First Post:

Planeteers -

We're redoing our core quantitative methods course for 1st year MURP graduate students, and I will be teaching it for the first time next year. I am going through the process of finding a good textbook(s). I seem to remember someone posting a question on PLANET in the past year or so asking for information about textbooks and perhaps syllabi for quantitative methods courses in planning. If that is the case, and if whoever posted the message is listening and has some findings to share, I would appreciate it. Otherwise, I welcome any advice from the rest of you reading this. The course is part of a 2-course methods sequence that includes qualitative and other methods, along with "planning analysis." GIS is included in a third course.

Thanks!
Jennifer

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Edited Responses:

From: Scott Campbell <sdcamp@umich.edu>

Here is one take on teaching it:
http://www-personal.umich.edu/%7Esdcamp/up504/

You might take a look at Planner's Use of Information which has just come out in the second, much improved edition. It is an APA Press publication. It has various methods of collecting, organizing and communicating information. I edited it

Hemalata C. Dandekar Ph.D.
Director and Professor
School of Planning
Arizona State University

From: David Sawicki <david.sawicki@arch.gatech.edu>

We'd like you to consider using Patton and Sawicki, Basic Methods of Policy Analysis and Planning. 2nd edition. I can send you a Teachers Manual should you decide to use it.
From: Kurt Paulsen <kurt.paulsen@temple.edu>

I teach the quant course here at Temple and would be glad to discuss this with you. …

In the meantime, I started to make a very rudimentary (and poor graphics because I haven't yet mastered web-design) website with links to places where people have posted their methods texts, notes, etc. I currently have it posted on a website designed for work I did with the Penn Planning Association of the methods review for the AICP exam, but it might be of interest to you. Perhaps what should emerge from your query is that those of us who teach this same course can all create at least links to each other's pages, and share ideas, homework sets, etc.

http://astro.temple.edu/~paulsenx/aicp.html

scroll down to Online Planning Methods Textbook.

As for textbooks, I only use a statistics book and not anything on planning methods. I just give them some lectures and readings.

From: Karen Chapple <chapple@berkeley.edu>

Here's the most recent version of our syllabus for 204a. I have gradually added powerpoint and other such things over time. We still use Healey, but I'm increasingly dissatisfied with it. Somebody needs to do a new planning text and a new version of Dowell Myers' book on the census!

[SYLLABUS IS AT END OF THIS DOCUMENT]

From: Tim Chapin <tchapin@garnet.acns.fsu.edu>

I have attached as a PDF file the course I teach called "Forecasting for Urban Development", one that focuses upon population analysis/projections and economic base analysis/projections. I hope this is of some use to you as you develop your course.

From: Erik Ferguson yoplanz@yahoo.com

I don't think I posted on PLANET re: QRM in the last year, but I have been working on the subject for the last four or five years. Several colleagues and I collected a number of relevant syllabi, as well as information on textbooks, additional readings, and the like.

Tim Chapin and I have a paper that has been tentatively accepted for publication by JPER subject to minor revisions and rereview.
It would be nice if there were a planning-specific textbook on stats, even though the market might be small.

Kreuckeberg and Silvers wrote a text along those lines in the seventies, but it is a bit dated not and out of print.

Don't know of any others that include stats specifically.

From: Stephanie Chang <sechang@interchange.ubc.ca>

Dear Jennifer,

One of my colleagues forwarded your email. We are modifying our curriculum here in the Planning school at UBC to also have a 2-course methods sequence for the 1st year master's students. I am teaching the quantitative methods term. When I taught it this spring, I was not able to find a good comprehensive text, so I put together a reader packet. Since this last year, we had the methods requirement in a condensed 1-course format, the syllabus and readings will change as we go to a 2-term sequence. I would appreciate it if you could share what information you gather.

From: "Marshall Feldman" <marsh@uri.edu>

A great deal depends on how you define quantitative methods. Below I describe the course I taught this spring, but it it's not what you're looking for, you might consider a new book by Greene and Pick, Exploring the Urban Community: A GIS Approach. It combines urban geography with GIS rather nicely.

