

Professor: Keith Robinson

Main Lecture: Online

Office Hours: Wed 2-3pm

Email: Keithrob@marshall.usc.edu

Course Description

This course is intended to give you the statistical toolkit which has become essential for modern day business. You will learn how to manipulate data, apply the fundamentals of probability, test basic hypotheses, and perform regression.

To practice using these tools in realistic settings, you will apply these techniques in Excel---perhaps the most ubiquitous and important data management tool on the market. You do not need any mathematical background beyond high school algebra to succeed in this class.

The course meets in person. Each week, students attend two main lectures and one discussion session.

Course Learning Objectives

By the end of the course, students will be able to:

Understand statistics theory:

1. Describe and visualize data,
2. Model outcomes using probability distributions,
3. Perform hypothesis tests,
4. Perform simple and multiple regression analysis,
5. Critique statistical analysis run by others,

Perform statistics in practice:

6. Understand the foundations of data storage and access on computers,
7. Implement statistical analysis in Excel,
8. Clean data to prepare for analysis,
9. Create business plans supported by statistical analysis,
10. Collaborate with others to answer complex business questions,
11. Understand the ethical guidelines for statistical practice,

Communicate to others about their statistical analysis:

12. Create presentations that are engaging and incorporate statistics,
13. Write reports describing data and communicating your findings,
14. Draft professional quantitative emails.

These course level objectives support the six Marshall Program Learning Goals to varying degrees. Details may be found in the Appendix of this syllabus.

Materials

The course textbook is *OpenIntro Statistics* (Fourth Edition) by David Diez, Mine Çetinkaya-Rundel, and Christopher D Barr. The book is available at no cost (or an optional donation to support the authors) at <https://www.openintro.org/book/os/> AND is posted on our main Brightspace page in the Content area.

Prerequisites and/or Recommended Preparation:

No mathematical background beyond high school algebra is required.

Course Notes:

Course materials are posted on Brightspace.

Software:

Excel:

- **If you don't have Excel:** Students can take advantage of the free version of Office 365 that USC provides to students, which includes MS Excel 365. The free Microsoft USC Office Suite can be downloaded from <http://itservices.usc.edu/officestudents/>.
- **If you have a Mac:** you need to have either the Mac version of Excel 2016 or you can use the PC version by installing Boot Camp (free from Apple) - or other Windows emulation software for Mac - and Windows, or by using the Marshall Virtual Lab.

Excel Add-ins:

- **The Analysis ToolPak:** This package allows students to perform regressions and run analysis quickly using Excel. It can be accessed in the PC environment by clicking on File/Options/Add-ins/Go, checking Analysis ToolPak and clicking OK. The procedure is similar for Macs. Other statistical add-ins may be encouraged for specific applications.

Statistics Competition:

Toward the end of the semester, there is an optional statistics competition where you can show your best analysis to a panel of judges. More details regarding the competition will come later in the semester.

Grading

This class is split into four modules. Each module has one exam and one portfolio project. Each week, you will be assigned preparatory material and a homework assignment. At the end of the course, you will refine your four portfolio projects into one comprehensive portfolio piece suitable for applying to jobs.

These deliverables contribute to your grade as follows:

1. EXAMS	35%
2. PORTFOLIO PROJECTS	35%
3. HOMEWORK	20%
4. PREPARATION AND PARTICIPATION	10%

The weights listed above will be used to calculate your overall score for the class. Final grades represent how you perform in the class relative to other students. Two items are considered when assigning final grades:

1. Your total weighted score for all assignments and exams.
2. Your rank among all students in the class.

1. EXAMS

At the end of each module, you will be given a multiple-choice exam which assesses your understanding of the material.

If you miss an exam, you will receive a grade of zero unless you have a written excuse from your doctor or the University.

