IBH2AD3
Statistical Data Analysis
Fall 2026 Course Outline

Operations Management Area
DeGroote School of Business
McMaster University

INSTRUCTOR AND CONTACT INFORMATION

Lecture: Tuesdays, 11:30am – 2:20pm
Dr. Berk Gorgulu

Instructor
gorgulub@mcmaster.ca
Office: DSB 414
Office Hours: Tuesdays, 2:30pm-3:20pm (in-person), or
Zoom by appointment

Tutorial: Wednesdays, 9:30am – 10:20am
TBA

Course sites:

- **Avenue to Learn:** https://avenue.mcmaster.ca/

  Please select IBH 2AD3: Statistical Data Analysis
- **Connect McGraw-Hill:** https://connect.mheducation.com
- **TopHat:** https://app-ca.tophat.com/e/945301/

COURSE ELEMENTS

Credit Value:	3	Leadership:	Yes	IT skills:	Yes	Global view:	Yes
A2L:	Yes	Ethics:	Yes	Numeracy:	Yes	Written skills:	Yes
Participation:	Yes	Innovation:	No	Group work:	Yes	Oral skills:	Yes
Evidence-based:	Yes	Experiential:	Yes	Final Exam:	Yes	Guest speaker(s):	No

COURSE DESCRIPTION

Statistics is an indispensable tool for modern management practice. This course delves into the application of statistical techniques and modelling for business decision-making. The course aims to build a deep understanding of the analysis and interpretation of statistical methods through applying the concepts of statistical inference to real decision-making problems. The statistical techniques covered in this course not only provide useful tools that can be applied to a variety of business problems, but most importantly, they equip the students with the critical skills required to assess the validity, significance, and interpretation of many of the reports that they deal with in their education and career.

This course covers many commonly used aspects of business statistics. The focus will be on concepts from descriptive and predictive analytics to address problems from different disciplines of business and humanities. Students learn about many concepts in business statistics including data and data types, visualizing and summarizing quantitative and qualitative data, defining and measuring the center and dispersion of data, fundamental probability concepts and probability distributions, random variables and their characteristics, sampling from population and sampling distributions, analysis of confidence intervals for population parameters, fundamental hypothesis testing methods, regressions and making inference based on regression results.

We illustrate the practical applications of statistical analysis in business through many practical examples. Emphasis is placed on connecting theory to real-world problems from different business disciplines. For this purpose, the use of computer software becomes an essential component of the course. Microsoft Excel is one of the most used data analysis and data science software in the industry as well as academia. In this course, Excel is employed to provide hands-on experience in applying such techniques for solving a variety of practical problems.

COURSE LEARNING OUTCOMES

This course focuses on converting data into information, with basic statistical methods and further yet - into managerial insights. Even though the primary emphasis is on business-related data, data coming from other sources (e.g., economic, social, etc.) is also explored, analyzed, and discussed. Upon completion of the course, students will achieve the following objectives:

- Develop an understanding of the concept of probability, random variables and probability distributions
- Develop a comprehensive understanding of sampling distributions, with a specific focus on comparing population mean and variance.
- Develop an understanding of the nature of statistical relationships between variables.
- Conduct regression analysis, including both simple and multiple linear regression.
- Demonstrate the ability to identify and navigate common pitfalls in regression analysis.
- Cultivate the skills to critically read and comprehend regression models presented in business and financial research papers, fostering a deeper understanding of their implications.
- Enhance familiarity with the execution of statistical tests and models using Microsoft Excel, empowering students to apply theoretical concepts in a practical, real-world context.

REQUIRED MATERIALS AND TEXTS

Required Textbook: Business Statistics: Communicating with Numbers; 5th Edition by Sanjiv Jaggia and Alison Kelly (Connect $183.52)

Top Hat Platform: We will be using the Top Hat (www.tophat.com) classroom response system in class for enhanced learning experience. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. You can register by simply visiting our course website: https://app-ca.tophat.com/e/945301. If you need familiarity with the platform, you can visit the Top Hat Overview (https://support.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center. Should you require further assistance with Top Hat, please contact their support team directly through email (support@tophat.com), the in-app support button, or by calling 1-888-663-5491.