My course is aimed mainly at the PAB statistics requirement, and after doing this for almost 20 years I think I finally got it right. You can learn more about this course at its web site: http://www.uri.edu/cels/cpla/marsh/cp1526/index.html. This rendition has several features that distinguish it from most introductory statistics courses for planners:

- A focus on a substantive research area (see below), in this case property taxes. This is important because it allows students to develop substantive knowledge of a topic. Property taxes is an ideal subject for this purpose because (1) all students, no matter what their area of interest, find the subject relevant, (2) there's a large research literature with all sorts of quantitative techniques and issues, including measurement error, t-tests, multivariate regressions, etc. (3) decent data are readily available from the Census Bureau, (4) it's quintessentially spatial, (5) it’s not redundant - most planning programs teach pathetically little about public finance, (6) it spills over to much broader questions, and (7) I'm doing research in this area, so I know something about it.

- The course uses three main textbooks. One, CyberStats is really an online statistics course (http://statistics.cyberk.com). This made
certain aspects of course delivery very easy, although it has its problems. Chief among these is the fact that Thompson Learning bought CyberStats this winter. The CyberStats online test system was still in beta this spring (something they did not advertise to potential adopters), and it will stay in beta because Thompson Learning intends to use its own system. Also, they told me it would take students about 2 hours per lesson, but this only works if you go through the lesson modules yourself and prescribe specific exercises for the students. I learned this about mid-semester.

- As a traditional, printed textbook I used *Statistical Methods for Geography* by Peter Rogerson. This will soon be out in a second edition. It’s an excellent, brief (about 200 page) introduction to statistics with lots of planning-related examples and good introductory coverage of issues with spatial data. It also uses SPSS, which I use too.

- The third text, *Philosophy of Social Science* by Ted Benton and Ian Craib is by far the best introductory overview of philosophical issues in social science that I have seen. I don’t know why the PAB insists on requiring statistics of planning students, but I do know that during the twentieth century the subject evolved under the overwhelming influence of positivism. Since positivism is largely discredited as a philosophy of social science, this poses serious problems for those of us who want to teach statistics as a social science research method and still retain some intellectual integrity. Using Benton and Craib to help students step back and critically examine the appropriate and inappropriate uses of statistics in planning works very well. For one thing, after the introductory chapters on empiricism, positivism, and their problems, students recognize the problems with statistics as most textbooks (including CyberStats and Rogerson) present the subject. The book covers structuralism and related approaches that maintain sciences can have no methods independent of their objects. Since according to this view there can be no such thing as generic “planning methods,” much less generic social science methods, students see the necessity for relating methods to substantive issues. In my course by the time they encounter this issue they have been working with property tax issues for some time, and using property taxes as our substantive issue, we can have some very good discussions about the relation of method to substantive issues. Another advantage is that for a sizeable minority of students, the study of quantitative methods is slightly less pleasant than being poked in the eye with a sharp stick. By adding philosophy of social science, a substantive research area, computers, and independent research (see below) to the mix, most students seem to find something that really excites them about the course, and yet they see how all these components fit together. (At the beginning of the semester, one woman, who did her undergraduate work in the Ivy League no less, confessed that she had successfully avoided all math as an undergraduate and was taking the course with much trepidation; by all appearances, she wound up loving it, and smiled when I told her she seems to have learned statistics in spite of herself.)

- We also used SPSS for Windows and WebCT. Thanks to the GUI, what used to require a course in itself can now be left mostly to the
students to do on their own. I used the SPSS tutorials (13.0) and WebCT to communicate with the class (more on this later).

- A project. The class broke into teams of “consulting firms.” These firms reply to an RFP with brief proposals, designed research, carried out the research, and report on their research.

To accomplish this, the course has a certain structure. The course is four credits, compared to our usual 3-credit semester classes. This translates into a workload of about 16 hours per week. Each week the class is scheduled for two 75-minute lecture/discussion sessions and two 75-minute sessions in a computer lab. The students made many of the decisions about course structure and content. I tell them everything is negotiable, since it’s their class. Relying heavily on computer delivery systems almost makes this true. During the first half of the semester, we focus solely on statistics, so that by mid-semester the students are doing ANOVA’s. This is a bit of a forced march, although it would have been less stressful had the folks at CyberStats been more upfront and said that instructors need to assign specific exercises for each unit in order to keep the students’ time down to two hours. I took them at their word about 2 hours per module, adjusted to student gripes, and around mid-semester finally learned this qualification from CyberStats. Because CyberStats is interactive, my class voted not to meet during most of the first half of the semester. We had quizzes, a few students dropped into my office for help (I was there during all regularly scheduled class meetings), and a few students complained that they needed more formal class sessions. With mixed success, we tried to use WebCT’s discussion boards to substitute for class meetings. Eventually, I wound up using much of the computer workshop time to lecture on statistics. I also had to curve the quizzes, although with more specific assignments from CyberStats this might be unnecessary. Also during the first half of the semester, I introduced some fundamental issues. We read about property taxes, measurement error and property tax assessments, statistics and the axiomatic method, sample weighting (the class used the 2000 Census PUMS data), and some SPSS techniques.

