



Syllabus: SCMA 5300, Fall 2023 Business Analytics and Statistics

About the Instructor



Contact information:

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Campus office: 220 ESH

Office Hours: Wednesdays, 1:00-2:00 pm via Zoom

(or in-person with min 24 hr advance request via email)

Office Hours Zoom Link (also on Canvas):

<https://umsystem.zoom.us/j/93232162545?pwd=YmJwcmMyeGl3bDhHcmVORXRscHBjdz09>

Additional office hours by appointment

Welcome: I am excited to welcome you to SCMA 5300. Quantitative methods in business provide insight and understanding to issues affecting businesses. My goal is to make these methods accessible to everyone in the class, demystifying probability and statistics by providing insight and intuition behind the concepts. In order to make the most of the course, however, it will take effort from you to complete assignments in a timely manner and a willingness to ask questions when you do not understand something.

Instructor Bio: I have been at UMSL since 2015 and do research in the areas of uncertainty quantification (e.g. “A Kullback-Leibler View of Maximum Entropy and Analytic Center Methods”), predictive analytics (ongoing projects on supply chain disruptions), and the value of information (e.g. “The Value of Information for Price Dependent Demand”). In my work, I enjoy finding insights that are not immediately obvious and leveraging them for enhanced decision making. In my spare time, you can find me enjoying the outdoors with my son and dog.

Teaching Philosophy: Education should extend beyond the classroom and enable students to become lifelong, self-directed learners in order to succeed in today’s rapidly changing world. I endeavor to provide a strong foundation of business analytics and to foster enhanced critical thinking skills that will build students’ confidence in their ability to apply quantitative methods in practice and to learn new techniques as needed. To reach these goals, I will ask questions that require you to think through problems and consider how different concepts are related to each other. I will also use case studies to illustrate application of course material.

About this course:

In-Person/Synchronous Class Meetings

Tuesdays, August 22 – December 12, 6-7:15 pm, ESH 103

with final exam on Tuesday, Dec. 12 from 5:30 – 7:30 pm

Asynchronous Online Class Content

This course will also include asynchronous content that will become available following the in-person Tuesday class.

Primary Text

Business Analytics: Data Analysis and Decision Making by Albright & Winston, 7th edition (Cengage). You will automatically receive access to the e-book as part of the Cengage Unlimited program.



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This class participates in the Cengage unlimited/auto access programs for the textbook. Students pay a reduced fee for online access to all Cengage titles. Additional, supplemental content from other textbooks may be added to Canvas based on instructor discretion. Online access to the textbook is necessary to complete the online homework which includes helpful supplemental material for many of the problems. Hard copies of the book are available separately through the Triton Store and various online sellers. However, if you prefer to study from a hard copy, you can save money by purchasing a used copy of an older edition of the book.

Time Requirements:

The asynchronous and synchronous content represents 2.5 hours/week of class time. Additional time outside of class is required for studying the material and completing assignments, which can take an additional 3-8 hours. Students should plan to spend a minimum of **6 hours a week** (up to 9-10 hours a week) on activities related to this course.

Technology Requirements:

As a student in an online course, you are expected to have reliable internet access almost every day. If you have computing problems, it is your responsibility to address these or to use campus computing labs. Problems with your computer or other technology issues are not an excuse for delays in meeting expectations and missed deadlines for the course. If you have a problem, get help in solving it immediately. At a minimum, you will need the following software/hardware to participate in this course:

1. Computer with an updated operating system (e.g. Windows, Mac, Linux)
2. Updated Internet browsers ([Apple Safari](#), [Internet Explorer](#), [Google Chrome](#), [Mozilla Firefox](#))
3. **Access to a full version Microsoft Excel** that includes the data analysis and solver add-ins.
4. Ability to navigate Canvas (Learning Management System)
5. Minimum Processor Speed of 1 GHz or higher recommended.
6. DSL or Cable Internet connection or a connection speed no less than 6 Mbps.
7. Media player such as [VLC Media Player](#).
8. [Adobe Flash player \(free\)](#)
9. [Adobe Reader or alternative PDF reader \(free\)](#)
10. A webcam and/or microphone is highly recommended if you anticipate accessing office hours via Zoom.

Prerequisites: (1) Spreadsheet modeling or equivalent competency and (2) an undergraduate level course in statistics.

