



Syllabus: SCMA 3300, Spring 2024 Business Analytics and Statistics

About the Instructor

Contact information:

Name: Andrea C. Hupman

Email address: hupmana@umsl.edu

Campus office: 220 ESH

Virtual Office Hours: Tuesdays 11-11:45 am via Zoom and by appointment

In-Person Office Hours: Immediately following in-person class sessions



Welcome: I am excited to welcome you to SCMA 3300. Statistics and data analytics in business provide insight and understanding to issues affecting organizations. My goal is to make these methods accessible to everyone in the class 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 (“Cutoff Decisions for Classification Algorithms with Risk Aversion”), and the value of information (e.g. “The Value of Information for Price Dependent Demand”). 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 encourage you to make connections between the class material and your everyday lives.

Office Hours: Office hours are a time for us to go over course material and course aims and are also an opportunity to talk about how this course relates to larger issues and your academic and professional goals.

Graduate Student Tutor

A graduate student tutor has been assigned to this course and will hold weekly office hours for drop-in Q&A and general questions on class content and homework assignments.

Contact information:

Name: Godfred Owusu

Email address: gao4rb@umsl.edu

Campus office: ESH 213



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About this Course

Format: Hybrid, 50% online (one asynchronous online class and one in-person class per week)

Prerequisites: MATH 1105, INFSYS 1800 and a 2.0 campus GPA

Course Description: This course covers basic statistical analysis (descriptive and predictive analytics) for business management. Tools include matched sample tests, chi-square tests, rank sum tests, simple linear regression and correlation, multiple linear regression, and extrapolative techniques such as moving averages and exponential smoothing. Emphasis is placed on problem definition, construction of statistical models, analysis of data, and interpretation of results.

Goals of the Course: Throughout the semester, students will

- Identify and define data-driven decision problems
- Understand methods for descriptive, predictive and prescriptive analytics and apply the methods
- Build predictive and prescriptive optimization models
- Use statistical software such as Excel to perform data analysis
- Interpret results and appreciate the significance of statistics and data analytics in a business context

Schedule:

Asynchronous content takes the place of one class meeting per week. The asynchronous content will mostly consist of video lectures and explanation of course material, as well as a short lecture quiz. Watching and reviewing the asynchronous content is required for success in the Thursday class. The short lecture quiz will evaluate understanding of this content in advance of the synchronous class.

In-Person Classes will occur **Thursdays from 11 am – 12:15 pm** in **ESH 005**. These class sessions will focus on the application of course material and will include regular in-class assignments.

Thursday Attendance Policy: In-person participation during the Thursday sessions is important for success in this class. However, sometimes situations arise which preclude in-person attendance, such as illness. If a student is unable to attend class in-person, the student may request the opportunity to make-up the in-class assignment, on a maximum of two (2) separate occasions without providing medical documentation. All such requests **MUST** be made **PRIOR** to the Thursday class period.

Requests for greater than two (2) opportunities to make-up the in-class assignments will be handled on a case-by-case basis and may require referral to the UMSL CARE Team and medical documentation provided to the UMSL CARE Team.

Required Text:

This class participates in the Cengage Unlimited/auto access programs, which provides digital access to all Cengage texts at a reduced price. Online access is necessary to complete the online homework which includes helpful supplemental material for many of the problems. With the Cengage Unlimited, the course uses multiple texts, tailoring text coverage based on specific unit topics. All textbook material is accessible through links on Canvas.

Unit 1, Statistical Inference

Statistics for Business and Economics by Anderson, Sweeney, and Williams, 13th edition (Cengage)

Unit 2, Regression Analysis & Forecasting

Business Analytics: Data Analysis and Decision Making by Albright & Winston, 7th edition (Cengage)



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Unit 3, Introduction to Advanced Analytics -- *Business Analytics* by Camm, 4th edition (Cengage)

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. If you prefer one hard copy, I would recommend purchasing an older edition of the Unit 1 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.

Calculators: You may use any calculator of your choice. Students who obtain either a scientific calculator or a graphing calculator tend to do better in the course. Having a screen that shows what you typed is a surprisingly large advantage.

