Network Analysis for Managers and Analysts
STM 504 (spring 2006)

Tuesday and Thursday
10:10 – 11:30 a.m.
Taubman 401

Professor David Lazer
david_lazer@harvard.edu
Room 362, Taubman
Office Hours: Tuesdays 3-4 and by appointment

Faculty Assistant: Bernie Cahill (384-8319)

Description: There has been an explosion of interest over the last decade in the role informal networks play in the success of individuals and organizations. This explosion has been fueled by two intellectual phenomena and one societal: (1) the interest in “social capital,” the idea that the set of relationships of an individual or an organization produces a measurable return, (2) the work of physicists on the statistical characteristics of large-scale networks, in particular around the “small world” phenomenon; and (3) the development of communication technologies, most notably the Internet, that clearly have a (potential) transformative effect on the structure of social networks.

This course will provide (1) an overview of the research on social networks, (2) some basic methodological skills; and (3) an examination of the practical managerial implications of this research.

Requirements and Assignments: The first requirement is participation. Most of the learning in this class will occur from the give and take among students. There will be a few “mini-lectures” during the class, but the large majority of the class will be discussion among participants in the seminar. This requires reading all of the materials, and coming to class with something to say.

There are short assignments due most weeks. There are two types of short assignments. The first is the “thought paper,” whose objective is to extrapolate in some interesting way from the readings for the coming week. It should be short (800 word maximum) and non-comprehensive—just picking out some thread from the ideas in the readings. Other than being connected to the readings, the topic is unrestricted. I would suggest two general thematic areas for thought papers: (1) extrapolation to application—e.g., what might be the management implications of these ideas? and (2) potentially novel ways of applying these ideas to new phenomena. You are expected to write two thought papers during the semester. You may choose which weeks you write a paper. Late papers are not accepted. Thought papers should be posted by students on the class website by noon the day before class, and you are expected to read the papers authored by their classmates.
The second type of assignment will be analyses of social network data, some of which we will give you, and some of which you will collect yourselves.

There will also be a paper (3000 word maximum) due at the end of the semester. You will be provided a data set for analysis. You also may choose an alternative subject of your choosing, subject to approval by the instructor. These papers may be done individually, or in small (maximum of 3) groups (group projects would be expected to be commensurately more ambitious).

In addition to the writing assignments there will be some network exercises/data collections to help illuminate the concepts we are discussing.

**Grading:** Your grade will be the average of 30% class participation, 40% “thought papers” and data analysis assignments, and 30% final paper.

**Other:** Students are encouraged to subscribe to the SOCNET listserv (go to [http://www.analytictech.com/connections/socnet.htm](http://www.analytictech.com/connections/socnet.htm) for instructions on how to join). This is a major resource for social network researchers. There is also a free online Social Network Analysis book written by Hanneman, Robert A. and Mark Riddle (2005): Introduction to social network methods, Riverside, CA: University of California, Riverside (published in digital form at [http://faculty.ucr.edu/~hanneman/](http://faculty.ucr.edu/~hanneman/)). For other resources, check out the website for the *International Network of Social Network Analysis* ([www.sfu.ca/~insna/](http://www.sfu.ca/~insna/)). Students are also encouraged to attend the *Cambridge Colloquium on Complexity and Social Networks*, which brings in leading researchers on social network analysis. The schedule, as well as papers, supporting materials, and related links, is available at [www.ksg.harvard.edu/complexity](http://www.ksg.harvard.edu/complexity). You are also encouraged to participate in the blog run by the *Program on Networked Governance* ([http://www.iq.harvard.edu/blog/netgov/](http://www.iq.harvard.edu/blog/netgov/)) and use the Social Network Analysis resource page ([http://www.ksg.harvard.edu/netgov/html/sna.htm](http://www.ksg.harvard.edu/netgov/html/sna.htm)).

**Readings:** There are required readings from *Social Network Analysis: A Handbook* by John Scott, and *The Hidden Power of Social Networks* by Rob Cross and Andrew Parker, which are available at the Coop. You should also plan to purchase a copy of UCINET, a standard network analysis software package, which may be purchased at [http://www.analytictech.com/ucinet.htm](http://www.analytictech.com/ucinet.htm), and download (for free) the network visualization program Netdraw at [http://www.analytictech.com/netdraw.htm](http://www.analytictech.com/netdraw.htm). The rest of the readings are available in the course pack available from the Course Materials Office.

Required readings are marked by *. Optional readings are just on reserve.
**February 2**

**Background, definitions, etc**

* Scott: 1-37.


| Thought paper due on **February 6** at noon. |

**February 7**

**Embeddedness**


| Thought paper due on **February 8** at noon. |
**February 9**

**Structural holes**


**February 14 & 16**

**Handling and visualizing network data**

* Scott: 38-62.


Visualization and data analysis assignment due on **February 20** at noon.

**February 21**

**Centrality**

* Scott: 82-100.


Analysis of ego network assignment due on **February 22** at noon.

**February 23**

**Small worlds**


Thought paper due **February 27** at noon.

**February 28**

**Network origins**


* Thomas Schelling. 1978. *Micromotives and Macrobehavior*. W.W. Norton & Company: 11-43, 137-166. [link to online simulation to be provided]


* Scott: 100-122.


UCINET analysis due **March 1** at noon.

**March 2**

**Social Capital**


Thought paper due on March 6 at noon.

March 7

Diffusion and social influence


* E. M. Rogers. 2003. “Diffusion Networks” in Networks in the Knowledge Economy (Rob Cross, ed.).


Thought paper due March 8 at noon.

March 9-14

Knowledge networks


You will also be given some web-based communities of practice to look at for class discussion.

| Thought paper due on March 15 at noon. |

**March 16**

**Intra-organizational networks**

* Cross: 1-68.


| Thought paper due on March 20 at noon. |

**March 21**

*Cross: 69-142.


| Thought paper due April 3 at noon. |

**April 4**


Nitin Nohria. “Is a Network Perspective a Useful Way of Studying Organizations?” in Networks and Organizations.


Thought paper due **April 5** at noon.

**April 6**

**Applying SN tools within an organization**

* Cross: 143-166.


Thought paper due **April 10** at noon.
April 11

Inter-organizational networks


Thought paper due on **April 12** at noon.

**April 13**


**April 18**

* KSG case #1570.0. “The Massachusetts DNA Database: Getting Started.”

**April 20**

Presentations of final projects

**April 25**

Presentations of final projects

**April 27**

No class

**May 2**

Presentations of final projects

**May 4**

Wrap up: lessons learned

Long paper (2500 word max) on mapping social network ideas to practice due **May 5** at noon.