Course Description:

How do companies make sense of data and understand the uncertainties they face on a daily basis? In this course, you will learn quantitative methods to analyze data and derive insights that can be leveraged for a competitive edge. This course examines probability distributions as a basis of statistical inference and provides an introduction to multivariate analysis, including regression methods. The course will include case studies with software analysis (Excel) to demonstrate the application of course content.



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Goals of the Course: Throughout this course, students will learn fundamental concepts in probability, statistics, and data analytics for business. Course materials will support the development of critical thinking skills so that students will understand the logic underpinning these. Such an understanding will promote attainment of the course goals, which include the following.

- Students will be able to choose and apply the appropriate descriptive and predictive statistical techniques to effectively describe, analyze data, and interpret results
- Students will understand statistical inference for descriptive inferential be able to apply appropriate descriptive statistics techniques to effectively describe data
- Students will be able to build statistical models to perform descriptive, predictive, and prescriptive analytics
- Student will be able to build models and apply the appropriate quantitative methods for making better decisions in operations and supply chain management
- Students will develop effective written and oral communication skills to identify problems, describe quantitative methods, and present solutions and results in operations and supply chains

How to Succeed in This Course

This course will be taught through both in-person synchronous and online asynchronous class meetings. The course will include lectures interspersed with example problems. Discussion during synchronous classes will be based on student questions. Students are encouraged to ask questions during the synchronous classes. Additional opportunities for discussion is available through online discussion boards. Small case studies in the form of Excel assignments will illustrate how course content is applied to real world problems.

Instructional Technology: The following tools will support the instructional strategies for this course: PowerPoint, Panopto videos, Zoom recordings, articles available online (links provided), and content from the textbook publisher Cengage available on the MindTap platform (links on Canvas).

Illness, COVID & Emergent Situations Policy

This class includes in-person meetings. We will observe the following safety policies:

- **DO NOT ATTEND CLASS IN-PERSON if you feel ill, have a fever, or have recently tested positive for an illness that is communicable in a classroom setting** (e.g. COVID or flu).

If you are ill and unable to attend class, you may request a make-up assignment for any in-class assignments. Such requests must be made PRIOR to any missed class.

If you should experience any health event(s) that affect your ability to complete assignments virtually, the instructor will refer you to the UMSL CARES team which can collect medical documentation. Please do not submit medical documentation directly to the instructor. Leniency on due dates will be extended as needed. However, ***it is very difficult to catch-up on class material if you fall behind. It is strongly advised that students do not request an illness-related extension unless it is actually necessary.***



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Assessment/Grading

Grading at a Glance: The grading will be based on a total of 1000 points available throughout the course.

- Homework (275 points—27.5%)
- Quizzes* (90 points—9%)
 - *Note: 11 quizzes*10 points each-2 lowest scores dropped = 90 total points
- In-Class Assignments/Participation (35 points—3.5%)
- Three Excel/Case Assignments (50 points each—5% each; 150 points total--15% total)
- Three Exams (150 points each—15% each; 450 points total—45% total)

Final letter grades will be assigned based on the following scale; however, the instructor reserves the right to modify the scale below based on class performance. Plus/minus grades will be assigned for scores within 2% points of the grade cutoff scores (e.g. 90-92 is an A-, 88-89.99 is a B+).

90-100%	A
80-89%	B
70-79%	C
60-69%	D
0-59%	F

Grading Scale: The UMSL Grading System is based on a four-point scale. The grade value for each letter grade is as follows:

A = 4.0	B- = 2.7	D+ = 1.3	EX = Excused
A- = 3.7	C+ = 2.3	D = 1.0	DL = Delayed
B+ = 3.3	C = 2.0	D- = 0.7	FN = Failure/Non
B = 3.0	C- = 1.7	F = 0.0	Participation

Assignments in Greater Detail:

Homework

Homework will be assigned almost weekly. Most homework assignments will be completed and submitted online through the MindTap/Cengage platform accessible through Canvas. A few homework assignments will be administered directly in Canvas. You will have an unlimited number of attempts on all homework problems. All homework must be completed individually. Homework numbering will correspond with the lecture slides that go with that homework.

