

First Year Seminar
Barnard College
Spring 2007
FSM BC1256

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Chaos

Course description: A typical dictionary definition of the word chaos is “a state of utter confusion.” However, the earliest examples of chaos depict it as emptiness; while modern mathematicians might define it as “a state of orderly disorder.” In this course, we will study chaos as defined each of these ways. We will see applications of chaos in the social and physical sciences. We will find examples in literature, the arts and modern life. By the end of the semester, however, we will see these definitions and applications not as distinct, but as overlapping and intimately related. In fact, we will come to see that the theme of chaos permeates our very existence.

Class meetings: This class will meet Mondays and Wednesdays from 10:35 to 11:50 am in Room 22 Lehman.

Web page: We will be using the courseworks page (go to <https://courseworks.columbia.edu/>) throughout the semester.

Goal: In my mind, the goal of this class is for you to improve your communication skills. In other words, your reading, listening, speaking and writing skills. All of the assignments will help develop your reading skills. The seminar format, which focuses on discussion as opposed to lecturing, will help tone these reading skills, and is designed to develop better listening and speaking skills. As far as writing, you will keep a weekly journal in which you will summarize and evaluate the readings; and write about whatever else is on your mind. In addition, you will write two papers, for each of which you will hand in a draft and a revision, and each of which will be graded. Lastly, you will combine all of these skills at the end of the semester by writing, presenting, and listening to your peers present, the results of an independent project.

Evaluation: With all this in mind, your grade will be based upon your journal writings (20%), your two papers (each 20%), your project (20%) and class participation (20%). Your grade for class participation will include evaluation of your work in facilitating one class meeting. Details of this will be discussed in class. Late assignments will be penalized 1/3 letter grade per day. Please note that after I submit final course grades, I will not respond to emails regarding them.

Required Reading: See below for specifics. Books are available at the Columbia University Bookstore and the course packet is available at Broadway Copy Center (at 121st; 864-6501).

Other resources: In addition to reading books and articles, we will access web pages throughout the semester. We will also watch a film, have some visitors, and take one field trip.

Honor code: I value Barnard's Honor Code for the integrity it fosters. All exams and assignments in this class are to be completed in accordance with the Barnard Honor Code. The code says, in part:

"We consider it dishonest to ask for, give, or receive help in examinations or quizzes, to use any papers or books not authorized by the instructor in examinations, or to present oral work or written work that is not entirely our own, unless otherwise approved by the instructor. We consider it dishonest to remove without authorization, alter, or deface library and other academic materials."

Schedule of Topics and Readings (see website for weekly updates on specific pages)

((CP): in course packet)

WEEKS 1-3: Introduction

WEEK 1: January 17: Introduction to the course

WEEKS 2-3: January 22, 24, 29: Introduction to Chaos Theory

(CP) Cambel, A.B. *Applied Chaos Theory: A Paradigm for Complexity*. Boston: Harcourt, Brace, Jovanovich. Preface and pages 1-17.

Stewart, Ian. *Does God Play Dice?: The Mathematics of Chaos*. Cambridge: Blackwell, 1989. **Prologue and Chapters 1, 6 and 8.**

(CP) Peak, David and Frame, Michael. *Chaos under Control*. New York: W.H. Freeman and Company, 1994. **Preface, Introduction, Chapters 1 and 10.**

Video with mathematician Bob DeVaney.

Student presentations of web pages

WEEKS 3-8: Chaos in Literature: Creation Stories

WEEKS 3-5: January 31, February 5, 7, 12, 14: *Paradise Lost*

Milton, John. *Paradise Lost and Paradise Regained*. New York: Penguin, 1968. **Paradise Lost.**

(CP) Chambers, A.B. "Chaos in *Paradise Lost*." *Journal of the History of Ideas* 24:1 (Jan.-Mar. 1963): pp. 55-84.

(CP) Adams, Robert M. "A Little Look Into Chaos." *Illustrious Evidence*. Berkeley: University of California Press, 1975., Chapter IV.

(CP) Readings from the Old Testament

Guest participants

WEEKS 6-8: February 19, 21, 28, March 5: *Jurassic Park*, and its similarities to *Paradise Lost*

Note: no class on Feb 26.

Crichton, Michael. *Jurassic Park*. New York: Ballantine Books, 1990.

(CP) Hawkins, Harriet. *Strange Attractors: Literature, Culture and Chaos Theory*. London: Prentice Hall, 1995. Chapter 2: Paradigms Lost: Chaos Theory, Milton's Eden and Jurassic Park.

WEEKS 8-10: Chaos in the Sciences

(Week 9 is Spring Break)

WEEKS 8-10: March 7, 19: The weather and other sciences

(CP) Lorenz, Edward. *The Essence of Chaos*. London: UCL Press Limited, 1993. Chapter 3: Our Chaotic Weather.

Stewart, Chapter 7: The Weather Factory.

(CP) Gleick, James. *Chaos*. New York: Penguin Books, 1987, pages 273-317.

Student presentations of newspaper/magazine articles

WEEK 10: March 21: Economics

(CP) Bass, Thomas. Black Box. *The New Yorker*. (April 26 and May 3, 1999).

Student presentations of newspaper/magazine articles

Trip to the New York Mercantile Exchange.

WEEKS 11-13: Chaos in the arts

WEEK 11: March 26, 28: *Arcadia*

Stoppard, Tom. *Arcadia*. London: Faber and Faber, 1993.

(CP) Gleick, James. "Stoppard: Creating Chaos in Arcadia."

(CP) *Arcadia*: A Glossary

Readings from Web Pages.

WEEKS 12 and 13: April 2, 4, 9, 11: *Pi*

Viewing of the film.

Readings from Web Pages.

Guest participant

WEEKS 14-15: In-class presentations

April 16, 18, 23, 25

See Peak and Frame, **Chapter 10** and the course packet for ideas.

WEEK 16: Re-cap of the semester

April 30

Preliminary Schedule of assignments:

Paper 1	
Date	Assignment
Wednesday, Feb 14	proposal due
Thursday, Feb 15	proposal returned to you
Wednesday, Feb 21	first draft due
Wednesday, Feb 28	first draft returned to you
Monday, Mar 5	final draft due

Paper 2	
Date	Assignment
Monday, April 2	proposal due
Tuesday, April 3	proposal returned to you
Monday, April 9	first draft due
Monday, April 16	suggested revisions returned to you
Monday, April 23	final draft due

Project	
Date	Assignment
Wednesday, April 4	topic decision made
April 16, 18, 23, 25	presentations
Monday, April 30	paper due