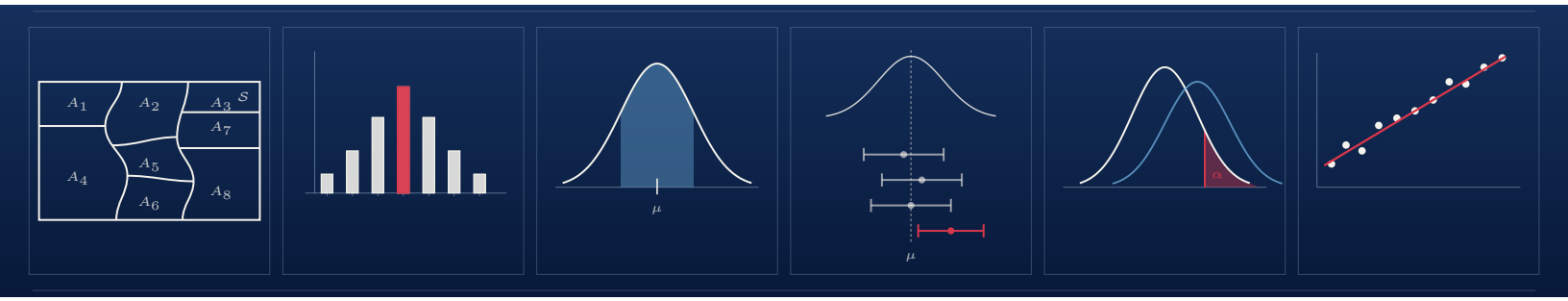
Western Science

Department of Statistical and Actuarial Sciences



Applied Probability and Statistics for Engineers (SS2141) Course Outline

1 Course Information

Course Name: Applied Probability and Statistics for Engineers

Course Number: SS2141

Term: Summer 2026

Delivery: Distance Studies

List of Prerequisites
One or more of Ontario Secondary School MCV4U, MHF4U, MDM4U, Mathematics 0109A/B, Mathematics 0110A/B, Mathematics 1229A/B, or equivalent.

Prerequisite Checking
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.

List of Antirequisites
Statistical Sciences 1023A/B, Statistical Sciences 2037A/B, Statistical Sciences 2857A/B, the former Statistical Sciences 1024A/B.

Lecture schedule

Section	Instructor	Location	Class Number
001	Pavel Shuldiner	Asynchronous	1457

Lectures are delivered asynchronously through Brightspace.

Problem-Solving Tutorials: Problem-solving tutorials will be held weekly throughout the course. Dates and times will be announced during the first week of class, pending on class availability. Tutorials will take place on Microsoft Teams and will be recorded; recordings will be posted to Brightspace afterwards.

2 Instructor Information

Instructor	Email	Location	Office Hours
Pavel Shuldiner	pshuldin@uwo.ca	Teams	TBD

TA office hours will be posted on Brightspace when available.

2.1 Piazza & Communication

We will use **Piazza** for all class discussions. The system is highly catered to getting you help fast and efficiently from classmates, TAs, and the instructor.
Please allow **up to 2 business days** for a response from the teaching team.

Etiquette & Guidelines

Public posts	Ask questions about course content, logistics, or assignment concepts here. Public Piazza posts are the correct channel for general course questions, including questions posted anonymously to classmates, so everyone can benefit from the answers.
Private posts	Use only for personal or sensitive matters that are not emergencies, including questions about regrade feedback. This is **not** the platform to request academic considerations; submit those through the Student Absence Portal.
Instructor-only posts	If a private matter should be seen by the teaching team, you may direct the private Piazza post to the instructional team.
Direct email	Use direct email to the instructor **only** for emergencies. Do not use email for ordinary course-content questions, faster responses, or grade disagreements.
Search first	Check if your question has already been answered to avoid duplicates and speed up response times.
Assignments	Discuss general strategies, but do not post complete solutions or direct answers.
Respectful conduct	Maintain professionalism and respect in all interactions with peers and teaching staff.
Anonymity	Post anonymously to classmates if desired; instructors will always see your identity.

Students must use @uwo.ca email addresses for any permitted email and include "SS2141" in the subject line.

3 Course Syllabus & Schedule

Course Description
Students will learn how to visualize and analyse continuous and categorical data. Concepts of distributions, sampling, estimation, confidence intervals, experimental design, inference, and correlation will be introduced in a practical, data-driven way.

