The University of Western Ontario

SOCIOLOGY 2205A
Statistics for Sociology
Fall 2022
Tuesdays, 1:30-4:30pm, SH-3345
In-person

Instructor: Patrick Denice, Assistant Professor
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Office Hours: Wednesdays, 2:00-4:00pm, in person or over Zoom; to schedule: https://calendly.com/patrickdenice/15min

Teaching Assistants:	**TAs' Office Hours:**
TBD (email)	TBD
TBD (email)	TBD
TBD (email)	TBD
TBD (email)	TBD

Each student will be assigned to a primary TA. Your primary TA will mark your work and serve as your best resource for getting help and answering questions. See the Overview page on our OWL course site for your primary TA assignment.

Course Description: An introduction to the techniques of statistical analysis used by sociologists, including descriptive statistics, the normal curve, hypothesis testing, and various measures of association.

Prerequisite(s): None.

Anti-requisite(s): Biology 2244A/B, Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B, MOS 2242A/B, the former Psychology 2810, the former Psychology 2820E, Psychology 2811A/B, Psychology 2830A/B, Psychology 2850A/B, Psychology 2851A/B, Social Work 2207A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Statistical Sciences 2858A/B.

Course Objectives and Learning Outcomes: Much of what we know about the world around us comes from statistics. We are inundated by the media with statistical claims about our society—what we believe and think, what we buy, how well we are doing financially, etc. But how do we evaluate what we read, hear, and see? How do we use statistics to make honest assessments of social processes, rather than to simply confirm our preconceived notions?

In this introductory course in statistics, we will cover the basics of descriptive and inferential statistics. Descriptive statistics involve organizing and summarizing key characteristics of data. The techniques of inferential statistics guide informed judgments about the unknown characteristics of a population based on the known characteristics of a sample. We will also measure and evaluate our uncertainty about those judgments.

Throughout, we will draw on real-world examples from social science, including public opinion polls, surveys, and economic data. In addition to learning the basics of statistical analysis, this course will also introduce students to the use of computing software (Stata) for data analysis.

The emphasis of this course will be on a combination of computation, understanding the process of analysis, and interpreting our results. No prior knowledge of statistics is assumed or required, although students should have a working knowledge of algebra.

By the end of the term, students will be able to:

1. Recognize the terminology and techniques of basic statistical analysis.
2. Compute and interpret descriptive statistics by looking at summary measures (e.g., mean, median, mode, percentiles, standard deviation) and common graphical tools (e.g., tables, bar plots, histograms, etc.).
3. Decide on and carry out the appropriate statistical test to use in real-life research contexts.
4. Gain basic familiarity with the statistical software package Stata in order to explore and interpret relationships in social science survey data.
5. Be aware of and critically consume statistical information encountered in everyday life.
6. Read and evaluate empirical, quantitative sociological research.

Course Materials:

Textbook: We will rely primarily on the following textbook:

> Illowsky, Barbara, and Susan Dean (2018). *Introductory Statistics*. OpenStax, Rice University.

It is available for ***free*** at the following website: https://openstax.org/details/books/introductory-statistics. You can find the link on our OWL course site.

You have the option of viewing the book's chapters online or downloading a PDF version. Each chapter has many examples and "try it" problems throughout, as well as practice questions at the end. You do *not* need to complete these, although you may find them helpful for reviewing the material and checking your understanding. You can also skip the "Using the TI-83 Calculator" sections.

Assigned readings from the textbook are labeled **IS** in the course schedule below.

Statistical Software: The focus of this course is on helping you learn basic statistical concepts and tools, which is often aided by analyzing real data using statistical analysis software. Throughout the term, we will gain basic familiarity with the software package called **Stata**. More information on using Stata will follow in the first few weeks of class.

Students have two choices for obtaining Stata on their personal computers:

1. *Strongly recommended:* You can download a copy of Stata to your own computer by purchasing a **6-month** license for $48 USD (about $60-65 CAD).[1] Be sure to purchase the **Stata/BE** version of the program (the SE or MP versions are only necessary for very large datasets, which we won't be using in this class). You have the option of purchasing a license for a longer period (e.g., annual or perpetual), but these are more expensive, and 6 months will more than suffice for our class. To purchase Stata, go to: https://www.stata.com/order/new/edu/profplus/student-pricing/.

