MATH 203

PRINCIPLES OF STATISTICS I

Instructor:	Yi Yang
Office:	BURN 1241
Office hours:	Mon/Wed, 10:45am–11:45am
Lecture Time:	Mon/Wed/Fri, 9:35am–10:25am
Lecture Location:	Stewart Biology Building S1/4
Teaching assistant:	Xiaonan Da
Email:	xiaonan.da@mail.mcgill.ca
TA's office hours:	Tu/Thur, 9:35am–10:35am at BURN 1036
Tutorial Time:	Tu/Thur, 8:35am–9:25am
Tutorial Location:	RPHYS 118
Course Website:	http://www.math.mcgill.ca/yyang/stat.html
Textbook:	*Statistics*, 13$^{\text{th}}$ edition James T. McClave & Terry Sincich

Software:	Freeware R, Version 3.2.3
	`www.r-project.org/`
	RStudio, Open Source Edition
	`www.rstudio.com/`

COURSE OBJECTIVES

The goal of this course is to introduce students to the field of statistics. From a practical standpoint, students will learn both descriptive and basic inferential techniques used in statistical analyses. More importantly, students will learn to evaluate statistical evidence critically in a variety of areas including, but not limited to, problems in science, medicine, finance, and the social sciences. The instructors will strive to provide as large a selection of examples and applications as possible in order to encourage the students to evaluate research encountered in their course of study and future work.

PREREQUISITES

There is no calculus pre-requisite for this course. It is not open to students who have taken MATH 324. It may conflict with statistics courses in other departments; please see the student handbook. Students who have received a B+ or higher in a Cegep statistics course cannot take MATH 203.

COURSE DESCRIPTION

The course will cover roughly Chapters 1–9 in the textbook. The main concepts covered in the course are as follows:

Descriptive statistics. Types of data and data collection; frequency distributions; graphical tools for data representation; measures of central tendency (mean, median, mode); measures of variability and relative standing.

Probability and random variables. Probability calculus; independence and conditional probability; Bayes' rule; discrete and continuous random variables; expectation and variance; standard models.

Sampling and estimation. Random samples and parameter inference; sampling distribution of the mean; Central Limit Theorem; notion of confidence interval; confidence intervals for a population mean and proportion.

Tests of hypotheses involving one or two samples. Principles of hypothesis testing; errors of type I and II; computation of p-values; one- and two-sample tests for a mean and a proportion; tests of significance.

EVALUATION

The evaluation will proceed as follows, on the basis of the course objectives:

Classes End:	April 14, 2020
Homework:	5 assignments, only an electronic version is accepted.
	No hard copy. Do not submit it through email.
	Upload homework through MyCourses.
	If programming is involved, include programming code.
	≤ 15 **mins, no penalty.**
	> 15 **mins and** ≤ 24 **hours, 10% penalty.**
	> 24 **hours, not accepted.**
Midterm:	55 minutes, in class, Monday, March 9, 2020
	A calculator is allowed, a letter-size cheatsheet, two-sided, handwritten
Final exam:	3 hours
	A calculator is allowed, a letter-size cheatsheet, two-sided, handwritten
	To be held in the exam period
	Date and venue to be confirmed

The final mark for the course will be the larger of

$$20\ \%\ \text{Coursework} + 20\ \%\ \text{Midterm} + 60\ \%\ \text{Final}$$

and

$$20\ \%\ \text{Coursework} + 80\ \%\ \text{Final}.$$

COURSE MANAGEMENT

a) The midterm exam will cover material from the first 3–4 chapters of the textbook. Absence at the midterm, whatever the cause, translates as a zero for the midterm grade.

b) There will be no opportunity for a makeup midterm and no makeup work in lieu of any aspect of the course assessment. However, reasonable excuses for missing the final exam will be considered and may result in a makeup exam; if granted, the latter would then be scheduled by the university according to the standard deferral process.

c) Five homework assignments will be handed out (roughly every other week) at least one week before the due date. Late homework will not be accepted for partial credit. Solutions will be provided for all homework problems. Questions about the homework will be answered via WebCT email and answered on the discussion message board. Before asking a question, please check on the discussion board whether it has already been answered. All questions about the particulars of homework grading should be addressed to the course instructor, Yi Yang.

d) In the event of extraordinary circumstances beyond the university's control, the content and/or evaluation scheme is subject to change.

WebCT AND COURSE WEBSITE

The course website will be located at `http://www.mcgill.ca/mycourses/`. You should be able to access all online course material through WebCT. You will need your student ID number and Minerva password to access the materials. If you encounter any problems, please ask your instructor during class or drop by his/her office during posted office hours.

The course website is the most efficient way for us to communicate. If you have questions regarding homework problems, please proceed as follows:

a) First, check the course discussion group to see whether a similar question has already been answered. All questions sent by students via email will be answered on the course website; the subject line will contain the homework and question number.

b) If you cannot find your answer on the course discussion page, email your question to your instructor via the WebCT mail system or post the question to the discussion group yourself.

c) An answer to your question will be provided on the course discussion group, either by your instructor or by a teaching assistant.

MCGILL POLICY STATEMENTS

The following statements are included in this course outline, in keeping with various Senate resolutions:

a) 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*. For more information, see

`http://www.mcgill.ca/students/srr/honest/`

[Approved by Senate on 29 January 2003]

b) Instructors who may adopt the use of text-matching software to verify the originality of students' written course work must register for use of the software with Educational Technologies and must inform their students before the drop/add deadline, in writing, of the use of text-matching software in a course.
[Approved by Senate on 1 December 2004]

c) In accord with McGill University's *Charter of Students' Rights*, students in this course have the right to submit in English or French any written work that is to be graded.
[Approved by Senate on 21 January 2009]

d) Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) 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*.

If you have a disability and need special arrangements, please contact the Office for Students with Disabilities at 514–398–6009.