Welcome
Welcome to Statistical Modelling (BUS AD 7301). I am so excited to teach the course because my passion is to solve business problems using statistical analysis. This course is the first in a series of methods courses designed to provide doctoral students with the skills to conduct rigorous academic research. In this course, we examine key quantitative concepts and methods with emphasis on application. 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 University of Missouri-St. Louis. I earned my Ph.D. in Marketing from UCLA in 2013. Since 2015, I have been teaching Digital Marketing Strategies and Measurement (MBA), Marketing and Business Analytics (MBA), and Marketing Analysis (Undergraduate). I also teach Statistical Modeling for DBA students, starting Fall 2021. My research interests include online word-of-mouth, online search, content analysis (text mining and LDA topic modeling), pricing of online products, and advertising of experience products. I use econometric/statistical models to understand how companies’ marketing activities influence consumers in the real world. I mainly 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 at 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* (a 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 professional activities, please visit my home page.

About the Course

Course Materials
1. The Canvas course site ([https://umsystem.instructure.com/courses/24240](https://umsystem.instructure.com/courses/24240)): Canvas is a learning management system that UMSL uses for online teaching. The Statistical Modeling course has a designated site in Canvas ([https://umsystem.instructure.com/courses/24240](https://umsystem.instructure.com/courses/24240)) where you can find the lecture videos and
slides. The site will be published on October 22, and you should be able to access all the materials in the site. I will send a separate video that explains how to navigate the site.

2. Textbook (McEvoy [2018]) and Coursepack (https://hbsp.harvard.edu/import/864779): The DBA program will distribute the book and coursepack during the orientation on November 5. McEvoy (2018) is a short, intuitive, easy-to-understand statistics guidebook without dense mathematics, and the coursepack includes the three business cases that we will solve together by applying statistical methods.

3. IBM SPSS Statistical Software: For statistical computations, we will use IBM SPSS. IBM SPSS is user-friendly and performs various statistical analyses, including all the statistical methods that we will use in this course. As a UMSL student, you can use the software free of charge. We will download and install the software during the November residence.

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 in rich contextual settings designed to provide a frame of reference for learning at a deeper level. Students will learn how to formulate quantitative research questions, apply various statistical methods to answer the questions, and interpret the results.

Course Objectives
• Quantitative Research Process
  o Explain how quantitative research is conducted from the discovery of research questions to the presentation of research findings
  o Identify how a published research project used the six-step quantitative research process
• Statistical Concepts and Methods
  o Explain essential statistical concepts and techniques required to conduct quantitative research: exploratory data analysis, statistical significance, p-value, t-test, chi-square test, regression analysis.
  o Identity and apply the most appropriate statistical method to answer a given research question.
• SPSS
  o Demonstrate competence in using SPSS 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 three assignments and their detailed information will be provided in Canvas.

• The Harvard Quantitative Method Online Course Final Assessment Test (30%)
  a. As you may remember, there were two Final Assessment Tests. I will use the higher for your grade. (Note: The minimum pass score is 60 points)
• Assignment #1 (30%, Due: Nov. 14)
  a. In this assignment, you will work on the Quality Alloys, Inc. case in your coursepack. Quality Alloys is US-based distributor of alloys used in industrial manufacturing. The company created a website and conducted a promotion to attract web traffic and increase sales. You will use summary statistics and
visualization tools to analyze the QA data of weekly web traffic and sales. **This is a group assignment where a group consists of four students.** Only one submission per group is required.

- **Assignment #2 (30%, Due: Nov. 21)**
  a. In this assignment, you will work on the RestaurantGrades 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 test the efficacy of alternative ad designs. Your job is to identify the correct statistical test, apply it to the collected data in SPSS, and interpret the test results to find the most effective ad design. **This is a group assignment where a group consists of four students.** Only one submission per group is required.

- **Assignment #3 (10%, Due: Nov. 28)**
  a. In this assignment, you will pick one of eight papers/dissertations designated for Assignment #2 and summarize how the paper/dissertation of your choice applied the six steps Quantitative Research Process. **This is a group assignment where a group consists of four students.** Only one submission per group is required.

**Final Grade Calculation:** Your final course grade will be computed as a percentage based on your total points earned from the above assignments. The specific percentage values corresponding to each letter grade can be found 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 F.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>$X \geq 93%$</td>
</tr>
<tr>
<td>A-</td>
<td>$90% \leq X &lt; 93%$</td>
</tr>
<tr>
<td>B+</td>
<td>$87% \leq X &lt; 90%$</td>
</tr>
<tr>
<td>B</td>
<td>$83% \leq X &lt; 87%$</td>
</tr>
<tr>
<td>B-</td>
<td>$80% \leq X &lt; 83%$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C+</td>
<td>$77% \leq X &lt; 80%$</td>
</tr>
<tr>
<td>C</td>
<td>$73% \leq X &lt; 77%$</td>
</tr>
<tr>
<td>C-</td>
<td>$70% \leq X &lt; 73%$</td>
</tr>
<tr>
<td>F</td>
<td>$X &lt; 70%$</td>
</tr>
</tbody>
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Note: $X$ is your course numeric score.