2. You may also use Stata for free through the MyVLab remote access interface. To set up MyVLab on your personal computer, visit https://myvlab.uwo.ca/. My recommendation is that you log onto the Web Client, rather than downloading and using the VMWare Horizon Client. Please also note that I must register our class for you to have access to Stata through MyVLab. So, if you don't immediately see Stata on your MyVLab desktop, allow me and the Social Science Technology Services staff about a week after the start of classes to get everyone registered. If after that point, you still don't see Stata, talk to me in class or send me an email.

Calculator: You will need a calculator for this class. It should be able to take square roots and work with square roots. You won't need anything fancier than that, and it shouldn't run you more than about $20. Note that for in-class exams, you will *not* be able to use the calculator on your phones.

Clicker: As a way to get some practice, and to maximize students' engagement with the material, we will be using iClickers. This is a *free* app (Western has purchased a university subscription) that can be downloaded to your smart phone, laptop, or tablet. This is required, as we will sometimes use the clickers to record our responses to in-class exercises (see below). Please create an account at https://presswestern.uwo.ca/students_and_audience/getting_started.html. You can also download the app for your smart devices. Again, this is a free app, and you do not need to purchase anything to use the software.

Additional Materials: Additional readings and materials will be made available through the course website on OWL.

Communication: Students are responsible for checking the *OWL course website* on a regular basis for news, updates, assignments, and additional materials. This is the primary method by which information will be disseminated to all students in the class. I will also announce any

[1] Part of the reason we're using a free, open-source textbook this term is to help lessen the financial burden of the class, given the option to purchase Stata.

upcoming deadlines or changes to the course schedule in class. If you miss a class, check first with a *classmate* for any announcements, notes, or other materials.

If you have a specific question or issue, reach out to your *primary TA*. If you have a question for me, you may send me an *email* (pdenice@uwo.ca). I typically respond to students within 24-48 business hours.

Students are also strongly encouraged to meet with your TAs or with me, individually or in small groups, during our *office hours*.

Method of Evaluation:

The evaluation methods listed and described below are essential requirements for the course.

1.	Survey Data Collection	5%
2.	In-Class Exercises	10%
3.	Problem Sets (4)	50%
4.	Final Exam	35%

Survey Data Collection (5%): At the beginning of the term, we're going to be collecting some survey data from our peers. The goal is to help us see where data come from. And we will analyze these data throughout the term. We'll talk more about this on the first day of class. This is also an easy opportunity for points: Students will receive *full credit* if they complete this assignment in full and on time. For those who do not complete this assignment, we will simply reweight your course mark without this component.

In-Class Exercises (10%): There will be approximately eight (8) short in-class exercises carried out at various points throughout the term to assess understanding of current topics or to practice using Stata. We'll complete these either using iClickers or on paper. They are intended to be very low stakes; for most of them, you will not be evaluated based on whether you get the right answers, only that you tried and answered all the questions. Additionally, we will only count 6 of the 8 in-class exercises toward your course mark. In other words, each student is permitted to miss or skip up to 2 of the in-class exercises. This serves as a *universal accommodation* available to all students, for any reason, and with no need for documentation. In-class exercises are unannounced, and there will be no make-ups offered.

Problem Sets (50%): In statistics, as in life, practice makes habit. As such, there will be four (4) problem sets to provide you with the opportunity to practice what we learn—including what we do in Stata—in a relatively low-stakes, non-test environment. To reflect the increasing complexity of what we learn throughout the semester, each problem set is worth an increasing share of your course mark (10%, 12%, 12%, and 16%) for a total of 50% of your overall grade. Students may work together on their problem sets, but each must turn in their own assignment reflecting their own effort and work. Problem sets can be accessed and submitted through OWL's Assignments tab. They are posted at the end of the prior week's class, and they are due at the start of the week's class they are listed. For example, Problem Set 1 is listed during Week 4

in the course schedule below. It will be made available to students on OWL at 4:30pm on Tuesday, September 27, and it will be due on Tuesday, October 4 at 1:30pm.

