

SS 3858 Course Outline

1. Course Information

a) Course Information

Course Number: SS3858

Course Name: Mathematical Statistics

Term: Winter 2025

Location: WSC 240 (Lecture and Tutorial)

Time: MWF 11:30 – 12:30

Tutorial: W 5:30 – 6:30

b) List of Prerequisites

A minimum mark of 60% in Statistical Sciences 3657A/B.

Unless you have either the requisites for this course or written special permission from your Dean's Designate to enroll in it, you may be removed from this course and it will be deleted from your record. (Please contact stats-inquiry@uwo.ca for more information). This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

c) Personal Teaching Approach

I believe that students learn best in an inclusive, welcoming environment that sparks questions, discussions and respect from all sides. For this reason, a typical class will involve a lecture period discussing and explaining the material, broken up with non-graded check ins (through the use of Mentimeter or iClicker) to assess student understanding. Examples will be used both as part of the lectures, and part of active learning, where the students get time to practice the problems themselves. In cases where feedback from the assessment is immediate (such as with Mentimeter or iClicker), the lecture may be tailored to sections that were most misunderstood. I welcome relevant disruptions to this lecture period such as with questions or discussion topics. I encourage participation and discussions throughout the lectures, and the active learning components. Throughout all of these components, I strive to be respectful to all learners and their individual learning needs, and I expect you to do the same.

d) Instructor Policies

As mentioned above, 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 silent and refrain from being on them. If you must answer your phone, immediately and quietly leave the room. I understand there are sometimes emergencies, but this should not disrupt other students.
- Please have Mentimeter/iClicker links open and ready to go.
- 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.
- Please allow 2 business day for a response via emails. I will not be answering emails in the evenings, weekends, or holidays, but I will get back to you as soon as possible. The same should be expected of your peers.
- Follow all emailing rules (seen in the next section).

2. Instructor Information

Instructors	Email	Office	Office Hours
Dr. Holly Steeves	Holly.steeves@uwo.ca	WSC 233	M 12:30 – 1:30 Th 11:00 – 1:00

Rules for Emailing

- Students **must** use their Western (@uwo.ca) email addresses when contacting their instructor, otherwise, you will not receive a response.
- Dr. Steeves is teaching multiple courses so you also must put “SS3858” in the subject line of the email or you will not receive a response.
- DO NOT send follow up emails. Allow at least 2 entire business days (not holidays or weekends) for a response. If you send a follow up email without allowing those 2 business days, you will not receive a response.
- Before emailing, look for the information you are inquiring about in the syllabus, announcements, or documents found on Brightspace. If the information IS posted elsewhere, you will not receive a response.

If these rules are not adhered to, you will not receive a response.

Office hours are held on a first come first serve basis. There is no need to make an appointment within that time frame. Please wait outside the room until the person ahead of you is finished (unless you came together or are asking the same question etc).

3. Course Syllabus, Schedule, Delivery Mode

a) Course Description

Point estimation: sufficiency, completeness, consistency, unbiasedness, Cramer-Rao inequality, Rao-Blackwell theorem, Hypotheses tests: uniformly most powerful tests, likelihood ratio tests.

b) Course Level Learning Outcomes

This course is designed to provide you with:

- An advanced introduction to the basic concepts of statistical inference.
- Basic theory that supports the procedures used for solving a variety of problems arising from data analysis.
- A foundation for advanced learning in statistical science.

c) Tentative Course Schedule

Week	Chapter	Lab	Assessment
Jan 6 – Jan 10	Review Topics		
Jan 13 – Jan 17	Chapter 8.1 – 8.4		
Jan 20 – Jan 24	Chapter 8.5		
Jan 27 – Jan 31	Chapter 8.6 – 8.9		
Feb 3 – Feb 7	Chapter 9.1 – 9.4		
Feb 10 – Feb 14	Chapter 9.5 – 9.6		
Feb 17 – Feb 21			
Feb 24 – Feb 28	Chapter 9.7 – 9.9		
Mar 3 – Mar 7	Chapter 10.1-10.2		
Mar 10 – Mar 14	Chapter 11.1 – 11.2		
Mar 17 – Mar 21	Chapter 11.3 – 11.4		
Mar 24 – Mar 28	Chapter 13.1 – 13.4		
Mar 31 – Apr 4	Chapter 13.5 – 13.6		

Note: Although we are following the textbook, topics will be covered in the notes that are not in the textbook. You will be responsible for knowing these topics for any assessments. The slides and notes from class should be your guideline for testing materials.

d) Key Sessional Dates:

Classes begin: January 6, 2025

Spring Reading Week: February 17 – 21, 2025

Classes end: April 4, 2025

Exam period: April 7 – 30, 2025

4. Course Materials

a) Textbook

- **Required textbook:** [John A. Rice, Mathematical Statistics and Data Analysis, Third Edition, Duxbury, 2007]. **The textbook is free** and can be found online at:

[Mathematical Statistics and Data Analysis](#)

b) Brightspace

All other course material will be posted to OWL: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

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

c) Technical Requirements

Students will need some sort of device (laptop, phone, tablet) to be able to access course materials, submit assignments, and participate in clicker questions. Along with this, access to a stable internet connection may be required. R (and an appropriate editor like RStudio) will also be used so ensure you have the necessary requirements to use these two programs. If you need access to a computer for coursework, please contact the instructor as early as possible.

d) Clicker

A clicker (TBD) will be used for both lab attendance as well as in class participation. Make sure you have created an account using the link and instructions from Brightspace using your name that is registered with Western, and your Western email address. If any other email address is used, the attendance will not be counted.