Immediately after mid-semester (Spring Break), the class began to meet regularly. The computer workshop portion (mornings) is devoted to a semester project, and the lecture/discussion session (afternoons) is devoted to philosophy of social science research. We continually bring the latter material back to the question of the appropriate use of statistics in planning. For instance, when reading about interpretive approaches, students also read Jim Throgmorton’s well-known article about survey research and rhetoric. When they read about critical realism, they read Andrew Sayer’s piece article about the three pomo flips, and apply it to Throgmorton’s article and to a multivariate model of fiscalization of land use and sprawl. Many of these multivariate models tie in really nicely to earlier discussions of measurement, criticisms of empiricism, thought objects versus real objects, etc. When we read about feminist approaches, we ask, “Is the use of statistics in planning really just a legitimizing gendered (and racialized) ritual?” Given the number of regressions in the literature on property taxes about Tiebout and the like -- and their almost total avoidance of otherwise obvious questions about race -- there is plenty of grist for this mill.

For the project, the class is divided into teams, and I issue an RFP to the class. In this case, it asked them to determine if, how, and why property taxes and race are related. One shortcoming is that reading raw data into SPSS is still difficult, so I tell them that, subject to negotiation, the
contracting agency (me) will provide them with an SPSS file of data they request. Each team responds to the RFP, and I work with them during the second half of the semester to carry out their research. As they learn new things, these become incorporated into their research. (E.g., this week they learned to use dummy variables in multivariate regressions, and some of them are learning about segregation measures to address one of the questions in the RFP.) This project approach works well to get them to think creatively. The analogy I use is that statistics is a tool, and learning to use statistics is like learning to use a hammer and saw. This is not enough to know how to design and build a house, so the project plays the role in the course that designing and building a house might play in a course for contractors. For instance, it’s amazing to me that so many students tried like crazy to figure out how to use the PUMS to measure segregation meaningfully, when they could use census tract data quite easily. Since they used the Census Bureau website extensively to learn about the PUMS data, they also know about other downloadable data on the site. When they finally ask, “How should we use the PUMS to measure segregation?”, I tell them they could download the SF1 data and compute t-scores comparing the proportion of each race in each tract to the MSA average; while this may not be the best measure of segregation, it’s acceptable, they already knew how to do it, but they just didn’t think outside the box. It’s a good lesson.

There are still some important kinks to work out. With assigned exercises from CyberStats, the workload during the first half of the semester would not be so heavy, and I might not have to curve the quizzes. CyberStats has its own tools for data analysis, but I would prefer to substitute SPSS. CyberStats’ tools do not lend themselves to the large, complex databases planners typically need to handle. I probably ought to lecture more during the first half of the course. WebCT may be unnecessary, since CyberStats supports most of its functions. There are more. Nonetheless, the overall content and design work quite well.

Marsh Feldman

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Why don't you add the manual for my CrimeStat program to your list? It's a spatial statistics program that interfaces with most GIS packages and conducts a variety of spatial and statistical analysis on point and polygon data. The points can be anything (incidents, residences, firms, facilities) and, in spite of the title, the routines are appropriate for many planning problems (e.g., identifying clusters of firms; identifying motor vehicle crash hot spots; visualizing the relationship between subsidized housing units and poverty levels, etc). In the new version, we have a travel demand model, widely used in transportation planning. The program and manual are being taught in classes and used as a research tool in many different fields; from what we can tell, it has a high circulation. Most importantly, it's free. The URL is:

http://www.icpsr.umich.edu/crimestat

Take care,

Ned Levine
Hi Everyone,

I offer the following list as an addendum to Jennifer Dill’s summary of responses received to her quantitative methods text request. I have been searching for a quantitative methods text that provides planning / policy applications and discusses software implementation of the latest and greatest statistical techniques. Below is a quick list of books meeting one or more of these criteria. The list is not exhaustive and is based only on the responses received to my recent query. I now own most of the books listed below, so feel free to email me for my normative assessment of the quality of each of these texts.

