

Glaciology Syllabus Fall 2011

Instructor:	Dr. Ginny Catania
Office Location:	EPS 3.128, gcatania@ig.utexas.edu
Office Hours:	Tuesdays 1-2pm, or by appointment
Class Times/Location:	T & Th: 11-12:30pm EPS 1.102

Textbook: Principles of Glacier Mechanics (Paperback), R.LeB. Hooke, 2nd Ed., 2005
-or- Physics of Ice, W.S.B. Paterson (any edition is fine)

Other Texts: Fundamentals of Glacier Dynamics, C.J. van der Veen (1999)
Mass Balance of the Cryosphere, J.L. Bamber and A.J Payne (2004)

Course Overview: This course addresses the fundamentals of glacier and ice-sheet dynamics and the key surface- and subsurface processes that drive ice to move. Course content includes a brief review of tensor analysis, glacier mass and energy balance, the material properties and rheology of ice, the basic equations of glacier deformation, ice-sheet and -shelf flow, basal processes, glacier hydrology, and unstable modes of flow. This course is intended for any graduate-level student interested in the deformation of natural materials and ice in the environment.

Prerequisites: No prior knowledge of glaciology is assumed, but students should have a reasonable grasp of classical mechanics, vector calculus, linear algebra and differential equations as background.

Course Materials: Dr. Catania will provide the lecture material in the form of pdf files, which will be posted on Blackboard (<http://courses.utexas.edu>). Students are responsible for reading the assigned materials prior to the lecture on each and additional class handouts and downloads (as distributed).

Course Requirements: Active participation in class discussion is an integral part of your learning experience. Students will vote on how they want the course grade structured with two options (one with more homework assignments and another with a mid-term substituting for two homework assignments). There will be no final. Instead, students are required to complete a research paper related to a specific glaciology topic. The research paper will consist of a 10 page paper due on/about **November 22** and an oral presentation to be given near the end of the semester. See the next page for more details. The topic of the paper will be chosen by each student with the approval of the instructor.

Course Evaluation:	Homework	50%
	Final Paper	30%
	Presentation	15%
	Participation	5%

Guidelines for Glaciology Research Paper

This paper is to be structured as a proposal for further research on some topic in glaciology that you find interesting. The grading standard for these papers will be high, and will involve as much the quality of the writing as the scientific content. You may submit one draft prior to the final deadline: the deadline for this first draft is **October 13** and the deadline for the final submission is the week before the last week of classes. I will not correct errors in spelling and basic grammar, although I will flag them for you. You are encouraged to discuss their research topics with me prior to submitting the proposal.

Length: no more than 10 pages, double spaced.

Abstract: about 200 words. The abstract should be a short, clear summary of the main points of the proposal. Read the attached article until you are certain that you have understood it. Then read it once more.

Introduction: about 4 pages. Explain the state of existing understanding in the area you want to work on, focusing on aspects critical to the problem of interest. Be thorough but selective.

Statement of the problem: about 3 pages. State clearly the critical problems(s) that you see in the current state of understanding and explain why they are important. Be specific and compelling; for instance, “we need to understand more about ice dynamics” is much weaker than “subglacial water has a strong influence on ice sheet flow, but how subglacial water organizes with differing basal conditions is poorly understood”.

Research Plan: about 3 pages. Explain what you would do to make progress on the problem you have chosen. Again, be specific, and be sure to explain how each aspect of your plan contributes to the overall goal of the project.

References: these don't count in your page total, but must be included. Use the citation style of the Journal of Glaciology.

Advice: If you don't already have one, beg, borrow, or buy a copy of The Elements of Style (4th Edition), by W. Strunk and E.B. White. Then read it the same way you read the attached article.

Oral Presentation

Short 12 minute presentations will be given at the end of the semester summarizing your research project. Email a PowerPoint or pdf file to Dr. Catania prior to your presentation. The presentation schedule will be determined and announced after the project proposals have been turned in and evaluated.

GEOLOGICAL NOTES

A SCRUTINY OF THE ABSTRACT, II¹

KENNETH K. LANDES²

Ann Arbor, Michigan

ABSTRACT

A partial biography of the writer is given. The inadequate abstract is discussed. What should be covered by an abstract is considered. The importance of the abstract is described. Dictionary definitions of "abstract" are quoted. At the conclusion a revised abstract is presented.

For many years I have been annoyed by the inadequate abstract. This became acute while I was serving a term as editor of the *Bulletin* of The American Association of Petroleum Geologists. In addition to returning manuscripts to authors for rewriting of abstracts, I also took 30 minutes in which to lower my ire by writing, "A Scrutiny of the Abstract."¹ This little squib has had a fantastic distribution. If only one of my scientific outpourings would do as well! Now the editorial board of the Association has requested a revision. This is it.

The inadequate abstract is illustrated at the top of the page. The passive voice is positively screaming at the reader! It is an outline, with each item in the outline expanded into a sentence. The reader is told what the paper is about, but not what it contributes. Such abstracts are merely overgrown titles. They are produced by writers who are either (1) beginners, (2) lazy, or (3) have not written the paper yet.

To many writers the preparation of an abstract is an unwanted chore required at the last minute by an editor or insisted upon even before the paper has been written by a deadline-bedeveled program chairman. However, in terms of market reached, the abstract is *the most important part of the paper*. For every individual who reads or

listens to your entire paper, from 10 to 500 will read the abstract.

If you are presenting a paper before a learned society, the abstract alone may appear in a pre-convention issue of the society journal as well as in the convention program; it may also be run by trade journals. The abstract which accompanies a published paper will most certainly reappear in abstract journals in various languages, and perhaps in company internal circulars as well. It is much better to please than to antagonize this great audience. Papers written for oral presentation should be *completed prior to the deadline for the abstract*, so that the abstract can be prepared from the written paper and not from raw ideas gestating in the writer's mind.

My dictionary describes an abstract as "a summary of a statement, document, speech, etc. . . ." and that which *concentrates in itself the essential information* of a paper or article. The definition I prefer has been set in italics. May all writers learn the art (it is not easy) of preparing an abstract containing the *essential information* in their compositions. With this goal in mind, I append an abstract that should be an improvement over the one appearing at the beginning of this discussion.

ABSTRACT

The abstract is of utmost importance, for it is read by 10 to 500 times more people than hear or read the entire article. It should not be a mere recital of the subjects covered. Expressions such as "is discussed" and "is described" should *never* be included! The abstract should be a condensation and concentration of the *essential information* in the paper.

¹ Revised from K. K. Landes' "A Scrutiny of the Abstract," first published in the *Bulletin* in 1951 (*Bulletin*, v. 35, no. 7, p. 1660). Manuscript received, June 3, 1966; accepted, June 10, 1966.

Editor's note: this abstract is published together with The Royal Society's "Guide for Preparation

and Publication of Abstracts" to give *Bulletin* authors two viewpoints on the writing of abstracts.

² Professor of geology and mineralogy, University of Michigan. Past editor of the *Bulletin*.