About the Instructor

Contact information:

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Virtual Office Hours via Zoom:
7:00 – 8:00 pm (November 6, 13, 20, and December 4)

Welcome

Welcome to Statistical Modelling (BUS AD 7301). I am excited to teach this course because my passion is to solve business problems using statistical analyses. This course is the first in a series of method courses to equip DBA students with quantitative skills to conduct rigorous academic research. In this course, we examine key quantitative concepts and methods emphasizing applications. Topics explored include descriptive statistics, visualization, hypothesis testing, and regression analysis.

Instructor Bio

I am an Associate Professor of Digital and Social Media Marketing at the University of Missouri-St. Louis. I earned my Ph.D. in Marketing from UCLA in 2013. I teach Digital Marketing Strategies and Measurement (MBA), Marketing and Business Analytics (MBA), and Marketing Analysis (Undergraduate), as well as Statistical Modeling (DBA). My research interests include online word-of-mouth, online search, content analysis (text mining and LDA topic modeling), pricing of online products, advertising of experience products, and causal inference methods in time-series cross-section data. I use econometric/statistical models to understand how companies' marketing activities influence consumers in the real world. I use observational (versus lab experiments) data to conduct research. I have published in leading academic journals in marketing and business, such as *Journal of the Academy of Marketing Science, International Journal of Research in Marketing, Journal of Business Ethics, Journal of Interactive Marketing*, and *European Journal of Marketing*. My research has been featured in various outlets, including [Harvard Business School's *Working Knowledge*](#), [*Forbes*](#), [*Huffington Post*](#), and [*The Globe and Mail*](#). I was also invited by the [*Maeil Business Newspaper*](#) (South Korea's leading business daily) to introduce my 2017 *Journal of Interactive Marketing* paper for practitioners. I am a recipient of the 2019 Emerald Literati Award and the 2019 Durand Award for Research Excellence. If you want to know more about my research, please visit [Google Scholar](#) or [my UMSL home page](#).

About the Course

Course Materials
1. The Canvas course site (https://umsystem.instructure.com/courses/272972): Canvas is a learning management system that UMSL uses for online teaching and learning. The Statistical Modeling course has a designated place in Canvas where you can find course materials, including lecture slides, videos, discussion forums, and assignments. **I will publish the course on Monday, October 14**, and you

should be able to access all the materials. I will send a separate video that explains how to navigate the site.

2. Textbook ([McEvoy (2018)](#)) and Coursepack (https://hbsp.harvard.edu/coursepacks/1165792): McEvoy (2018) is a short and easy-to-understand statistics guidebook without dense mathematics. The coursepack includes four business cases/statistical exercises we will solve together. The DBA program will distribute the book and the coursepack during the orientation on November 1.

3. BlueSky Statistics and R: For statistical analyses, we will use BlueSky Statistics (https://blueskystatistics.com) and R (https://www.r-project.org/). BlueSky Statistics performs various statistical analyses, including all the analyses in this course. It has a graphical user interface that helps statistics novices easily apply statistical methods. R is arguably the most popular statistical analysis tool in business academia and is the software that you will use in Quantitative Research Methods I & II (BUS AD 7101 & 7103). While R is used optionally in this course, I strongly encourage you to watch the R practice videos in Canvas and replicate them. **Please follow the installation instructions in Canvas and install the software programs before joining the first residency class**.

Course Description

As the first course of quantitative research methods in the UMSL DBA program, this course covers basic statistical concepts and techniques and their application. Students will learn how to formulate quantitative research questions, identify and apply the most appropriate statistical methods to answer the questions, and interpret the results.

Course Objectives

- Quantitative Research Process
  - Explain how quantitative research is conducted, from discovering a research question to presenting research findings.
  - Identify how published research projects use the six-step quantitative research process.
- Statistical Concepts and Methods
  - Explain statistical concepts and techniques required to conduct quantitative research: exploratory data analysis, statistical significance, p-value, t-test, chi-square test, and regression analysis.
  - Identify and apply the most appropriate statistical method to answer a research question.
- BlueSky and R
  - Demonstrate competence in using BlueSky and R to solve data analysis problems.

Assessment/Grading

Grade Composition: The course grade will be based on the Final Assessment Test in the Harvard Quantitative Method Online Course and three assignments.