2. PORTFOLIO PROJECTS

Each module, you will be assigned a portfolio project which is due on Brightspace when the module is completed. The portfolio project is designed to guide you through independent statistical analysis in a subject area of your own interest. The final component of each project asks you to reflect on the statistical tool you felt strongest with in the module and explain how your mastery of that tool is valuable in the workplace.

Portfolio project instructions and rubrics will be posted on Brightspace. They will be graded on the thoroughness of your analysis and the quality of the conclusions you draw from that analysis, as outlined in the rubrics. Late submissions for portfolio projects are penalized 20% per day late after the deadline.

3. HOMEWORK

You will be assigned 7-10 homework assignments throughout the course. Homework assignments are due Sundays at midnight. These homework assignments will allow you to practice implementing the skills you learn in class on a realistic dataset. Then, you will summarize your results and use them to make decisions in realistic business settings. Late submissions are penalized 20% per day late. These homework assignments are designed to build the skills you need to succeed on your portfolio project.

All homework assignments are to be submitted on Brightspace. Guidelines for submission, such as submission format, will be posted on Brightspace when the assignment is given out.

4. PREPARATION & PARTICIPATION

You will be assigned preparation material on Brightspace each week. A brief quiz is associated with the preparatory material to confirm that it was completed. **It is expected that students will have completed all required activities and assignments before attending their class sessions each week.**

You are expected to attend all classes and participate in class activities. In addition to providing expanded explanations and examples of important statistical analysis concepts, the discussion sessions also present you with the opportunity to pose questions. Being present and active during in-class activities constitutes participation in the course.

Collaboration Policy:

Discussion of homework problems is permitted and encouraged; however, each student is required to prepare and submit his or her solutions, including computer work, independently.

Collaboration of any sort on exams is prohibited and will, at minimum, result in a 0 on that exam.

Add/Drop Process:

Please note that the last day to register and add classes is **Jan 31**. The last day to drop a class without a mark of “W” is **Jan 31** and receive a tuition refund. The last day to drop a class without a mark of “W” is **Feb 4**. The last day to drop with a mark of W is **April 11**. For more information, visit <https://classes.usc.edu/term-20251/registration-calendar/>

Open Expression and Respect for All

An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one’s beliefs. In this course we will support the values articulated in the USC Marshall “[Open Expression Statement](https://www.marshall.usc.edu/open-expression-statement)” (<https://www.marshall.usc.edu/open-expression-statement>).

Academic Integrity

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university’s mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services \(OSAS\)](#) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

Class Notes Policy

Notes or recordings made by students based on a university class or lecture may only be made for purposes of individual or group study, or for other non-commercial purposes that reasonably arise from the student's membership in the class or attendance at the university. This restriction also applies to any information distributed, disseminated or in any way displayed for use in relationship to the class, whether obtained in class, via email or otherwise on the Internet, or via any other medium. Actions in violation of this policy constitute a violation of the Student Conduct Code, and may subject an individual or entity to university discipline and/or legal proceedings.

AI Use Policy

In this course, I allow you to use artificial intelligence (AI)-powered programs to help you with some assignments; for those assignments, we will explicitly tell you that AI is permitted. Otherwise, use of AI tools is not permitted. You should also be aware that AI text generation tools may present incorrect information, biased responses, and incomplete analyses; thus they are not yet prepared to produce text that meets the standards of this course. To adhere to our university values, you must cite any AI-generated material (e.g., text, images, etc.) included or referenced in your work and provide the prompts used to generate the content. Using an AI tool to generate content without proper attribution will be treated as plagiarism and reported to the Office of Academic Integrity. Please review the instructions in each assignment for more details on how and when to use AI Generators for your submissions.

AI use is not permitted on exams and will result in a report to the Office of Academic Integrity.

Classroom Zoom Policy (if and when applicable)

This class will meet in person. However, if unforeseen circumstances move instructional time online, we will meet over Zoom. A link and instructions to join the Zoom sessions will be posted in the Brightspace Course Pages. For more information about Zoom, go to: [Zoom Support Tutorials](#)

1. Class attendance and participation is important in developing a coherent view of the materials covered in the course. Unless accommodated as described in (b) below, attendance and active participation is expected at the synchronous Zoom class sessions.

