

SS2857A: Probability and Statistics I

Fall 2019

1. General Course Information

Lectures

Monday & Wednesday 12:30-1:30 in MC 110

Tutorial

Tuesday 4:30-5:30 in WSC 55

Pre-requisites

A minimum mark of 60% in 0.5 course from (Calculus 1000A/B or Calculus 1500A/B) plus 0.5 course from Calculus 1301A/B (minimum mark 85%) or Calculus 1501A/B (minimum mark 60%). A minimum mark of 60% in Applied Mathematics 1413 may also be used to meet this 1.0 course prerequisite.

As noted in the Senate Guidelines, unless you have either the requisites for this course or written special permission from your Dean to enrol 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

Contact

The best way to contact me outside of class is either by coming to my office hours or by sending me an e-mail. I do my best to respond to e-mail within one business day. You may also 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 Description

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).

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](#) link on OWL. I will notify you if the schedule changes. It is your responsibility to check the schedule and keep up-to-date.

5. Methods of Evaluation

Assessment Activities

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

Assignments	20%
Tutorial Quizzes	50%
Final exam	30%

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

Assignments

I will post Assignments every second Monday starting September 9th. These questions will serve as models for the questions on the Tutorial Quizzes and Final Exam. Answers to these questions must be submitted through [GradeScope](#), an on-line collaborative grading system. Instead of submitting paper copies you will scan your answers with your phone or other electronic device and submit these online.

You are welcome to handwrite your solutions, but it is your responsibility to make sure that the text is legible. Submissions that cannot be read by the grader will receive a grade of zero.

Each assignment will contribute 4% to your final grade. Submissions are due before midnight on the due date. Half credit will be given for late submissions within 24 hours of the deadline. No credit will be given for submissions beyond this time unless a valid excuse is confirmed by an academic counsellor (see Section 6 for details on excused absences).

Tutorial Quizzes

Tutorial quizzes will cover the material in one chapter of the text and will be held on the following days:

- October 1: Chapter 1
- October 15: Chapter 2
- October 29: Chapter 3
- November 19: Chapter 4
- December 3: Chapter 5

Each quiz will contribute 10% to your final grade. No credit will be given for missed quizzes without a valid excuse confirmed by an academic counsellor (see Section 6 for details on excused absences).

Final Examination

The date and time of the final examination will be set by the university. The final exam will be cumulative. Note that the final examination will cover all material presented in the course, even the material in Chapter 6 which will not be covered by the Tutorial Quizzes or a submitted Review Exercise.

Minimum Requirements

You must submit at least three sets of Review Exercises and write at least three Tutorial quizzes to pass the course, unless this requirement is overruled by an Academic Counsellor.

Midterm Grades

Midterm grades based on at least the first two quizzes (20% of your final grade) will be available before the midterm grading deadline in early November.

How to Do Well in this Course

The different forms of assessment are intended to reinforce each other. The final exam for this course will be based on the Tutorial Quizzes which will be based on the Review Exercises. The best way to do well in this course is to:

1. Read the assigned sections of the textbook before coming to lecture.
2. Complete the Review Exercises posted every two weeks.
3. Review the solutions for the Review Exercises before the review tutorials.
4. Attend tutorials to clarify any solutions that you didn't follow.
5. Meet with myself or the TA during office hours if you still have questions.
6. Write the Tutorial Quizzes.
7. Check the solutions of the Tutorial Quizzes after they are posted.

8. Meet with me or the TA if you have questions about the Tutorial Quiz solutions.
9. Write the final exam.

Approximately 80% of the final grade will be based on your ability to perform mechanical calculations (i.e., identify the correct tool and apply it). The final 20% will be based on your understanding and your ability to think more deeply about the material that we cover.

6. Accommodation and Accessibility

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reporting of absence or via the Dean's Office/Academic Counselling unit of your Home Faculty. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca.

For further information, please consult the university's policy on academic consideration for student absences:

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

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (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" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, 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.

You will be permitted to use non-programmable calculators on the Tutorial Quizzes and Final Exam. You may not use any other electronic device in place of a calculator.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

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](#). For more information, please visit [Obtaining UAP Credits](#) and the [CIA FAQ](#).

8. Support Services

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 Student Accessibility Services (SAS) at 661-2147 if you have any questions regarding accommodations.

The policy on Accommodation for Students with Disabilities can be found here:
www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

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/mental_health) 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. UAP Accreditation

This course is accredited under the Canadian Institute of Actuaries (CIA) [University Accreditation Program](#) (UAP). Achievement of the minimum required grades in accredited courses may provide credit for preliminary exams. Please note that a combination of courses may be required to achieve exam credit. Details of required courses and grades at Western University are available [here](#).