RPAD 637
Social and Organizational Networks in Public Policy, Management, and Service Delivery: Theory, Methods, and Analysis
Course Number: 8129
Fall 2003

Instructor: R. Karl Rethemeyer, Assistant Professor
Office: Milne 312A
Phone: (O) 442-5283 (H) 478-9599
E-mail: karethem@albany.edu
Office Hours: 9:00 – 9:30 PM Wednesday 3:30 – 5:30 PM Thursday By Appointment

CLASS MEETING TIME AND PLACE; EXAMS AND PAPER DUE DATES
Wednesday, 5:45 PM to 8:50 PM in Richardson 290

Take-home final
Distributed: December 3, 2003 during class
Returned: December 15, 2003 @ 5:00 PM
Empirical Exercise: December 15, 2003 @ 5:00 PM

CATALOGUE DESCRIPTION: The concept of “network” has become central to many discussions of public policy, management, and service delivery. However, use of the term is rarely backed with strong theoretical and empirical analysis of actual social networks. This course is designed to (1) explore the theoretical underpinnings of the concept; (2) introduce the basic methods needed to collect and analyze network data; and (3) familiarize you with the process of initiating and completing a network analysis using real data from real cases; and (4) compare your network findings with results generated using other methods and techniques.

ASSUMED PREREQUISITES: This course assumes that you are (1) familiar with microcomputers and spreadsheet software such as Microsoft Excel (2) comfortable learning new software packages; (3) familiar with college-level algebra, basic statistical techniques, and probability theory; and (4) comfortable using quantitative analysis to analyze social, political, and policy questions. Being familiar with common sociological concepts and language is also helpful but not required. Similarly, being familiar with calculus, linear regression, and/or maximum likelihood techniques is helpful but not required. If you are a mathophobe I guarantee you that you can gain a lot from this class without too much trauma!

ADMISSION TO THE CLASS: All students must be enrolled in a Ph.D. or Masters program, with preference given to those in Ph.D. programs. Undergraduate students will not be admitted. Students from the Public Administration Department are given first priority for slots in the class, which is limited to 20 students. All others will be admitted on a first come, first served basis, until the class maximum is reached.
AUDITORS: Auditors are welcome, up to the room’s practical capacity (about 35). However, I expect auditors to have read the assignments and reserve the right to cold-call anyone who is in the room. Auditors who are unprepared to contribute may be asked to leave. Because I will get more credit for the Department, I would prefer students to formally auditor (i.e., by registering as an auditor with the powers that be), but I will not enforce this policy unless the class is too small to sustain.

OVERVIEW: The concept of “network” has become central to many discussions of public policy, management, and service delivery. Yet the use of the term is rarely backed with theoretical and empirical analysis of actual social networks. This course is designed to explore the theoretical underpinnings of the concept “networks,” to introduce the basic methods needed to collect and analyze network data, and to compare findings generated with network methods with standard social and economic analysis.

Social network analysis takes seriously the proposition that the behaviors of individual units or “actors” are non-random and that their patterns have meaning and significance. It seeks to operationalize concepts such as “position”, “role”, or “social distance” that are sometimes used casually or metaphorically in social, political, and/or organizational studies. Network theory views dimly the idea that social behavior may be understood by aggregating individuals. If most “normal” statistics starts with the idea that randomly drawing “observations” from a “population” will lead one to identify population "characteristics,” network theory begins with the assumption that randomization obliterates an essential element of a person or organization’s social world: their interconnections. There are many models and methods in social network analysis, but all share an emphasis on the relationships of actors as the basis of social structure.

After an overview during the first half of the first session, we will examine two major forms of network data, egocentric and complete. Issues arise in the areas of study design, sampling, data collection, and measurement. Egocentric data measure the “interpersonal environments” that surround individual “actors.” Such designs are more compatible with large-population survey research than some other approaches to network studies. As we shall see, actors may be persons, organizations, groups, countries, or regions. Network analytic ideas may be applied to any group of interconnected social units; they are without a particular scale.