Software References with Emphasis on Statistical Methods:

Data Analysis with Microsoft Excel, 2nd Ed.
Duxbury Press.

SPSS 13.0 Guide to Data Analysis.
Prentice Hall.

Policy / Planning Methods Texts with Emphasis on Statistical Methods:

Research Methods in Public Administration and Nonprofit Management.
M.E. Sharpe.

Meier, Kenneth J. and Jeffrey L. Brudney. 2002.
Applied Statistics for Public Administration, 5th Ed.
Harcourt.

Basic Methods of Policy Analysis and Planning, 2nd Ed.
Prentice Hall.

Welch, Susan and John Comer. 2001.
Quantitative Methods for Public Administration, 3rd Ed.
Harcourt.
General Statistics Texts:

Radius Press.

Introduction to the Practice of Statistics, 3rd Ed.
Freeman.

Statistics Text with Applications from Geography:

Burt, James E. and Gerald M. Barber. 1996.
Guilford Press.

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Course Overview

CP 204A introduces quantitative methods for describing, analyzing, and modeling data in city and regional planning. It covers a variety of methods, from exploratory data analysis to population modeling to multiple regression analysis. Statistical formulas and proofs are kept to a minimum. Instead emphasis is placed on building a conceptual framework and gaining practical skills for conducting data analysis in city planning. The use of a computer as a tool for data presentations and analyses is also emphasized.

CP 204A is organized into two parts. Part I (weeks 1-7) deals with Analysis of Secondary Data (mainly from the census), in particular tract-, city-, and metropolitan-level data on population and employment. Focusing on applied planning methods, it presents a variety of techniques for analyzing and presenting secondary data, preparing population and economic forecasts, and conducting regional economic analysis.

Part II (weeks 7-15) focuses on the range of Statistical Tools available for analyzing primary data (mainly samples from surveys). It deals with inferential statistics (“how sure am I of this typical value?”), bivariate measures of association (“how do two variables move across cases in relation to one another?”), and introductory modeling. It concludes with the use of regression analysis to help explain phenomena (“to what degree does rent control increase housing prices?”) and predict (“if residential densities increase, on average, by 25 percent, how much will transit ridership likely increase?”).

The main text for the course is Statistics: A Tool for Social Research (Joseph Healey: Belmont, Wadsworth Publishing, 2002, 6th edition), available in the ASUC Bookstore. Note that students can also use the 5th edition of Healey, which is widely available as a used book. Used versions of both the 5th and 6th editions are also available on Amazon.com.

A reader of additional articles and book chapters (for Part I of the course) will also be available at Krishna Copy Center (2501 Telegraph Avenue, at Dwight).

For the first half of the class, lecture notes (in powerpoint) will be posted on-line at http://webct.berkeley.edu. To sign up for WebCT, use your student ID as your login and your password. To download the files, you will need to log in to CP204a on WebCT (under College of Environmental Design, City and Regional Planning); click on “Course Materials” on the home page; click on the lecture (“August 31 lecture”). It will open in its own window; go to file-save-as; save to your home directory; click on the .ppt file to open it in powerpoint; and print it as notes or handouts.
Requirements

CP 204A is open to all city planning students, and, with instructor permission, others outside the department. Although no prior statistics course work is assumed, students are expected to have a working knowledge of introductory college algebra.

Two-credit option: For this option, students take the first 7 weeks of the class, including the computer labs. They complete three homework assignments involving extensive computer analysis. Class and lab attendance is required and can affect borderline grades. This option is intended for master’s students specializing in areas of planning that do not rely on quantitative methods.

Four-credit option: The four-credit option requires students to take the entire class. They would complete all six homework assignments, as well as the final exam, given during exam week. Assignments count toward 80% of the class grade and the final exam counts for the remaining 20%. Class attendance is required and can affect borderline grades. This option is recommended for master’s students in the more quantitatively oriented planning concentrations, as well as for Ph.D. students who lack preparation in planning data analysis and methods.

All computer assignments will involve the use of data and software available in or through the DCRP Computer Lab. Students are expected to know how to use Windows as an operating system. If you are unfamiliar with either Windows or DCRP’s lab, you are encouraged to attend orientation sessions. The primary software packages that will be used are Excel and SPSS. Labs will be offered weekly (scheduled for Thursday 3:30 – 5:00 and Friday, 10:30-12) to introduce the American FactFinder, Excel, ArcView, Access, and SPSS packages and their applications. SPSS examples are used liberally during regular sessions for the second part of the course.

