

SS 1023B/2037B: Statistical Concepts Course Outline

1. Course Information

Course Information

Term: Winter 2025

Location: SEB-1200

Lectures: Monday 3:30-4:20, Wednesday 3:30 – 5:20

List of Prerequisites: none

List of Anti-requisites: For students registered in SS2037, the anti-requisites are SS1023A/B, DS1000A/B, SS2244A/B, and Bio2244A/B. For students registered in SS1023, the anti-requisites are SS2037A/B, DS1000A/B, SS2244A/B, and Bio2244A/B.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Guowen Huang	ghuan23@uwo.ca	WSC 270	NA	MF 10:00 – 11:00 F 14:00 – 15:00

Students must use their Western (@uwo.ca) email addresses when contacting their instructors and have SS1023B or SS2037B in the subject line.

Communication:

Please use the Discussion board (you can find it by clicking on Communications tab) on the OWL site (<https://westernu.brightspace.com/>) to post questions about course material (e.g., lecture, reading, etc). This helps other students who may have the same question, and I encourage you to help each other if you can. The Discussion board will be monitored on a regular basis and the instructor or TAs will interject with corrections or responses as necessary. As this is an open Forum, please be respectful of your peers, instructor(s), and TAs. Derogatory, discriminatory, or otherwise inappropriate language or topics will be removed and dealt with at the instructor's discretion.

Instructor Policies

I expect respect and inclusivity in our classroom. To promote this, I have several policies that you should follow:

- Please do not be late. If you must be, please enter quietly and choose a seat closest to the door to limit the disruption.

- Put your phones on silently and refrain from being on them. If you must answer your phone, please do so quietly and immediately leave the room. I understand there are sometimes emergencies, but this should not disrupt other students.
- Treat others as you would like to be treated. When speaking for the first time in a new group, introduce yourself with your name, and pronouns if you feel comfortable. Do not judge others for their work in this class, their questions, or anything they choose to share.
- When others are speaking, whether it be instructor or student, listen and do not speak over them.
- You can expect a response to a message to the instructor within approximately 48 hours during the work week (during busy times, it may take a little longer). Note that messages will not be answered within the 24-hour period before exams or project deadlines, nor can I guarantee responses over weekends/holiday.

3. Course Syllabus, Schedule, Delivery Mode

Course Description

An examination of statistical issues aiming towards statistical literacy and appropriate interpretation of statistical information. Common misconceptions will be targeted. Assessment of the validity and treatment of results in popular and scientific media. Conceptual consideration of study design, numerical and graphical data summaries, probability, sampling variability, confidence intervals and hypothesis tests.

Learning Outcomes

By the end of this course, students will be able to

- Use statistical techniques to explore, organize, and describe data.
- Produce data through surveys and experiments.
- Define, explain, and use basic concepts of statistics.
- Define, explain, and use basic concepts of probability and distributions.
- Perform statistical inference including confidence intervals and hypothesis tests.

Key Sessional Dates

Classes begin: January 6, 2025

Reading Week: February 15– 23, 2025

Classes end: April 4, 2025

Exam period: April 7 – 30, 2025

Week	Dates	Class	Topics	Assessments
1	Jan 6	Course Intro & 1.1	• Syllabus • Key characteristics of datasets	
	Jan 8	1.2	• Graphing categorical and quantitative variables	
2	Jan 13	1.3	• Measures of center • Measures of spread • Boxplots	
	Jan 15	1.4	• Density curves • Normal distributions • Normal Q-Q Plots	

3	Jan 20	2.1 & 2.2	- Examining relationships - Scatterplots - Transformations	
	Jan 22	2.3	Correlation	
4	Jan 27	2.4	- Least-squares regression - Prediction - Correlation and regression	
	Jan 29	2.5	Cautions about correlation and regression	
5	Feb 3	2.6 & 2.7	- Contingency tables - Joint distributions - Simpson's paradox - Causation	Assignment 1: Chapter 1
	Feb 5	3.1 – 3.3	- Sources of data - Experiments and randomization - Matched pairs and block designs - Sampling techniques	
6	Feb 10	3.4	Ethics	
	Feb 12	4.1 & 4.2	- Probability - Sample spaces - Probability rules	Test 1: 7:00pm – 9:00pm Chapters 1 & 2
7	Reading Week			
8	Feb 24	4.3	- Discrete and continuous random variables - Normal Distributions	Assignment 2: Chapter 2 & 3
	Feb 26	4.4	- Mean of a random variable - Law of Large Numbers	
9	Mar 3	4.5	- Probability Rules - Tree Diagrams - Independence	
	Mar 5	5.1	Sampling Distributions	
10	Mar 10	5.2	- Sampling distribution of a sample mean - Central Limit Theorem	
	Mar 12	5.3	- Binomial Distribution - Normal Approximation - Poisson Distributions	
11	Mar 17	6.1	- Confidence Intervals for population mean - Choosing a sample size	Assignment 3: Chapter 3, 4, 5
	Mar 19	6.2 & 6.3	- Hypothesis testing - Testing for population means	Test 2: 7:00pm – 9:00pm Chapters 3, 4, 5

			• Cautions about hypothesis testing	
12	Mar 24	6.4	• Decision errors	
	Mar 26	7.1	• T distribution • One sample CI and test • Matched pairs	
13	Mar 31	7.2	• Two sample testing • Two sample confidence intervals • Pooled two-sample procedures	
	Apr 2	7.3	• Sample size for confidence intervals • Power for a significance test	Assignment 4: Chapter 6 & 7

Personal Teaching Approach

I want students to have a meaningful learning experience in this course, having an inclusive, respectful, and welcoming learning environment. A typical class will involve a lecture period covering the materials scheduled for the day followed by check-in activities (likely iClicker). When check-in activities provide immediate feedback, I will design the next class to cover most misunderstood concepts. I encourage students to participate during class activities and ask questions that promote discussion during class. I also expect students to be respectful to their peers during the activities in class and outside class.