We will devoted most of our time to studying analytic methods for “complete network data,” which consist of measurements of the social ties linking all actors within some closed population. Included here are spatial models driven by the concept of social distance; graph theoretic models emphasizing connectedness; and models for “positional analysis” (also known as blockmodel analysis) centered on the idea of structural equivalence and its generalizations.

A good deal of the course will focus on methods for describing social structures or locating structural regularities in network data. Toward the end, however, we will examine approaches to assessing network effects.
**TEXTS:** There are two texts that have been requested at both the UAlbany Bookstore and at Mary Jane’s. (I have asked the bookstore to make copies available in the Annex in the cafeteria.)


The Wasserman and Faust book is a text that gives a comprehensive overview of analytic methods and provides illustrations. It will be the primary source we draw upon during the semester. The Burt book is primarily a substantive study that draws heavily on a network orientation. Both books were ordered in paperback editions and are available for purchase at the Coop. They are also available through amazon.com; as of this past week prices listed there were $32.95 (Wasserman and Faust) and $21.00 (Burt), plus shipping.

In addition, I recommend the following texts, in part because Steve Borgatti, author of UCINET VI, recommends them:


Additional online readings may be found on the course web site (see below).

**READINGS:** Additional readings (primarily journal articles) have been/will be placed on ERes. The ERes system may be accessed from the library's home page or from the course web site (see below). To find the readings for R. Karl Rethemeyer, select the PAD637 Fall 2003 option, and use the class password, pad637f03. Approximately half of the readings are currently available; the others will be placed on the system during the term.

Because this course is new, the syllabus may change. At the beginning of each class I will pass out a “Class Note” that both summarizes the topics for that class and the readings that should be completed by the next class. If necessary, I will post a new copy of the syllabus to the course web site.

**COMPUTER PROGRAMS:** Many applications of network methods involve substantial manipulation of quantitative data in matrix form. Some of this can be undertaken using elements of standard statistical software packages such as SPSS, SAS, or Stata. These packages often include multidimensional scaling and hierarchical clustering routines, for example. Some models for network effects can be studied using such software, while others require special stand-alone implementations. Software packages like GAUSS or SAS PROC IML (presumably S-plus, too, though I haven’t worked with that) can be useful for inventive work.
Most of this course will focus on learning to use and manipulate the “industry standard” application for social network analysis, UCINET VI:


This is the recommended software for the course. The homework will teach you how to use it. UCINET VI runs on Windows computers. Unfortunately, there is no Macintosh version. Public-use copies are available in all student labs across all three campuses. However, no more than 24 students may use UCINET VI at one time, and anyone may boot it up - even those who are not in this class. Analytic Technologies offers this software to students at $40. If you wish to make an order, contact Analytic Technologies at (phone) 978-456-7372; (fax) 978-456-7373; (email) sales@analytictech.com. You might have heard of other related pieces of network visualization software called Krackplot or NetDraw. UCINET VI has incorporated NetDraw into it, so we will not use Krackplot in this course.

**ASSIGNMENTS:** Homework assignments must be handed in at the beginning of class on the day they are due. Assignments must be submitted *in class*. Late assignments will not receive full credit, in part because the findings will be extensively discussed during the class in which they are due. Students are *strongly encouraged* to work in small groups (2 - 4 people) but each student must write up his or her answers separately. The assignments and associated data sets will be distributed through the course website:

http://www.albany.edu/faculty/kretheme/PAD637/overview.html

In addition to the regular assignments there will be a longer Empirical Exercise due at the end of the course. *The Empirical Exercise is to be completed either individually or in pairs.*

The Empirical Exercise is designed to test your ability to make an argument about some phenomenon using network data. I am open to many types of paper proposals, but each must have a data component. Ideally, your paper will rely on data you have collected yourself. However, recent struggles with the Institutional Review Board make original research in the context of a semester-long course difficult. Nonetheless, I encourage you to consider this option. However, I have put nine data sets on the course web site that you may wish to use in one fashion or another. For instance, you could extend the analysis originally done by the author; you could test a new hypothesis; or could write a research proposal for a larger study that is motivated by a preliminary analysis that is done using one of these data sets. All students must submit a one or two paragraph paper proposal by October 29.