Final Exam (35%): There will be a final exam scheduled for the regular end-of-term exam period. The exam will be comprised of conceptual and computational multiple-choice questions. This exam will *not* test your memorization of statistical formulas; instead, you will be asked to know when and how to employ the statistical concepts and formulas that we discuss in class. Students will be given a list of formulas and scratch paper for their reference during the exam, and they will be allowed to use a calculator (although students may not use the calculator on their phones).

Students with an approved absence from an in-class exam will be required to write a makeup exam. The course professor or TAs may not be available to respond to questions during the makeup exam. Students should be aware that the makeup exam will not necessarily be in the same format, be of the same duration, or cover the same material as the original exam. If there is no approved justification for a missed exam, the student will receive a mark of zero for that exam.

Computer-marked multiple-choice exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Additional Notes About Grading: There will be no opportunities for extra credit. I encourage you to work consistently throughout the semester, and to reach out to other students in the class, the TAs, or me as soon as you have trouble with the material. Consistent with departmental guidelines, it is expected that the class average for this course will be around 70-75%. Should the final overall grades yield a value significantly below this range, grades will be adjusted upward to ensure an appropriate mean for the class.

Contingency Plan for an In-Person Class Pivoting to 100% Online Learning: In the event of a COVID-19 resurgence during the course that necessitates the delivery of our course moving away from face-to-face interactions, affected course material will be delivered entirely online and asynchronously through OWL. The grading scheme will not change. Any remaining assessments will also be conducted as determined by the course instructor.

Student Absences: If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below:

Assignments worth less than 10% of the overall course grade: In this class, we only have one assignment worth less than 10% of your overall course mark. Students will receive full credit if they complete the Survey Data Collection assignment in full and on time. For those who do not complete this assignment, we will simply reweight your course mark without this component.

Assignments worth 10% or more of the overall course grade: For work totaling 10% or more of the final course grade (i.e., problem sets), students must provide valid medical or supporting documentation to their Home Faculty Academic Counselling Office as soon as possible. In most cases, students with approved accommodations will be granted a one-week extension. If a

student's situation requires a longer absence or extension, the assignment will be dropped, and their overall course grade will be reweighted without it.

Absences from final examinations: Students must provide valid medical or supporting documentation to their Home Faculty Academic Counselling Office as soon as possible. Academic Counselling will determine eligibility to write a Special Examination (the name given by the University to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

Note: Missed work can only be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is not sufficient on its own. Students should check the Western website to see what directives for Covid are to be followed. Western has been and will continue to follow directives established by the Middlesex-London Health Unit. That directive will state whether students should or should not come to campus/class and any other requirements (e.g., masks are mandatory). Please check on your own and do not email the instructor, the Department Undergraduate Advisor/Coordinator, or the Faculty of Social Science Academic Counselling Office.

Course Schedule and Readings

Please note: This outline is subject to change over the course of the term in order to meet the needs of the class. Any changes will be announced through our OWL course website. Readings and assignments are to be completed prior to the date they are listed.

Week / Date		Topics	Readings and Deadlines
Part I: Descriptive statistics			
1	Sept. 13	What is statistics? Data measurement	**IS:** Ch. 1 (intro + sections 1.1-1.3)
2	Sept. 20	Organizing our data **Stata Lab 1:** The basics	**IS:** Ch. 2 (intro + sections 2.1-2.3) **OWL:** Stata Lab 0 (install Stata on your computer)
3	Sept. 27	Describing our data	**IS:** Ch. 2 (sections 2.5-2.7) **Survey Data Collection due**
4	Oct. 4	Probability **Stata Lab 2:** Describing data	**IS:** Ch. 3 (intro + sections 3.1-3.4), Ch. 4 (intro + sections 4.1-4.3), Ch. 5 (intro + section 5.1) **Problem Set 1 due**
5	Oct. 11	The Normal curve Calculating *z*-scores	**IS:** Ch. 6 (intro + sections 6.1-6.2)
Part II: Inferential statistics			
6	Oct. 18	Samples and populations **Stata Lab 3:** Graphs	**IS:** Ch. 7 (intro + sections 7.1-7.3), Ch. 8 (intro + sections 8.1-8.3) **Problem Set 2 due**
7	Oct. 25	Hypothesis testing: Differences in means	**IS:** Ch. 9 (intro + sections 9.1-9.6), Ch. 10 (intro + sections 10.1-10.4)
	Nov. 1	*Reading Week*	*Enjoy the break!*
8	Nov. 8	Hypothesis testing: Proportions **Stata Lab 4:** Testing differences	**IS:** Continue with Week 7's readings