Connect & Avenue to Learn: In this course, we will be using McGraw Hill Connect online portal (https://connect.mheducation.com/) and McMaster's Avenue to Learn (http://avenue.mcmaster.ca).

CLASS FORMAT

Lectures (In-Person): This is an in-person 3-hour course. The three hours will consist of lengthier discussions of the topics, problem-solving and applied exercises (not necessarily always in this order).

Tutorials (In-Person): One hour of tutorial session. The session will consist of problem-solving and Excel tutorials.

COURSE EVALUATION

GRADE COMPONENT	WEIGHT	DESCRIPTION
Class Participation	**11%**	Participation questions using TopHat. In-class discussions and events (games) based on the course contents. (Optional) Reading assignments.
In-Class Quizzes	**14%**	9 Quizzes; best 7 will be used.
Assignments	**15%**	6 Assignments; best 5 will be used.
Midterm Exam	**27%**	
Final Exam	**33%**	

COURSE DELIVERABLES

Class Participation (11%, individual work)

The lectures are aimed to be interactive. Participation questions are to be asked during lectures both verbally and through TopHat. Additionally, there will be occasional in-class discussions and events (games) based on the course contents.

In-Class Quizzes (14%, individual work)

Quizzes are extensions of the classroom lectures and discussions. Quizzes will be given typically at the beginning of the lectures to solidify the students' understanding of the material covered in the previous class. They take on average 10-15 minutes and will be conducted before new material is introduced.

Homework Assignments (15%, individual work)

The Homework Assignments are carefully designed to help students keep up with the course material and prepare them for the exams. There will be 6 assignments; dates are posted below under the Course Outline section. The Homework Assignments are hosted by the McGraw Hill Connect platform. Connect is accessible through Avenue to Learn. You will need to log in to Avenue to Learn to see the assignments on the course webpage. The assignments will be submitted online and automatically graded. You will receive their results immediately after submitting your assignments. **The lowest mark out of the 6 assignments will be dropped.** Homework Assignments will strictly be due on the scheduled date and time. Please note that each homework assignment is estimated to take around 1-2 hours. Please allow for sufficient time to start and finish the homework assignment on time.

Midterm Exam (27%, individual work)

The Midterm Exam can have quantitative analysis, short answer, True/False and multiple-choice questions.

Final Exam (33%, individual work)

The Final Exam covers all the topics covered in the course (with higher weight on the topics covered after the midterm), and can have quantitative analysis, short answer, True/False and multiple-choice questions.

LATE ASSIGNMENTS

Late assignments will be penalized by 4% per hour except under extraordinary circumstances. Please discuss any extenuating situation with your instructor at the earliest possible opportunity.

COMMUNICATION AND FEEDBACK

Students who wish to correspond with instructors or TAs directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and

sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Area Administrative Assistants.

All students must receive feedback regarding their progress prior to the final date by which a student may cancel the course without failure by default.

- *For Level 1 and Level 2 courses, this feedback must equal a minimum of 20% of the final grade.*
- *For Level 3 courses and above, this feedback must equal a minimum of 10% of the final grade.*

Instructors may solicit feedback via an informal course review with students by Week #4 to allow time for modifications in curriculum delivery.

Students who have concerns about the course content, evaluation methods, or delivery should first reach out to the course instructor. If your concern remains unresolved after speaking with the instructor, you may then reach out to the relevant Area Chair for further consideration.

REQUESTING RELIEF FOR MISSED ACADEMIC WORK

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work" and the link below;

http://ug.degroote.mcmaster.ca/forms-and-resources/missed-course-work-policy/

* Non-Commerce students must follow the Missed Course Work protocols outlined by their home faculty and Program Office.

COURSE MODIFICATION

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy.

The following illustrates only three forms of academic dishonesty:

- Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained
- Improper collaboration in group work.
- Copying or using unauthorized aids in tests and examinations.

AUTHENTICITY/PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. Avenue to Learn, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software.

