

SAN JOSÉ STATE UNIVERSITY
URBAN AND REGIONAL PLANNING DEPARTMENT
URBP 204: QUANTITATIVE METHODS
Spring 2021

Instructors:	Dr. Shishir Mathur Dr. Chao Liu
Office location:	Mathur: online Liu: online
Email:	shishir.mathur@sjsu.edu chao.liu01@sjsu.edu
Office hours:	Mathur: By appointment Liu: By appointment
Class days/time:	Monday 7:30-10:15pm
Classroom:	Zoom meeting
Class website:	https://sjsu.instructure.com/courses/1416159
Prerequisites:	None
Units:	4

Course Catalog Description

Urban research design, measurement, selected statistical research tools and introduction to computer processing. Extensive treatment of survey research.

Course Description

This course is designed to familiarize students with research design and collection and statistical analysis of data for planning and public policy purposes. We will begin with an overview of social science research and then provide opportunity for students to define and conceptualize planning related research questions, to execute statistical tools that students can use to make inferences from quantitative and qualitative data.

Course Learning Outcomes (CLOs)

This course partially covers the following PAB Knowledge Components:

- 1e) The Future: understanding of the relationships between past, present, and future in planning domains, as well as the potential for methods of design, analysis, and intervention to influence the future.

2a) Research: tools for assembling and analyzing ideas and information from prior practice and scholarship, and from primary and secondary sources.

2b) Written, Oral and Graphic Communication: ability to prepare clear, accurate and compelling text, graphics and maps for use in documents and presentations.

2c) Quantitative and Qualitative Methods: data collection, analysis and modeling tools for forecasting, policy analysis, and design of projects and plans.

Upon successful completion of the course, students will be able to:

- 1) Identify the overall strengths and weaknesses of quantitative, qualitative, experimental, and survey research methods; and assess which research method/s, given resource constraints, are most appropriate for answering a specific research question.
- 2) Develop research questions worthy of informing public policy, and identify the statistical tools appropriate for answering the research question. The tools learned in this class are: Tests between Means of Different Groups, Tests Between Means of Related Groups, ANOVA, Factorial ANOVA, Correlation, One- and Two- Factor Chi Square; Ordinary Least Squares Regression; and Logistic Regression.
- 3) Develop survey research questions that conform to conventional best practices in survey design.
- 4) Critically evaluate the strengths and weaknesses of various non-probability and probability based sampling techniques.
- 5) Present quantitative data and results in text and graphics.
- 6) Identify the policy implications of statistical test results.

Required Course Texts

There are two required textbooks for this course. They are:

a) Babbie, Earl R. 2012. *Practice of Social Research, 13th ed.* Belmont: Wadsworth. (ISBN: 9781133049791). A used paperback edition would cost approximately \$30.

You may also use the 10th edition of the book.

b) Salkind, Neil. 2010. *Statistics for People Who (Think They) Hate Statistics, 4th Edition.* Thousand Oaks: Sage. (ISBN: 9781412979597). A new paperback edition would cost approximately \$50.

You may also use the 2nd edition of the book. A used book would cost approximately \$20.

You do not need to buy the book that comes with SPSS CD.

Other Readings

There is one recommend textbook for this course. It is:

Agresti, Alan, and Barbara Finlay. 2008. *Statistical Methods for the Social Sciences*, 4th edition. New Jersey: Prentice Hall. (ISBN: 9780130272959). A paperback edition would cost approximately \$60. You may also use the 3rd edition of the book.

Course Assignments and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Your grade for the course will be based on six take home exercises and two engagement unit activities. You will be able to revise and re-submit the take home six exercises and several term project-related assignments and earn up to 75% of the lost points.

