

**University of Western Ontario
Department of Statistical and Actuarial Sciences**

Applied Probability and Statistics for Engineers – Statistical Sciences 2141A

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Text: “*Probability and Statistics for Engineers and Scientists*” by Anthony Hayter (4th edition)—E-texts should be available very soon. Information will be posted on OWL.

Prerequisites:

Applied Mathematics 1413 or Calculus 1000A/B or 1100A/B plus either Calculus 1501A/B or 1301A/B

Students are advised that they are responsible to ensure that they possess the necessary prerequisites (or have written special permission). If you do not have a minimum of 50% in a first year calculus course, you MUST drop the course. If you fail to do so, you can be de-registered at any time even after writing the final exam.

Approximate Course Outline (We MAY end up skipping some sections in some chapters. This will be communicated in OWL).

Chapter 1 – Probability

- Probabilities, Events, Union, Intersection, Conditional Probability, Bayes Rule, Chebyshev’s Theorem

Chapter 2 – Random Variables (exclude 2.5)

- Discrete and Continuous, Expectation, Variance, Combinations and Functions

Chapter 3 – Discrete Probability Distributions (3.1 to 3.4)

- Binomial, Poisson, Geometric, Negative Binomial, and Hypergeometric Distributions

Chapter 4 – Continuous Probability Distributions (4.1 to 4.3)

- Uniform, Exponential, and Gamma

Chapter 5 – Normal Distribution (5.1 to 5.3)

- Normal Curve Calculations, Linear Combinations, Normal Approx. to Binomial

Chapter 6 – Descriptive Statistics (6.1 to 6.3)

- Graphing Data, Sample Statistics: Mean, Median, Variance, IQR, Percentiles, Outliers

Chapter 8 – Inference About a Population Mean (8.1 and 8.2)

- One Sample Confidence Intervals and Hypothesis Testing (Variance known/unknown)

Chapter 9 – Inference About Two Population Means (9.1 to 9.3)

- Two Independent Samples Confidence Intervals and Hypothesis Testing; Paired Samples

Chapter 12 – Simple Linear Regression and Correlation

- Regression, Inferences About Slope, Prediction Intervals, Coefficient of Determination, Residual Analysis, Correlation Analysis

Course Website: OWL site. Login in using your UWO ID and your p@S\$w0rD. You should check this page regularly for periodic updates and information relevant to the course. I hope to be able to post the class overheads a day or so before each class.

Online Quizzes:

There will be **FOUR** 60-minute online quizzes. Release dates and coverage will be announced on OWL. I have set up a very short sample quiz so that you can get some practice answering and submitting your quiz. This will be released on Wednesday May 6. You do NOT have to study for it. It is simply an exercise to get you used to submitting an online quiz. It will not be worth any marks. Please note that once you start a test, the timer will start. If for some reason, you get “kicked out” of the test, you need to get back on to the website and continue with the quiz as soon as possible.

These quizzes are not technically cumulative. However, please know that you will have to understand earlier material in the course in order to be successful with some of the later material.

The quizzes are open-book. I encourage you to make use of my lecture slides and the text when writing the test. However, you must work independently. Before you begin each test, you will agree to an Honour Statement. I will be conducting response and cheating analysis after each quiz. Please honour the Honour Statement.

There will be no make-ups for any of the online tests. If you miss a test (with a valid reason), the weight will be reassigned to your final exam.

Online Test:

There will be an online test. Think of this as a larger quiz. You will be given 2-hours to write the test. All the same rules apply for the test as with the quizzes. They are open-book, but you are required to work independently.

Final Exam:

There will be a CUMULATIVE THREE HOUR final exam in the course. The format will be multiple choice OR a combination of multiple choice / short answer questions.

The details have not been finalized for the final exam as far as how it will be administered. There is a tentative plan to use a remote proctoring service to complete the final exam. More details will be communicated to you as they become available to me. I have included some general information about the final exam below. Nothing has been finalized as of yet though.

Here's what I know (as of May 3):

***Examinations During the Intersession and Summer Terms**

The University has been told that enough seats would be available for all courses through eCampus Ontario using the Proctortrack remote proctoring service.

I'll provide details on how to get signed up for these as they become available. As such, it should be possible to have remotely proctored final exams this summer.

We will plan for the final exam in this course to be conducted using the remote proctoring service Proctortrack. Therefore, completion of this course will require you to have a device that meets the requirements at

<https://www.proctortrack.com/tech-requirements/>
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By taking this course, you are consenting to the use of this software and to be monitored during the final exam. Furthermore, you are declaring that you have a reliable internet connection with sufficient capacity to support video proctoring.

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).

***** It may also be the case that we could have our Final Exam in OWL. We will wait for more details. *****

Course OWL Web Page

Students should check OWL (<http://owl.uwo.ca/portal>) 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. Students are responsible for checking OWL on a regular basis. The web page will contain:

1. A copy of this course outline
2. Updates and information about the course that you need to know.
3. A discussion Board
4. Class notes and extra practice questions.
5. You will access your tests and quizzes from this site.
6. Marks of quizzes and tests as they are marked.

Evaluation:

	Option 1	Option 2
Introduce Yourself on OWL	4%	4%
4 Online Quizzes; equally weighted	20%	28%
Online Test (2-hour)	20%	24%
Final Exam (3-hour)	56%	44%

**The marking scheme that gives the higher final mark will be the one used. This will be done automatically.

Again, there will be no make-up tests or assignments for students that miss these assessments for a valid reason (accommodation approved by their faculty or a recorded self reported absence). For details on how to request academic consideration, please see the Academic Consideration section included in a later section of this course outline. For students that miss either a test or assignment for a valid reason, the weight of the missed assessment will be reassigned to your final exam.

Calculator:

You will also need a non-programmable calculator for tests and the final exam.

Only non-programmable calculators may be used for your tests and the final exam. The following models are strongly recommended:

- Texas Instruments BA-35
- BA II Plus or TI-30X II (memory must be cleared prior to start of exam)
- TI-30X or TI-30Xa

Intellectual Property Statement

Course material (i.e. course content, such as lecture notes, any videos, supplementary material, extra practice questions, and solutions created by your Instructor) is the intellectual property of your Instructor. It has been made available to you for your personal use in the course. **Sharing, posting, selling, or using these materials outside of your personal use in this course is considered to be an infringement of intellectual property rights and is not permitted.**

Policy on E-mail communication

You are welcome to communicate with your instructor by e-mail, but e-mail communication should only be used to provide them with information or to ask a question that requires a brief response. For more lengthy discussions and for discussions on lectures/course material please make use of the Discussion Board on OWL. If you do e-mail me, please use your UWO account, as these are often the only emails read (as e-mails sent from other addresses often get spammed).

Please note that content-related questions or messages posted on OWL Discussion Forums while there is an online assessment will not be addressed until the assessment period has closed.

Attendance

Regular engagement with the online course materials is an important part of the learning process. Students are advised that excessive absenteeism from the OWL site may result in the student being disbarred from the final exam (see Western Academic Calendar).

Classroom Environment

There are various policies governing the classroom environment and all work submitted by students and here is an example <https://www.uwo.ca/stats/undergraduate/mutual-expectations.html>. Although these were developed with a lecture-based course in mind, the spirit of the expectations applies to this course as well. In summary the policies developed are under the premise that all interactions between student and faculty should be governed by the principles of courtesy, respect and honesty. Students are encouraged to ask questions on the appropriate forums. Do not use course-related OWL Forums for social conversation unrelated to the course. Keep postings to the OWL Forums positive and productive – the OWL Forums are an important component of our learning environment. Inappropriate or disrespectful postings will not be tolerated.

Rough Weekly Course Schedule – Includes Assessments

This is a 6-week course. Things move quickly. In the classroom, we would have 6 lecture hours. So, missing a day would be like missing a week of course material. Please do not fall behind. I can give you a rough idea as to where you should be in the course material each week.

Week No.	Dates	Course Material
1	May 4 – 8 Introduce Yourself on OWL	Chapters 1 and 2
2	May 11 – 15 Quiz #1	Chapters 2 and 3
3	May 18 – 22 Quiz #2	Chapters 4 and 5
4	May 25 – 29 Test #1	Chapters 5 and 6
5	June 1 – 5 Quiz #3	Chapters 8 and 9
6	June 8 – 12 Quiz #4	Chapters 9 and 12
	Final Exam	Details – To Be Announced

What Do You Do if You Miss a Course Requirement Due to Illness or Special Circumstances?

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is your responsibility to make alternative arrangements with your instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:

<http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

If you require academic accommodation due to illness, you should use the Student Medical Certificate when visiting an off-campus medical facility. The form can be found here:

https://studentservices.uwo.ca/secure/medical_document.pdf

Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

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. During the COVID-19 pandemic, medical notes are not required. Medical absence can be reported through the Student Illness Reporting Tool at

https://www.registrar.uwo.ca/academics/academic_considerations/index.html

https://www.registrar.uwo.ca/academics/academic_considerations/index.html>.

If this portal is not available (i.e., if the COVID-19 pandemic has lifted before the end of the course), or if you have missed (or will be missing coursework) for a non-medical reason beyond your control, approval can be granted either through a Self-reported Absence (if the portal is available) or via the Dean's Office/Academic Counselling unit of your Home Faculty. Non-medical reasons must be accompanied by supporting documentation. If you are a Science student, contact information for the Academic Counselling Office for the Faculty of Science is available at

<https://www.uwo.ca/sci/counselling/> <<https://www.uwo.ca/sci/counselling/>>.

In all cases, you must contact your instructor as soon as possible, and no later than 24 hours after the period covered, to clarify how you will be expected to fulfil the academic expectations you have missed (unless other instructions are indicated in this Course Outline). For further information, please consult the University's policy on academic consideration for student absences:

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

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf%3Chttps://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf.

Academic Policy

The website for Registrar 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.

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

Computer-marked, multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Support Services

Learning-skills counsellors at the Student Development Centre 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: <http://sdc.uwo.ca/>.

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

Additional student-run support services are offered by the USC: <https://westernusc.ca/your-services/>.

Accessibility

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 Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

The policy on Accommodation for Students with Disabilities can be found here: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_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

Good luck everyone!!