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Weekly Course Schedule

Week/Date/Topic

**Part I. Basic Planning Methods Using Secondary Data**

1. 8/31  Introduction and data analysis in planning: variables and measurement scales.  
    9/2  Introduction to the U.S. Census  
    Library Planning Data Orientation: 305 Wurster Hall, with Deborah Sommer  
    (library and statistical/archival resources)

2. 9/7  Using census data.  
    9/9  Planning reports: Examples from real life  
    Computer lab: Downloading web-based data, American Factfinder

3. 9/14  Describing population, households, jobs, and places  
    9/16  Indicators, indices, and more: analytical techniques for presenting data  
    Computer lab: Organizing data in Excel

4. 9/21  Indicator reports - examples  
    9/23  Communicating your results: writing and presentation techniques  
    Computer lab: Introduction to ArcView

5. 9/28  Populations projections and forecasts: review of methods  
    9/30  Projection population, part 2  
    Computer lab: The cohort-survival method

6. 10/5  Using and presenting economic and job data  
    10/7  Location quotients, shiftshare analysis, and multipliers  
    Computer lab: shiftshare methods in Excel; manipulating large datasets

7. 10/12  Social science research and overview of statistical tests  
    10/14  Descriptive statistics, analysis of survey data  
    No scheduled computer lab

**Part II. Statistical Analysis of Survey and Primary Data**

8. 10/19  Z-scores and the normal distribution  
    10/21  Sampling distributions and the central limit theorem  
    Computer lab: Introduction to SPSS

9. 10/26  Sampling and point estimation  
    10/28  Confidence intervals and sample sizes  
    Computer lab: Recoding in SPSS, exploratory data analysis

10. 11/2  Hypothesis testing, difference of means and proportions  
    11/4  Non-parametric tests  
    Computer lab: Difference of Means tests in SPSS

11. 11/9  Introduction to contingency analysis, chi-squared  
    11/11  Veterans Day  
    Computer lab: Crosstabs in SPSS

12. 11/16  PRE-based Measures of Association
11/18  Correlation and ANOVA  
   Computer lab: Correlation, ANOVA & bivariate regression

13.  11/23  Introduction to bi-variate regression
       11/25  Thanksgiving Holiday  
               No computer lab scheduled

14.  11/30  Bi-variate regression: parameter estimation and significance tests
       12/2   Introduction to multi-variate regression, multicollinearity  
               Computer lab: Multi-variate regression models

15.  12/7   Categorical data models, logit analysis
       12/9   Dummy variables  
               Computer lab: Categorical data analysis
READINGS

Week 1: Introduction


Week 2: Secondary Data Sources and Uses


3. For September 9th, please read one of these reports carefully and familiarize yourself with the other four. All are examples of data used with an advocacy bent, i.e., data for decision-making. Come to class prepared to confer with your classmates for about 20 minutes about the following questions: Where do these reports get their data? How do they communicate their data? How do they employ the data to make recommendations? How sound are the conclusions? Can you suggest different interpretations of the data? Where would you look for counter argumentative data?

   
   
   
   
**Week 3: Data Presentation; Measuring Inequality**


**Week 4: Indicators, Powerpoint in Planning**

Please read one of the first four reports and familiarize yourself with the other three. All are examples of the construction and use of indicators. Come to class prepared to confer with your classmates for about 20 minutes about the following questions:

What arguments are the authors making with these indicators? How effective are the indicators? What other indicators are the reports missing? Can you suggest different interpretations of the indicators?


Week 5: Working with Population Data


Week 6: Working with Economic Data


2. Richard Klosterman, *op. cit.*, Chapters 9, 10, 12


Week 7: Descriptive statistics: Healy *(5th and 6th editions)* Chapters 3-5.

Week 8: Sampling: Healey *(5th and 6th editions)*: Chapter 6

Week 9: Estimation and Confidence Intervals: Healey *(5th and 6th editions)*: Chapter 7

Week 10: Hypothesis testing, difference of means and proportions: Healey *(5th and 6th editions)*: Chapters 8 & 9

Week 11: Contingency analysis, chi-square tests: Healey *(5th & 6th editions)*: Chapters 11-12

Week 12: PRE-based measures of association: Healey *(5th and 6th editions)*: Chapters 13 & 14
