University of British Columbia
STAT 203 - STATISTICAL METHODS
Winter 2022/23 Term 1

Description: Organizing, displaying and summarizing data. Inference based on elementary probability models including estimation and hypothesis testing. Faculty of Science credit will not be given. Credit will be given for only one of STAT 200 and STAT 203.

Prerequisite: Mathematics 11

Objectives: Determining the validity of a political, economic, legal or scientific argument calls for the weighing of evidence. Often this evidence consists of data. In this course, you will learn statistical methods for presenting and evaluating data. You will also develop ways of thinking critically about data collection and analysis.

Course instructors: Eugenia Yu (Department of Statistics)
Md. Jahurul Islam (Department of Linguistics)

Lectures: MWF 1-2pm (in-person in ESB 1012)

Tutorial: During the weekly tutorial sessions, TA's will discuss pre-assigned problems, lead the class in practical activities. There may be in-class quizzes.

Computer use: You will need a calculator that can do basic arithmetic, including taking square roots. For activities conducted in the tutorials, we will use R and R Commander (a freeware).

Assessment: Written assignments (2 assignments, 10%)
WeBWorK online assignments (10-11 assignments, 10%)
Tutorials (10%)
Midterm exams (two in-class exams, 15% each)
Final exam (40%)

Note:
There will be no make-up exams.

Missed final exam policy:
Students who miss the final exam must report to their Faculty advising office within 48 hours of the missed exam, and must supply supporting documentation. Only your Faculty Advising office can grant deferred standing in a course. You must also notify your instructor prior to (if possible) or immediately after the exam. Your instructor will let you know when you are expected to write your deferred exam. Deferred exams will ONLY be provided to students who have applied for and received deferred standing from their Faculty.

Teaching method: We will adopt a partially flipped classroom teaching approach. There will be assigned reading which students are expected to complete before class. During lecture, the instructor will review concepts, deliver course material and use part of the lecture for in-class activities. Students will be working in groups and solving problems on topics recently covered during in-class activities. Clicker questions will be given along the way to check progress and provide feedback to students.

Recommended Textbook: Stats: Data and Models by De Veaux et al., 3rd Canadian edition, Pearson Canada. Copyright 2018.

Lecture schedule (tentative):

Lecture	Topic	Chapter
I. Exploring and understanding data (displays and summaries of categorical and quantitative data, Normal model)		
1	Introduction; type of variables	1
2	Displaying and summarizing categorical data	2
3	Simpson's Paradox	2
4	Displaying quantitative data	3
5	Summarizing quantitative data	3
6	Understanding and comparing distributions	4
7	Standardization and Normal model	5
8	More on Normal model	5
II. Exploring relationships between variables, (scatterplots, correlation, regression)		
9	Scatterplots, correlation	6
10	Linear regression	7
11	More on linear regression	7
12	Regression wisdom	8
III. Gathering data (sample surveys, experiments)		
13	Population versus sample, parameters versus statistics; sample surveys	9
14	Observational studies versus experiments	10
15	Experimental design	10
IV. Randomness and probability, central limit theorem		
16	Randomness, introduction to probability	11
17	Probability rules	11
18	Conditional probabilities	12
19	Independence of events	12
20	Sampling distribution for proportions	14
21	More on sampling distribution for proportions	14
22	Sampling distribution for means	14
23	Central Limit Theorem	14
V. One-sample inference for proportions		
24	Confidence intervals for proportions	15
25	More on confidence intervals for proportions	15
26	Hypothesis testing for proportions	16
27	More on hypothesis testing for proportions	16
28	Significance level, type I and type II errors	17

VI. Inference for means		
29	Confidence intervals for means, t-model	18
30	Hypothesis testing for means	18
31	Comparison of two means (two-sample confidence t confidence intervals	19
32	Comparison of two means (two-sample t-test)	19
33	Analysis of Variance (if time permits)	24

University policies and resources to support student success:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available at https://senate.ubc.ca/policies-resources-support-student-success .

Related academic policies:
Academic Concession
Academic Honesty and Standards
Attendance
Grading Practices
Student Conduct and Discipline
Viewing Marked Work

EY

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