

Summer 2018
POLICYMAKING IN A COMPLEX WORLD
ITRN 701-B02(#42783)
LOCATION – ARLFH #320

TIME— 4:30PM-7:10PM TUESDAY&THURSDAY

DRAFT April 30, 2018

Instructor: Prof. Hilton Root
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Office Hours: 7:15pm-8:15pm (TUESDAY&THURSDAY)

This course employs scientific theories and innovations to understand complex processes that represent the most challenging policy dilemmas of the twentieth first century: networks, epidemics/crisis management, land use/transport/cities, model validation, public policy, marketing, and the information economy. It explores the proposition that the frontiers of modern science can provide social scientists with a common set of thinking tools for observing and abstracting patterns of social behavior and ultimately for adapting policy mechanisms to address the wickedly hard questions of contemporary, global political economy.

When policy makers confront a complicated problem, they often ask "What do we do first?" or "what is the best solution?" But for problems that are not just complicated, but complex in nature, those are the wrong questions. These problems -- which include everything from *state-building* to peacemaking to *consolidating democracy* -- are created by *networks* of interacting agents influencing each other in a dynamic system. So one cannot isolate a first step from a second, or identify a single optimal solution -- one has to approach the entire landscape of interacting units *as a complex system*, and identify its feedbacks and *interdependencies* to understand the effects of different actions. Only then can one build a strategy that is sufficiently dynamic and adaptive to attain desired outcomes in a constantly changing environment. **Without understanding the nature of complexity, policy makers will continue to fail -- as they have so often in the last few decades -- to make progress on crucial problems that develop from the dynamic interactions among actors within linked systems.**

LEARNING OUTCOMES:

The course will enable students to become familiar with the analytical framework of *complex adaptive systems* and its application to global public policy. Students will acquire

new tools to understand the adaptive processes and possible discontinuities that will shape the emergent global order. Analysis of the military, political, economic and cultural interactions of both Western and non-western societies will illustrate and validate the complex systems approach, challenging conventional conceptions of what the state should do, and the ways in which it can act.

COURSE REQUIREMENTS:

Students are expected to keep up with each week's required readings and to participate in class discussion.

20%: Class discussion and **one** class presentation of a title in the syllabus.

20%: **Midterm** Take Home: A set of questions will be emailed to the class from which students will select their topic and write an essay of 1,000 words.

60%: **One term paper**, 2,500 words due at the end of the semester *or* an agent-based model revealing a property of a complex social environment.

A) Write a 2,500-word essay in which you explore how the study of complexity can be applied to practical problems of global public policy. Demonstrate potential connections between theories of complexity and problems in global management, government or organizations. Students can choose topics in public health, environment, critical infrastructure, global security, cyber ware fare, demographic transitions As examples consider problems that are inadequately explained; can models of complexity can be applied to provide a more realistic understandings and better policies than conventional analytical tools? Devise experiments that can reveal laws or patterns that govern how complex institutions, organizations or technologies organizations evolve.

OR:

B) Computationally adept students can construct computer-based simulation models to analyze complex systems. Show how artificial worlds like Sugars cape can be created to capture relevant aspects of the global problems under consideration during the semester. Given all exogenous and endogenous factors, construct model economies that evolve over time so that different scenarios can be analyzed using the models as virtual testbeds for theory generation and exploration.

OR:

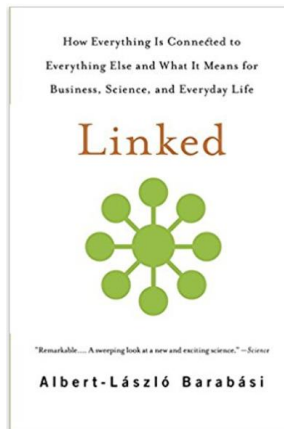
C) Using Douglass's North article "Institutions" JEP 1991, as an example write an essay about the role of networks in long term economic change with implications for contemporary development policy.

