

Winter 2024

Seminar: Thurs **12:00*** – 14:25 (*note revised start time)

Instructor: Elyn Humphreys, elyn.humphreys@carleton.ca

Office hours: Please feel free to stop by and knock on the door anytime or email me to make an appointment.

1. Course description:

Most organisms, including us, live within microclimates. Microclimatology describes the physical environment (light, temperature, humidity, wind speed) formed within a shallow layer near the Earth's surface at a range of scales. Unique microclimates can form within a few millimetres of a leaf surface and can occur within extensive surfaces such as forests. Microclimates can change dramatically from one surface to the next and from one moment to the next because of the exchange of energy, water, momentum, and other constituents between the surface and the atmosphere. The interaction between surface physical properties and atmospheric processes is key to successfully understanding ecosystem function at both local and global scales. These principles can be directly applied to a variety of practical applications and topics such as agriculture, forestry, urban planning, and global climate change.

2. Prerequisites: GEOG2013 or permission of the Department; **Preclusions:** none

3. Texts & lecture notes:

1) Required text: Oke, T.R. 1987. *Boundary Layer Climates*, 2nd Edition. Methuen, London, 435 pp. Available for purchase via bookstore or [online through the Carleton University library](#).

2) Lecture slides and supplemental readings will be made available through Brightspace*

*Student or professor materials created for this course (including presentations and posted notes, labs, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

4. Course Schedule:

Lectures may be accompanied by a demonstration or activity, which may be outside. The following schedule may be subject to change.

- Unit 1 *Light and leaves* (Jan 11, 18)
Readings: pg 3-17, 117-118, 130-134, 366-374, 399, 20-23, 84-87, 143-148
- Unit 2 *Hot Soils* (Jan 25, Feb 1)
Readings: pg 33-37, 42-48, 232-236
- Unit 3 *Microclimates of tiny things* (Feb 8, 15)
Readings: pg 6-8, 37-39, 51-54, 120-124, 236-240
- *Prep for midterm test (Feb 15)*
- No classes during Reading Break (Feb 22)
- *In-class test (first half of Feb 29 class)*
- Unit 4 *Wind & eddies* (Feb 29, Mar 7)
Readings: pg 54-59, 138-139, 167-170, 242-245
- Unit 5 *Evaporation* (Mar 7, 14)
Readings: pg 63-71, 120-127, 158-167, 375-391
- Unit 6 *How do you feel?* (Mar 21)
Readings: pg 190-197, 206-226
- Unit 7 *City Heat* (Mar 21, Mar 28)
Readings: pg 272-303

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- *Prep for final test (April 4)*

Tentative assignment due dates: #1 – Jan 25; #2 – Feb 15; #3 – Mar 28

5. Evaluation:

- 30% Take-home assignments (3)
- 10% Quizzes on readings
- 30% In-class test #1 (February 29)
- 30% Final test #2 (during the exam period)

Assignments will be based on the lecture material, activities, and demonstrations in class. Collaboration is encouraged while working through the assignments, but each student must hand in their own individually prepared assignment. See statement on plagiarism below. All assignments are due at the beginning of class on the date specified. Late assignments will be deducted 10% if submitted after class but still on the due date or within the next day. Each additional day will be deducted 10% per day including weekends. No assignments will be accepted for grading once graded assignments have been returned. If you are having difficulty meeting the deadlines, speak to Elyn Humphreys **in advance** of the due date.

At least 6 short open-book quizzes on readings, each worth 2%, will be given throughout the term. The final quiz mark will be calculated using the top 5 quiz results.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

6. Statement on Plagiarism:

Plagiarism will not be tolerated. Students should consult the [Academic Integrity Policy](#).

The University Academic Integrity Policy defines plagiarism as “*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.*” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and
- failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course or even suspension or expulsion from the University.

7. Statement on Student Mental Health

As a University student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you.

[You may include the following list or reference this link (<https://carleton.ca/wellness/>)] :

Emergency Resources (on and off campus): <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

Carleton Resources:

- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>
- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

Off Campus Resources:

- Distress Centre of Ottawa and Region: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

8. Requests for Academic Accommodations

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Academic consideration for medical or other extenuating circumstances: If you require an extension for assignments or the midterm, please contact me in advance of the deadline and include in your request the Self-Declaration for Academic Considerations form (<https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>). Note: final exam deferrals must be arranged through the Registrar's Office (<https://carleton.ca/registrar/deferral>).

Pregnancy and Family-Status Related Accommodation: Please write to me with any requests for academic accommodation during the first few weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details about the accommodation policy, visit the Equity and Inclusive Communities (EIC) website.

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details [click here](#).

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability

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requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, please request your accommodations for this course through the [Ventus Student Portal](#) at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). Requests made within two weeks will be reviewed on a case-by-case basis. For final exams, the deadlines to request accommodations are published in the [University Academic Calendars](#). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation will be provided to students who compete or perform at the national or international level. Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>