

MATH 203: PRINCIPLES OF STATISTICS 1  
FALL 2024

|             |             |                                                                                                                                                                                                                     |
|-------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Instructors | Section 001 | David A. Stephens (david.stephens@mcgill.ca, Burnside 1225)                                                                                                                                                         |
|             | Section 002 | José A. Correa (jose.a.correa@mcgill.ca, Burnside 1233)                                                                                                                                                             |
| Textbook    |             | <i>Statistics</i> (13th Edition)<br>J.T. McClave and T. Sincich<br>Purchasing the textbook is not mandatory; the course will follow the structure of Chapters 1–9, but the course materials will be self-contained. |

**Method of Evaluation:** Evaluation for the course will be on the following basis

- **50 % Final Examination**

- ▶ Examination will be in-person and held during the final exam period.
- ▶ Please note that the Instructors have no jurisdiction over the date of the final examination.

- **20 % Midterm Examination**

- ▶ Section 001: Midterm will be held in class on **Wednesday, 9th October**
- ▶ Section 002: Midterm will be held in class on **Thursday, 10th October**
- ▶ Midterm examination will be a written exam covering material up to and including Lecture 16 material.

- **18 % Assignments**

- ▶ There will be **four** assignments, the best **three** will count for the assessment.
- ▶ Assignments will be a combination of short and long answer questions, submitted electronically.

- **12 % Quizzes**

- ▶ There will be **nine** quizzes, the best **six** will count for the assessment.
- ▶ Quizzes will be open-book, and comprise time-limited machine-scored short answer questions.
- ▶ Quiz topics will be closely related to topics discussed in lectures.

Please see the Course Schedule for the timing of the in-term assessments.

**Note:** The final grade will be determined by the aggregate score

$$70\% \text{ Final Exam} + 18\% \text{ Assignments} + 12\% \text{ Quizzes}$$

if this score exceeds the principal method of evaluation.

## TARGET COURSE SCHEDULE

| Wk | Date  | Lectures | Topics                                                                                                                                                                            | Q  | A  |
|----|-------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 1  | 26/08 | 1–2      | Outline & General Information. Introduction. Elements of Statistical Analysis                                                                                                     |    |    |
| 2  | 02/09 | 3–4      | Types of Data. Data Collection. Designed and Observational Studies. Descriptive Methods Simpson's Paradox. Graphical Methods: Histograms                                          |    |    |
| 3  | 09/09 | 5–7      | Graphical Methods: Histograms & interpretation. Measures of Centre. Measures of Spread                                                                                            | Q1 |    |
| 4  | 16/09 | 8–10     | Describing Quantitative Data. The Empirical Rule. Chebyshev's Rule. Z-scores Graphical Methods: Boxplots                                                                          | Q2 | A1 |
| 5  | 23/08 | 11–13    | Probability: Uncertainty. Set theory, operations and Venn Diagrams. Sample spaces & Events. Mutually Exclusive Events. Partitions. De Morgan's Laws. Probability rules.           | Q3 |    |
| 6  | 30/09 | 14–16    | Conditional Probability. Independence, Theorem of Total Probability. Bayes Theorem.                                                                                               | Q4 |    |
| 7  | 07/10 | 17–18    | Discrete Random Variables. Expectation & Variance. Discrete Uniform, Bernoulli, binomial, geometric, Poisson distributions.                                                       | Q5 | A2 |
| 8  | 14/10 | -        | Fall Reading Break                                                                                                                                                                | -  | -  |
| 9  | 21/10 | 19–21    | Cumulative Probability. Continuous Distributions. Normal Distribution. Sampling Distributions. Sample Mean as a Random Variable                                                   | Q6 |    |
| 10 | 28/10 | 22–24    | Central Limit Theorem. Point Estimation ( $\mu$ and $p$ ). Interval Estimation: The t distribution.                                                                               | Q7 | A3 |
| 11 | 04/11 | 25–27    | Inference for one sample: Interval Estimators, Confidence Intervals, Examples The Assumption of Normality. Q-Q Plots. Hypothesis Testing: Hypotheses Set-up. Type 1 and 2 Errors. | Q8 |    |
| 12 | 11/11 | 28–30    | Hypothesis Testing: Test Statistic Rejection Region. Scenarios Test Statistic Rejection Region. Examples. p-values. Motivation. Interpretation.                                   | Q9 | A4 |
| 13 | 18/11 | 31–33    | Inference for two samples. Confidence Intervals. Examples. Hypothesis testing for two samples.                                                                                    |    |    |
| 14 | 25/11 | 34–36    | Inference & Hypothesis testing for two samples: Scenarios and Examples                                                                                                            |    |    |
| 15 | 02/12 | 37–38    | Course Review<br>Exam preparation                                                                                                                                                 |    |    |

- Lecture numbers refer to Section 001.
- 'Q' refers to Quiz number; 'A' refers to Assignment number due date.
- Extra (non-assessed) practice quizzes and other materials may be provided.

**Policy on Late Submission:**

- Late submissions may be subject to 100% penalty.
- Requests for accommodation due to extenuating circumstances should be directed to the Course Coordinator (Prof. Stephens, david.stephens@mcgill.ca).

**Key Academic Dates:** <https://www.mcgill.ca/importantdates/key-dates>

- Add/Drop deadline: Tuesday, September 10th
- Classes end: Wednesday, December 4th

**Tutorials & Office Hours:**

- There will be three one hour optional tutorials per week; these will begin in Week 2.
- Instructors and Teaching Assistants will also hold weekly Office Hours.

Scheduling details will be announced shortly.

**myCourses:**

- Official communications will take place via myCourses.
- All course materials will be available via myCourses.

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McGill University  
August 27, 2024

## MCGILL POLICY STATEMENTS

- **Policy on Assessment of Student Learning:** [Policy on Assessment of Student Learning](#)

*The purpose of the Policy on Assessment of Student Learning (PASL) is to provide a set of common principles to guide the assessment of students' learning. Per PASL, assessment should be equitable and consistent, and promote effective learning experiences, a healthy learning environment, and academic integrity. Learn more on the For Students page of the PASL website. Also see Faculty of Science-specific rules on the implementation of PASL.*

- **Accommodations:**

- ▶ *Legally mandated academic accommodations are handled by Student Accessibility and Achievement. For more information see <https://www.mcgill.ca/access-achieve/>*
- ▶ *Academic considerations for assessments that are missed or late for valid reasons will be provided at the instructor's discretion. Repeated, similar requests for academic considerations in this course are unlikely to be granted.*

- **Language of Submission:** *In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.*

*Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté, sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue.*

[Charter of Students' Rights](#) (Approved by Senate on 21 January 2009)

- **Academic Integrity:** *McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures*

*L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires.*

[Code of Student Conduct and Disciplinary Procedures](#) (Approved by Senate on 29 January 2003)

- **Extraordinary circumstances:** *In the event of extraordinary circumstances beyond the University's control, the content and/or assessment tasks in this course are subject to change. Students will be advised of the change.*
- **Copyright:** *Instructor-generated course materials (e.g., handouts, notes, summaries, exam questions) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.*