

**Managing Complexity (MIS 382N.5)  
Spring 2007 Syllabus and Course Schedule**

**Unique number:** #03710  
**Meeting time:** MW 8:00 – 9:30 a.m.  
**Meeting location:** GSB 3.138

**Professor:** Reuben R. McDaniel, Jr.  
**Office:** CBA 6.454  
**Office phone:** 512.471.9451  
**Home phone:** 512.345.0006  
**Office fax:** 512.471.0587  
**Email:** reuben.mcdaniel@mcombs.utexas.edu  
**Office Hours:** Tuesdays 9:00 a.m. - 12:00 noon

**TA:** Holly Lanham  
**Office:** CBA 5.334E  
**Email:** [holly.lanham@phd.mcombs.utexas.edu](mailto:holly.lanham@phd.mcombs.utexas.edu)

---

**Description:**

Modern organizations can be understood as complex adaptive systems. This understanding leads us to new insights about managing complexity, particularly the role of information and information systems in this task. The purpose of this course is to explore these new insights. We will discuss salient management implications of complex adaptive system theories with particular attention to the specific prescriptions for information systems that emerge from these theories.

Basic characteristics presented to managers by the fact that organizations are complex adaptive systems include the fundamental unknowability and unpredictability of the world, the importance of nonlinear relationships in defining reality, and the role of self-organization, emergence and co-evolution in organizational dynamics. We will emphasize sense making, learning, improvisation, thinking about the future and designing as substitutes for traditional activities of command, control, prediction and planning when managing complex adaptive systems. Managerial strategies that depend on a fairly detailed knowledge of the present situation as well as the ability to make reasonable forecasts of a future situation are less useful than in the past. Fortunately, complexity science offers some ways of better understanding these uncertain situations.

The course is designed for advanced MBA students, particularly those interested in consulting and/or problem solving roles in complex organizations and for Ph.D. students who are exploring new frameworks for investigation of organizational phenomenon. There are no prerequisites other than graduate standing but this course is not recommended for first year master's degree students.

**Course Expectations:**

The primary source documents are a set of reading that enables us to explore basic concepts of complex adaptive systems theories and their usefulness in understanding organizations. Readings explore key managerial approaches suggested by these theories. Course readings are available from the University Duplicating Service in the GSB Distribution Center. Additional readings may be distributed during the semester.

Each student is required to complete a major paper. The paper may be on any topic of the student's choosing; however, it must demonstrate to the instructor that the student understands the material of the course. In order to receive an A on this assignment, it should include some ideas that extend beyond the material covered in the course. The length of the paper is dependent upon the topic chosen and the student's writing skill. In the past, papers have been about 25-40 pages in length. The paper is due at the beginning of class on **Wednesday, May 2, 2007**. *The major paper will count for 50% of the final grade.*

Each student is required to prepare a written discussion of two articles – one from the first section of the course and one from the second section. These discussions should not be a summary of the article. Rather, they should show how the article relates to other articles assigned for this course and to other scholarly material that the student may be familiar with. You may use information from your previous life experiences to enhance the discussion. The purpose of the discussion is to put the chosen article in a rich framework and to facilitate the understanding of the article. These discussion papers should be no more than 7 pages (doubled spaced) and should be emailed to the class and the instructor **24 hours before** the class day that the chosen article is assigned. Students should use Blackboard to distribute these papers. *Discussion papers will count for 25% of the final grade.*

Student will be assigned two readings from the readings listed in the syllabus - one from the set of ten readings marked "A" and one from the set of ten readings marked "B". In order to facilitate the assignment of readings, each student is asked to submit to the course TA a choice of two "A" papers and two "B" papers that they would like to review. These choices should be submitted by email to [holly.lanham@phd.mcombs.utexas.edu](mailto:holly.lanham@phd.mcombs.utexas.edu) before midnight **Saturday, January 20**. Every effort will be made to accommodate your choices. We plan to distribute the assignments by email Monday, January 22.

Class discussions will be based on the assigned readings and on the issues that the students raise in their written discussion of the readings. Attendance is required and you are expected to read all required readings before the class in which they are to be discussed. If you must miss a class, please be sure to notify the instructor by email before the class that you miss. Remember, when you miss a class, assigned work must be turned in before the class missed and your participation expectations for that day must be made up in subsequent classes. *Class participation will count for 25% of the final grade.*

## Class Schedule and Reading Assignments

*You are required to read 2-4 articles for each class period. The readings should be done before the class assigned. For several of the articles, your classmates will have prepared a discussion paper which you should read before coming to class. Your goal should be to come to class prepared to discuss the topic with the required readings as a starting place for discussion. You are encouraged to use any material that you have access to in preparing for class discussion. There are numerous sources on the Internet for information about complexity theory. The reading packet is intended as a start, not as the end of insights into the topic. Use your imagination and your skills to enhance your sources of knowledge. Share your discoveries with the class so that we can all enjoy the fruits of your labor.*

### **Wednesday, January 17, 2007**

#### Introduction

##### *Readings:*

- Mintzberg, Henry (1996). Ten ideas designed to rile everyone who cares about management. Harvard Business Review, 6, 61-97.
- Robbins, Stever (2006). Thinking outside your beliefs. Working Knowledge, found online at <http://hbswk.hbs.edu/item.jhtml?id=5309&t=srobbins>. April 24, 2006.

### **Monday, January 22, 2007**

#### The Science of Complexity

*Presentation by Dr. Linda Reichl, Professor of Physics and Director of The Center for Complex Quantum Systems, The University of Texas at Austin.*

##### *Readings:*

- A. Reichl, Linda E. (2005). Fundamental “uncertainty” in science. In Reuben R. McDaniel, Jr. & Dean J. Driebe (Eds.). Uncertainty and Surprise in Complex Systems (pp. 71-76). Springer-Verlag, Berlin.
- Lighthill, Sir James, F.R.S. (1986). The recently recognized failure of predictability in Newtonian dynamics. Proceedings of the Royal Society of London, A 407, 35-50.

### **Wednesday, January 24, 2007**

#### Overview of Complex Adaptive Systems

##### *Readings:*

- A. McDaniel, Reuben R., Jr., Jordan, Michelle E., & Fleeman, Bridgette F. (2003). Surprise, surprise, surprise! A complexity science view of the unexpected. Health Care Management Review, 28(3), 266-278.
- Arthur, W. Brian (1999). Complexity and the economy. Science, April '99, Vol. 284, 107-109.

### **Monday, January 29, 2007**

#### Complex Adaptive Systems (Uncertainty and Surprise)

##### *Readings:*

- A. Allen, Peter M., Strathern, Mark, & Baldwin, James S. (2005). The evolutionary complexity of social economic systems: the inevitability of uncertainty and surprise. In Reuben R. McDaniel, Jr. & Dean J. Driebe (Eds.). Uncertainty and Surprise in Complex Systems (pp. 31-50). Springer-Verlag, Berlin.
- Chu, D., Strand, R., & Fjelland, R. (2003). Theories of complexity: Common denominators of complex systems. Complexity, 8(3), 19-30.

### **Wednesday, January 31, 2007**

#### Complex Adaptive Systems (Diversity)

##### *Readings:*

- A. McDaniel, Reuben R., & Walls, Michelle E. (1997). Diversity as a management strategy for organizations: A view through the lenses of chaos and quantum theories. Journal of Management Inquiry, 6(4), 371-383.
- Dahlin, K.B., Weingart, L.R., & Hinds, P.J. (2006). Team diversity and information use. Academy of Management Journal, 48(6), 1101-1123.
  - Buchanan, Mark (2002). Small worlds. In Nexus (pp. 48-60). W.W. Norton & Company, Inc. New York, New York. Wednesday, January 24, 2007

### **Monday, February 5, 2007**

#### Complex Adaptive Systems (Self-organization)

##### *Readings:*

- A. Kauffman, Stuart (1995). The origins of life. At Home in the Universe: The Search for the Laws of Self organization and Complexity. Oxford University Press, Oxford, 31-45.
- Stanley, H.E., Amaral, L.A.N., Buldyrev, S.V., Goprikrishnam, P., Plerous, V., & Salinger, M.A. (2002). Self-organized complexity in economics and finance. Proceedings of the National Academy of Science. USA 99, 2561- 2565.

### **Wednesday, February 7, 2007**

#### Complex Adaptive Systems (Landscapes)

##### *Readings:*

- A. Rivkin, J. W., & Siggelkow, N. (2002). Organizational sticking points on NK landscapes. Complexity, 7 (5), 31-43.
- Beinhocker, Eric D. (1999). Robust adaptive strategies. Sloan Management Review, 3, 95-106.

### **Monday, February 12, 2007**

#### Complex Adaptive Systems (Co-evolution)

##### *Readings:*

- A. Levinthal, Daniel A., & Warglien, Massimo (1999). Landscape design: Designing for local action in complex worlds. Organization Science, 10(3), 342-357.
- Pascale, Richard T. (1999). Surfing the edge of chaos. Sloan Management Review, 3, 83-94.
  - Elena, Santiago F., & Sanjuan, Rafael (2003). Climb every mountain? Science, 302, 2074-2075.