REQUIRED READING

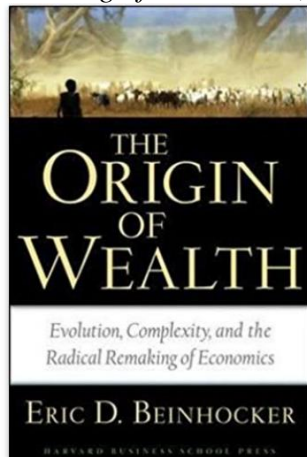
1. Ball, Philip (2012) *Why Society is a Complex Matter? Meeting Twenty-first Century Challenges with a New Kind of Science*. Springer



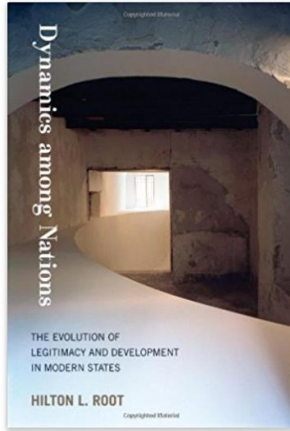
2. Barabasi, A.L. 2003. *Linked: How Everything is Connected to Everything Else and What It Means*. Plume.



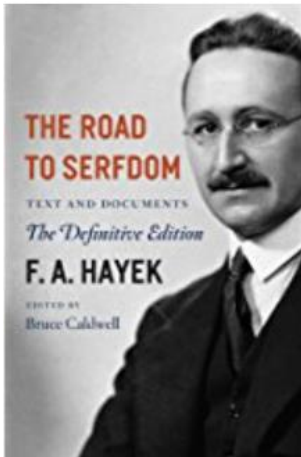
3. Beinhocker , E., 2006, *The Origin of Wealth: Evolution, Complexity, and the Radical Remarking of Economics*, Harvard Business School Press, Boston.



4. Root, Hilton. L. 2013. *Dynamics among Nations: The Evolution of Legitimacy and Development in Modern States*. MIT Press.



5. F. A. Hayek (1944), *The Road to Serfdom*, First published 1944 by George Routledge & Sons, First published in Routledge Classics 2001, by Routledge Reprinted 2001, 2002, 2003, 2004, 2006



WEEK 1: June 5, 2018 June 7, 2018

Theme: Understanding Complex system

Topic1: Introduction

Topic2: What is Social Complexity: Building Blocks to examine global political economy and complexity

“Theories of complex social systems are tested on massive scales every day, when governments implement various policies that often involve substantial resources and ultimately have tremendous impacts on the lives of countless citizens” (Miller and Page 2007: 235). Scholars from many disciplines are applying perspectives from the study of dynamical systems to problems of global and international public policy. How will this affect some of the basic paradigms of governance, development policy, foreign policy and international relations?

Required reading

Ball, Philip (2012) *Why Society is a Complex Matter? Meeting Twenty-first Century Challenges with a New Kind of Science*. Springer

Recommended:

Social Complexity 1: Overview: via@YouTube (youtu.be/kkcGr3y70bk?a via @youtube) This module will provide a quick overview to the application theory to the social sciences. See Complexity Academy@Complexityacad
Johnson, Jeffrey. 2010. "The Future of the Social Sciences and Humanities in the Science of Complex Systems." *Innovation: The European Journal of Social Science Research* 23 (2): 115–134. doi:10.1080/13511610.2010.518422.

WEEK 2: June 12, 2018 June 14, 2018

Theme: *The Great Debate on the Role of the State and Economy*

Topic 1: *Keynes and Hayek*

Keynes, J. M. (1931). "Economic Possibilities for our Grandchildren." Essays in Persuasion. <http://www.econ.yale.edu/smith/econ116a/keynes1.pdf>

Hayek, F. (1944). *The Road to Serfdom*. Chicago: The University of Chicago Press.

Topic 2: *Is the Road to the Future Mechanistic or Organic?*

Macrae, Norman. "The Coming Entrepreneurial Revolution: A Survey" *The Economist* December 25, 1976: 41-65.

Hilton Root, (2018) "Keynes, Hayek, and the Roots of complexity Theory in Economics" in *Journal on Policy and Complex Systems*.

WEEK 3: June 19, 2018 June 21, 2018

Theme: *The Economy as a Complex Adaptive System*

Topic 1: *Evolution, Complexity. And the Radical Remarking of Economics.*

Bienhocker, Eric D. *The Origin of Wealth*. Harvard Business School Press. page 3-187

Topic 2: *Evolution, Complexity. And the Radical Remarking of Economics*

Bienhocker, Eric D. *The Origin of Wealth*. Harvard Business School Press:187-455

OR

W. Brian Arthur, *Complexity and the Economy*, Oxford University Press 2015, chapter 1, Page 1-30; chapter 4-6, Page 69-119; chapter 9-12, Page 144-182.

