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Executive Master of Public Administration

**QUANTITATIVE TECHNIQUES I**  
For Policy Making and Administration  
U6310, Sec. 03

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FALL 2002

**INSTRUCTORS:**

	<b>PROFESSOR:</b>	<b>TEACHING ASSISTANT:</b>
	Stuart E. Ward	Hamid Rashid
E-Mail:	sew9@columbia.edu	hr99@columbia.edu
Office Phone#	212.854.5941 (o)	To Be Announced
Office Room#	407A	To Be Announced

**MEETING TIMES:**

<b>LECTURE:</b>	<b>LAB:</b>
Saturday 3 PM – 5 PM	Saturday: Group I - 5-6PM Group II - 6-7PM
Room 407 Lecture Room	5 <sup>th</sup> Floor Lab

**REQUIRED TEXTS:**

1. Statistical Analysis:  
An Interdisciplinary Introduction to Univariate and Multivariate Methods  
Sam Kash Kachigan; New York, Radius Press
2. Quantitative Methods for Public Administration:  
Techniques and Applications, Third Edition  
Susan Welch and John Comer; Florida, Harcourt College Publishers

**RECOMMENDED TEXT: (Discuss with Professor before purchasing.)**

1. Mathematical Statistics and Data Analysis  
John A. Rice; California, Duxbury Press

**COURSE OVERVIEW:**

The objective of this course is to provide professionals with the statistical resources necessary to make reasonable decisions about policy problems and business challenges, based on quantitative research. In order to accomplish this goal, a fundamental understanding of graduate-level statistics and its applications will be taught. During the first semester, students will learn the basics of probability and statistics. By the end of the second semester, students will be able to apply basic analytical techniques and, ultimately, will be qualified to make management decisions based on research conducted by professional analysts.

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**COURSE OVERVIEW, (continued):**

The prerequisites for this course are basic mathematics and high school algebra. No prior knowledge of statistics or calculus is necessary. However, performing well in the course requires attendance of all classes, completion of all assignments, and staying current with the required readings. Following these guidelines will result in being successful in this class.

Note that the syllabus contains both required readings and additional recommended readings. The required readings *must* be completed before the corresponding lecture. The recommended readings are designed only for those students who need or want a more in depth treatment of the subject matter.

The structure of the course is as follows. During the first semester, we will begin with the fundamental concepts of data collection and organization. We will progress to summarization and description of the data. After an introduction to probability, we will begin to focus on statistical methods, which will be applied to test hypotheses about the data. During the second semester, we will study and apply more advanced techniques, which will refine your analytical methods and improve the accuracy of your decisions. At every step, we will be focusing on the application of statistics to policy problems.

Finally, because today's statistical analysis is performed with computers, during this course you will become familiar with a popular statistical software package: SPSS. This software package is a key element to saving time while doing research. Doing the analysis by hand is very cumbersome, so I strongly advise you to follow the labs closely to avoid wasting this time.

In summary, we will begin with the basics of data collection and move quickly into probability and, finally, focus deeply on more and more advanced statistical methods. To help expedite your research, your readings, lectures and assignments will be complemented by significant exposure to SPSS. Throughout this time, your analytical skills will improve and, most importantly, your ability to make policy decisions will increase.

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**FALL 2002 SYLLABUS:**

Sept. 07: Fundamental Concepts - Course Overview & Introduction to Statistics

Required

Kachigan- Chapters 1 & 2

Welch- Chapters 1 & 2

Recommended

Rice- Chapter 1

Sept. 14: Descriptive Statistics – Data Measurement & Reduction

Required

Kachigan- Chapter 3

Welch- Chapters 3 & 5

Recommended

Rice- Chapter 2

Sept 21: Descriptive Statistics - Central Tendency & Variation

Required

Kachigan- Chapters 4 & 5

Welch- none

Recommended

Rice- Chapter 3

Sept. 28: Basic Probability: Random Variables, Counting Methods & Independence

Required

Kachigan- Chapters 6

Welch- none

Recommended

Rice- Chapter 4

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**FALL 2002 SYLLABUS, (continued):**

Oct. 05: Advanced Probability: Permutations, Combinations & Distributions

Required

Kachigan- Chapter 20

Welch- none

Recommended

Rice- Chapters 5 & 6

Oct. 12: Introduction to Statistical Inference – Sampling, Parameter Estimation

Required

Kachigan- Chapters 7 & 8

Welch- none

Recommended

Rice- Chapters 7 & 8

Oct. 19: Introduction to Statistical Inference – Hypothesis Testing

Required

Kachigan- Chapter 9

Welch- Chapter 7

Recommended

Rice- Chapter 9

Oct. 26: MID-TERM EXAM

Nov. 02: No class

Nov. 09: Analysis of Categorical Data - Contingency Tables

Required

Kachigan- none

Welch- Chapter 6

Recommended

Rice- Chapter 10

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**FALL 2002 SYLLABUS, (continued):**

Nov. 16: Analysis of Categorical Data - Measures of Association

Required

Kachigan- Chapter 13

Welch- none

Recommended

Rice- Chapter 13

Nov. 23: Introduction to Analysis of Variance – One-Way ANOVA

Required

Kachigan- Chapter 12

Welch- none

Recommended

Rice- Chapter 12

Nov. 30: No class

Dec. 07: Introduction to Regression Analysis – Simple Linear Regression

Required

Kachigan- Chapter 11

Welch- Chapter 8

Recommended

Rice- Chapter 12

Dec. 14: FINAL EXAM

(WINTER BREAK)

**FALL 2002 GRADING SUMMARY:**

Assignments: 20%

Computer Projects: 20%

Mid-Term Exam: 30%

Final Exam: 30%