STAT 2857A: Probability and Statistics I
Course Outline

1. Course Information

Course Information
Lectures
Monday & Wednesday 12:30-1:30 in HSB-40
Tutorial
Tuesday 4:30-5:30 in AHB-1R40

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 your Dean 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

Instructor
Dr. Simon Bonner   Office: WSC 276
                          Phone: 519-661-2111 ext. 88205
                          E-mail: sbonner6@uwo.ca
                          Office hours: To Be Determined

Teaching Assistants
Sherly Alfonso Sanchez   E-mail: salfonso@uwo.ca
                          Office hours: To Be Determined

Yiming Huang   E-mail: yhuan545@uwo.ca
                          Office hours: To Be Determined

Chengqian Xian   E-mail: cxian3@uwo.ca
        Office hours: To Be Determined

Contact

The best way to ask about the course material is to post a question on the [Forums in OWL](#). The advantages of the forums over e-mail is that the forums will be monitored by myself and the TAs, so the response time will be faster, and the posts are visible to all students. I find that students often have the same questions and everyone benefits when the answers are available to the entire class. If you send me or one of the TAs a question about the course material by e-mail then we will copy it over to the forum. Note that you can insert mathematical expressions into your posts using LaTeX notation. Enclosing an expression both before and after by "$$" will create a displayed equation (i.e., an equation that sits on its own line). Enclosing an expression by "\(" before and "\)" after will create an inline equation (i.e., an equation that is embedded within a sentence). You can find an introduction to LaTeX mathematical notation on [Overleaf](#) and in the pages linked from the bottom of that site.

You can also ask questions during my office hours or the TAs office hours.

If you have a personal question or administrative concersn then please stop by during my office hours or send me an e-mail. I do my best to respond to e-mail within one business day (i.e., within 24 hours not including Saturday, Sunday, or holidays). You may drop by my office at any time. If I can't meet you when you come by then I will set up a time to meet later.

3. Course Syllabus, Schedule, Delivery Mode

Outline

Western's 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 technically 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. 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 about the world around us 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 (SS2858).

Important Dates

Classes Start	Reading Week	Classes End	Study day(s)	Exam Period
September 8	November 1 - 7	December 8	December 9	December 10 - 23

* November 12, 2021: Last day to drop a first-term half course or a first-term full course without penalty

Contingency plan for an in-person class pivoting to 100% online learning
In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Course Materials

Textbook
The required text for this course is:

> Devore, JL and Berk, KN (2012) Modern Mathematical Statistics with Applications. 2nd Edition. Springer.

You may access a free electronic copy of this book in PDF or EPUB format through Western Libraries by following this link to Springer Link. From there you can also purchase a softcover copy of the book for 25 USD (approximately 34 CAD).

We will cover most of Chapters 1 through 6 in the text except for the sections which rely on multivariate calculus. The tentative schedule for textbook readings is available through the Textbook Reading Schedule. The link to this file is also provided in the Resources on OWL. 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 (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.

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

5. Methods of Evaluation

Assessment Activities
Your progress and performance in the course will be on the following activities:

Quizzes (5% each)	25%
Midterm	31%

Final exam	44%

To pass the course you must write at least three of the five tutorial quizzes and the final exam.

Schedule
Textbook sections covered by each quiz or exam are provided in the following list. These are tentative and subject to change, and any changes will be posted in the [course schedule](#) and announced at least one week prior to the assessment. All quizzes and exams are closed book. Quizzes will be conducted during the weekly tutorials (from 4:30-5:30 in AHB-1R40).

> Quiz #1 -- September 28
> > Sections Covered: 1.1, 1.2, 1.3, 1.4, 2.1
>
> Quiz#2 -- October 12
> > Sections Covered: 2.2, 2.3, 2.4, 2.5, 3.1
>
> Quiz #3 -- October 26
> > Sections Covered: 3.2, 3.3, 3.4, 3.5, 3.6
>
> Midterm -- November 12, 7:00 – 9:00pm (Subject to confirmation by Exam Central)
> > Sections Covered: 1.1 to 3.6
>
> Quiz #4 -- November 16
> > Sections Covered: 3.7, 4.1, 4.2, 4.3, 4.4
>
> Quiz #5 -- November 30
> > Sections Covered: 4.6, 4.7, 5.1, 5.2
>
> Final Exam -- TBD
> > Sections Covered:
> > - 1.1, 1.2, 1.3, 1.4,
> > - 2.1, 2.2, 2.3, 2.4, 2.5,
> > - 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7
> > - 4.1, 4.2, 4.3, 4.4, 4.6, 4.7,
> > - 5.1, 5.2, 5.3
> > - 6.1, 6.2, .6.3, 6.4

Accommodated Evaluations
If you miss a quiz or the midterm due to an excused absence (see Section 6) then the weight of that assessment will be moved to the final exam. If the absence is not excused then the you will receive a grade of zero with no option to submit late or alternate work.

Rounding of Marks Statement
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.

6. Student Absences

Academic Consideration for Student Absences
Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

(i)   Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:

• an absence must be no more than 48 hours
• the assessments must be worth no more than 30% of the student's final grade
• no more than two SRAs may be submitted during the Fall/Winter term

(ii)   For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.

(iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation
When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic

Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Absences from Final Examinations
If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write 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).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

6. Accommodation and Accessibility

Accommodation Policies
Students with disabilities work with Accessible Education (formerly SSD), 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,

7. Academic Policies

The website for Registrarial Services is http://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 his/her official university address is attended to in a timely manner.

Non-programmable calculators are permitted during quizzes and exams. Other electronic devices are not allowed and will be confiscated.

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:

Tests and examinations in this course will be conducted using a remote proctoring service in the event of health restrictions that prevent in person tests. 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.

8. 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/.

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 (519) 661-2147 if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (http://www.sdc.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.

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

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

9. University Accreditation Program

This course is accredited under the Canadian Institute of Actuaries (CIA) University Accreditation Program (UAP) for the 2021-22 academic year. Achievement of the established exemption grade in this course may qualify a student from exemptions from writing certain preliminary exams.

This course with a minimum mark of 75%, along with Statistics 3657A (minimum mark of 80%), can give you an exemption for Exam P.

Please see the following link for full details:

http://www.cia-ica.ca/membership/university-accreditation-program---home

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** and the associated **Policy on Conduct and Ethics for Candidates in the CIA Education System**.