Succeeding in This Course: This course will include a mix of lecture, example problems, small discussions during synchronous sessions, and small case studies in computer lab assignments. Success requires your active and ongoing participation, including

- Accessing and completing all assignments in a timely manner. The instructor may be unable to respond to email less than 12 hours before the assignment due date.
- Ensuring that you understand the homework problems that you solve rather than blindly plugging-in numbers following an example. Making sure you would know how to approach and solve a similar in the future (such as a quiz or exam).
- Actively participating in in-person classes and discussions
- Asking questions when you do not understand something
- Staying up-to-date on the material. If you fall behind, it is very difficult to catch up.
- Checking your email regularly for any class updates
- Ensuring that you have

Technology Requirements:

As a student in a hybrid/partially 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 browser of your choice
3. Ability to navigate Canvas (Learning Management System)
4. Access to a full copy of Microsoft Excel **that includes the data analysis add-in and the solver add-in.** Students can get a version for free (<http://products.office.com/en-us/student/office-in-education>)
5. Minimum Processor Speed of 1 GHz, 2 or more GHz recommended.
6. DSL or Cable Internet connection or a connection speed no less than 10 MB/s
7. Media player such as Windows Media Player to open course media. Flash player may be required by some aspects of the course and is available as a free download (<http://get.adobe.com/flashplayer/>)
8. Adobe Acrobat to open PDF files throughout the course – available as a free download (<http://get.adobe.com/reader/>)



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9. A webcam and/or microphone is recommended in order to interact with the professor during online office hours.

Withdrawal Policy:

- The last day to drop/withdraw without a grade is Monday, Feb. 13.
- The Last day to drop a course or withdraw from school without instructor approval is Monday, March 13. EX (excused) grade will be assigned.
- The last day a student may drop a course is Monday, April 17. Instructor approval is required. A grade of EX or EX-F will be assigned.

*Students with exigent circumstances that need to withdraw from a class or withdraw from the term after this date must provide documentation of the exigent circumstance and receive both the instructor's permission and approval of the dean of the College of Business. Grades of EX or EX-F will be assigned to each course.

- All drops must comply with the official procedure specified by the Registrar's Office.

Illness 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 the in-class assignment on two (2) separate occasions without providing medical documentation.

If you should experience any health event(s) that affect your ability to attend class or complete assignments over an extended period of time, the instructor will refer you to the UMSL CARE 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 absolutely necessary.

Assessment/Grading/Late Assignment Policy

Grading at a Glance:

- *Homework (120 points--12%)*
- *Quizzes (120 points—12%)*
- *In-class assignments (120 points--12%)*
- *Syllabus Quiz, Guest Speaker Reflection, Participation, & Professionalism (40 points--4%)*
- *Three Midterm Exams (200 points each--20% each)*
- *Optional Cumulative Final Exam (Replaces lowest midterm exam score. If final exam score is lower than lowest midterm exam, it does not count. Students may choose not to take the final exam.)*

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+).

A: 90-100%

B: 80-89%

C: 70-79%

D: 60-69%

F: 0-59%



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

Assignments in Greater Detail:

Syllabus Quiz: You must read this syllabus and answer some questions about information contained in the syllabus. (10 points).

Guest Speaker Reflection: We will have a guest speaker join class near the end of the semester to discuss applications of data in industry. Following the guest speaker presentation, you will write a 5-7 sentence reflection on what you learned in the presentation about how the class material is applicable to industry (10 points).

Homework

Homework will be assigned nearly weekly. Most homework will be completed and submitted online, either through a Cengage platform available through a link on Canvas or directly in Canvas. You will have an unlimited number of attempts on all homework problems. All homework must be completed individually, but you are allowed to discuss the concepts with other students. Homework numbering will correspond with the lecture slides that go with that homework. In Week 1, there are two homework assignments (HW1a and HW1b), but later weeks will have only one homework assignment. Homework is due on Sunday each week, but there is a one-day grace period (i.e. no late penalty for submission within 1 day of due date). No late homework may be submitted for credit after the grace period. Each homework is worth 10 points.

