

SS 2857A: Probability and Statistics I Course Outline

1. Course Information

Course Information

Term: Summer 2023

Location: Virtual

Lectures: TWThF 9:00-11:00

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

Instructors	Email	Office	Phone	Office Hours
Dr. Holly Steeves	USE OWL MESSAGES	WSC 233	519-661-2111 x86426	Virtual T, Th, 12-1.
TA: Yuhao (Jet) Zhou	yzho82@uwo.ca			
TA: Karzan Saeedi	kseedi2@uwo.ca			

Students must use OWL messages to contact Dr. Holly Steeves. Emails will not be answered.

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 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 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.

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.
- 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 24 hours for a response via email. 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.

3. Course Syllabus, Schedule, Delivery Mode

Course Description

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.

The introduction to statistics side of the course will begin with descriptive statistics, that is, summarizing and describing the data at hand. We will discuss graphs and numerical summaries to display the data and describing what is depicted.

The introduction to probability side of the course will go over the basics of probability: the laws of probability, axioms of probability, conditional probability and Bayes' theorem. This leads us into random variables and probability distributions, which are the foundations upon which data modelling is built. This will provide you with the basics you need for any mid to high level statistics course you may be itching to take. We will specifically look at descriptive statistics, probability, continuous and

discrete random variables, continuous and discrete probability distributions, joint probability distributions and sampling distributions.

Learning Outcomes

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

- Summarize data with the use of graphs and numerical summaries, and describe characteristics of the data.
- Define probability and use the axioms, rules, and counting techniques to solve for probabilities.
- Define random variables and describe their probability distributions, solving for expected values, moment generating functions, and variances as needed.
- Solve for expected values, covariance, and correlation of jointly distributed random variables.
- Define sampling distributions and solve for the sampling distribution of the sample mean.

Week	Dates	Hour	Section	Assignment
1	May 16	9:00-10:00	1.1	
		10:00-11:00	1.2	
	May 17	9:00-10:00	1.3	
		10:00-11:00	1.4	
	May 18	9:00-10:00	1.4	
		10:00-11:00	2.1	
	May 19	9:00-10:00	2.2	
		10:00-11:00	Tutorial 1	
2	May 23	9:00-10:00	2.3	
		10:00-11:00	Quiz 1	Assignment 1 Due
	May 24	9:00-10:00	2.4	
		10:00-11:00	2.5	
	May 25	9:00-10:00	3.1	
		10:00-11:00	3.2	
	May 26	9:00-10:00	3.3	
		10:00-11:00	Tutorial 2	
3	May 30	9:00-10:00	3.4	
		10:00-11:00	Quiz 2	Assignment 2 Due
	May 31	9:00-10:00	3.5	
		10:00-11:00	3.6	
	June 1	9:00-10:00	3.7	
		10:00-11:00	4.1	
	June 2	9:00-10:00	MIDTERM TEST	
		10:00-11:00	MIDTERM TEST	
4	June 6	9:00-10:00	4.2	
		10:00-11:00	Tutorial 3	
	June 7	9:00-10:00	4.3	
		10:00-11:00	Quiz 3	Assignment 3 Due

	June 8	9:00-10:00	4.4	
		10:00-11:00	4.6	
	June 9	9:00-10:00	4.7	
		10:00-11:00	4.7	
5	June 13	9:00-10:00	5.1	
		10:00-11:00	Tutorial 4	
	June 14	9:00-10:00	5.2	
		10:00-11:00	Quiz 4	Assignment 4 Due
	June 15	9:00-10:00	5.3	
		10:00-11:00	5.3	
	June 16	9:00-10:00	6.1	
		10:00-11:00	Tutorial 5	
6	June 20	9:00-10:00	6.2	
		10:00-11:00	Quiz 5	Assignment 5 Due
	June 21	9:00-10:00	6.3	
		10:00-11:00	6.3	
	June 22	9:00-10:00	Catch-up	
		10:00-11:00	Tutorial 6	
	June 23	9:00-10:00	Exam Review	
		10:00-11:00	Quiz 6	Assignment 6 Due

4. Course Materials

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 if you prefer.

We will cover most of Chapters 1 through 6 in the text except for the sections which rely on multivariate calculus.

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

The overall course grade will be calculated as listed below:

Assignments (6)	20%
Quizzes (6)	15%
Midterm Test	25%
Final Exam	40%

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** (<https://www.gradescope.com/>) 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.
- **One assignment will be dropped. Be it the lowest one, or one that you don't have time to do, or one that you are sick for. Whatever the reason, I don't need to know.**
- 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 11:55 pm (Eastern Time) on the due date.** Assignments that are up to 24 hours late will receive a deduction of 15% on their mark. Late assignments up to 48 will receive a deduction of 30% on their mark hours that. No credit will be given for submissions beyond 48 hours of the deadline time unless a valid academic accommodation is obtained.
- 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.
- **Quizzes** will be done online in Webworks. You will be graded on your best 5 out of 6 quizzes. For each quiz, you will be given one hour. If any violations are seen cheating for the online quizzes, there will be repercussions.
- **Midterm Exam** is during class time on June 2nd. This will be done virtually via ProctorTrack. The midterm is closed book but you are allowed one single sided, letter sized, handwritten cheat sheet.
- **Final Exam** date and time to be decided. This will also be done virtually via ProctorTrack. You will be allowed **one double sided, handwritten, letter sized cheat sheet.** Again, any violations seen on the cheat sheet and it will be taken from you.

6. Student Absences

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

Assessments worth less than 10% of the overall course grade:

Please contact your Dean's Office Academic Counselling unit as soon as possible. When I get word that your absence has been approved, the weight will be shifted into the remaining of the category. For example, if you missed an assignment, instead of each assignment being worth 4.2%, each assignment will be worth 5.25%.

Assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

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

The Student Medical Certificate is available at

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

If the midterm exam is missed, the weight will be shifted towards the final exam.

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).

Note: missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

6. Accommodation and Accessibility

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>.

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.

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 their official university address is attended to in a timely manner.

Participants in this course are not permitted to record lectures and/or labs, except where recording is an approved accommodation, and the participant has the prior written permission of the instructor.

Online services such as Chegg are actively monitored. Any questions that are coming out from assignments and are posted to an online service will be searched. Such an activity will be considered as a scholastic offence and will result in an academic penalty.

A scientific calculator will be allowed on the midterm and 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:

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

Clickers, specifically iClicker will be used in this class for instant feedback and non-graded assessments. Clickers will not be used for any marks towards the course.

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/>.

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 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/>.