9	Nov. 15	Nonparametric test of significance **Stata Lab 5:** Chi-square	**IS:** Ch. 11 (intro + sections 11.1, 11.3, 11.4) **Problem Set 3 due**
10	Nov. 22	Correlation	**IS:** Ch. 12 (intro + sections 12.1-12.5)
11	Nov. 29	Regression **Stata Lab 6:** Correlation & regression	**IS:** Continue with Week 11's readings
12	Dec. 6	Regression, continued Final exam review	**Problem Set 4 due**

Final Exam – Date & Time TBD (set by Registrar)
The examination period is December 10 to 22.

The Department of Sociology runs one makeup exam for the final exam: Friday, January 13, 12:00-3:00pm, location TBD. For students who have an excused absence from the final exam, this will be your only opportunity to make it up.

Important Policies

Academic Consideration for Missed Work: Students must provide valid medical or supporting documentation in order to receive accommodation for missed work worth 10% or more of the final grade in the course. All required documentation for absences must be submitted to the Academic Counselling office of a student's Home Faculty. Individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds or for other reasons.

Western's policy on Accommodation for Medical Illness can be found at www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf. The student medical certificate is available at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation: When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

All students pursuing academic consideration, regardless of type, must contact their instructors no less than 24 hours following the end of the period of absence to clarify how they will be expected to fulfill the academic responsibilities missed during their absence. Students are reminded that they should consider carefully the implications of postponing tests or midterm exams or delaying submission of work and are encouraged to make appropriate decisions based on their specific circumstances.

Accessibility Options: Students with disabilities or accessibility challenges should work with Accessible Education (formerly SSD, http://academicsupport.uwo.ca/accessible_education/index.html), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: Academic Accommodation for Students with Disabilities. Information regarding accommodation of exams is available on the Registrar's website: www.registrar.uwo.ca/academics/examinations/accommodated_exams.html

Scholastic Offences: 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: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

A Note on Plagiarism: Students must write their assignments in their own words. Whenever students take an idea from another author, they must acknowledge their debt both by using

quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major scholastic offence.

Plagiarism Checking: All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (https://www.turnitin.com/).

Mental Health: Students who are in emotional/mental distress should refer to Mental Health@Western (www.uwo.ca/health/mental_wellbeing/index.html) for a complete list of options how to obtain help.

Please visit the Social Science Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: Academic Counselling - Western University (uwo.ca).

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at https://www.uwo.ca/health/student_support/survivor_support/get-help.html .To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Copyright of Lectures and Other Course Materials: Any materials created by the instructor (e.g., videos, notes, hand-outs, summaries, slide decks, assignments, exams, etc.) are protected by copyright law and may not be copied or distributed in any form without the explicit permission of the instructor. Any non-authorized use of these materials constitutes an academic offense.

Disputing a Grade: Students who wish to dispute an assignment, exam, or course grade must write a one-page explanation justifying why their work should be re-evaluated. Work will not be re-evaluated on the basis that students were sick or feeling stressed when completing the assignment. Please be advised that a student's mark may go up or down upon re-evaluation.

Rounding of Marks: Final marks, irrespective of the number of decimal places used in marking individual assignments and exams, will be calculated to one decimal place and rounded to the nearest integer (e.g., 74.4 becomes 74, 74.5 becomes 75). Marks will not be bumped to the next grade or GPA (e.g., a 79 will not be bumped up to an 80). The mark attained is the mark you achieved; requests for mark "bumping" will go unanswered and will be denied.