QUANTITATIVE TECHNIQUES I
For Policy Making and Administration
U6311, Sec. 003

SPRING 2003

INSTRUCTORS:

PROFESSOR
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MEETING TIMES:

LECTURE
Saturday 3 PM – 5 PM
Room 407 Lecture Room

LAB
Saturday 5 PM – 7 PM
5th Floor Lab

REQUIRED TEXTS (Same as Fall Semester):
1. {ISBN: 0942154991} Statistical Analysis:
   An Interdisciplinary Introduction to Univariate and Multivariate Methods;
   Sam Kash Kachigan; New York, Radius Press
2. {ISBN: 0155078631} Quantitative Methods for Public Administration:
   Techniques and Applications, Third Edition;
   Susan Welch and John Comer
   Harcourt College Publishers /South-Western Publishing/Thompson Learning

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.
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.
SPRING 2003 SYLLABUS:

Required
- Kachigan: Chapter 12
- Welch: Chapter 9
Recommended
- Rice: Chapter 12

Feb. 01: [LECTURE #02] Advanced Analysis of Variance – Two-Way ANOVA
Required
- Kachigan: Chapter 12
- Welch: Chapter 9
Recommended
- Rice: Chapter 12

Feb. 08: [LECTURE #03] More Regression Analysis – Simple Linear Regression
Required
- Kachigan: Chapters 10 & 11
- Welch: Chapter 8
Recommended
- Rice: Chapter 14

Feb. 15: [LECTURE #04] More Regression Analysis – Multivariate Techniques
Required
- Kachigan: Chapters 10 & 11
- Welch: 9
Recommended
- Rice: Chapter 14
SPRING 2003 SYLLABUS, (continued):

Feb. 22: [LECTURE #05] Advanced Regression Analysis – Non-linear Techniques
Required
   Kachigan: Chapters 10 & 11
   Welch: 9
Recommended
   Rice: none

Mar. 01: [LECTURE #06] Advanced Regression Analysis – Non-linear Techniques, continued
Required
   Kachigan: Chapters 10 & 11
   Welch: 9
Recommended
   Rice: none

Mar. 08: [LECTURE #07] Advanced Regression Analysis – Exponential Techniques
Required

Mar. 15: [No Lecture]

Mar. 22: [MID-TERM EXAM]

   Kachigan: Chapters 10 & 11
   Welch: 9
Recommended
   Rice: none
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SPRING 2003 SYLLABUS, (continued):

Mar. 29: [LECTURE #08] Time Series Analysis ·
Required
   Kachigan· 18
   Welch· Chapter 10
Recommended
   Rice· none

Apr. 05: [LECTURE #09] Probit and Decision Analysis · Introduction
Required
   Kachigan· Chapter 21
   Welch· 10
Recommended
   Rice· none

Apr. 12: [LECTURE #10] App. of Chaid/Survival/ 6-Sigma/Bayesian/2nFactorial (TBA)
Required
   Kachigan· TBA
   Welch· TBA
Recommended
   Rice· none

Apr. 19: [No Lecture]

Apr. 26: [LECTURE #11] Factor Analysis ·
Required
   Kachigan· Chapter 15
   Welch· none
Recommended
   Rice· none

May 3: [FINAL EXAM]
ADDITIONAL RESOURCES:

1. http://groups.yahoo.com
   ➔ Requires Yahoo Account
   ➔ Picker Center Administration will provide access
   ➔ Requires Columbia Account
   ➔ Columbia ACIS will provide access

SPRING 2003 GRADING SUMMARY:
Policy Project: 20%
Computer Projects: 20%
Mid-Term Exam: 30%
Final Exam: 30%