Assignments	Share of Course Grade	Course Learning Objectives Covered
Exercises		
1) Exercise 1: Social research	10%	1
2) Exercise 2: Survey, experiments, field research	10%	3 & 4
3) Exercise 3: Inferential Statistics, Part 1	10%	2, 5& 6
4) Exercise 4: Inferential Statistics, Part 2	10%	2, 5& 6
5) Exercise 5: Logistic Regression	10%	2, 5& 6
6) Exercise 6: Ordinary Least Squares Regression	25%	2, 5& 6
Engagement Unit: Quantitative Analysis of a San Jose Neighborhood		
Memo A: Engagement Unit, Part 1	15%	2
Memo B: Engagement Unit, Part 2	10%	2

Due to the relatively large number of assignments in this class and the potential for re-submissions, this class has a tight grading schedule. As a result, late work will not be accepted, except with the instructor's prior permission.

Preparing profile of a San Jose neighborhood and comparing and contrasting your profile with your classmates' will constitute the 1-unit engagement unit. For this 1-unit engagement unit, the instructor will spend an additional 15 hours per semester on activities such as: designing the engagement unit activities and the related assignments, coordinating with community partners to implement the activities, advising students outside of class on a weekly basis as needed, and grading the engagement unit activity assignments.

Grading Information

Grades for the course will be assigned based on your percentage of total points earned on all assignments according to the following distribution:

A plus = 100 to 96

A = 95 to 93 points

A minus = 92 to 90 points

B plus = 89 to 87 points

B = 86 to 84 points

B minus = 83 to 81 points

C plus = 80 to 78 points

C = 77 to 73 points

C minus = 72 to 70 points

D plus = 69 to 67 points

D = 66 to 63 points

D minus = 62 to 60 points

F = 59 points or lower

University Policies

Per University Policy S16-9 (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information web page (<http://www.sjsu.edu/gup/syllabusinfo>), which is hosted by the Office of Undergraduate Education. Make sure to visit this page to review and be aware of these university policies and resources.

URBP 204: QUANTITATIVE METHODS

Spring 2021

COURSE SCHEDULE

(Subject to change with fair notice. Instructor will notify students of the changes in the class and by uploading a revised syllabus on the course webpage)

Please note: In the Course Schedule below, the chapter numbers for the Earl Babbie book are as per the 13th Edition. The Chapters numbers for the 13th and the 10th editions are provided at the end of the syllabus. If you buy a different edition, look for the corresponding chapter titles. Chapter numbers for the Salkind book are as per the 4th Edition. The Chapters numbers for the 4th and the 2nd editions are provided at the end of the syllabus. If you buy a different edition, look for the corresponding chapter titles. Chapter numbers for the Agresti and Finlay book are as per the 4th Edition. The Chapters numbers for the 4th and the 3rd editions are provided at the end of the syllabus. If you buy a different edition, look for the corresponding chapter titles.

Course Schedule

Week 1 (February 1)

Instructors: Mathur and Liu

Course Overview; Social Research

Required reading: Babbie, Earl. Ch. 2, 3 and 5

Week 2 (February 8)

Instructor: Mathur

Social Research and Census Overview

Required reading: Babbie, Earl. Ch. 2, 3 and 5

Exercise 1 Introduced

Week 3 (February 15)

Instructor: Mathur

Activities for Engagement Unit Activities (neighborhood profile and survey data)

Required reading: Babbie, Earl Ch. 9

Neighborhood Profile Memo "A" and "B" Introduced

Week 4 (February 22)

Instructor: Mathur

Survey Research

Required reading: Earl, Babbie Ch. 9

Exercise 1 Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Ex 1")

Week 5 (March 1)

Instructor: Mathur

Survey Research continued

Required reading: Babbie, Earl, Ch. 9

Neighborhood Profile Memo "A" Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Memo A"; instructor will distribute your Memo A to classmates for preparing Memo B)

Exercise 1 Graded

Week 6 (March 8)

Instructor: Mathur

Experiments and Qualitative Field Research

Required reading: Babbie, Earl, Ch. 8 and 10

Exercise 2 Introduced

Revised Exercise 1 Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Rev Ex 1")

Neighborhood Profile Memo "A" Graded

Week 7 (March 15)

Instructor: Liu

Descriptive Statistics; Normal Distribution, Hypothesis Testing; T-statistics

Required reading: Salkind, Neil. Ch. 2, 3, 4, 7, 8 and 9

Research Questions Assignment Introduced (not graded)

Neighborhood Profile Memo "B" Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Memo B")

Revised Exercise 1 Graded

Week 8 (March 22)

Instructor: Liu

Tests between Means of Different Groups; Tests Between Means of Related Groups; ANOVA

Required reading: Salkind, Neil. Ch. 11, 12 and 13

Exercise 2 Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Ex 2")

Neighborhood Profile Memo "B" Graded

Exercise 3 Introduced

Research Questions Assignment Discussion

March 29 - no class, Spring Break!

