

Professor Sharon G. Harrison
Barnard College
Fall 1999
FSM BC1256

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Office Hours: Wednesday 1-3
and by appointment

First Year Seminar: 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 Tuesdays and Thursdays from 10:30 to 11:50 am.

Web Access and Email: It is essential that you have access to the web and email. We will use both throughout the semester. The home page for this course is

<http://econ.barnard.columbia.edu/~sharriso/fysemf99/>

Goal: In my mind, the goal of this class is for you to improve your communication skills. In other words, your listening, speaking and writing skills. The seminar format, which focuses on discussion as opposed to lecturing, 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, each of which you will revise. Lastly, you will combine all three skills at the end of the semester by presenting the results of an independent project. Throughout the semester, you will also develop these skills in part by critically evaluating the writing of your classmates and of the authors we read.

Evaluation: With all this in mind, your grade will be based upon class participation (20%), your journal writings (20%), your two papers (each 20%) and your project (20%). (Your grade for class participation will include your participation in electronic discussions each week. Late assignments will be penalized 1/3 letter grade per day.)

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 watch several videos and access web pages throughout the semester. We will also have one guest lecturer, and take one field trip.

Schedule of Topics and Readings (see web page for weekly updates)
((CP): in course packet)

WEEKS 1-2: September 7-16: Introduction to First-year seminar and to Chaos Theory

Videos with mathematician Bob DeVaney.

Peak, David and Frame, Michael. *Chaos under Control*. New York: W.H. Freeman and Company, 1994. **Preface, Introduction, Chapters 1 and 4.**

Stewart, Ian. *Does God Play Dice?: The Mathematics of Chaos*. Cambridge: Blackwell, 1989. **Chapters 1, 6 and 8. Skip pages 105-108, 114-121, and 145-155.**

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

WEEKS 3-4: September 21-30: Chaos in *Paradise Lost*

Milton, John. *Paradise Lost. Paradise Lost and Paradise Regained*. New York: Penguin, 1968. **Books I-II, IV, IX of 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.

WEEKS 5-6: October 5-14: Chaos in *Jurassic Park*, and the similarities to *Paradise Lost*

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 7-8: October 19-28: Chaos in the sciences

Videos with mathematician Bob DeVaney.

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

Stewart, **Chapter 7: The Weather Factory.**

Readings from Web Pages.

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

Trip to the New York Mercantile Exchange.

WEEKS 9-10: November 4-11 (no class November 2): Chaos in the arts: *Arcadia* and *Pi*

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

Readings from Web Pages.

Viewing of *Pi*.

WEEK 11: November 16, 18: Chaos in *Pi*

Readings from Web Pages.

Guest lecturer.

WEEKS 12-13: November 23-December 2 (no class November 25): In-class presentations

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

WEEK 14: December 7, 9: In-class presentations, Re-cap of the semester

Schedule of assignments:

Paper 1	
Date	Assignment
Thursday, October 7	topic decision made
Tuesday, October 19	first draft due
Tuesday, October 26	suggested revisions returned to you
Thursday, November 4	final draft due

Paper 2	
Date	Assignment
Tuesday, November 9	topic decision made
Tuesday, November 16	first draft due
Thursday, November 18	peer edited draft returned to you
Tuesday, November 30	final draft due

Project	
Date	Assignment
Tuesday, November 16	topic decision made for those presenting in weeks 12-13
Tuesday, November 23	topic decision made for those presenting in week 14
Monday, December 13	paper due