4. Course Materials

Required Textbook (we will cover Chapters 1-7)

Introduction to the Practice of Statistics (Tenth Edition) by David S. Moore, George P. McCabe, and Bruce Craig. There are two options available for this textbook:

- Ebook Rental (150 days): \$89.00
- Printed Version (Limited Stock): \$149.85

STA 1023B: https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2024B&courses%5B0%5D=001_UW/STA1023B

STA 2037B: https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2024B&courses%5B0%5D=001_UW/STA2037B

Recommended Online Learning Platform

Achieve for Introduction to the Practice of Statistics integrates outcome-based learning objectives and a wealth of examples with assessment in an easy-to-use interface. Students are provided with rich digital resources that solidify conceptual understanding, as well as homework problems with hints, answer-specific feedback, and fully worked solutions. <https://achieve.macmillanlearning.com/start>

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

Course Evaluation Components

Component	Weight	Deadlines/Due dates
Assignment 1	5%	Feb 3, due at 11:55 pm
Assignment 2	5%	Feb 24, due at 11:55 pm
Assignment 3	5%	Mar 17, due at 11:55 pm
Assignment 4	5%	Apr 2, due at 11:55 pm
Midterm 1	30% (or 0%)	Feb 12, 7 pm to 9 pm (to be confirmed by the Registrar's Office)
Midterm 2	0% (or 30%)	Mar 19, 7 pm to 9 pm (to be confirmed by the Registrar's Office)
Final exam	50%	During exam period (to be scheduled)

iClicker might be used for in class feedback and non-graded assessments

Assessment Descriptions

- **Assignments will be available on the course OWL site. However, you will not submit your solutions to OWL. Instead, assignments must be submitted through [Gradescope](#)**, an online collaborative grading system. It is your responsibility to make sure that your assignment is successfully uploaded and legible. Submissions that cannot be read by the grader will receive a grade of zero. Assignment questions must be assigned properly to each page or the submission will not be graded.
- After receiving the grades from an assignment, **students will have seven days to submit any regrade requests on that assignment**. After this seven-day period, regrade requests will NOT be accepted. Regrade requests must be made using the Gradescope tool "Regrade Request".
- **Assignment submissions are due 11:55pm (Eastern Time) on the due date.** Assignments that are up to 24 hours late will receive a deduction of 15% on their mark. Late assignments up to 48 hours will receive a deduction of 30% on their mark. No credit will be given for submissions beyond 48 hours of the deadline time unless valid academic accommodation is obtained.
- Each student will have **2 late coupons** worth 24 hours each that they can use at their own discretion for whatever reason (Note: I do not need to know the reason) towards their assignments. Students can use them together on one assignment for a 48-hour extension, or on separate assignments for 24-hour extensions. **No extensions will be given for any reason beyond the use of late coupons; therefore, I suggest saving them until you absolutely need them.**
- Solutions to assignments **will not** be posted; however, TAs will provide comments on incorrect answers using Gradescope, which will allow students to find out the correct solutions. In addition, students can ask the instructor and TAs for more details on solutions via the Regrade Request tool on Gradescope and during office hours.

- There will be **two tests scheduled for February 12 and March 19, though these dates are tentative and may be adjusted if significant scheduling conflicts arise for students. Both will be from 7:00-9:00 PM.** The locations are yet to be determined. Students will be graded on their best test only. That is, the lowest test mark will be dropped. **This is to account for any absences of any reason. No excuses will be given for missed tests as the lowest mark gets dropped.** All tests are closed book. For each test, students will be allowed **one single sided, letter sized, handwritten cheat sheet. Handwritten means pen to paper, no printing from a computer of any kind. Photocopying or scanning is also not permitted.** Any violations of this requirement will result in a student not being permitted to use such a cheat sheet.
- **Final exam** will be booked by the Registrar's Office. Students will be allowed **one double sided, handwritten, letter sized cheat sheet. Handwritten means pen to paper, no printing from a computer of any kind. Photocopying or scanning is also not permitted.** Any violations of this requirement will result in a student not being permitted to use such a cheat sheet.

Rounding of marks

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assignments: The assignments have late coupons to account for any extensions needed, for any reason. No extensions will be given beyond this.

Midterms: For tests, the lowest mark gets dropped, so no tests will be excused. If you miss a test for any reason, that test will count as your dropped test.

Final Exam: If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you can do so. They will assess your eligibility to take the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

A scientific calculator will be allowed on the final exam. A graphics calculator will not be allowed.

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.