WEEK 4: June 26, 2018 June 28, 2018

Theme: *Networks*

Topic 1: *How Everything Is Connected to Everything Else?*

Barbasi, Albert-Laszlo. 2003. *Linked: How Everything Is Connected to Everything Else and What It Means for Business, Science, and Everyday Life*. Plume. page 1-123.

Topic2: *What It Means for Business, Science, and Everyday Life?*

Barbasi, Albert-Laszlo. 2003. *Linked: How Everything Is Connected to Everything Else and What It Means for Business, Science, and Everyday Life*. Plume. page 123-281.

WEEK 5: July 3 (no classes), 2018 July 5, 2018

Theme: *Global Finance*

Topic 1: *Economics, Crashes and Finance System*

Bienhocker, Eric D. *The Origin of Wealth*. Harvard Business School Press. page 381-415

Ball, Philip (2012) *Why Society is a Complex Matter? Meeting Twenty-first Century Challenges with a New Kind of Science*. Springer page 33-38

Root, Hilton. 2012. "The Policy Conundrum of Financial Market Complexity" in *Research Handbook on Banking and Governance* (edited by James R. Barth, Clas Wihlborg and Chen Lin). Northampton: Edward Elgar Publishing. Chapter 20.

WEEK 6: July 10, 2018 July 12, 2018

Theme: Cognition

Topic 1: The Black Box of Economics

Topic 2: Culture, Cognition and Social Evolution

Brian Arthur "Cognition: The Black Box of Economics" in *Complexity Economics* page 158-178.

Hilton Root, *Fast, slow and endless variation drives global development*, Cambridge Review of International Affairs. Published online: 18 Oct 2016

Richerson, Peter J, and Robert Boyd. 2005. *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago: University of Chicago Press. Chapter 1 – 4, pages 1 – 147.

WEEK 7: July 17, 2018 July 19, 2018

Theme: Institutions and performance of nations

Topic 1: Great transitions in economic history

Root, Hilton L. (2018) *Structure and Change in Economic History*, chapter.

4-6

Topic 2: Large-scale Structure, Change and Universality in Historical Regimes

North, Douglass C. "Institutions" *Journal of Economic Perspectives* Vol 5 #1, 1991: 97-112.

Root, Hilton L. (2018) *Structure and Change in Economic History*, chapter10

WEEK 8: July 24, 2018

Theme: Networks, Complexity and International Relations

Required reading:

Root, Hilton L. 2013. *Dynamics Among Nations: The Evolution of Legitimacy and Development in Modern States*. MIT Press.

Antoine Bousquet (2012), "Complexity theory and the War on Terror : understanding the self-organizing dynamics of leaderless jihad" *Journal of International Relations and Development*, 15(3), 345-369.

Antoine Bousquet and Simon Curtis (2011), Beyond models and metaphors: complexity theory, systems thinking and international relations, *Cambridge Review of International Affairs* , Volume 24, Number 1, March 2011

Recommended reading:

Castells, M. (2006). *The Network Society: From Knowledge to Policy*. In M. Castells &G. Cardoso (eds), Washington, DC: Johns Hopkins Center for Transatlantic Relations.

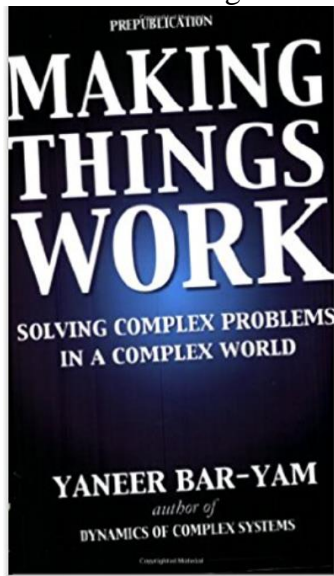
Castells, M. (2010). *The rise of the network society*. Chichester: Wiley-Blackwell.

Kahler, M. (2009) *Networked Politics: Agency, Power, and Governance*. NY: Cornell University Press.

Kadushin, C. (2012). *Understanding social networks: Theories, concepts, and findings* Oxford: Oxford University Press.

Urry, J. (2003), *Global complexity*. Cambridge: Blackwell.

Bar-Yam, Yaneer. 2005. *Making Things Work: Solving Complex Problems in a Complex World*. Neesi Knowledge.



Arthur, B., Durlauf, S. and Lane, D. (1997). *The Economy as an Evolving Complex System II*. Addison Wesley, Redwood City Ca. Chapter 1.