- a. Students are expected to have cameras on during the synchronous Zoom sessions, and preferably use headsets or earphones to ensure the best audio quality. *Please advise me if you have circumstances under which you will not be able to meet these expectations.*
 - b. For students who are located in a time zone where the synchronous class sessions or exams fall outside the window of 8 a.m. to 10 p.m. in your local time zone, please contact me. You will not be penalized for not attending the live Zoom class sessions. The Zoom sessions will be recorded and posted on Brightspace, and you will be responsible for watching the recorded sessions. Exams and other synchronous assessments will be scheduled for students to be able to complete the assessment between 8 a.m. and 10 p.m. in your local time zone.
 - c. *[If applicable]* In addition, for any student who does not attend the Zoom session live, you will be required to complete the following assignment as an alternate method of contribution to the class: *[insert; or see one sample below]*
2. During synchronous Zoom sessions, the following netiquette is expected, as if you were in a physical classroom.
 - a. Please do:
 - i. Log into class early or promptly
 - ii. Arrange to attend class where there is a reliable internet connection and without distractions
 - iii. Dress respectfully. Video conference business meetings are and will be the norm, so practice your professional telepresence.
 - iv. If you use a virtual background, please keep it respectfully professional.
 - v. Display both your first and last name during video conferencing and synchronous class meetings.
 - vi. Respectfully minimize distractions by muting and or turning off video if necessary and when appropriate.
 - vii. Engage in appropriate tone and language with instructors and classmates.
 - b. Please try not to:
 - i. Engage in a simultaneous activity not related to the class.
 - ii. Interact with persons who are not part of the class during the class session.
 - iii. Leave frequently or not be on camera for extended periods of time.
 - iv. Have other persons or pets in view of the camera.
 - v. Use all CAPITAL LETTERS in emails or discussion board postings. This is considered "shouting" and is seen as impolite or aggressive.
 - vi. Use more than one punctuation mark, this is also considered aggressive!!!!
3. All Zoom sessions will be recorded and posted in the Brightspace Course pages.

Class Technology Requirements (when applicable)

The following equipment and system requirements are recommended to successfully participate in this online course:

- Computer with webcam
- Earphones or headset
- Reliable (preferably high speed) Internet connection
- Current operating system for Windows or Mac
- Current browser

- Google Chrome
- Firefox
- Internet Explorer (not recommended)
- Safari (Mac)

For technical support please see:

- **USC Systems** (Brightspace, USC Login, MyUSC, USC Gmail, GoogleApps)
For assistance with your USC login or other USC systems, please call +1 (213) 740-5555 or email Consult@usc.edu. They are open Mon – Fri 9:30am – 5pm and weekends from 8am - 5pm (all Pacific time).
- **Zoom Video Web Conferencing System** (MarshallTALK)
For assistance using Zoom, go to [Zoom Support Page](#). You may also call +1 (888) 799-9666 ext. 2. They are available 24/7.
- **Marshall Systems** (MyMarshall, Marshall Outlook email)
For assistance with Marshall systems you can call +1 (213) 740-3000 Mon-Fri 8am-6pm (Pacific), email HelpDesk@marshall.usc.edu, or use our self-help service portal as shown below. The portal allows you to get immediate assistance by searching for the information you need. You can also use it to chat with a technician or input a request. To access the service portal, follow these steps:
 - On a computer or mobile device, go to [MyMarshall Home Page](#) and click the “**Help**” link on the upper right.
 - Log in using your Marshall username and password.
(If you don’t know your Marshall login please follow the onscreen instructions pertaining to login issues)

If your computer does not have Microsoft Word, Office 365 package is available to you free of charge and allows you to install Word, Excel, PowerPoint, Outlook, OneNote, Publisher, and Access on up to 5 PCs or Macs and Office apps on other mobile devices including tablets. Office 365 also includes unlimited cloud storage on OneDrive. To download Office 365 log into your student (University) email through a web browser, choose Settings (top right corner), and select software. If you have further questions or need help with the software, please contact the USC ITS service portal.

