

GLACIOLOGY

Geography C241/EPS C242. Spring 2024.

Professor: Kurt Cuffey
kcuffey@berkeley.edu

Class Sessions: Tuesdays 4:10 to 6:30 p.m. or a bit later, in McCone 145.
We will break for 15 minutes in the middle of each session.
We need to start on time, please help by arriving promptly.

We will need to schedule one or two make-up lectures.
No class March 26 (Spring Break).
No class April 9 (I will be traveling)
I leave the country on May 4. Everything must be finished by then.

Office Hours: By appointment, usually via Zoom. Send me an email to schedule.

Text: Cuffey and Paterson (2010). *The Physics of Glaciers, 4th Edition*.
Copies on reserve (?) in Earth Science Library (McCone Hall).

All chapters are uploaded to bcourses/Files. This is for your reading only, you are not permitted to share with people outside the class or post them online (the publisher makes me say that).

All figures are available for everyone online at
<http://www.elsevierdirect.com/companion.jsp?ISBN=9780123694614>

Reference list is online (not in the printed book).
I will upload it to bcourses/Files.

I might assign additional readings from the primary literature, when warranted.

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Description: A graduate-level introduction to glaciology, with emphasis on flow and evolution of glaciers, and emphasis on conceptual foundations.

Goals:

- To understand fundamentals of glacial systems.
- To improve understanding of continuum mechanics applied to geosciences.
- To learn how glaciologists think about problems.

Prerequisites:

1. Comfort with Calculus (multi-variable and vector).
2. Familiarity with basic glacial and other Earth science concepts.

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Topics to be covered, as time permits (Readings in POG4):

1. Introduction (Chapter 1)
2. Deformation of Ice (Chapter 3)
3. Basal Slip (Chapter 7)
4. Flow (Chapter 8). *Warning:* this one is a large amount of reading.
5. Reaction to Environmental Changes (Chapter 11)
6. Mass Balance (Chapter 4)
7. Energy Balance (Chapter 5)
8. Hydrology (Chapter 6)

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Student Requirements:

1. attend all lectures, read all assigned materials
2. two exams (take-home, open-note), a few problem-sets

This being a graduate class, I will adapt requirements to student needs

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Questionnaire for You (email your answers to kcuffey@berkeley.edu):

1. Name:
2. Your level and focus of study (or academic major, if you're an undergrad):
3. Why are you taking this class?
4. What is your prior training in glacier science?