

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

1. Course Information

Course Information

Statistical Science 2141: *Applied Probability and Statistics for Engineers*

Prerequisite(s)

Applied Mathematics 1413, or either Calculus 1000A/B or 1100A/B plus either Calculus 1301A/B or 1501A/B. Applied Mathematics 1413 (026), or either Calculus 1000A/B or 1100A/B (050a/b) plus either Calculus 1301A/B (051a/b) or 1501A/B (081a/b).

Anti-requisite(s)

All other courses or half courses in Introductory Statistics except for Statistical Sciences 1023A/B, Statistical Sciences 1024A/B. All other courses or half courses in Introductory Statistics except for Statistical Sciences 1023A/B, Statistical Sciences 1024A/B.

Students are responsible to ensure that they possess the necessary prerequisites (or have written special permission) and that de-registration may occur at any time if they lack the prerequisite or have taken an anti-requisite course. 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. Course Information

Instructor: Katsu Goda
Email: kgoda2@uwo.ca
Lecture Hours: Not applicable, **asynchronous lectures**; presentation videos will be posted weekly on OWL
Online Office Hours: Mondays, Wednesdays, and Fridays, 1:30 PM-2:30 PM (Zoom link will be provided on OWL website)
Teaching Assistants: Aoyko, Andrew (aboyko4@uwo.ca), Cui, Jingyu (jcui92@uwo.ca), Deng, Gansen (gdeng7@uwo.ca), Faroughi, Pouya (pfarough@uwo.ca), Li, Yuying (yli2982@uwo.ca)

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, and Delivery Mode & 3.

Learning Outcomes

At the end of the course, students should be able to:

- x state fundamental concepts of applied probability and statistics,
- x see how the concepts are related and interact with each other,
- x decide where and under what circumstances a given concept is applicable,
- x combine the concepts to produce solutions for real-life problems,
- x make appropriate inferences and decisions.

Type	Mode	Dates	Time	Frequency
Lecture	Asynchronous online	N/A	3 hours/sessions	weekly
Office hours/Questions and answers	Synchronous online	M/W/F	1:30 – 2:30 pm	weekly

4. Course Materials

Text Books

- x *Probability and Statistics for Engineers and Scientists, 4th ed., by A. Hayter (main)*
- x *MATLAB Recipes for Earth Sciences* by M. Trauth (electronic book is available via Western Libraries; <http://link.springer.com/book/10.1007%2F978-3-662-46244-7>)
- x *Statistics and Probability Theory* by M.H. Faber (electronic book is available via Western Libraries; <https://link.springer.com/book/10.1007%2F978-94-007-4056-3>)

Course Outline

Chapter of the main text book	Topics
1 – Probability theory	Probabilities, Events, Union, Intersection, Conditional Probability, Bayes Rule
2 – Random variables	Discrete and Continuous Random Variables, Expectation, Variance, Combinations, Functions of Random Variables
3 – Discrete probability distributions	Binomial, Poisson, Negative Binomial
4 – Continuous probability distributions	Uniform, Exponential, Gamma
5 – Normal distributions	Normal Curve Calculation, Linear Combinations, Normal Approximation to Binomial, Related Distributions
6 – Descriptive statistics	Graphing Data, Sample Statistics: Mean an

Course Schedule

Week	Topics
Week1 (Sept 7 -)	Briefing
Week2 (Sept 14 -)	Chapter 6 (Sessions 1 & 2) and MATLAB (Session 3)
Week3 (Sept 21 -)	Chapter 1 (Sessions 4-6)
Week4 (Sept 28 -)	Chapter 2 (Sessions 7 and 8)
Week5 (Oct 5 -)	Chapter 2 (Sessions 9 and 10)
Week6 (Oct 12 -)	Chapter 3 (Sessions 11 and 12) and Chapter 4 (Session 13)
Week7 (Oct 19 -)	Chapter 5 (Sessions 13 and 15) and Monte Carlo methods (Session 16)
Week8 (Oct 26 -)	Review 1 and Midterm
Fall reading week (Nov 2-8)	
Week9 (Nov 9 -)	Chapter 7 (Sessions 17-19)
Week10 (Nov 16 -)	Chapter 8 (Sessions 20 and 21) and Chapter 9 (Session 22)

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf and for the Student Medical Certificate (SMC), see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

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

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).

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 Academic Calendar for details (under Special Examinations).

7. Academic Policies

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

In accordance with policy, [nivsec/pdf/acad](#)

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.

Tests and examinations in this course will be conducted using the remote proctoring service, such as **Proctortrack**. 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. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link: <https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>.

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. Information about the technical requirements are available at the following link: <https://www.proctortrack.com/tech-requirements/>.

Professionalism & Privacy

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- x Students are expected to follow online etiquette expectations provided on OWL
- x All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- x Recordings are not permitted (audio or video) without explicit permission
- x Permitted recordings are not to be distributed
- x Students will be expected to take an academic integrity pledge before some assessments
- x All recorded sessions will remain within the course site or unlisted if streamed

Copyright Statement

Please be aware that all course materials created by the instructor(s) are copyrighted and cannot be sold/shared. Those include materials used in midterms and finals. Any posting/sharing of such materials in part or whole without owner's consent is considered as violation of the Copyright Act and will be considered as a scholastic offence.

In addition, online services such as Chegg are actively monitored. Any questions that are coming out during midterms and finals and are posted to an online service will be searched. Such an activity will be considered as a re that f M

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentati