



Applied Statistics and Data Analysis for Engineers 2014/2015

[Statistical Science 2143B Section 001](#)

Course Outline

Instructor Information

Instructor	Zinovi Krougly
Office	WSC 270
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Phone	519-661-2111 ext 88007
Office Hours	Mon,Wed,Fri 2:30 PM-3:30 PM;

Course Information

Course Description	A data-driven introduction to statistics intended primarily for students in Chemical and Mechanical Engineering. Exploratory data analysis, probability, the Binomial, Poisson, Normal, Chi-Square and F distributions. Estimation, correlation and regression (model building and parameter estimation), analysis of variance, design of experiments. Cannot be taken for credit in any module in Statistics, Actuarial Science, or Financial Modelling.
Prerequisites	A full mathematics course, or equivalent, numbered 1000 or above. Statistical Sciences 1024A/B can be used to meet 0.5 of the 1.0 mathematics course requirement. Applied Mathematics 1413 or Calculus 1000A/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.
Antirequisites	All other courses or half courses in Introductory Statistics except Statistical Sciences 1023A/B, Statistical Sciences 2037A/B and Statistical Sciences 1024A/B.
Pre,Co-requisites	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. You can be deregistered at any time even after writing the final exam. 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
Warning	
Lecture Hours	Mon,Wed,Fri 1:30 PM-2:30 PM SEB 1059;
Tutorial Hours	Thu 11:30 AM-12:30 PM WSC 55

Book Information

Text Book(s)

Custom course package: "Probability and Statistics for Engineers and Scientists" by Anthony Hayter – 4th edition (in the UWO bookstore)



OR

You can buy a used/new copy of “Probability and Statistics for Engineers and Scientists” by Anthony Hayter (4th edition) – same text as used in Stats 2141A

Course Objectives

Approximate Course Outline (time given to cover the material are just estimates)

Chapter 1 – Probability (1.1 to 1.7) (1.5 weeks)

Chapter 2 – Random Variables (2.1 to 2.4, 2.6 [skip 2.5]) (1.5 weeks)

- Discrete and Continuous, Expectation, Variance, Combinations and Functions of Random Variables

Chapter 3 – Discrete Probability Distributions (3.1 to 3.4) (1 weeks)

- Binomial, Geometric and Negative Binomial, Hypergeometric, Poisson

Chapter 4 – Continuous Probability Distributions (4.1 to 4.4) (1 week)

- Uniform, Exponential, Gamma, Weibull

Chapter 5 – Normal Distribution (5.1 to 5.4) (1.5 weeks)

- Probability Calculations, Linear Combinations, Normal Approximation to Binomial, Central Limit Theorem, Distribution Related to Normal

Chapter 6 – Descriptive Statistics (6.1 to 6.4) (0.5 week)

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

Chapter 8 – Inference About a Population Mean (8.1 to 8.3) (1.5 weeks)

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

Chapter 9 – Inference About Two Population Means (9.1 to 9.4) (1.5 weeks)

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

Chapter 12 – Simple Linear Regression and Correlation (12.1 to 12.9) (2 weeks)

- Regression model, Least squares equation, Coefficient of determination, Inference about the slope coefficient, Inference about dependent variable, Correlation

Chapter 11 – Analysis of Variance (11.1) (1 week)

- Single factor ANOVA, Multiple comparisons



Chapter 16 – Quality Control Methods (if time permits)

- Control charts (sections 16.1 to 16.4)

Assessment

Assignments and/or Quizzes

Tutorials

A tutorial hour has been set aside every Thursday from 11:30 to 12:20 pm in the WSC 55. Some tutorials will be used for 4 quizzes. The other tutorials will be used to expand on material covered during the regular lecture hours, including giving extra examples that students will work on during the tutorial.

Tutorial Quizzes:

There will be FOUR 30-minute quizzes held during the tutorials on the following Thursdays from 11:35 to 12:15. The quizzes will be held in WSC 55:

1	January 22	2	February 12	3	March 19	4	April 2
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The topics to be covered for each quiz will be stated in class and on the course web site on the Monday before the quiz date.

Midterms or Tests

2-hour multiple-choice exam – Scheduled TBA

Missed Midterm

If you have any conflict, you must check with your instructor as soon as possible (and prior to the exam). The policy of the department of Statistical and Actuarial Sciences is that there will be **no make-up exams for missed midterms**. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam

Final Exam

The final exam will be scheduled for the final exam period in April. It will be a 3-hour exam covering the whole term, with emphasis on material covered since the midterm. It will be part multiple choice and part written answer. Do not make travel arrangements until you know your exam schedule; holding an airline ticket is *not* an acceptable reason to miss the final exam.



Evaluation

	Original	If you do poorly on mid term
Quizzes (best 3 out of 4)	15%	15%
Mid Term	34%	21%
Final Exam	51%	64%

The marking scheme that gives the higher final mark will be the one used.

Computing and/or Calculator Requirement

You will also need a pocket calculator for quizzes, the mid term and the final exam.

Only non-programmable calculators may be used for the mid term and final exam.

What To 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.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Department Policy on Missed Course Requirements and Student Health and Wellness

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 your Dean's office as soon as possible, and contact your instructor immediately. If accommodation is approved by your Dean's office, your instructor will be notified, then it is your responsibility to make alternative arrangements with your instructor. 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.stats.uwo.ca/accommodation_medical.pdf. A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility.



The form can be found at: <http://www.stats.uwo.ca/medicalform.pdf>. Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

Missed Midterm or Test: The policy of the department of Statistical and Actuarial Sciences is that there will be no make-up exams for a missed midterm. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

Student Health and Wellness: As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page <http://www.music.uwo.ca/>, and our own McIntosh Gallery <http://www.mcintoshgallery.ca>. Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html.

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

Email 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 see your instructor during their scheduled office hours or by appointment. If you do e-mail them, please use your UWO account, as these are often the only emails read (as e-mails sent from other addresses often get spammed).

Attendance

The Department of Statistical and Actuarial Sciences views classroom attendance as a very important part of the learning process. You are expected to attend all classes and tutorials. If you miss too many classes, you may be debarred from writing the final examination.

Attendance at all lectures is required. If you must miss a lecture, it's your responsibility to get notes and any other information you may have missed from a classmate. I will not provide people with notes if a class is missed.

You are expected to read the text sections covered in class, and will be tested on material from the text whether or not it was covered in the lectures, and sometimes I will lecture "outside of the text." Your key to success is coming to class and taking good notes. If you are going to miss a class, find a way to get the notes from a classmate.

Classroom Environment

The Department of Statistical and Actuarial Sciences has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full text of the policy can be found on the departmental web page, www.stats.uwo.ca, by clicking on the "Undergraduate" section. In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principles of **courtesy, respect and honesty**.