

CITY AND REGIONAL PLANNING 771
APPLICATIONS OF QUANTITATIVE METHODS IN URBAN PLANNING

Winter, 2004 Credit: 4 hours

Lectures: Mondays and Wednesdays, 2:30 to 4:18, 223 Brown Hall

Professor: Hazel A. Morrow-Jones

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Office Hours: MW 12:30 to 2:30 and by appointment (I am generally around the building most afternoons)

Peer teachers will also hold office hours during the term and may run review sessions and perform other tasks to help students learn. Peer teachers will not be grading the content of assignments. The Peer teachers and their contact information and office hours will be announced in class.

Required Text: W.W. Daniel and J.C. Terrell, Business Statistics: Basic Concepts and Methodology, 7th edition, Houghton Mifflin Company, Boston, 1995.

Assumed Knowledge

In response to student suggestions and after successfully implementing this idea for several years, I am NOT going to cover the basics of descriptive statistics (mean, median, mode, histograms, quartiles, etc.) in detail. Instead I will discuss those things briefly but I will assume that you know them reasonably well already. I will give a closed book quiz on them on Jan. 26, 2004. If you want to review this material, take a look at chapter 2 in the required text book (Daniel and Terrell, Business Statistics, 7th edition). Skip sections 2.6, 2.10 and 2.11 in your review. Concentrate on 2.3, 2.4, 2.5 and 2.8.

The advantage of this approach is that we should get to the more difficult parts of the course while you are still fresh, and we should have more time toward the end when we get to the interesting material, so we won't have to hurry through it as badly.

Test Out

If you want to test out of the class, the test out examination will start at 1:30 p.m. on **Friday, January 9** and last until 3:30. A minimum score of 60% will be required to pass the test out exam. If you pass the exam, you will be exempt from taking the class and receive four hours of credit (if you signed up for the class and pass the test out exam, you'll need to drop the class). I will hand out some sample problems so you'll have an idea about how to study. Look over this syllabus for the material to be covered. There is a lot of emphasis on hypothesis testing. If you don't know whether you should take the exam or not, go ahead and try it -- you have nothing to lose. Please let me know by Wednesday at the end of class if you plan to take the test out so that I can make the appropriate number of copies. **THIS EXAM IS A CLOSED BOOK AND CLOSED NOTE EXAM.**

If you have already received college or graduate level credit for two or more statistics classes with a grade of B or better you are not eligible to take either the test out or the class. Instead I will put your name before the graduate studies committee to have this requirement waived. That means you will have four more hours of elective to take in your program. If you fall into this category you should have received a letter from me. If you have not received a letter but think you should have, please see me or send me an e-mail message.

Advanced Students

If you are especially interested in quantitative methods and/or have a strong math background and/or are a Ph.D. student, **I strongly encourage you to take statistics from the Statistics or Agricultural Education Departments.** CRP 771 will focus on basic material, intuitive explanations, practical applications, and written interpretation of results rather than the underlying theoretical rationales and mathematical derivations. The computer portion of the course can be learned using EXCEL tutorials, and if you will be doing large amounts of serious quantitative research you should use a different software package. EXCEL is excellent for practicing planners because it is readily available and handles the techniques that most planners need very well and in a format people are familiar with. However it is not appropriate for PhD level research or some of the more sophisticated techniques.

Course Objectives - At the end of the course the student should:

- be able to create and graphically represent frequency distributions and to compute and interpret basic descriptive statistics such as mean, median, mode, variance, and standard deviation;
- be able to compute probabilities in simple cases and to solve elementary combinatorial (that is, counting) problems;
- be able to use the normal area table and to describe the distribution of a sample mean;
- know the general method of hypothesis testing and be able to use it;
- be able to describe the concepts of point and interval estimations, and to find confidence intervals for a mean of a population by use of normal and t distributions;
- be able to set up the hypotheses and use the appropriate tests for problems involving the mean, the difference between means (z -- the normal distribution, and t), the fit of a distribution, tests of independence/homogeneity (Chi squared), the equality of variances (F), and the appropriate tests for correlation and regression analysis (t and F). Students should understand the concepts and be able to use EXCEL to perform the tests.
- understand the concepts of simple and multiple regression, be able to interpret regression results and be able to use EXCEL to estimate coefficients in simple and multiple regression analyses.
- be able to discuss statistical results either orally or in writing; present these results in table, figure, or map form; and
- be suitably skeptical about the results of any statistical analyses.

These same ideas are the focus of the MCRP comprehensive exam statistics questions.

I try to teach this course as nonmathematically as possible. The emphasis is on how you set up hypotheses and test them, how to select the appropriate procedures to use, how to judge the results, and how to report the results. If you are interested in a more mathematical presentation, feel free to take a mathematics statistics class as a substitute for this one. Do not expect derivations and proofs in this class. Do expect that I will ask you to explain in words what your results mean. You should also expect that this class will be time consuming.

We may move somewhat more slowly than the course syllabus suggests. Last year we made it to regression, but couldn't spend as much time as we would have liked on it. If you want a more advanced class please take a statistics course in the Statistics Department.