There will be one take-home exam during the course. It will be distributed on December 1 on the course web site and via the course LISTSERV. A hard copy of your take-home is due in my mailbox by 5:00 PM on December 15, 2003.

*Special thanks to Professor Peter V. Marsden, Department of Sociology, Harvard University for generously sharing his “workshops” and related materials, which are the basis of the assignments in this course.*
GRADING: The final grade will consist of the class participation, homework assignments, the Take-Home Final, and the Empirical Exercise, with the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>15%</td>
</tr>
<tr>
<td>Problem Sets</td>
<td>20%</td>
</tr>
<tr>
<td>Take-Home Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Empirical Exercise</td>
<td>45%</td>
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</tbody>
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Participation will be graded principally on the basis of the class discussion that results when you (or your group, depending on the number enrolled) summarize the weekly readings and lead the discussion. However, class participation will also be evaluated on the frequency of relevant, constructive contributions that reflect a close reading of assigned materials and thoughtful reflection on the topic.

Because this course requires an empirical paper, I will allow incompletes, provided that (a) you have made substantial progress on the paper during the term and (b) that we agree in writing that the incomplete will be resolved by no later than May 5, 2004.

E-MAIL COMMUNICATION: To reach me, use my personal e-mail address. To subscribe to this list, send an e-mail message to LISTSERV@LISTSERV.ALBANY.EDU with the line SUBSCRIBE PAD637-F03 <FIRST NAME> <LAST NAME> in the body of the message and nothing in the subject. You will be asked to confirm your membership in the list by a return message. To send a message to EVERYONE who is subscribed, use the address PAD637-F03@LISTSERV.ALBANY.EDU. Please register for this list as soon as possible and check your e-mail regularly for class news and information. If the class must be cancelled on short notice, the announcement will be made through the LISTSERV. Also use this LISTSERV for sharing common concerns and issues. Please do not use it for discussions or announcements that are not related to the class.

TIME COMMITMENT FOR THIS COURSE: This is a four-credit graduate course. Hence you should plan on spending three to five hours per week in class and in the lab plus approximately five to seven hours per week doing the reading and preparing problem sets. Students with strong prior background or experience in computing and/or statistics may spend less time than this. Students with little prior background may have to spend more time than this, especially in the first several weeks. If you discover that you are spending more time than this on the course, please let me know so that we can discuss it.

PLAGIARISM AND CHEATING: Due to the intensive nature of this course, students are expected to form study groups and to work together on assignments. Learn by interacting with one another — support and help one another. However, (a) all students must submit an individually prepared copy of their homework and (b) some work such as the Empirical Exercise must be completed by the individual without collaboration with anyone else. As a policy for this course, plagiarism or cheating will result in a failing grade for the whole course. In addition, I will pursue further disciplinary action at the University level, including suspension and/or expulsion.
For the purposes of this course, the following are taken as evidence of plagiarism or cheating:

- Material reproduced from another source without adequate citation.
- Identical answers being turned in by two or more students on the Take-Home Final.
- A pattern of unusually similar answers being turned in by two or more students on the Take-Home Final.
- Written answers or solutions that a student cannot logically explain verbally.
- Other evidence of unauthorized collaboration between students on the Take-Home Final or Empirical Exercise.

Your work may be subject to computerized analysis to discover whether materials have been taken from on-line sources or to determine statistically whether answers are more similar than random chance would allow. Since this is such an important matter, if you have any questions about this course policy, you should ask me for any clarification that you may need.