- The Harvard Quantitative Method Online Course Final Assessment Test (2%)
  a. The Harvard Quantitative Method Online Course has two final assessment tests. I will use the higher of the two scores for your course grade. Please also remember that you must complete the tests and earn at least 60 points to pass this course.
- Statistical Analysis Series (40%)

a. Exploratory Data Analysis for Quality Alloys: In this assignment, you will work on the Quality Alloys case in your coursepack. You will use descriptive statistics and visualization tools to analyze the QA data of weekly web traffic and sales. Check [Statistical Analysis Series] EDA of Quality Alloys, Inc Data for detailed information.
b. A/B testing for RestaurantGrades: In this assignment, you will work on the RestraurantGrades case in your coursepack. RestaurantGrade is a fictitious online review platform for restaurants with online reviews written by ordinary restaurant-goers. RG has run randomized controlled experiments with a control group and two treatment groups to assess the efficacy of alternative ad designs. Your job is to identify the correct statistical test, apply it to the collected data, and interpret the test results to find the most effective ad design. Check [Statistical Analysis Series] t-Tests of RestaurantGrades Data for detailed information.
c. Regression Analysis for GoodBelly: In this assignment, you will work on the GoodBelly case in your coursepack. GoodBelly is a line of probiotic juice products produced by Colorado-based NextFoods, Inc. GoodBelly conducted a series of in-store demonstrations and endcap displays to boost its sales. Your job is to run regression analyses to find whether in-store demos and endcap displays increased GoodBelly sales and by how much. Check for [Statistical Analysis Series] Regression Analysis (GoodBelly) for detailed information.

- Real Research Series (18%): There will be four discussion forums that ask how real academic research uses the statistical methods you learned in this course.
- Group Assignment (40%)
  a. In this assignment, you will pick one of eight papers or dissertations and summarize how the paper or dissertation applied the six steps of the Quantitative Research Process. **This is a group assignment where a group consists of three students**. Only one submission per group is required. Check [Group Assignment] Identifying the Six Steps of Quantitative Research Process in a Serious Academic Research Project for detailed information.

Final Grade Calculation: Your final course grade will be a percentage based on your total points earned from the above assignments. You can find the specific percentage values corresponding to each letter grade in the table below. UMSL's graduate school does not recognize D or lower grades for graduate courses, so any grade below C- will be listed as an F.

Letter Grade	Percentage	Letter Grade	Percentage
A	$X \geq 93\%$	C+	$77\% \leq X < 80\%$
A-	$90\% \leq X < 93\%$	C	$73\% \leq X < 77\%$
B+	$87\% \leq X < 90\%$	C-	$70\% \leq X < 73\%$
B	$83\% \leq X < 87\%$	F	$X < 70\%$
B-	$80\% \leq X < 83\%$		

Note: X is your course numeric score.

Topics and Schedule

Topic 1: Variables, Data, and Quantitative Research Process
Learning Objectives
- Explain how categorical and numerical variables differ and how different measurement levels (or measure scales) are used.
- Identify how academic papers and dissertations implement the six steps of the quantitative research process to conduct research.

Reading
- McEvoy (2018), Chapter 1 (pp. 1 – 17)

Topic 2: Exploratory Data Analysis (November Residency Topic)
Learning Objectives
- Contrast the definitions and usage of various descriptive statistics.
- Identify and apply appropriate descriptive statistics to answer your research questions.
- Contrast the definitions and usage of various visualization tools, including histogram, boxplot, and scatter plot.
- Identify and apply the most appropriate visualization methods to achieve the analysis objectives.
- Use BlueSky or R to compute descriptive statistics and create various graphs and charts to find managerially relevant insights.

Reading
- Quality Alloys case (pp. 1 – 4, before the Assignment section on Page 4)
- McEvoy (2018), Chapter 3 (pp. 19 – 30)

Suggested Pre-Residency Self-Study Schedule in Canvas (Complete Before Coming to Class on Nov. 2)

Date	Topic	Learning Materials and Reading
Oct. 14 – Nov. 1	Variables, Data, and Quantitative Research Process Descriptive Statistics	McEvoy (2018), Chapters 1 & 3. Quality Alloys case (pp. 1 – 4, before the Assignment section on Page 4) VoiceThread Lecture in Canvas

* More detailed information can be found in Canvas

Residency Activity (on Nov. 2)
1. Lecture on Exploratory Data Analysis
2. Solve the Quality Alloys case together using Bluesky
3. Introduction to Assignments #1

Topic 3: Statistical Hypothesis Tests
Learning Objectives
- Explain the concepts related to statistical hypothesis tests: null and alternative hypotheses, p-value, significance level, and types of errors.
- Develop the null and alternative hypotheses for a given problem.
- Identify the correct statistical test method for a given problem.
- Use BlueSky or R to conduct statistical hypothesis tests and interpret the results.

