The University of Western Ontario
Department of Statistical and Actuarial Sciences
STATISTICAL SCIENCE 2143B – 2019

Instructors	Sec	Day/Time	Location	email	Office
Dr. David Stanford	001	MWF 1:30-2:30	MC-110	stanford@stats.uwo.ca	WSC 211
Dr..Azaz Sharif	002	MWF 1:30-2:30	3M - 3250	asharif@stats.uwo.ca	WSC 105

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 <u>any time</u> if they lack the prerequisite or have taken an anti-requisite course.

Reference Book

1. Probability and Statistics for Engineering and the Sciences (9th 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):

Chapter	Topics
1 – Charts & Graphs (1 week)	Introduction, Graphing representation of sample data
2 – Descriptive Statistics (1 week)	Sample Statistics: Mean, Median; Variance, Intra-quartile range, Percentiles, Outliers
3 – Probability (1 week)	Basic Probability and rules to calculate probabilities
4 – Discrete Probability Distributions (1 week)	The Binomial and Poisson distributions
5 – Continuous Probability Distributions (1 week)	The Uniform, Exponential, Gamma and Normal distributions
6 – Sampling Distributions, LLN, CLT, Normal Distributions (1 week)	Sampling distribution of the Mean, the Law of Large Numbers, the Central Limit Theorem, Normal Curve Calculation; Linear Combination, Normal Approximation to Binomial
7 – Inference about population: Estimation (1 week)	One- and Two-sample Confidence Intervals (variance known/unknown)
8 – Inference about population: Hypothesis Testing (1 week)	One- and Two-sample Hypothesis Testing (for independent samples and for paired samples)
9 – Correlation and Simple Regression Analysis (1 weeks)	Correlation, Regression models; Least Squares Equation, Coefficient of Determination, Inference about Slope Coefficient; Inference about Dependent Variable.
10 – Multiple Linear Regression (1 Week)	Regression models where there is more than one independent variable
10 – ANOVA and Design of Experiments (1 week)	One Factor ANOVA; Randomized Block Design; Multiple Comparison Tests
12 – Statistical Process Control (SPC) (1 week)	Control Charts for variables and attributes

GRADING & MEANS OF EVALUATION:

In-class Clickers (10%)

- Can arise anytime during the class time
- **To obtain 100% clicker marks, you must have managed to record 90% coherent responses (but need not be the right answer)**
- There will be trail period to make sure that clicker works

Weekly Quizzes or Activities (15%)

- Every week students must complete an online activity OR a quiz.
- **3 weekly activities worth 6% and 9 weekly quizzes worth 9% of the course grade**
- Activities and quizzes are due every Friday by the stipulated time (may be class time)

Group Submissions (20%)

- There will be five group works spread throughout the semester
- **Students will be assigned in a group consists of 5 students and each group member will lead one of these group works.**
- Monday classes and Thursday tutorials are devoted to help students for their group work related queries

Midterm Exam (15%) (1.5 hour exam)

Location, date, time, and syllabus: **TBA**
Format: a mix between written and MC alternatives

Final Exam (40%)

Scheduled during the final exam period. The final exam will be a 3-hour exam.
Location, date, time, and syllabus: **TBA**
Format: a mix between written and MC alternatives

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

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

Evaluation

	Percent
Clickers	10%
Quiz/Online Activity	15%
Group Submissions	20%
Mid Term	15%
Final Exam	40% (must pass)

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 3rd 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, 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 rarely, only to provide us with information or to ask a question that requires a very brief response. We will not respond to see emails with themes such as "What did I miss in class today?". For more lengthy discussions, you should raise questions after class or during office hours and/or Monday lectures, or make a separate appointment if necessary; that is what these times are for. 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

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: https://www.uwo.ca/health/

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

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 meet your documented accessibility needs.. You may also wish to contact Services for Students with Disabilities (SSD) by phone at 519-661-2147 OR by email at ssd@uwo.ca if you have questions regarding accommodation.