All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

GENERATIVE AI

This course will be guided by McMaster University's ***Provisional Guidelines on AI*** use. (https://provost.mcmaster.ca/office-of-the-provost-2/generative-artificial-intelligence/task-force-on-generative-ai-in-teaching-and-learning/provisional-guidelines-on-the-use-of-generative-ai-in-teaching-and-learning/).

The course strongly encourages individual students (and groups) to undertake the **Honour Pledge** and list it after the title page of their report the following:

"I (we) understand and believe the main purpose of McMaster and of a university to be the pursuit of knowledge and scholarship. This pursuit requires my (our) academic integrity; I (we) do not take credit that I (we) have not earned. I (we) believe that academic dishonesty, in whatever form, is ultimately destructive to the values of McMaster, and unfair to those students who pursue their studies honestly.

I (we) pledge that I(we) completed this assessment following the guidelines of McMaster's academic integrity policy."

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn, LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviors that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students with disabilities who require academic accommodation must contact Student Accessibility

Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator.

For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Academic Accommodation For Religious, Indigenous or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.

Research Using Human Subjects

All researchers conducting research that involves human participants, their records or their biological material are required to receive approval from one of McMaster's Research Ethics Boards before (a) they can recruit participants and (b) collect or access their data. Failure to comply with relevant policies

is a research misconduct matter. Contact these boards for further information about your requirements and the application process.

McMaster Research Ethics Board (General board): https://reo.mcmaster.ca/

Hamilton Integrated Research Ethics Board (Medical board): http://www.hireb.ca/

ACKNOWLEDGEMENT OF COURSE POLICIES

Your enrolment in IBH 2AD3 will be considered to be an implicit acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. **It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.**

Lack of awareness of the course policies **cannot be invoked** at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

COURSE SCHEDULE

IBH 2AD3
Statistical Data Analysis
Fall 2026 Tentative Course Schedule

Week	Reading Materials	Deliverables
1 (Sep. 8 – Sep. 11)	**Course Introduction** **Chapter 1: Data and Data Preparation** • Required reading: 1.1 to 1.4 (inclusive). **Chapter 2: Data Visualization** • Required reading: 2.1 to 2.4 (inclusive).	
2 (Sep. 14 – Sep. 18)	**Chapter 3: Summary Measures** • Required reading: 3.1, 3.2, 3.3, and 3.6.	
3 (Sep. 21 – Sep. 25)	**Chapter 4: Introduction to Probability** • Required reading: 4.1 to 4.5 (inclusive).	Assignment 1
4 (Sep. 28– Oct. 2)	**Chapter 5: Discrete Probability Distributions** • Required reading: 5.1, 5.2, and 5.4. **National Day for Truth and Reconciliation. No tutorial this week! There will be a lecture as regular.**	Assignment 2
5 (Oct. 5 – Oct. 9)	**Chapter 6: Continuous Probability Distributions** • Required reading: 6.1, 6.2 and 3.5.	Assignment 3

6 (Oct. 12 – Oct. 16)	**MID-TERM RECESS**	
7 (Oct. 19 – Oct. 23)	**Chapter 7: Sampling and Sampling Distributions** • Required reading: 7.1 to 7.3 (inclusive).	
8 (Oct. 26 – Oct. 30)	**Chapter 8: Interval Estimation** • Required reading: 8.1 to 8.4 (inclusive).	Assignment 4
9 (Nov. 2 – Nov. 6)	**MIDTERM EXAM**	
10 (Nov. 9 – Nov. 13)	**Chapter 9: Hypothesis Testing** • Required reading: 9.1 to 9.4 (inclusive).	
11 (Nov. 16 – Nov. 20)	**Chapter 10: Statistical Inference Concerning Two Populations** • Required reading: 10.1 to 10.3 (inclusive).	Assignment 5
12 (Nov. 23 – Nov. 27)	**Chapter 14: Correlation and Regression** • Required reading: 14.1 to 14.4 (inclusive). **Chapter 15: Inference with Regression Models** • Required reading: 15.1 to 15.4 (inclusive).	
13 (Nov. 30 – Dec. 4)	**Chapter 16: More Topics in Regression Analysis** • Required reading: 16.1 and 16.2.	Assignment 6
14 (Dec. 7 – Dec. 10)	**Final Review**	