Reading
- McEvoy (2018): Chapters 2, 8, 9, and 10 (pp. 9 – 18, 89 – 132)
- RestaurantGrades case (included in the HBSP coursepack)

Topic 4: Regression Analysis
Learning Objectives
- Explain the various concepts in regression analysis.
- Identify the research problems that can be best solved with regression analysis.
- Develop a linear regression model to answer a business question.
- Conduct a regression analysis in BlueSky, interpret the results, and find managerial insights.
- Use BlueSky or R to conduct regression analyses and interpret the results.

Reading
- McEvoy (2018): Chapters 11 and 12 (pp. 133 – 164)
- GoodBelly case (included in the HBSP coursepack)

Suggested Pre-Residency Self-Study Schedule in Canvas (Complete Before Coming to Class on Dec. 6)

Date	Topic	Learning Materials and Reading
Nov. 4 – Nov. 10	Statistical Hypothesis Test I	McEvoy (2018), Ch. 2, 8, 9, & 10
Nov. 11 – Nov. 17	Statistical Hypothesis Test II	RestaruantGrades case VoiceThread Lecture in Canvas
Nov. 18 – Nov. 24	Regression Analysis I	McEvoy (2018), Ch. 11 & 12
Nov. 25 – Dec. 5	Regression Analysis II	GoodBelly case VoiceThread Lecture in Canvas

* More detailed information in Canvas

Residency Activity (Dec. 6)
1. Reviewing assignments

Residency Activity (Dec. 7)
1. Reviewing assignments
2. Presenting group project
3. Course wrap-up

Additional Course Policies

Participation
- You must be present during each residency, as we will cover critical material during these periods.

Assignments and Due Date
- Successful completion of this course requires that you keep up with all assignments. We will cover a lot of materials, and late assignments may make it difficult for you to keep up with the new material you will be learning.
- As noted in Canvas, assignments are due by midnight on the assignment due date. You must turn in the assignments on time.

Course Materials, Intellectual Property, and Recordings
- Course materials are available exclusively for your learning in this course. You are free to watch the course videos and Voice Thread® lectures as many times as you like through Canvas while you are enrolled in the course as a student. You can also keep any handouts and data sets distributed through Canvas and the Harvard Business School coursepack for your personal use.
- **Please do not share course handouts, datasets, videos, assignments, or any other materials from this course with any other parties unless you have obtained prior written consent from the instructor.**
- Please speak with me to obtain written permission before recording any class activity. It violates university policy to create and distribute such recordings without prior authorization and the consent of all recorded others.

Academic Integrity/Plagiarism
- You are responsible for being attentive to and observant of University policies about academic honesty, as stated in the Code of Student Conduct found in the UMSL Bulletin.
- Academic dishonesty is a serious offense that may lead to probation, suspension, or dismissal from the University. One form of academic dishonesty is plagiarism – using an author's ideas, statements, or approaches without crediting the source. Academic dishonesty also includes cheating by using any unauthorized sources of information, providing or receiving unauthorized assistance on any form of academic work, and engaging in any behavior specifically prohibited by the faculty member (e.g., copying someone else's answers on tests). Unauthorized possession or distribution of academic materials is another type of academic misconduct. It includes the unauthorized use, selling, or purchasing of examinations or other academic work, using or stealing another student's work, unauthorized entry or use of material in a computer file, and using information from or possessing exams that an instructor did not authorize for release to students. Falsification is any untruth, either verbal or written, in one's academic work. Facilitation is knowingly assisting another to commit an act of academic misconduct. **Plagiarism, cheating, and falsification are not acceptable.**
- All instances of academic dishonesty will be reported to the Office of Academic Affairs, which will determine whether you will appear before the Student Conduct Committee for possible administrative sanctions such as dismissal from the university. The instructor will make an academic judgment about the student's grade on that work in this course. The campus process regarding academic dishonesty is described on the Academic Affairs website.

Title IX Policies

- **Mandatory Reporting:** Under Title IX, I am obligated to report any incidents of sexual harassment, sexual misconduct, sexual assault, or gender discrimination to the Student Affairs office and/or other University officials. This ensures that all parties are protected from further abuses and that victim(s) are supported by trained counselors and professionals. Please visit UMSL's [Title IX/Equity Website](#) for more information.

Technical Support

Canvas

If you have problems logging into your online course or an issue within the course site, don't hesitate to contact the Technology Support Center:

- Phone: (314) 516-6034
- Email: helpdesk@umsl.edu
- Website: http://www.umsl.edu/technology/tsc/

If you are having difficulty with a technology tool in Canvas, consider visiting the [Canvas Student Guides](#), which has overviews of each tool and tutorials on how to use them.