Quizzes

Homework Quizzes (HQ)

Homework quizzes are short quizzes that correspond to a homework assignment. For example, HQ1a covers the content from HW1a. 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. There is a strict 20 minute time limit on the quizzes. Homework quizzes are due on Sunday each week, but there is a one-day grace period. Each homework quiz (HQ) is worth 5 points.

Asynchronous Content Quizzes (AQ)

Asynchronous content/videos will be available weekly in advance of the Thursday class session (usually the preceding Friday). You are required to watch the asynchronous content prior to the synchronous Thursday class. There will be an online quiz over the asynchronous content that will be due the Wednesday before the Thursday class, but there is a one-day grace period. Each asynchronous quiz (AQ) is worth 5 points.

In-Class Assignments (ICA)

Each Thursday class session will include activities. Some classes may include two or more separate assignments with a mix of individual and group work. Each Thursday class will include assignments worth a total of 10 points.

Midterm 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. Exams will be administered in person during Thursday classes.



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You are permitted to bring one page of notes, on 8.5x11" paper (standard printer size), with writing on both the front and the back of the page. However, **to succeed on the midterm exams, it is imperative that you understand the material without the notes.**

Optional Final Exam

There will be an optional final exam that is cumulative. Students have the option of taking the final exam to replace one of their midterm exam scores. If a student scores lower on the final exam than the student's lowest midterm exam score, the final exam score will not count toward the final grade.

Participation, Guest Speaker Reflection, & Professionalism

Regular engagement with class is vital to success. In addition, academic settings are a great opportunity to practice the level of professionalism that is required in the workplace. For full credit, students are expected to attend class regularly and participate by asking questions, answering questions, or contributing comments to class discussion. Students are also expected to maintain behavior consistent with the promotion of a positive work and learning environment, which includes following the communication and professionalism guidelines provided in this syllabus.

Late Assignment Policy

There is a one-day grace period for all homework and quizzes where the assignment is accepted without penalty. Beyond this grace period, late assignments are not accepted, except in cases where a student communicates with the instructor about exigent circumstances and obtains special permission before the due date of the assignment.

Course Policies

We will follow all policies in the UMSL *Student Conduct Policy*
(<http://www.umsl.edu/~studentconduct/Student%20Conduct%20Policy/index.html>)

Participation

- 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)
- It is vitally important that our 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.

Communication Plan

Email

The best way to contact the instructor is by email (hupmana@umsl.edu). All email from the instructor will be sent to each student's UMSL email address. Check this email address regularly. The median response time to all student emails is less than one business day. However, there may be times when it takes up to two business days to receive a response. Sending multiple emails within short time spans (e.g. five emails within an hour) will not speed the response rate and will contribute to longer response times. If you do not receive a response within two business days, please send a follow-up email.



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Treat all email as professional correspondence, paying attention to the following pointers and policies:

- Use an appropriate salutation (e.g. Hello Dr. Hupman or Hello Prof. Hupman)
- Use an appropriate closing (i.e. sign your name at the end of the email)
- Be as specific as possible about your question. If you have a question about a particular assignment, include the name of the assignment.
- If a question is broadly phrased, the instructor will direct you to the appropriate class material that covers the broad topic.
- The instructor will not solve homework problems for students over email.
- If you would like to schedule an appointment to meet with the instructor, include a few time windows when you will be available in your email.
- Use proper spelling (i.e. do not use “threw” or “thru” for “through”)
- Do not include hashtags in your email (e.g. #Annoying, #YesThisHasHappened)

Questions After Class

Another excellent way to ask questions is to stay after class. The instructor holds office hours after class. This is a great opportunity to ask questions.

Phone

The instructor is also available by phone (314-515-4746). A recording of all voicemails is sent to her email. The instructor will answer the phone as she is able and respond to voicemail via email as appropriate.

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.

Academic Integrity/Plagiarism

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

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

Infractions of academic integrity will result in a failing grade for the assignment and will be referred to the Vice Chancellor of Academic Affairs for further disciplinary action.



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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: iss@umsl.edu
- Website: <http://www.umsl.edu/~intelstu/contact.html>

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

MindTap Technical Support

Technical support for any issues related to the online Cengage content is available through the “MindTap Technical Support” link on Canvas.



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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/>

Academic Support

Math Academic Center (Math Lab)

The Math Academic Center offers free individual assistance to students needing help with any mathematics from basic math through calculus or any course involving mathematical skills.

- 222 Social Sciences and Business Building (SSB)
- Website: <http://www.umsl.edu/mathcs/math-academic-center/>



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Course Schedule (subject to modification)

Week 1 Jan 16	Unit 1: The Normal Distribution, Sampling, & Confidence Intervals	Asynch: Syllabus Quiz & 1a Normal distribution (Section 6.2) Th: 1b Sampling Distributions (Chp. 7)	Syllabus Quiz due 1/18, Asynch. Quiz (AQ) 1 due 1/18, HW1a/HQ1a due 1/21 HW1b/HQ1b due 1/24
Week 2 Jan 22		Asynch: 2 Confidence Interval Estimation (Chp. 8) Th: Review CI's; Introduce Hypothesis Testing 1 (Chp9)	AQ2 due Wed. 1/24 HW2/HQ2 Due Sun. 1/28
Week 3 Jan 29	Unit 2: Hypothesis Testing	Asynch: 3 Hypothesis Testing 1 (Chp. 9) Th: Hypothesis Testing 2 (Chp. 9)	AQ3 due Wed. 1/31 HW3/HQ3 Due Sun. 2/4
Week 4 Feb 5		Asynch: 4 Hypothesis Testing 2 (Chp. 9) Th: Hypothesis Testing 1 & 2 (Chps.8 & 9)	AQ4 due Wed. 2/7 HW4/HQ4 Due Sun. 2/11
Week 5 Feb 12		T/Asynch: Exam review in Office Hours Th: Exam 1 In Person	EXAM 1
Week 6 Feb 19	Unit 3: Regression Analysis	Asynch: 5 Regression Analysis 1 (Chp. 10) Th: Regression Analysis 1 (Chp. 10)	AQ5 HW5/HQ5
Week 7 Feb 26		Asynch: 6 Regression Analysis 2 (Chp. 11) Th: Regression Analysis 2 (Chp. 11)	AQ6 HW6/HQ6
Week 8 March 4	Unit 4: Time Series Analysis and Forecasting	Asynch: 7 Time Series & Forecasting 1 (Chp. 12) Th: Time Series & Forecasting 1(Chp. 12)	AQ7 HW7/HQ7
Week 9 March 11		Asynch: 8 Time Series & Forecasting 2 (Chp. 12) Th: Guest Speaker	AQ8 HW8/HQ8 Guest speaker reflection
Week 10 March 18		Asynch: Pre-Recorded Exam Review Th: Exam 2 In Person	EXAM 2
<i>Spring Break, March 23-31</i>			
Week 11 April 1	Unit 5: Optimization	Asynch: 9 Introduction to Optimization (Chp. 13) Th: Introduction to Optimization (Chp. 13)	AQ9a
Week 12 April 8		Asynch: 9 LP in Excel (Chp. 13) Th: Practice with LP in Excel (Chp. 13) / 10 Intro Data Mining	AQ9b HW9/HQ9
Week 13 April 15	Unit 6: Advanced Topics	Asynch: Data Mining Practice (Chp. 17) Th: 11 Decision Analysis (Chp. 6)	AQ10 HW10/HQ10
Week 14 April 22		Asynch: Decision Analysis (Chp. 6) Th: Practice Problems	AQ11 HW11/HQ11
Week 15 April 29		T/Asynch: Exam Review in Office Hours Th: Exam 3 In Person	EXAM 3
Week 16 May 6	Final Exam Week - Optional Final Exam Tuesday, May 7, 10 am – 12 noon		