Exercise 2 Graded

Week 9 (April 5)

Instructor: Liu

Tests between Means of Different Groups; Tests Between Means of Related Groups; ANOVA (continued); Factorial ANOVA; Chi-squared tests; Correlation

Required reading: Salkind, Neil. Ch. 14, 15 and 17

Exercise 4 Introduced

Research Questions Assignment Discussion

Revised Exercise 2 Due (email at shishir.mathur@sjsu.edu with the subject line: "first name, last name, 204: Rev Ex 2")

Week 10 (April 12)

Instructor: Liu

Factorial ANOVA; Chi-squared tests; Correlation (continued); Logistic Regression

Required reading: Salkind, Neil. Ch. 14, 15 and 17

Recommended Reading: Agresti and Finlay Ch. 15

Exercise 5 Introduced

Research Questions Assignment Discussion

Revised Exercise 2 Graded

Exercise 3 Due (email at chao.liu01@sjsu.edu with the subject line: "first name, last name, 204: Ex 3")

Week 11 (April 19)

Instructor: Liu

Logistic Regression continued and working session

Recommended Reading: Agresti and Finlay Ch. 15

Exercise 4 Due (email at chao.liu01@sjsu.edu with the subject line: "first name, last name, 204: Ex 4")

Exercise 3 Graded

Week 12 (April 26)

Instructor: Liu

Ordinary Least Squares Regression (OLS)

Recommended Reading: Agresti and Finlay Ch. 9, 10, 11 and 14

Exercise 4 Graded

Revised Exercise 3 Due (email at chao.liu01@sjsu.edu with the subject line: "first name, last name, 204: Rev Ex 3")

Exercise 5 Due (email at chao.liu01@sjsu.edu with the subject line: "first name, last name, 204: Ex 5")

Week 13 (May 3)

Instructor: Liu

Ordinary Least Squares Regression (OLS) continued

Recommended Reading: Agresti and Finlay Ch. 9, 10, 11 and 14

Exercise 6 Introduced (email at chao.liu01@sjsu.edu with the subject line: “first name, last name, 204: Ex 6”)

Revised Exercise 4 Due (email at chao.liu01@sjsu.edu with the subject line: “first name, last name, 204: Rev Ex 4”)

Exercise 5 Graded

Week 14 (May 10)

Instructor: Liu

OLS continued; Working session for Ex 6

Recommended Reading: Agresti and Finlay Ch. 9, 10, 11 and 14

Revised Exercise 5 Due (email at chao.liu01@sjsu.edu with the subject line: “first name, last name, 204: Rev Ex 5”)

Exercise 6 Due May 13 (email at chao.liu01@sjsu.edu with the subject line: “first name, last name, 204: Ex 6”)

Revised Exercise 4 Graded

Week 15 (May 17)

Instructor: Mathur, Liu

Research Design (Mathur); Working session for revising Ex 6 (Liu)

Required reading: Earl, Babbie Ch. 4 and 6

Revised Exercise 5 Graded

Week 16 (May 24)

Instructor: Liu

Please note: Since this is exams week, the class will begin at 7:45 pm

Course reflection

Revised Exercise 6 Due (email at chao.liu01@sjsu.edu with the subject line: “first name, last name, 204: Rev Ex 6”)

Plagiarism and Citing Sources Properly

Plagiarism is the use of someone else's language, images, data, or ideas without proper attribution. It is a very serious offense both in the university and in your professional work. In essence, plagiarism is both theft and lying: you have stolen someone else's ideas, and then lied by implying that they are your own.

Plagiarism will lead to grade penalties and a record filed with the Office of Student Conduct and Ethical Development. In severe cases, students may also fail the course or even be expelled from the university.