Emergency Preparedness/Course Continuity

If an officially declared emergency makes travel to campus infeasible, USC Emergency Information (<https://www.usc.edu/emergency/>) will provide safety and other updates, including ways in which instruction will be continued by means of Brightspace, teleconferencing, and other technology.

Course Schedule

Date	Week #	Subject	Assignment Given	Due Date
5/21/2025	1	Introduction, organizing data, cleaning data, using Excel		
5/26/2025	2	Descriptive statistics	HW #1 Assigned	6/2/2025
5/28/2025	2	Visualizations		
6/2/2025	3	Cutting and splitting data		
6/4/2025	3	Module 1 Exam	Portfolio Project 1 Assigned	6/18/2025
6/9/2025	4	Introduction to probability, empirical distributions		
6/11/2025	4	Named probability distributions, Triangle distribution	HW #2 Assigned	6/18/2025
6/16/2025	5	Normal distribution		
6/18/2025	5	T distribution, Binomial distribution		
6/23/2025	6	Module 2 Exam	Portfolio Project 2 Assigned	7/9/2025
6/25/2025	6	Sampling and the Central Limit Theorem		
6/30/2025	7	Hypothesis test basics	HW #3 Assigned	7/7/2025
7/2/2025	7	Tests of means: Normal and T		
7/4/2025	Holiday	No Class: Independence Day		
7/7/2025	8	Tests of proportions: Normal		
7/9/2025	8	Tests of distributions: Chi-square	HW #4 Assigned	7/16/2025
7/14/2025	9	Two-sample hypothesis tests		
7/16/2025	9	ANOVA		

7/21/2025	10	Module 3 Exam	Portfolio Project 3 Assigned	8/4/2025
7/23/2025	10	Transforming data and troubleshooting regressions		
7/28/2025	11	Transforming data and troubleshooting regressions (continued)	HW #5 Assigned	8/4/2025
7/30/2025	11	Multiple regression: adding variables		
8/4/2025	12	Multiple regression: adding variables (continued)		
8/6/2025	12	Adding dummy variables into regressions	HW #6 Assigned	8/13/2025
8/11/2025	13	Multicollinearity concerns		
8/13/2025	13	Multicollinearity concerns continued / Review		
8/18/2025	14	Module 4 Exam	Portfolio Project 4 Assigned	8/18/2025

APPENDIX I
How BUAD310 Applied Business Statistics Contributes to Student Achievement of
Marshall's Six Undergraduate Program Learning Goals