### **Wednesday, February 14, 2007**

#### Complex Adaptive Systems (Emergence)

*Readings:*

- A. Bettis, Richard A., & Prahalad, C.K. (1995). The dominant logic: Retrospective and extension. Strategic Management Journal, 16, 5-14.
- Jen, Erica (2003). Stable or robust? What's the difference? Complexity, 3, 12-18.

### **Monday, February 19, 2007**

#### Complex Adaptive Systems (Boundaries)

*Readings:*

- A. Cilliers, P. (2001). Boundaries, hierarchies and networks in complex systems. International Journal of Innovation Management, 5(2), 135-147.
- Nicholls-Nixon, Charlene L. (2005). Rapid growth and high performance: The entrepreneur's "impossible dream?" Academy of Management Executive, 19, 1, 77-89.

### **Wednesday, February 21, 2007**

#### A Model of Complex Adaptive Systems

Wynton Marsalis Video

*Readings:*

- A. Ritter, Thomas, Wilkinson, Ian F., & Johnston, Wesley J. (2004). Managing in complex business networks. Industrial Marketing Management, article in press, pp. 1-9.
- Bedau, Mark A. (2003). Artificial life: Organization, adaptation, and complexity from the bottom up. Science Direct: Trends in Cognitive Sciences, 7(11), 505-512.
  - Meyer, Christopher, & Davis, Stan (2003). Economic evolution: Learning from life cycles & Code is code. It's Alive. Crown Business, New York, NY, 3-43.

### **Monday, February 26, 2007**

Sensemaking

Firestorm Video

*Readings:*

- B. Weick, Karl E. (1993). The collapse of sense making in organizations: The Mann Gulch Disaster. Administrative Science Quarterly, 12(38), 628-652.
- Dutton, Jane E. (1997). Strategic agenda building in organizations. Zur Shapira (Ed.). Organizational Decision Making: Chapter 5. (PR. 81-107). New York, NY: Cambridge University Press.

### **Wednesday, February 28, 2007**

Sensemaking

*Readings:*

- B. Weick, Karl E., & Roberts, Karlene H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. Administrative Science Quarterly, 9(38), 357-381.
- Weick, Karl E., Sutcliffe, Kathleen M., & Obstfield, David (1999). Organizing for high reliability: Processes of collective mindfulness. Research in Organizational Behavior, 21, 81-123.
  - Weick, Karl E. (1985). Cosmos vs. chaos: Sense and nonsense in electronic contexts. Organizational Dynamics, 14(2), 51-64.

### **Monday, March 5, 2007 \***

Review of Complex Adaptive Systems

*Reading:*

- McDaniel, Reuben R., Jr., & Driebe, Dean J. (2001). Complexity science and health care management. Advances in Health Care Management, 2, 11-36.

**Wednesday, March 7, 2007 \***

\*\*\*No Class\*\*\*

\*\*\*\*\*

**March 12-15: Spring Break**

\*\*\*\*\*

**Monday, March 19, 2007**

Learning

*Readings:*

- B. March, James G., Sproull, Less S., & Tasmuz, Michal (1991). Learning from samples of one or fewer. Organization Science, 2(1), 1-13.
- Liebeskind, Julia Porter, Lumerman, A., Oliver, Lynne Zucker, & Brewer, Marilyn (1996). Social networks, learning and flexibility: Sourcing scientific knowledge in new biotechnology firms. Organization Science, 7(4), 428-443.
  - Weick, Karl E. & Sutcliffe, Kathleen M. (2003). Hospitals as cultures of entrapment: A re-analysis of the Bristol Royal Infirmary. California Management Review, 45(2), 73-85.

**Wednesday, March 21, 2007**

Learning

*Readings:*

- B. Edmondson, Amy C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. Journal of Management Studies, 40(6), 1419-1452.
- Tyre, Marcie J., & Von Hippel, Eric (1997). The situated nature of adaptive learning in organizations. Organization Science, 8(1), 71-83.
  - Tucker, Anita L., & Edmondson, Amy C. (2003). Why hospitals don't learn from failures: Organizational and psychological dynamics that inhibit system change. California Management Review, 45(2), 55-72.

### **Monday, March 26, 2007**

Improvisation

*Readings:*

- B. Crossan, Mary M., White, Roderick, Lane, Henry W., & Klus, Leo (1996). The improvising organization: Where planning meets opportunity. Organizational Dynamics, 2, 20-35.
- Cheng, Yu-Ting, & Van de Ven, Andrew H. (1996). Learning the innovation journey: Order out of chaos? Organization Science, 7(6), 593-614.

### **Wednesday, March 28, 2007**

Improvisation

*Readings:*

- Weick, Karl E. (1998). Improvisation as a mindset for organizational analysis. Organizational Science, 9(5), 543-555.
- Barrett, Frank J. (1998). Creativity and improvisation in jazz and organizations: implications for organizational learning. Organizational Science, 9(5), 605-622.

### **Monday, April 2, 2007**

Thinking about the Future – Lecture on Formal Planning and Formal Control

*Readings:*

- B. Eisenhardt, Kathleen M. (1990). Speed and strategic choice: How managers accelerate decision making. California Management Review, 2, 39-54.
- McDaniel, Reuben R., Jr. (2004). Chaos and Complexity in a Bioterrorism Future. In John D. Blair, Myron D. Fottler, & Albert C. Zapantam (Eds.). Advances in Health Care Management, Vol. 4 (pp.119-139). Oxford, UK: Elsevier, Ltd.

### **Wednesday, April 4, 2007**

Thinking about the Future

*Readings:*

- B. Stone, Melissa Middleton, & Brush, Candida Greer (1996). Planning in ambiguous contexts: The dilemma of meeting needs for commitment and demands for legitimacy. Strategic Management Journal, 17, 633-652.
- Hedberg, Bo, & Jonsson, Sten (1978). Designing semi-confusing information systems for organizations in changing environments. Accounting, Organizations and Society, 3(3), 47-64.

### **Monday, April 9, 2007**

Thinking about the Future

*Readings:*

- Bobbit, Philip (2003). Seeing the futures. The New York Times, December 8, 2003.
- Sornette, Didier (2002). Predictability of catastrophic events: Material rupture, earthquakes, turbulence, financial crashes, and human birth. Proceedings of the National Academy of Science. USA 99, 2522-2529.

### **Wednesday, April 11, 2007**

Designing

*Readings:*

- B. Watts, Duncan J. (2003). Innovation, adaptation, & recovery. In Six Degrees. W.W. Norton & Company, New York, New York, 253-289.
- Pfeffer, Jeffrey (1994). Competitive advantage through people. California Management Review, 1(5).
  - Weick, Karl E. (1993). Organizational redesign as improvisation, in George P. Huber and William H. Glick (editors), Redesigning Organizations, 346-378.

### **Monday, April 16, 2007**

#### Designing

##### *Readings:*

- B. Brown, Shona L., & Eisenhardt, Kathleen M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. Administrative Science Quarterly, 42, 1-34.
- Fleming, Lee & Juda, Adam (2004). A network of invention. Harvard Business Review, 82(4), 22.
  - Anderson, Ruth A., & McDaniel, Jr., Reuben R. (1999). RN participation in organizational decision making and improvements in resident outcomes. Health Care Management Review, 24(1), 7-16.

### **Wednesday, April 18, 2007**

#### Designing

##### *Readings:*

- B. Ashmos, Donde P., Huonker, John W., & McDaniel, Jr., Reuben R. (1998). Participation as a complicating mechanism: The effect of clinical professional and middle manager participation on hospital performance. Health Care Management Review, 23(4), 7-20.
- Kelleher, Herb (1997). A culture of commitment. Leader to Leader, 2, 20-24.
  - Camazine, Scott (2003, June). Patterns in nature. Natural History Magazine. [Online] Available: [http://www .amnh.org/naturalhistory/0603/0603\\_feature.html](http://www.amnh.org/naturalhistory/0603/0603_feature.html)

### **Monday, April 23, 2007**

#### Relationships

##### *Readings:*

- Lanham, H.J., McDaniel, R.R. Jr., Crabtree, B.F., Miller, W.L., Stange, K.C., Tallia, A.F., & Nutting, P.A. A relationship-centered model of family practice. Unpublished manuscript. Paper presented at North American Primary Care Research Group Annual Conference, October 17, 2006. ***Do not cite or make attributions without permission from the authors.***
- Gratton, Lynda (2006). Connections and conversations provide the fuel for innovation. Financial Times, March 30, 2006.

### **Wednesday, April 25, 2007**

#### Leadership

##### *Readings:*

- Weick, Karl E. (2001). Leadership as the legitimation of doubt. In W. Bennis, (Ed.). The Future of Leadership. San Francisco: Jossey-Bass.
- Arthur, W. B., Day, J., Jaworski, J., Jung, M., Nonaka, I., Scharmer, O., & Senge, P. (2002). Illuminating the blind spot. Leader to Leader, 24, 11-14.

### **Monday, April 30, 2007**

#### Review

### **Wednesday, May 2, 2007**

#### Review

**\*\*\*Paper Due\*\*\***