If you are unsure what constitutes plagiarism, it is your responsibility to make sure you clarify the issues before you hand in draft or final work.

Learning when to cite a source and when not to is an art, not a science. However, here are some common examples of plagiarism that you should be careful to avoid:

- Using a sentence (or even a part of a sentence) that someone else wrote without identifying the language.
- as a quote by putting the text in quote marks and referencing the source.
- Paraphrasing somebody else's theory or idea without referencing the source.
- Using a picture or table from a webpage or book without reference the source.
- Using data some other person or organization has collected without referencing the source.

The University of Indiana has developed a very helpful website with concrete examples about proper

- paraphrasing and quotation. See in particular the following pages:
- Overview of plagiarism at www.indiana.edu/~istd/overview.html
- Examples of plagiarism at www.indiana.edu/~istd/examples.html
- Plagiarism quiz at www.indiana.edu/~istd/test.html

If you still have questions, feel free to talk to me personally. There is nothing wrong with asking for help, whereas even unintentional plagiarism is a serious offense.

Citation style

It is important to properly cite any references you use in your assignments. The Department of Urban and Regional Planning uses Kate Turabian's *A Manual for Writers of Research Papers, Theses, and Dissertations*, Ninth edition (University of Chicago Press, 2016, ISBN 978 0226430577). Copies of older editions might be available in the SJSU King Library, which you can use. Additionally, the book is relatively inexpensive, and you may wish to purchase a copy. Please note that Turabian's book describes two systems for referencing materials: (1) "notes" (footnotes or endnotes), plus a corresponding bibliography, and (2) in-text parenthetical references, plus a corresponding reference list. The instructor prefers the latter.

Appendix

Chapter Titles: Babbie 13th edition

- Ch. 1: Human Inquiry and Science
- Ch 2: Paradigms, Theory and Social Research
- Ch 3: The Ethics and Politics of Social Research
- Ch 4: Research Design
- Ch 5: Conceptualization, Operationalization, and Measurement
- Ch 6: Indexes, Scales, and Typologies
- Ch 7: The Logic of Sampling
- Ch 8: Experiments
- Ch 9: Survey Research
- Ch 10: Qualitative Field Research
- Ch 11: Unobtrusive Research
- Ch 12: Evaluation Research
- Ch 13: Qualitative Data Analysis
- Ch 14: Quantitative Data Analysis
- Ch 15: The Logic of Multivariate Analysis
- Ch 16: Statistical Analyses
- Ch 17: Reading and Writing Social Research

Chapter Titles: Babbie 10th edition

- Ch.1: Human Inquiry and Science
- Ch 2: Paradigms, Theory and Social Research
- Ch 3: The Ethics and Politics of Social Research
- Ch 4: Research Design
- Ch 5: Conceptualization, Operationalization, and Measurement
- Ch 6: Indexes, Scales, and Typologies
- Ch 7: The Logic of Sampling
- Ch 8: Experiments
- Ch 9: Survey Research
- Ch 10: Qualitative Field Research
- Ch 11: Unobtrusive Research
- Ch 12: Evaluation Research
- Ch 13: Qualitative Data Analysis
- Ch 14: Quantitative Data Analysis
- Ch 15: The Elaboration Model
- Ch 16: Social Statistics
- Ch 17: Reading and Writing Social Research

Chapter Titles: Salkind 4th edition

- Ch 1. Statistics or Sadistics? It's Up to You Part II
- Ch 2. Means to an End: Computing and Understanding Averages
- Ch 3. Vive la Diff,rence: Understanding Variability
- Ch 4. A Picture Really Is Worth a Thousand Words
- Ch 5. Ice Cream and Crime: Computing Correlation Coefficients
- Ch 6. Just the Truth: An Introduction Understanding Reliability and Validity Part III
- Ch 7. Hypotheticals and You: Testing Your Questions
- Ch 8. Are Your Curves Normal? Probability and Why It Counts Part IV
- Ch 9. Significantly Significant: What It Means for You and Me
- Ch 10. Only the Lonely: The One-Sample Z Test
- Ch 11. t(ea) for Two: Tests Between the Means of Different Groups
- Ch 12. t(ea) for Two (Again): Tests Between the Means of Related Groups
- Ch 13. Two Groups Too Many? Try Analysis of Variance