**Class Format**

**COURSE STRUCTURE AND STUDENT ACTIVITIES**

- **Face-to-Face Class on Campus**
  - Students review class materials, discuss assignments, and solve assigned cases together
- **Asynchronous Online Class in Canvas**
  - Students self-study in Canvas and complete assignments
  - Read the assigned cases, textbook chapters, and other materials
  - Watch lecture videos
  - Complete assignments
November Residence Topics and Schedule

**Topic 1: Variables, Data, and Quantitative Research Process**

**Learning Objectives**
- Explain how categorical variables differ from numerical variables and how different levels of measurement 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**

**Learning Objectives**
- Contrast the definitions and usage of various descriptive statistics.
- Identify and apply appropriate descriptive statistics to answer your specific 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 IBM SPSS 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-Residence Self-Study Schedule in Canvas (Complete Before Coming to Class on Nov. 5)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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</thead>
<tbody>
<tr>
<td>Oct. 22 – Nov. 4</td>
<td>Variables, Data, and Quantitative Research Process</td>
<td>McEvoy (2018), Chapters 1 &amp; 3. Quality Alloys case (pp. 1 – 4, before the Assignment section on Page 4)</td>
</tr>
</tbody>
</table>

* More detailed information can be found in Canvas

**Residence Activity (on Nov. 6)**
1. Lecture on Exploratory Data Analysis
2. Solve the Quality Alloys case together using SPSS
3. Introduction to Assignments #1
December Residence Topics and Schedule

**Topic 1: 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
- Distinguish when to use different statistical tests
- Use SPSS to conduct statistical hypothesis tests and interpret the results

**Reading**
- McEvoy (2018), Chapters 8 – 10 (pp. 89 – 132)
- RestaurantGrades case (included in the HBSP coursepack)

**Topic 2: Regression Analysis**

**Learning Objectives**
- Identify the types of research problems that can be best solved with regression analysis.
- Explain the various concepts in regression analysis.
- Develop a linear regression model to answer a business question.
- Conduct a regression analysis in SPSS, interpret the results, and find managerial insights from the results.
- Use IBM SPSS to conduct regression analyses and interpret the results

**Reading**
- McEvoy (2018), Chapters 11 – 12 (pp. 133 – 164)
- Sarah Gets a Diamond case (included in the HBSP coursepack)

**Suggested Pre-Residence Self-Study Schedule in Canvas (Complete Before Coming to Class on Dec. 3)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Learning Materials and Reading</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 8 – Nov. 14</td>
<td>Statistical Hypothesis Test I</td>
<td>McEvoy (2018), Ch. 8 – 10 RestaurantGrades case VoiceThread® Lecture in Canvas</td>
<td>Assignment #1 (Due: Nov. 14)</td>
</tr>
<tr>
<td>Nov. 15 – Nov. 21</td>
<td>Statistical Hypothesis Test II</td>
<td>McEvoy (2018), Ch. 8 – 10 RestaurantGrades case VoiceThread® Lecture in Canvas</td>
<td>Assignment #2 (Due: Nov. 21)</td>
</tr>
<tr>
<td>Nov. 22 – Nov. 28</td>
<td>Regression Analysis I</td>
<td>McEvoy (2018), Ch. 11 – 12 Sarah Gets a Diamond case VoiceThread® Lecture in Canvas</td>
<td>Assignment #3 (Due: Nov. 28)</td>
</tr>
<tr>
<td>Nov. 29 – Dec. 2</td>
<td>Regression Analysis II</td>
<td>McEvoy (2018), Ch. 11 – 12 Sarah Gets a Diamond case VoiceThread® Lecture in Canvas</td>
<td>Assignment #3 (Due: Nov. 28)</td>
</tr>
</tbody>
</table>

* More detailed information can be found in Canvas

**Residence Activity (Dec. 3)**
- Assignments #1 & #3 discussion

**Residence Activity (Dec. 4)**
- Solve the Sarah Gets a Diamond case together
Additional Course Policies

Participation
- You are expected to be present during each residency, as we will cover critical material during these periods. In addition, it is expected that you will actively participate during each residency. If you are not sufficiently present and participating, your grade may be adjusted accordingly.

Assignments and Due Date
- Successful completion of this course requires that you keep up with all assignments. We will cover a lot of important materials, and late assignments will make it more difficult for you to keep up with the new material you will be learning.
- Assignments are due by midnight on the assignment due date, as noted in Canvas. It is critical that assignments are turned in on time to keep your pace through the course.

Course Materials, Intellectual Property, and Recordings
- Course materials are available exclusively for your learning in this course. You are free to keep any handouts and data sets that are distributed through Canvas and the Harvard Business School coursepack for your own personal use. 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.
- 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 is a violation of university policy to create and distribute such recordings without prior authorization and the permission of all others who are recorded.

Academic Integrity/Plagiarism
- You are responsible for being attentive to and observant of University policies about academic honesty as stated in the University’s Campus Policies and 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 – the use of an author’s ideas, statements, or approaches without crediting the source. Academic dishonesty also includes such acts as cheating by using any unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work, or engaging in any behavior specifically prohibited by the faculty member (e.g., copying someone else’s answers on tests and quizzes). 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, who 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 in the “Policies” section of 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](http://www.umsl.edu/academicaffairs/policies) for more information.

Student Resources

**Access, Disability and Communication**

Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please contact Disability Access Services (DAS) immediately. Students must provide documentation of their disability to the office of Disability Access Services in order to receive official University services and accommodations. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. Information about your disability is confidential. Once DAS reviews your medical documentation, they will provide you with the information and steps to inform me about the accommodations to which you are entitled. Your accommodations will begin as soon as we discuss your approved accommodations.

- 144 Millennium Student Center (MSC)
- Phone: (314) 516-6554
- Email: Tara Cramer, cramert@umsl.edu, or Adam Mann, mannad@umsl.edu
- Website: [http://www.umsl.edu/services/disability/](http://www.umsl.edu/services/disability/)

Technical Support

**Canvas**

If you have problems logging into your online course or an issue within the course site, please contact the Technology Support Center:

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

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

If you continue to experience problems or just have questions, you can also contact the Learning Resource Lab:

- Phone: (314) 516-6704
- Email: lrl@umsl.edu
- Website: [http://www.umsl.edu/technology/lrl/](http://www.umsl.edu/technology/lrl/)