**SOURCES ON SOCIAL NETWORKS.** Because students may have quite diverse reasons for taking this course, I offer the following listing of some sources on the social network orientation for your reference purposes. Many of these will go into more depth on substantive applications than will the bulk of the course. You may find them useful as you develop your projects and areas of interest. Most of them include rather substantial bibliographies that will offer further leads. I make no claim that this is a complete bibliography, but it does include a number of sources that you may find useful.

**On-line Resources**

The course website contains links to several online resources I have found useful over the years. However, the most useful resource is probably the SOCNET LISTSERV. I strongly encourage you to subscribe to this list. Subscription instructions may be found at [www.analytictech.com/connections/socnet.htm](http://www.analytictech.com/connections/socnet.htm). If you find pages that are especially useful, please send the URL to me by e-mail with a sentence or two of description; I will put the references on the web site.

While at Harvard I “harvested” data from nine prominent studies published in paper form. The data is available from the website, along with references and comments on the articles from which the data was originally mined. You may wish to use one or more of these data sets for your Empirical Exercise.

**Periodicals**


Books providing overviews:


Anthologies:


TOPIC SCHEDULE AND READINGS

**Introductions, Class Organization, and an Overview of UCINET - September 3**

No required readings – bring your *a priori* understanding of social networks and social network methods. We will spend some time getting to know one another and UCINET.

**Overview of Network Theory - September 10**

Wasserman and Faust, chapter 1.

**Network Data; Introduction to Graph Theory - September 17**

Wasserman and Faust, chapters 3-4.
**Data Collection & Social Cognition** - September 24

Wasserman and Faust, chapter 2.

Due in class: Problem Set #0 – Getting to Know UCINET VI

**Centrality and Centralization** – October 1

Wasserman and Faust, chapter 5.


**Studying Cohesive Subgroups and Core-Periphery Structures – October 8**

Wasserman and Faust, chapter 7.


Rethemeyer, R. Karl. (in submission). “Policymaking in the Age of Internet: Is the Internet is Tending to Centralize Rather Than Democratize Policy Processes - Findings from Two State-Level Policy Networks.” (Current draft on course website).

Due in class: *Problem Set #1* – Connectedness, Centrality, and Centralization

**Picturing Networks - October 15**


Freeman, Linton C. (2000) “Visualizing Social Networks.” *Journal of Social Structure, 1*. [This is an electronic journal. Its address is http://www.heinz.cmu.edu/project/INSNA/joss/]


Due in class: *Problem Set #2* – Cohesive Subgroups & Core/Periphery Structures
**Analyzing and Representing “Two-Mode” Network Data - October 22**

Wasserman and Faust, chapter 8  

Due in class: *Problem Set #3 – Visualizing Networks*  

**Blockmodels/Positional Analysis – Fundamentals - October 29**

Wasserman and Faust, chapters 9, 10.  

Due in class: *Problem Set #4 – Working With Two-Mode Data*  

**No class November 5 - APPAM Conference**

**Blockmodels/Positional Analysis – Implementation and Applications - November 12**

Wasserman and Faust, chapter 12.  

Due in class: Problem Set #5 – Positional/Blockmodel Analysis
Paper proposal due.

**Networks, Social Capital, Autonomy, and Achievement – November 19**

Burt, Structural Holes, chapters 1-4 at a minimum; try to read the rest.

Due in class: Problem Set #6 – Abstract Equivalence

**No class November 26 - Thanksgiving**

**Statistical Approaches to Networks: p and p* - December 3**

Wasserman and Faust, chapters 15-16.
*Note:* Additional information about p* can be found at kentucky.psych.uiuc.edu/pstar/

Due in class: Problem Set 7 – Handling Egocentric Network Data
Models for Studying Network Effects and Diffusion and Course Wrap-up – December 10


Due in class: Problem Set #8 – The P* Model