- Ch 14. Two Too Many Factors: Factorial Analysis of Variance
- Ch 15. Cousins or Just Good Friends? Testing Relationships Using the Correlation Coefficient
- Ch 16. Predicting Who'll Win the Super Bowl: Using Linear Regression
- Ch 17. What to Do When You're Not Normal: Chi-Square and Some Other Nonparametric Tests
- Ch 18. Some Other (Important) Statistical Procedures You Should Know About
- Ch 19. A Statistical Software Sampler Part V
- Ch 20. The Ten (or More) Best Internet Sites for Statistics Stuff
- Ch 21. The Ten Commandments of Data Collection

Chapter Titles: Salkind 2nd edition

- Ch 1. Statistics or Sadistics? It's Up to You Part II
- Ch 2. Means to an End: Computing and Understanding Averages
- Ch 3. Vive la Diff,rence: Understanding Variability
- Ch 4. A Picture Really Is Worth a Thousand Words
- Ch 5. Ice Cream and Crime: Computing Correlation Coefficients Part III
- Ch 6. Hypotheticals and You: Testing Your Questions
- Ch 7. Are Your Curves Normal? Probability and Why It Counts Part IV
- Ch 8. Significantly Significant: What It Means for You and Me
- Ch 9. t(ea) for Two: Tests Between the Means of Different Groups
- Ch 10. t(ea) for Two (Again): Tests Between the Means of Related Groups
- Ch 11. Two Groups Too Many? Try Analysis of Variance
- Ch 12. Two Too Many Factors: Factorial Analysis of Variance
- Ch 13. Cousins or Just Good Friends? Testing Relationships Using the Correlation Coefficient
- Ch 14. Predicting Who'll Win the Super Bowl: Using Linear Regression
- Ch 15. What to Do When You're Not Normal: Chi-Square and Some Other Nonparametric Tests
- Ch 16. Just the Truth: An Introduction Understanding Reliability and Validity
- Ch 17. Some Other (Important) Statistical Procedures You Should Know About
- Ch 18. A Statistical Software Sampler Part V
- Ch 19. The Ten Best Internet Sites for Statistics Stuff
- Ch 20. The Ten Commandments of Data Collection

Chapter Titles: Agresti and Finlay 4th edition

- Ch 1. Introduction
- Ch 2. Sampling and Measurement
- Ch 3. Descriptive statistics
- Ch 4. Probability Distributions
- Ch 5. Statistical inference: estimation
- Ch 6. Statistical Inference: Significance Tests
- Ch 7. Comparison of Two Groups
- Ch 8. Analyzing Association between Categorical Variables
- Ch 9. Linear Regression and Correlation
- Ch 10. Introduction to multivariate Relationships
- Ch 11. Multiple Regression and Correlation
- Ch 12. Comparing groups: Analysis of Variance (ANOVA) methods
- Ch 13. Combining regression and ANOVA: Quantitative and Categorical Predictors
- Ch 14. Model Building with Multiple Regression
- Ch 15. Logistic Regression: Modeling Categorical Responses
- Ch 16. Introduction to Advanced Topics

Chapter Titles: Agresti and Finlay 3rd edition

- Ch 1. Introduction
- Ch 2. Sampling and Measurement
- Ch 3. Descriptive statistics

- Ch 4. Probability Distributions
- Ch 5. Statistical inference: estimation
- Ch 6. Statistical Inference: Significance Tests
- Ch 7. Comparison of Two Groups
- Ch 8. Analyzing Association between Categorical Variables
- Ch 9. Linear Regression and Correlation
- Ch 10. Introduction to multivariate Relationships
- Ch 11. Multiple Regression and Correlation
- Ch 12. Comparing groups: Analysis of Variance methods
- Ch 13. Combining regression and ANOVA: Analysis of Covariance
- Ch 14. Model Building with Multiple Regression
- Ch 15. Logistic Regression: Modeling Categorical Responses
- Ch 16. Introduction to Advanced Topics