

STAT 2857: Probability and Statistics I

Course Outline

1. Course Information

Lectures:

Monday, Wednesday, Friday 12:30-1:30pm in SEB-1059

Tutorial:

Friday 4:30-5:30pm in **NSC-1**

List of Prerequisites

0.5 course from Calculus 1000A/B, Calculus 1500A/B, or Applied Mathematics 1412A/B, each with a minimum mark of 60%, plus 0.5 course from Calculus 1301A/B (minimum mark 85%), Calculus 1501A/B (minimum mark 60%), or Applied Mathematics 1414A/B (minimum mark 60%). The former Applied Mathematics 1413 with a minimum mark of 60% may also be used to meet this 1.0 course prerequisite.

Unless you have either the requisites for this course or written special permission from the Dean or Department to enroll in it, you may be removed from this course, and it will be deleted from your record. 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.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Simon Bonner	sbonner6@uwo.ca	WSC 276	88205	TBC
Teaching Assistant (TBD)				

I recommend that you use your Western (@uwo.ca) email addresses when contacting me or the TAs. Office hours will be held in person. Times will be chosen to align with the availability of as many students as possible.

3. Course Syllabus, Schedule, Delivery Mode

The course calendar states that this course will cover: “Probability axioms, conditional probability, Bayes' theorem. Random variables motivated by real data and examples. Parametric univariate models as data reduction and description strategies. Multivariate distributions, expectation and variance. Likelihood function will be defined and exploited as a means of estimating parameters in certain simple situations.” This is a correct, but rather boring, description of what you will learn in this class. It's a bit like telling someone that for dinner you are going to eat paste made from ground wheat topped with crushed tomatoes boiled with herbs and garlic, grated coagulated cow's milk, the preserved fruit of *Olea europaea*, and American salami flavoured with paprika baked on high heat. Yes, it's a pizza with black olives and pepperoni – but the final product is much more than the sum of its ingredients.

Statistics gives us a way to answer questions and make decisions in the face of uncertainty. Life would be much easier if there were no uncertainty. You'd always pick the right clothes for the weather, investors would always choose the best financial products, and doctors would never misdiagnose patients' illnesses. The world isn't like that, and it's probably good thing. Life would be pretty boring if there was no uncertainty. Decisions are hard to make because we can never know all of the necessary information. The field of probability provides a language with which we can talk and reason about uncertainty in the world and forms the underpinnings of all statistical methods. In this class you will learn the mathematics of probability with a focus on real world examples in order that you can understand and apply the statistical methods presented in the follow-up course (SS2858B).

Key sessional dates:

Classes begin: September 5

Add/Drop Day: September 13

Canada Life Day: September 13 (No Class)

National Day for Truth and Reconciliation: September 30 (No Class)

Fall Reading Week: October 12 – 20

Midterm Examination: November 13, 7:00 – 10:00pm (To be confirmed)

Classes End: December 6

Study Days: December 7 -- 8

Exam Period: December 9 – 22

4. Course Materials

The required text for this course is:

Devore, JL and Berk, KN (2021) Modern Mathematical Statistics with Applications. 3rd Edition. Springer.

You may purchase an electronic copy of this book in PDF or EPUB format through [Springer Link](#). You can also purchase a physical copy of the book at the same link or through the campus bookstore. The university library does have access to the electronic version of this book through ProQuest. However, only three people may access it simultaneously and downloads are limited to 148 pages. Note that this course will cover much of the material on pages 49 to 396.

We will cover most of the topics Chapters 2 through 6 in text. The tentative schedule for the lecture topics and textbook readings is provided on the course OWL site. In the last two weeks of the course, we

will cover applications of the material to a variety of real world problems. This material will be assessed on the Final Examination. I will notify you if the schedule changes. It is your responsibility to check the schedule and keep up-to-date.

You 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.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

Your understanding of the material will be based on a series of quizzes, a Midterm Examination, and the Final Examination. However, the grading scheme is flexible, and you may replace the grades on some assessments with grades on related assessments to prove your proficiency.