Policies

1. Attendance is up to the individual; I will not take attendance. However, if I notice that you are seldom in class and you are on a border line for a grade, you may not get the benefit of the doubt. You are responsible for any missed material, handouts, assignments, changes in due dates or exam dates, etc that are announced in class. All readings should be done before the lecture on the material, and again afterwards. I will try to keep my notation as similar to the text as possible. For most of the course we will follow the text very closely in order to avoid confusion and to help you learn how to learn from a statistics book.
2. No smoking is allowed in the building.
3. All cell phones and pagers must be turned off or put on vibrate during the class period.
4. Make up exams will be given only for reasons acceptable under University policy. You must inform me in advance if you will miss an exam or due date for an assignment.
5. All assignments are on time if turned in by the beginning of class on the due date. Late assignments will lose 10% per day. Please note that there is no advantage in skipping class in order to complete an assignment -- if you turn the assignment in after the class begins, you will be a day late anyway. Consequently, if you are not finished by the time class starts, you might as well attend class and finish the assignment later. No assignment will be accepted more than one week after it was due or after it has been returned to the class. You should count on the computer going down just when you are about to make the deadline. Do your work in advance -- the fact that the computer went down on the last day of the week you've had to do a project does not constitute an acceptable excuse for being late.
6. In all cases you must clearly and neatly show your work and a portion of your grade will also depend on your ability to clearly explain your results in written English sentences.
7. I encourage you to see me or one of the peer teachers outside of class if you have questions or problems, if you would like extra help, if you would like to pursue a topic in more depth, etc. Don't suffer silently if there is a problem -- come see us before the problem gets overwhelming.
8. I strongly discourage you from considering an incomplete in this course. I will only grant them for officially acceptable reasons.
9. I consider your continued presence in class an agreement to abide by the policies and structure set out in this syllabus, and an agreement that when you attend class you will refrain from disturbing others in the course.

Course Requirements and Grading

Quiz and Exams:

There will be a quiz on assumed knowledge (1 hour), one midterm (two hours) and a comprehensive final exam (one hour and forty eight minutes). These will all be closed book and closed note exams and you must work individually. The examinations will be designed to measure the degree to which students have achieved the objectives of the course. The meaning of grades and all official marks of the University are explained in the University Bylaws as revised on June 7, 1973, in Sections 35.00, 37.00, and 47.00. The assumed knowledge may be tested on any of the exams, not just the quiz that is specifically on it. The midterm and final exam will be comprehensive.

Although the quiz, midterm and final are closed book exams, I will hand out formula sheets (as well as the necessary tables) with the midterm and final exam. The exception is the assumed knowledge quiz. There will be no formula sheet handed out because those formulas are so fundamental to statistics that you should know them. For the exams you will see these formula sheets in advance so that you will know what you can expect to have for help during the exam. I do this because I don't see any reason to worry about memorizing most formulas. Some formulas you should know, however, such as those on the assumed knowledge quiz (that is why there will be no formula sheet for it).

You will need a working calculator and you will need to understand it. For example, if your calculator will do VARIANCE calculations it is fine for you to use that function. However, you will need to know which kind of variance formula the calculator is using and how to make adjustments if you need to.

Homework:

Homework will be handed out during the quarter. It is essential that students complete homework assignments individually in order to grasp the material. These assignments will include working problems, but it will also be necessary that students clearly and correctly interpret the results in written paragraphs. The homework will be graded and incorporated into the final grade as detailed below. Some problems may specify EXCEL, a calculator or a manual solution, so be careful to follow the directions. These homework assignments will receive a check if they are reasonable efforts or a minus if you turn something in that shows little effort and/or results that are completely off-base. You will receive a 0 if you do not turn an assignment in. Otherwise I will not grade the homework. Instead, I will hand out answer keys so that you can work through problems on your own. No homework assignment will be accepted after I have made the answer key available.

Computer Projects:

Statistical analysis projects will be performed in groups and will use EXCEL. This is a requirement of the class, so if you prefer to work alone, take a different statistics class.

Jan. 7	Sets and Probability	Ch. 3
Jan. 12	Introduction to Computer projects	Handouts
	Normal Distributions	Ch 4.8
Jan. 14	Sampling Distributions	Ch. 5
Jan. 19	Martin Luther King Day – no class	
Jan. 21	Sampling Distributions	
Jan. 26	<u>Quiz</u> on assumed knowledge	
Jan. 28	Estimation	Ch. 6.1-6.3; <u>Computer Project 1 due</u> (6.4), 6.5, (6.6), 6.7-6.10
Feb. 2	Tests of Hypotheses	Ch. 7.1-7.3; 7.5-7.9
Feb. 4	Tests of Hypotheses	
Feb. 9	t distribution	Ch. 6.4, 6.6; 7.4, 7.6
Feb. 11	F distribution	Ch. 6.12, 7.11 <u>Computer Project 2 due</u>
Feb. 16	<u>Midterm</u>	
Feb. 18	Chi Squared	Ch. 12
Feb. 23	Chi Squared	
Feb. 25	Linear Regression	<u>Computer Project 3 due</u>
Mar. 1	Regression and Correlation	Ch. 9.7-9.11
Mar. 3	Multiple Linear Regression	Ch. 10 and 11
Mar. 8	<u>Oral presentations</u> of project 4	
Mar. 10	<u>Oral presentations</u> of project 4	
Mar. 12	<u>Computer Project 4 written report due (Friday of the last week of classes)</u>	
Mar. 17	(Wednesday) <u>FINAL EXAM</u>	1:30 – 3:18 p.m.

**This material is available in alternative formats upon request.
Please contact Hazel Morrow-Jones, City and Regional Planning,
278a Brown Hall, 292-1027.**