Tentative Course Schedule (Summer 2026)

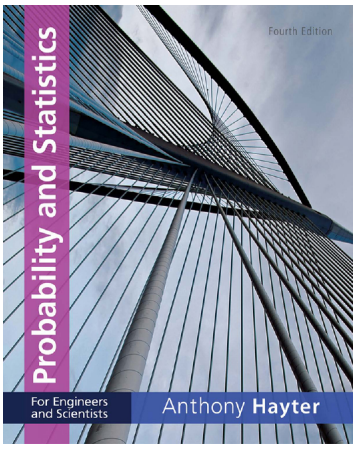
Week	Chapter(s)	Topic	Assessments
Week 1 May 4–8	1	**Probability** sample spaces, events, probability axioms, conditional probability, independence, Bayes' theorem, Chebyshev's theorem	A0 due Sat May 9 (8:00 PM)
Week 2 May 11–15	2 (excl. 2.5), 3.1–3.4	**Random variables** discrete and continuous random variables, expectation, variance, functions of random variables; discrete probability distributions: binomial, Poisson, geometric, negative binomial, and hypergeometric	A1 due Sat May 16 (8:00 PM)
Week 3 May 19–22	4.1–4.3, 5.1–5.3	**Continuous probability distributions** uniform, exponential, and gamma; normal distribution: probability calculations, linear combinations, and normal approximation to the binomial	Midterm Sun May 24 2:00–4:00 PM, in person Covers Ch 1, §§2.1–2.4, 3.1–3.4, 4.1
Week 4 May 25–29	6.1–6.3, 8.1–8.2	**Descriptive statistics** graphing data, sample mean, median, variance, IQR, percentiles, and outliers; **Inference for one population mean** confidence intervals and hypothesis testing with known and unknown variance	A2 due Sat May 30 (8:00 PM)
Week 5 Jun 1–5	9.1–9.3	**Inference for two population means** confidence intervals and hypothesis testing for two independent samples; paired samples inference	(No assessments)

(continued on next page)

Week	Chapter(s)	Topic	Assessments
Week 6 Jun 8–12	12	Simple linear regression and correlation: regression inference, inferences about slope, prediction intervals, coefficient of determination, residual analysis, and correlation analysis	A3 due Fri Jun 12 (8:00 PM)

For clarity, all assignment deadlines are at 8:00 PM Eastern Time: A0 is due Saturday, May 9; A1 is due Saturday, May 16; A2 is due Saturday, May 30; and A3 is due Friday, June 12. The midterm is held in person on Sunday, May 24 from 2:00–4:00 PM.

4 Course Materials



Recommended textbook: Hayter, *Probability and Statistics for Engineers and Scientists*, 4th Ed. (Cengage, 2012). ISBN 9781111827045.

The textbook is **recommended, not required**. All essential material is covered in lectures; problems from the text are assigned for practice. Chapters 1, 2, 3, 4, 5, 6, 8, 9, and 12 are covered.

Approximate cost (April 2026; the publisher does not list a CAD price, and prices are subject to change):

- New print copy: USD $272.95 list (Cengage; currently out of stock at the publisher).
- Cengage eTextbook, 180-day digital access: USD $71.99.
- Used print copies: typically USD $60–95 through AbeBooks, Amazon.ca, and other online resellers.
- The 3rd Edition (2007, ISBN 9780495107576) is also acceptable; chapter numbering matches the chapters used in this course.

There are no restrictions on the use of second-hand copies. **The textbook is not stocked through the Western Bookstore for SS2141**; students who wish to purchase a copy should source it independently through the channels above.

Technical Requirements: A reliable internet connection is required to access asynchronous course materials, submit assignments, and use Brightspace, Gradescope, and Piazza. A scientific non-programmable calculator is permitted on assessments; graphing calculators are not allowed.

Brightspace: All course material will be posted to Brightspace. Students are responsible for checking Brightspace regularly.

Course Website: Course materials are additionally available in a more organized and navigable format at pavelshuldiner.com/ss2141.

5 Methods of Evaluation

Course Evaluation

Component	Weight	Deadline
Assignments (best 3 of 4)	5%	Sat May 9, Sat May 16, Sat May 30, Fri Jun 12 8:00 PM
Midterm Coverage: Ch 1, §§2.1–2.4, 3.1–3.4, 4.1	35%	Sunday, May 24 2:00–4:00 PM Location: NSC-1
Final Exam Coverage: Cumulative	60%	Saturday, Jun 20 12:00–3:00 PM Location: NSC-1

Permitted Exam Aids: The only permitted aids on the midterm and final exam are a scientific (non-programmable) calculator and an instructor-provided formula sheet. Graphing calculators and all other materials or devices are not permitted.

5.1 Assignment Structure & Collaboration

Submission: All assignments are submitted via Gradescope and will be posted at least 5 days before the due date. Submissions must be uploaded as a single **PDF** file; submissions in any other format receive zero. If you submit multiple times, Gradescope displays and grades only your most recent submission. Work may be handwritten or typed; handwritten work is accepted provided it is legible. Students are not required to include the original question text.

Each question must be matched to the page(s) containing its work on Gradescope. Any unmatched question receives zero; properly matched questions are graded normally. Any question whose submitted work is illegible receives zero; legible, properly matched questions are graded normally. Students unfamiliar with Gradescope should consult the official guides for submitting a PDF and matching pages to questions before their first submission.