Your final grade will be computed based on three components as shown:

Component #1 (30%)	Component #2 (30%)	Component #3 (40%)
Average of Quiz 1 & Quiz 2	Average of Quiz 3 & Quiz 4	Final Examination
OR	OR	
Midterm Examination	Final Examination	

Specifically :

- Component #1 will comprise 30% of your final grade determined by the maximum of a) your average score on Quiz 1 and Quiz 2 (each worth 15% of your final grade) and b) your grade on the Midterm Examination.
- Component #2 will comprise 30% of your final grade determined the maximum of a) your average score on Quiz 3 and Quiz 4 (each worth 15% of your final grade) and b) your grade on the Final Examination.
- Component #3 will comprise 40% for your final grade determined by your grade on the Final Examination.

The assessments will cover the topics in the following sections of the textbook. Quizzes will be held in-person during the tutorial on the specified day. Times and locations for the Midterm and Final Examination will be posted as soon as possible.

- Quiz #1: October 4
 - o Sections 2.1, 2.2, 2.3, 2.4, 2.5
- Quiz #2: October 25
 - o Sections 3.1, 3.2, 3.3, 3.5, 3.6, 3.7
- Quiz #3: November 8
 - o Sections 4.1, 4.2, 4.3, 4.4

- Quiz #4: November 22
 - o Sections 5.1, 5.2, 5.3
- Midterm: November 13 7:00-10:00pm (Tentative)
 - o All sections covered by Quizzes 1 and 2
- Final Examination (3 hours)
 - o All sections covered by Quizzes 1, 2, 3, and 4 plus Sections 6.1, 6.2, 6.3, and 6.4 and the material covered in the Applications Lectures in Week 12 and 13.

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.

Coursework with Assessment Flexibility

The assessments for this course have been designed to provide multiple opportunities for you to demonstrate your understanding of the course material and flexibility in the calculating of your final grade. As per the policy for Academic Consideration without supporting documentation: "An instructor may deny academic consideration for any assessment that is not required in the calculation of the final grade". This implies that requests for academic consideration without support consideration may be denied for all quizzes and the Midterm Examination, since alternative methods of assessment are provided.

The Final Examination is excluded from the policy for Academic Consideration without supporting documentation, and always requires formal supporting documentation as defined by the policy.

Evaluation Scheme for Missed Assessments

If you are granted Academic Consideration for Quiz 1 or Quiz 2 (with supporting documentation), then your grade for that quiz will be replaced by your grade on the Midterm Examination (weighted to 15% of your final grade).

If you are granted Academic Consideration for the Midterm Examination (with supporting documentation), then your grade for the midterm will be replaced by the average of your grades on Quiz 1 and Quiz 2.

If you are granted Academic Consideration for either Quiz 1 or Quiz 2, or both, and the Midterm Examination (all with supporting documentation), then your grade for Component #1 will be replaced by your grade on the Final Examination (weighted to 30% of your final grade).

If you are granted Academic Consideration for Quiz 3 or Quiz 4 (with supporting documentation), then your grade for that quiz will be replaced by your grade on the Final Examination (weighted to 15% of your final grade).

When a student misses the Final Exam and 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.

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.

Students are permitted to use non-programmable calculators for the quizzes, Midterm examination, and Final Examination.

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.

Quizzes and examinations in this course will be conducted using a remote proctoring service in the event that in-person tests are not possible. 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/>.

University Accreditation Program – Canadian Institute of Actuaries (CIA)

Honours Specialization in Actuarial Science

If you graduate from Western with an HSP in Actuarial Science, this course will be one of the courses that you will take in your program that will allow you to be exempt from the preliminary exams of the Society of Actuaries (SOA). If your plan is to become a fully qualified actuary working in Canada, then all you would need to do is graduate from your HSP in actuarial science and you would then be eligible for the CIA Capstone Exam. Taking and passing this exam, along with completing two online modules and a practice education course, would make you eligible to become an ACIA (Associate of the Canadian Institute of Actuaries).

Major in Actuarial Science

If you graduate from Western with a major in Actuarial Science, the CIA accreditation program will not apply to you. If your plan is to become a fully qualified actuary, then you will need to continue to write and pass the preliminary exams of the SOA.

Please see the following link for full details:

<https://www.cia-ica.ca/starting-your-journey/actuarial-education-in-canada/>

In addition to the university's internal policies on conduct, including academic misconduct, candidates pursuing credits for writing professional examinations shall also be subject to the **Code of Conduct and Ethics for Candidates in the CIA Education System**.

<https://www.cia-ica.ca/publications/223159e/>