Goal	Marshall Program Learning Goal	BUAD310 Course Objectives that support this goal
1	<p>Our graduates will demonstrate critical thinking skills so as to become future-oriented decision makers, problem solvers and innovators.</p> <p>Specifically, students will:</p> <p>1.1 Students will understand the concepts of critical thinking, entrepreneurial thinking and creative thinking as drivers of innovative ideas (not explicit for this course).</p> <p>1.2 Critically analyze concepts, theories and processes by stating them in their own words, understanding key components, identifying assumptions, indicating how they are similar to and different from others and translating them to the real world.</p> <p>1.3 Be effective at gathering, storing, and using qualitative and quantitative data and at using analytical tools and frameworks to understand and solve business problems.</p> <p>1.4 Demonstrate the ability to anticipate, identify and solve business problems. They will be able to identify and assess central problems, identify and evaluate potential solutions, and translate a chosen solution to an implementation plan that considers future contingencies.</p>	<p>1. Describe and visualize data</p> <p>2. Model outcomes using probability distributions</p> <p>3. Perform hypothesis tests</p> <p>4. Perform simple and multiple regression analysis</p> <p>5. Critique statistical analysis run by others</p> <p>6. Understand the foundations of data storage and access on computers</p> <p>7. Implement statistical analysis in Excel</p> <p>8. Clean data to prepare for analysis</p> <p>9. Create business plans supported by statistical analysis</p> <p>10. Collaborate with others to answer complex business questions</p>
2	<p>Our graduates will develop people and leadership skills to promote their effectiveness as business managers and leaders in the 21st century's evolving work and organizational structures.</p> <p>Specifically, students will:</p> <p>2.1 Students will recognize, understand and analyze the roles, responsibilities and behaviors of effective managers and leaders in diverse business contexts e.g., functionally diverse, culturally diverse, geographically diverse, etc.</p> <p>2.2 Students will understand factors that contribute to effective teamwork including how to elicit, manage and leverage diverse perspectives and competencies.</p> <p>2.3 Students will recognize, understand, and analyze the motivations and behaviors of stakeholders inside and outside organizations (e.g., teams, departments, consumers, investors, auditors)</p>	<p>5. Critique statistical analysis run by others</p> <p>9. Create business plans supported by statistical analysis</p> <p>10. Collaborate with others to answer complex business questions</p> <p>11. Understand the ethical guidelines for statistical practice</p>
3	<p>Our graduates will be effective communicators to facilitate information flow in organizational, social, and intercultural contexts.</p> <p>Specifically, students will:</p> <p>3.1 Identify and assess diverse personal and organizational communication goals and audience information needs.</p> <p>3.2 Understand individual and group communications patterns and dynamics in organizations and other professional contexts.</p> <p>3.3 Demonstrate an ability to gather and disseminate information and communicate it clearly, logically, and persuasively in professional contexts.</p>	<p>12. Create presentations that are engaging and incorporate statistics,</p> <p>13. Write reports describing data and communicating your findings,</p> <p>14. Draft professional quantitative emails.</p>
4	<p>Our graduates will demonstrate ethical reasoning skills, understand social, civic, and professional responsibilities and aspire to add value to society.</p> <p>Specifically, students will:</p> <p>4.1 Understand professional codes of conduct.</p>	<p>11. Understand the ethical guidelines for statistical practice</p>

	4.2 Recognize ethical challenges in business situations and assess appropriate courses of action.	
5	<p>Our graduates will develop a global business perspective. They will understand how local, regional, and international markets, and economic, social and cultural issues impact business decisions so as to anticipate new opportunities in any marketplace. Specifically, students will:</p> <p>5.1 Understand how local, regional and global markets interact and are impacted by economic, social and cultural factors.</p> <p>5.2 Understand that stakeholders, stakeholder interests, business environments (legal, regulatory, competitor) and business practices vary across regions of the world.</p>	N/A
6	<p>Our graduates will understand types of markets and key business areas and their interaction to effectively manage different types of enterprises.</p> <p>Specifically, students will:</p> <p>6.1 Demonstrate foundational knowledge of core business disciplines, including business analytics and business economics.</p> <p>6.2 Understand the interrelationships between functional areas of business so as to develop a general perspective on business management.</p> <p>6.3 Apply theories, models, and frameworks to analyze relevant markets (e.g. product, capital, commodity, factor and labor markets).</p> <p>6.4 Show the ability to utilize technologies (e.g., spreadsheets, databases, software) relevant to contemporary business practices.</p>	<ol style="list-style-type: none"> 1. Describe and visualize data 2. Model outcomes using probability distributions 3. Perform hypothesis tests 4. Perform simple and multiple regression analysis 5. Critique statistical analysis run by others 6. Understand the foundations of data storage and access on computers 7. Implement statistical analysis in Excel 8. Clean data to prepare for analysis 9. Create business plans supported by statistical analysis 10. Collaborate with others to answer complex business questions 11. Understand the ethical guidelines for statistical practice 12. Create presentations that are engaging and incorporate statistics, 13. Write reports describing data and communicating your findings, 14. Draft professional quantitative emails.