Assessment Conventions: Unless a problem states otherwise, carry extra digits through intermediate calculations and give final numerical answers to 2 decimal places or as an exact expression. You must show your work and justify your steps. You may cite named results from the course without re-deriving them; derive a result only when the prompt explicitly says "derive," "show," or "prove."

Collaboration Policy: You may discuss assignment problems with peers at a conceptual level (e.g., clarifying what a question is asking, discussing general approaches). However, **all written work and solutions must be completed and submitted individually**. Each student must produce their own original solutions.

Academic Integrity: The permitted resources for assignments are the course lecture materials and the course textbook. External resources, including online homework-help websites, AI tools, private tutoring on active assessment questions, solution sharing, or copying from others, are not

permitted unless the instructor explicitly allows them for a specific task. Submitting work that is not your own constitutes a **scholastic offence** and may result in a grade of zero and referral to the Academic Dean.

5.2 Assignment Breakdown

The following is a tentative schedule of assignments, their due dates, and the topics they cover:

Assignment	Coverage & Focus
A0: Orientation Sat, May 9	Course onboarding Gradescope setup and page-matching practice, academic integrity acknowledgement, math fundamentals, and student interest survey.
A1: Probability & Discrete Distributions Sat, May 16	Chapters 1–3 sample spaces, events, conditional probability, Bayes' theorem, Chebyshev's theorem; random variables, expectation, variance; binomial, Poisson, geometric, negative binomial, and hypergeometric distributions.
A2: Continuous Distributions & One-Sample Inference Sat, May 30	Chapters 4, 5, 6, 8 uniform, exponential, gamma, and normal distributions; graphical and numerical summaries of data; confidence intervals and hypothesis testing for one population mean.
A3: Two-Sample Inference & Regression Fri, Jun 12	Chapters 9, 12 confidence intervals and hypothesis testing for two independent population means; paired samples inference; simple linear regression and correlation.

5.3 Missed Coursework Policy

Assignments: Your best 3 of 4 assignment scores (A0–A3) count toward your final grade (5% total); the lowest score is dropped. A 48-hour "no-penalty" grace period applies to every assignment deadline. Assignments not submitted within the 48-hour grace period will receive a grade of zero.

Due to the dropped-assignment policy and 48-hour grace period, no documentation is required for a single missed assignment. If you cannot submit an assignment before the grace period closes, no individual extension request is required; the missed or late assignment is handled through the automatic lowest-score drop. Assignments submitted after the grace period will **not** be accepted, and no further academic consideration will be granted.

Midterm: If you miss the midterm, you must submit formal supporting documentation to have the weight moved to the final exam. Missed midterms without approved documentation will receive a grade of zero.

Final Exam: If you miss the final exam, you must submit formal supporting documentation to be eligible for a makeup exam.

5.4 Regrade Requests

Assignment and midterm regrade requests will be available for 7 days after grades are returned and must be submitted exclusively through Gradescope. Before submitting a request, carefully review the posted solutions.

Regrade requests will be considered only when there is evidence of a grading error or oversight on the part of the grader, such as a calculation error in the marking, a mark applied to the wrong question, a misapplication of the marking scheme, or a submitted question that received no marks. Dissatisfaction with a grade is not a valid basis for a regrade request. If it is marked according to the marking scheme, then the grade assigned is correct.

Please note that regrade requests may result in your score increasing, decreasing, or remaining unchanged.

6 Additional Statements

6.1 Online Course Expectations

This course is offered in a fully **asynchronous online** format. All lecture content will be recorded and distributed through Brightspace. Regular and sustained engagement with lectures, practice exercises, assignments, and course readings is expected of all enrolled students.

6.2 In-Person Assessment Expectations

The midterm and final exam will be written **in person**. Students are responsible for checking Brightspace for room information and assessment instructions before each exam. Students must bring appropriate identification and any explicitly permitted aids.

6.3 Religious Accommodation

When conflicts arise 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 of 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.

6.4 Academic 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 on the university website.

6.5 General Academic Policies

Additional information is available on the Registrar Services website. Use of @uwo.ca email: In accordance with policy, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account

holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

6.6 Requests for Relief (formerly known as appeals)

Policy on Request for Relief from Academic Decision can be found here.

Procedures on Request for Relief from Academic Decision (Undergraduate) can be found here.

6.7 Scholastic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy. Procedures on Scholastic Offences (Undergraduate) can be found here.

6.8 Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a scholastic offence, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

6.9 Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization, unless otherwise **explicitly** specified, will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

6.10 Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters.

Students who are in emotional/mental distress should refer to Mental Health @ Western for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts. 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. If you have any questions regarding accommodations, you may also wish to contact Accessible Education.

Learning-skills counsellors at Learning Development and Success 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 Summer term in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC.