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

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      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:


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


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:


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.

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

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”)

5 of 12
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 10. Only the Lonely: The One-Sample Z Test
Ch 11. (ea) for Two: Tests Between the Means of Different Groups
Ch 12. (ea) for Two (Again): Tests Between the Means of Related Groups
Ch 13. Two Groups Too Many? Try Analysis of Variance
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. (tea) 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 (or More) 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