



## Applied Probability and Statistics for Engineers 2013/2014

[Statistical Science 2141A Section 001](#)

### Course Outline

#### Instructor Information

<b>Instructor</b>	<a href="#">Zinovi Krougly</a>
<b>Office</b>	WSC 270
<b>Email</b>	zkrougly@stats.uwo.ca
<b>Phone</b>	519-661-2111 ext 88007
<b>Office Hours</b>	Mon,Wed,Fri 2:30 PM-3:30 PM;

#### Course Information

<b>Course Description</b>	An introduction to statistics with emphasis on the applied probability models used in Electrical and Civil Engineering and elsewhere. Topics covered include samples, probability, probability distributions, estimation (including comparison of means), correlation and regression. Cannot be taken for credit in any 3-year or honors program or in any module in Statistics, Actuarial Science, or Financial Modelling.
<b>Prerequisites</b>	Applied Mathematics 1413, or either Calculus 1000A/B or 1100A/B plus either Calculus 1301A/B or 1501A/B.
<b>Antirequisites</b>	All other courses or half courses in Introductory Statistics except Statistical Sciences 1023A/B, Statistical Sciences 1024A/B.
<b>Pre,Co-requisites Warning</b>	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
<b>Lecture Hours</b>	Mon,Wed,Fri 1:30 PM-2:30 PM SEB 1059;
<b>Tutorial Hours</b>	Wed 5:30 PM-6:30 PM SSC 2050

#### Book Information

##### Text Book(s)

Probability and Statistics for Engineers and Scientists, 4th ed., by Anthony Hayter

#### Course Objectives

##### Approximate Course Outline

##### Chapter 1 – Probability Theory

Probabilities, Events, Union, Intersection, Conditional Probability, Bayes' Theorem,



Counting Techniques

**Chapter 2 – Random Variables**

Discrete and Continuous Distributions, Expectation, Variance, Combinations and Functions, Joint Distributions, Correlation, Covariance

**Chapter 3 – Discrete Probability Distributions**

Binomial, Geometric, Negative Binomial, Hypergeometric and Poisson Distributions

**Chapter 4 – Continuous Probability Distributions**

Uniform, Exponential, Gamma and Weibull Distributions

**Chapter 5 – Normal Distribution**

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

**Chapter 6 – Descriptive Statistics**

Data Presentation, Charts, Histograms, Sample Statistics, Mean, Median, Variance, Coefficient of Variation, Outliers, Percentiles

**Chapter 7 – Statistical Estimation and Sampling Distributions**

Point Estimates and their Properties, Sampling Distributions, Construction Parameter Estimates

**Chapter 8 – Inferences on a Population Mean**

Confidence Intervals, Hypothesis Testing (Variance known/unknown)

**Chapter 9 – Comparing Two Population Means**

Two Independent Samples Confidence Intervals and Hypothesis Testing, Paired Samples

**Chapter 12 – Simple Linear Regression and Correlation**

Regression, Inferences on the Slope Parameter, Prediction Intervals, Coefficient of Determination, Residual Analysis, Correlation Analysis



## Chapter 16 – Quality Control Methods

Statistical Process Control, Variable Control Charts, Attribute Control Charts

### Assessment

#### Assignments and/or Quizzes

**Quizzes:** There will be four quizzes held during the tutorials on the following Wednesdays  
 from 5:30 PM to 6:20 PM.

The quizzes will be held in the SSC-2050:

- 1 -- September 25
- 2 -- October 16
- 3 -- November 13
- 4 -- November 27

The topics to be covered for each quiz will be stated in class and on the course website on Monday before the quiz date. The best 3 out of the 4 quizzes will count toward your final mark.

#### Midterms or Tests

Two-hour multiple-choice exam:TBA

#### Final Exam

The final exam will be a three-hour examination covering all material in the course,with emphasis on material covered since the midterm. It will be scheduled in December by the Registrar's office. 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

	scheme 1	scheme 2
Quizzes (best 3 out of 4)	15%	15%
Midterm	34%	21%
Final Exam	51%	64%

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

### Department Policy on Missed Course Requirements

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](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.

### **Email Communication**

You are welcome to communicate with your instructor by email, but email 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 email them, please use your UWO account, as these are often the only emails read (as emails sent from other addresses often get spammed).

### **Attendance**

Classroom attendance is viewed as an important part of the learning process. Students are advised that excessive absenteeism may result in the student being disbarred from the final exam (see Western Academic Calendar).

### **Classroom Environment**

The Department 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 at: [http://www.stats.uwo.ca/mutual\\_expectations.pdf](http://www.stats.uwo.ca/mutual_expectations.pdf). 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.