

The University of Western Ontario  
Department of Statistical and Actuarial Sciences  
**STATISTICAL SCIENCE 2143B – 2018**

<b>Instructor</b>	<b>Sec</b>	<b>Day/Time</b>	<b>Location</b>	<b>email</b>	<b>Office/Phone (519-661-2111)</b>
Dr. David Stanford	001	M 1:30-2:30	UCC-146	stanford@stats.uwo.ca	WSC 211, x83612
Dr. David Stanford	001	WF 1:30-2:30	SEB- 2200	stanford@stats.uwo.ca	WSC 211, x83612
Dr..Azaz Sharif	002	MWF 1:30-2:30	3M - 3250	asharif@stats.uwo.ca	WSC 285, x86992

**Prerequisite(s):**

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.

**Anti-requisite(s):**

All other courses or half courses in Introductory Statistics except Statistical Sciences 1023A/B, Statistical Sciences 2037A/B and Statistical Sciences 1024A/B.

**Students are advised that they 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.**

**Reference Book**

1. Probability and Statistics for Engineering and the Sciences (9<sup>th</sup> Edi) – by Jay Devore

**Course Objectives**

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.

**Course Outline (with “approximate” length of time for each chapter):**

<b>Chapter</b>	<b>Topics</b>
<b>1 – Descriptive Statistics (1 week)</b>	Graphing Data, Sample Statistics: Mean, median; Variance, IQR, Percentiles, Outliers
<b>2 – Probability (1 week)</b>	Not included in the custom text book
<b>3 – Random Variables (1 week)</b>	Discrete and Continuous Random Variables; Expectation; Variance; Combination, Functions of Random Variables
<b>4 – Discrete Probability Distributions (1 week)</b>	Binomial; Poisson
<b>5 – Continuous Probability Distributions (1 week)</b>	Uniform; Exponential; Gamma
<b>6 – Normal Distributions (1 week)</b>	Normal Curve Calculation; Linear Combination, Normal Approximation to Binomial, Multivariate Normal
<b>7 – Inference about single population: Estimation &amp; Hypothesis Testing (2 week)</b>	One Sample Hypothesis Testing and Confidence Interval (variance known/unknown)
<b>8 – Inference about two population: Estimation &amp; Hypothesis Testing (2 week)</b>	Two Samples Hypothesis Testing and Confidence Interval (independent and paired samples)
<b>11 – ANOVA and Design of Experiments (1 week)</b>	One Factor ANOVA; Randomized Block Design; Multiple Comparison Tests
<b>12 – Correlation and Simple Regression Analysis (1 weeks)</b>	Correlation, Regression models; Least Squares Equation, Coefficient of Determination, Inference about Slope Coefficient; Inference about Dependent Variable.

**Midterm Exams (35%) (1 hour exams)**

1. Exam 1: **Monday, February 12, 2018, 1:30 pm to 2:30 pm** (Topics TBA)
2. Exam 2: **Monday, March 12, 2018, 1:30 pm to 2:30 pm** (Topics TBA)

**Final Exam (50%)**

**Scheduled for the final exam period.** The final exam will be a 3-hour exam covering material ONLY since Midterm Exam #2. It will NOT cover the whole year, but only the last one third of the material. It will consist of multiple-choice questions. A formula page will be provided.

**Cellular phones, iPods, and other similar technology are *not* permitted in the exam room.** This means that cellular phones, iPods, and other similar technology **cannot** be used as a timekeeper/clock, calculator, or for any other purpose

**You will also need a non-programmable calculator for all exams/in-class tests.**

**In-class Clickers (15%)**

- Anytime during the class time
- **90% legitimate attempt will award you 100% clicker marks**
- There will be trail period to make sure that clicker works

**Evaluation**

	<b>Percent</b>
Clickers	15%
Mid Term 1	17.5%
Mid Term 2	17.5%
Final Exam	50%

### **Statistics Help Centre**

The help centre is a “drop in” centre and is located in room 275, Middlesex College. It will be staffed by TA’s from the Statistics department. It is usually open from 10:00 a.m. to 4:00 p.m., Monday to Friday (starting 3<sup>rd</sup> week of January). This is an excellent resource for one-on-one help.

### **Course OWL Web Page**

The web page will contain various things throughout the year:

1. A copy of this course outline
2. Updates and information about the course that you need to know
3. Marks of tests as they are marked.

### **Classroom Environment**

We have 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 Statistical and Actuarial Science departmental web page, [www.stats.uwo.ca](http://www.stats.uwo.ca), by clicking on the “Undergraduate” section]. In summary, all interactions between students and faculty should be governed by the principles of **courtesy, respect and honesty**.

**Students are encouraged to ask questions in the class.** But cell phones should be turned off before class/during class, and any unnecessarily loud talking among students is to be discouraged. The goal is to reduce any behaviour by students that may disrupt other students

### **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. You are advised that excessive absenteeism may result in being debarred from the final examination.

### **Policy on e-mail communication**

E-mail can be an efficient and effective way to communicate with your Professor, but it should be used very rarely, only to provide us with information or to ask a question that requires a very brief response. We do not wish to see emails that ask “What did I miss in class today?”. For more lengthy discussions, you should raise questions after class or during office hours, or make a separate appointment if necessary. Please remember that we will only read e-mails from your UWO student account. E-mails from other accounts (e.g. hotmail, yahoo, etc.) will not be read. **Please conduct yourselves professionally if you choose to e-mail your Professor.**

### **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](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.

### **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://www.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: [http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)

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

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

### **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.