Quizzes

Quizzes are short quizzes that correspond to a homework assignment. For example, Quiz 1 covers the content from HW 1. The quizzes are open-note. The best way to prepare for the quiz is to ensure that you understand all the concepts and problems in the homework. The problem(s) on the quizzes will be similar in format and content to the homework. Quizzes will be administered in-person during class, generally during the last 10 minutes of class. The lowest two quiz scores from the semester will be dropped.



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In-Class Assignments & Participation

There will be in-class assignments involving participation throughout the semester that will take a variety of formats.

Case Assignments Using Excel

There will be three case assignments throughout the course that involve some analysis in Excel worth 50 points each. There will also be conceptual questions to answer. Type your responses in a Word document using complete sentences and *in your own words*. Turn in both the Excel file and Word file through Canvas.

All short answer responses to the questions in the assignments must be completed *individually and in your own words*. These assignments must be completed using only materials provided in class. Copying responses from another student is not acceptable. Using online discussion boards or online posts to discuss responses online is not acceptable. Using generative artificial intelligence is not acceptable. Using a word spinner is not acceptable. Using any un-authorized resource is considered an academic integrity violation. All such violations and suspected violations will be reported to the Vice Chancellor of Academic Affairs. Evidence of copying among students will result in a grade of "0" for the entire assignment for all students involved unless investigation by the Vice Chancellor of Academic Affairs recommends otherwise. Evidence of copying shall include, but not be limited to, any short answer response containing four consecutive words or more that are the same as another student's response.

Exams

There will be three exams. The exams are not cumulative. However, some concepts from the beginning of the course will reappear throughout the course and will therefore also reappear on later exams. There is a strict time limit of 75 minutes on exams 1 and 2, and 90 minutes on exam 3.

Exam 1 will be administered through Canvas. The exam must be completed individually, but you may use your notes. However, **to succeed on the exams, it is imperative that you know the material without the notes**. Students who attempt to look everything up during the exam will run out of time and will have a high likelihood of failing the exam.

Exams 2 and 3 will be administered in person during class. You will be allowed one to bring one page of notes (front and back, 8.5x11") for each in-person exam.



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Course Schedule (subject to modification)

HW1/Q1 refers to homework 1 and quiz 1. Numbering is sequential and matches to the lecture slide numbering. Book chapter numbers are different and are included for reference.

(T) = Tuesday Class

(A) = Asynchronous Content

L = Lecture Slides

BLOCK 1: Excel Skills, Descriptive Statistics, Probability, & Decision Analysis		
Week 1 Aug 21	(T) L1. Descriptive Statistics (Chp. 2) (A) L2. Excel skills checklist & Data Visualization in Excel	
Week 2 Aug 28	(T) L3. Relationships Among Variables (Chp. 3) & Review (A) L4. Probability (Chp. 5)	HW1 due (8/29)
Week 3 Sept 4	(T) Decision Analysis (Chp. 4) / Case 1 (A) Case 1	HW2 due (9/5) (on L2&L3)
Week 4 Sept 11	(T) Practice Problems & Review (A) Exam 1 (online/at-home 9/15-17)	HW3 due 9/12 (on L4)
BLOCK 2: Classical Statistics (from sampling to hypothesis tests)		
Week 5 Sept 18	(T) L6. Sampling & Sampling Distributions (Chp 7) (A) L7. Confidence Intervals (Chp. 8)	
Week 6 Sept 25	(T) Case 2 (A) L8. Hypothesis Testing 1 (Chp. 9)	HW4 due 9/26 (on L6)
Week 7 Oct 2	(T) L8. Hypothesis Testing 2 (Chp. 9) (A) Practice Problems	HW5 due 10/3 (on L7)
Week 8 Oct 9	(T) Review (A) Practice Problems	HW6 due 10/10 (on L8)
Week 9 Oct 16	(T) Exam 2 (in-person, 6-7:15 pm)	
BLOCK 3: Regression, Forecasting, & Intro to Optimization		
Week 10 Oct 23	(T) L8. Regression Analysis 1 (Chp. 10) (A) L9. Regression Analysis 2 (Chp. 11)	
Week 11 Oct 30	(T) <i>No in-person class (Halloween)</i> (A1) Practice problems (A2) L10. Time Series and Forecasting (Chp.12)	HW7 due 10/31 Q7 online
Week 12 Nov 6	(T) Case 3 (A) L11a. Introduction to Optimization (Chp. 13)	HW8 due 11/7
Week 13 Nov 13	(T) L11. Introduction to Optimization (A) Practice Problems	HW9 due 11/14
<i>Week of Nov. 20 – Thanksgiving Break – Happy Thanksgiving!</i>		
Week 14 Nov 27	(T) Finish Optimization / Start data mining (A) L12. Data Mining (Chp. 17)	HW10 due 11/28
Week 15 Dec 4	(T) Intro to Data Mining (A) Example problems & review	HW11 due 12/5
Week 16 Dec 11	Exam 3 on final exam schedule Tues. Dec. 12 from 5:30-7:30 pm	



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Course Policies

We will follow all policies in the UMSL *Student Conduct Policy*

(<http://www.umsl.edu/~studentconduct/Student%20Conduct%20Policy/index.html>)

Participation

- It is vitally important that our online course promotes a safe learning environment in which every student feels comfortable participating.
- Your success in this course will heavily depend on your ability to communicate, engage and participate in all course activities. Successful completion of this course requires that a student keep up with all assignments, coursework and discussions. Timely participation in online discussions is an important part of this course and participation in these discussions, and other activities as assigned, is not optional. You are expected to prepare and post to discussions in a timely manner consistent with the requirements contained within the course syllabus.

Late Assignments

- No late assignments are accepted.

Online Discussion Protocol

- Participation in the course should maintain a positive work and learning environment, as outlined in the UM Collected Rules & Regulations, 330.080 (http://www.umsl.edu/services/ctl/faculty/facultyorientations/maintaining_work_environment.html)

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, <http://umsl.edu/services/academic/policy/academic-dishonesty.html>, and Code of Student Conduct, <https://bulletin.umsl.edu/studentconduct/>, 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.**
- Accessing online discussion boards to discuss solutions to class assignments is not permitted.
- Using artificial intelligence (AI) platforms to complete class assignments is not permitted.
- Copying from an unauthorized source and replacing words with synonyms is not permitted.
- 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



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grade on that work in this course. The campus process regarding academic dishonesty is described in the "Policies" section of the Academic Affairs website

Accommodations

Any student requiring special accommodations for any reason should contact the instructor as soon as possible. Students with disabilities who believe that they may need accommodations in this course are encouraged to contact Disability Access Services in 144 Millennium Student Center at 314-516-6554. Information about your disability is confidential.

Title IX Policies

- **Mandatory Reporting:** Under Title IX, all UMSL faculty, staff, and administrators (with limited exception) are 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. Note: There are several offices at UMSL (e.g., Counseling Services, Health Services, Community Psychological Service, Center for Trauma Recovery, and Student Social Services) whose staff are exempt from Title IX mandated reporting, when the information is learned in the course of a confidential communication.

Email Communications

All email from the instructor will be sent to each student's UMSL email address. Check this email address regularly. Treat all email as professional correspondence with an appropriate salutation and closing.

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/>

Office of International Students and Scholar Services

If you have difficulty communicating in English with the instructor of this course, contact ISS.

- 362 Social Sciences & Business Building (SSB)
- Phone: (314) 516-5229
- Email: jss@umsl.edu
- Website: <http://www.umsl.edu/~intelstu/contact.html>



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Student Enrichment and Achievement

SEA provides comprehensive support and intervention strategies that support your road to graduation!

- 107 Lucas Hall
- Phone: (314) 516-5300
- Email: umslsea@umsl.edu
- Website: <https://www.umsl.edu/services/sea/>

Office of Multicultural Student Services (MSS) and the University Tutoring Center (UTC)

MSS provides comprehensive student retention services to diverse student populations; through their tutoring center, the MSS offers comprehensive tutoring services free to students at UMSL.

- 225 Millennium Student Center (MSC)
- Phone: (314) 516-6807
- Email: multicultural@umsl.edu
- Website: <https://www.umsl.edu/~mcraa/index.html>

Technical Support

Online Mentor Program

Online education requires different teaching, learning, and technology skills than those found in traditional face-to-face classes. We assist students with the online technology in Canvas and provide resources for studying and success in online classes.

- 598 Lucas Hall
- Phone: (314) 516-4211
- Email: onlinementor@umsl.edu
- Website: <http://www.umsl.edu/services/ctl/studentsupport/omp.html>

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/>

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.

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/>