5. Methods of Evaluation

a) Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Assignments (5)	20%
Quizzes (4)	15%
Tutorial Attendance	5%
Midterm Test	25%
Final Exam	35%

b) Assessment Descriptions

- **Assignments will be available on the course Gradescope site. Assignments must be submitted through Gradescope** (<https://www.gradescope.ca/>) 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.

- **Assignment dates** are as follows:

Assignment 1	January 31, 11:55 PM
Assignment 2	February 14, 11:55 PM
Assignment 3	March 7, 11:55 PM
Assignment 4	March 21, 11:55 PM
Assignment 5	April 4, 11:55 PM

- After receiving the grades from an assignment, **students will have seven days to submit any regrade requests on that assignment, with the exception of the final assignment which may have a shortened period.** 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 11:55 pm (Eastern Time) on the due date.** Assignments that are up to 24 hours late will receive a deduction of 15% on their mark unless late coupons are used. Late assignments from 24 to 48 hours late will receive a deduction of 30% on their mark, unless late coupons are used. **No submissions are accepted and no credit will be given for submissions beyond 48 hours of the deadline.**
- 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. You can use them together on one assignment for a 48 hour extension, or on separate assignments for 24 hour extensions each. **No extensions will be given for any reason beyond the use of the late coupons, therefore I suggest saving them until you absolutely need them.** You do not need to tell me when you will use the coupons, they will automatically come off the first two late days. The late coupons are to cover technical problems, illness, unexpected life situations, extra-curricular events, etc... I repeat. NO extensions are granted for ANY reasons beyond late coupons.
- 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 are 11 **labs**, however you only need to attend 9 to earn 5% of your grade. We will use clickers to track who is in attendance. Make sure you set this up BEFORE the first lab. No academic considerations will be considered beyond these two allowances for absences. If you

have an issue with the clicker recording your attendance, you must bring this up with your TA DURING THE LAB to have it fixed. It will not be fixed retroactively.

- **Midterm** is tentatively scheduled for February 26, 7-9, to be confirmed early in the semester. This will be closed book. You will be allowed **one single sided, letter sized, handwritten cheat sheet (handwritten means pen to paper, no printing from a computer or any kind)** and a **non-programmable calculator**. Students must bring their student ID with them to write the exam. Note: This is the assessment that you cannot use an undocumented absence on!
- **Final Exam** will be booked by the registrar's office, so date and time is to be determined. This will be closed book. You will be allowed **one double sided, handwritten, letter sized cheat sheet. Handwritten means pen to paper, no printing from a computer or any kind.** Note: Under the new policy, you can never use an undocumented absence on a final exam.

c) General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- Examinations scheduled during official examination periods (Defined by policy)
- Midterm (Designated by the instructor as the one assessment that always requires documentation when requesting Academic Consideration)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

d) Evaluation Scheme for Missed Assessments

Note: there is flexibility built into the assignments (late coupons), quizzes (best 3 or 4) and attendance (only 9/11 required), therefore, according to the current Academic Policy, instructors have the right to reject any approved absences, documented or undocumented (SRAs).

For the midterm exam, SRAs are not allowed. However, if you miss with an approved documented absence (approved by your faculty), the weight will be shifted onto the final exam.

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

e) Coursework with Assessment Flexibility

By policy, instructors may deny Academic Consideration requests for the following assessments with built-in flexibility:

Flexible Completion

Quizzes. This course has 4 quizzes, and the 3 quizzes with the highest marks are counted towards your final grade. Should extenuating circumstances arise, students do not need to request Academic Consideration for the first missed quiz. Academic consideration requests will be denied for at least the first missed quiz. The instructor may deny all requests for Academic Consideration, give them a zero mark, and let students follow the appeal pathway to ask for an exception.

Tutorial Attendance. This course has 11 tutorials. Attendance is only mandatory at 9 of these tutorials to receive full attendance grades. Should extenuating circumstances arise, students do not need to request Academic Consideration for the first two tutorials. Academic consideration requests will be denied for at least the first two tutorials. The instructor may deny all requests for Academic Consideration, give them a zero mark, and let students follow the appeal pathway to ask for an exception.

Deadline with a No-Late-Penalty Period

Assignments. Students are expected to submit each of the 4 assignments by the deadline listed. Should extenuating circumstances arise, students do not need to request Academic Consideration and they are permitted to submit their assignment up to 48 hours past the deadline without a late penalty with the use of a late coupon. They have two late coupons worth 24 hours each to use throughout the entire term, so use them wisely. Should students have run out of late coupons, if their assignment is submitted past the deadline, a late penalty of 15% per day will be applied. Assignments will not be accepted 48 hours after the assignment deadline. The instructor may deny all requests for Academic Consideration, give them a zero mark, and let students follow the appeal pathway to ask for an exception.

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.

Only non-programmable calculators are allowed on all in person assessments (quizzes, midterm, final exam). If you are unsure whether your calculator is programmable, feel free to ask the instructor **prior** to the assessment.

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.

Clickers will be used for attendance and for non graded participation in class. Your information from the clickers will only be used for attendance and immediate feedback of student understanding. The data will not be used in any other way, and your login for the clicker cannot be used by any other person. If you are found to be incorrectly using the clicker for attendance grades, this will be considered an academic offense.

If (and only if) the course moves online due to lockdowns:

Tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**.

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

Support Services

Please visit the Science & Basic Medical Sciences Academic Advising 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. You may also wish to contact Accessible Education at

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

if you have any questions regarding accommodations.

Learning-skills counsellors at Learning Development and Success (<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/>.